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Innovation

# Invention, Knowledge Transfer, and Innovation

## Supplemental Tables

NSB-2020-4

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| S8-50 | Number of registered USPTO and EUIPO trademarks in the business sector of chemicals, by region, country, or economy: 1998–2018 |
| S8-51 | Number of registered USPTO and EUIPO trademarks in the business sector of clothing, by region, country, or economy: 1998–2018 |
| S8-52 | Number of registered USPTO and EUIPO trademarks in the business sector of construction, by region, country, or economy: 1998–2018 |
| S8-53 | Number of registered USPTO and EUIPO trademarks in the business sector of health, by region, country, or economy: 1998–2018 |
| S8-54 | Number of registered USPTO and EUIPO trademarks in the business sector of household equipment, by region, country, or economy: 1998–2018 |
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TABLE S8-1

## USPTO utility patents granted, by sector: 1998–2018

(Number)

| Owner and sector | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total | 147,576 | 153,592 | 157,595 | 166,158 | 167,400 | 169,077 | 164,384 | 143,891 | 173,822 | 157,331 | 157,788 | 167,463 | 219,848 | 224,871 | 253,633 | 278,518 | 301,643 | 299,382 | 304,126 | 320,003 | 308,853 |
| Assigned to foreign owner | 63,777 | 66,133 | 69,159 | 75,096 | 77,850 | 79,061 | 78,097 | 67,453 | 82,055 | 76,011 | 77,992 | 82,843 | 108,922 | 112,847 | 128,432 | 139,075 | 149,933 | 150,879 | 152,539 | 159,492 | 154,302 |
| Assigned to owner from unknown location | 42 | 26 | 38 | 44 | 50 | 37 | 23 | 177 | 213 | 233 | 220 | 238 | 281 | 274 | 250 | 353 | 384 | 376 | 434 | 397 | 595 |
| Assigned to U.S. owner | 83,757 | 87,432 | 88,398 | 91,018 | 89,500 | 89,979 | 86,264 | 76,261 | 91,554 | 81,087 | 79,577 | 84,382 | 110,645 | 111,749 | 124,951 | 139,090 | 151,326 | 148,127 | 151,153 | 160,114 | 153,956 |
| Academic | 3,432 | 3,628 | 3,308 | 3,438 | 3,496 | 3,497 | 3,261 | 2,876 | 3,518 | 3,213 | 3,022 | 3,264 | 4,514 | 4,413 | 5,040 | 5,619 | 6,081 | 6,177 | 6,628 | 7,002 | 6,885 |
| Business | 61,196 | 64,155 | 66,153 | 69,605 | 70,286 | 71,413 | 69,386 | 61,741 | 74,626 | 66,566 | 66,171 | 70,655 | 91,849 | 93,764 | 105,234 | 117,520 | 128,660 | 125,701 | 128,690 | 136,451 | 131,121 |
| Government | 1,130 | 1,095 | 1,047 | 1,137 | 1,122 | 1,078 | 1,019 | 844 | 1,008 | 946 | 905 | 931 | 1,257 | 1,195 | 1,358 | 1,446 | 1,429 | 1,376 | 1,299 | 1,340 | 1,310 |
| Individual | 17,279 | 17,862 | 17,282 | 16,366 | 14,116 | 13,535 | 12,173 | 10,473 | 11,996 | 10,034 | 9,197 | 9,204 | 12,546 | 11,892 | 12,789 | 13,903 | 14,397 | 14,060 | 13,875 | 14,330 | 13,572 |
| Other | 502 | 468 | 388 | 421 | 406 | 383 | 361 | 292 | 371 | 303 | 262 | 300 | 449 | 446 | 491 | 562 | 565 | 540 | 484 | 612 | 556 |
| Unclassified | 218 | 225 | 220 | 50 | 73 | 73 | 62 | 34 | 36 | 25 | 20 | 28 | 30 | 39 | 40 | 40 | 193 | 274 | 178 | 379 | 512 |

USPTO = U.S. Patent and Trademark Office.

**Note(s)**

Patents are allocated according to patent ownership information. Patents are credited on a fractional-count basis (i.e., for articles with collaborating institutions, each institution receives fractional credit on the basis of its proportion among participating institutions). Business covers the for-profit business sector. Government includes federal, state, local, and municipal and federally funded research and development centers. Other includes private nonprofits, including foundations, associations, nonacademic hospitals, and research-performing institutions.

**Source(s)**

Science-Metrix; PatentsView, USPTO, accessed June 2019.

*Science and Engineering Indicators*

TABLE S8-2

## U.S. university utility patent awards, by technology area: 1998–2018

(Number)

| Technology area | 1998–2018 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| All university patents | 92,311 | 3,432 | 3,628 | 3,308 | 3,438 | 3,496 | 3,497 | 3,261 | 2,876 | 3,518 | 3,213 | 3,022 | 3,264 | 4,514 | 4,413 | 5,040 | 5,619 | 6,081 | 6,177 | 6,628 | 7,002 | 6,885 |
| Biotechnology | 15,664 | 821 | 891 | 722 | 791 | 709 | 634 | 576 | 485 | 669 | 603 | 553 | 600 | 740 | 686 | 750 | 790 | 882 | 850 | 952 | 983 | 977 |
| Pharmaceuticals | 13,343 | 599 | 656 | 602 | 571 | 578 | 509 | 439 | 368 | 455 | 394 | 365 | 378 | 557 | 521 | 660 | 726 | 877 | 942 | 1,005 | 1,099 | 1,040 |
| Medical technology | 8,071 | 237 | 278 | 225 | 227 | 238 | 306 | 235 | 202 | 224 | 191 | 210 | 219 | 351 | 377 | 463 | 565 | 632 | 655 | 696 | 763 | 779 |
| Measurement | 6,675 | 189 | 224 | 213 | 225 | 219 | 257 | 292 | 247 | 283 | 267 | 282 | 283 | 347 | 376 | 389 | 404 | 393 | 417 | 439 | 456 | 473 |
| Organic fine chemistry | 6,350 | 242 | 231 | 245 | 250 | 296 | 250 | 206 | 201 | 250 | 214 | 190 | 220 | 308 | 253 | 355 | 376 | 418 | 427 | 472 | 480 | 464 |
| Computer technology | 4,507 | 122 | 97 | 90 | 111 | 115 | 115 | 132 | 110 | 164 | 163 | 159 | 172 | 254 | 258 | 304 | 333 | 356 | 345 | 383 | 363 | 361 |
| Analysis of biological materials | 4,501 | 181 | 160 | 129 | 163 | 145 | 144 | 140 | 124 | 148 | 155 | 182 | 176 | 273 | 257 | 250 | 301 | 308 | 288 | 298 | 350 | 331 |
| Electrical machinery, apparatus, energy | 3,108 | 88 | 99 | 80 | 80 | 89 | 100 | 113 | 99 | 123 | 99 | 93 | 98 | 166 | 132 | 156 | 178 | 218 | 234 | 265 | 301 | 298 |
| Optics | 3,034 | 101 | 104 | 128 | 102 | 142 | 136 | 151 | 145 | 151 | 140 | 134 | 134 | 155 | 126 | 167 | 156 | 176 | 182 | 175 | 175 | 153 |
| Semiconductors | 2,987 | 69 | 77 | 80 | 99 | 108 | 139 | 98 | 98 | 100 | 95 | 79 | 111 | 161 | 164 | 169 | 202 | 225 | 227 | 240 | 236 | 208 |
| Micro-structural and nano-technology | 2,279 | 38 | 34 | 46 | 49 | 65 | 79 | 92 | 88 | 109 | 110 | 105 | 105 | 141 | 158 | 145 | 187 | 183 | 184 | 143 | 123 | 93 |
| Chemical engineering | 2,233 | 78 | 86 | 78 | 76 | 71 | 97 | 87 | 81 | 80 | 71 | 69 | 69 | 111 | 99 | 119 | 137 | 139 | 157 | 167 | 189 | 172 |
| Macromolecular chemistry, polymers | 1,802 | 59 | 77 | 69 | 73 | 80 | 89 | 59 | 51 | 67 | 59 | 40 | 56 | 92 | 80 | 81 | 117 | 110 | 116 | 133 | 150 | 144 |
| Basic materials chemistry | 1,763 | 55 | 67 | 61 | 71 | 52 | 70 | 59 | 54 | 60 | 44 | 47 | 52 | 73 | 84 | 96 | 138 | 118 | 125 | 141 | 135 | 162 |
| Other special machines | 1,549 | 64 | 62 | 65 | 73 | 82 | 79 | 57 | 55 | 56 | 58 | 46 | 56 | 75 | 72 | 77 | 89 | 86 | 86 | 99 | 100 | 112 |
| Materials, metallurgy | 1,526 | 67 | 60 | 59 | 59 | 63 | 61 | 51 | 48 | 54 | 53 | 40 | 62 | 74 | 75 | 82 | 99 | 85 | 103 | 112 | 114 | 106 |
| Digital communication | 1,436 | 14 | 11 | 25 | 27 | 27 | 23 | 33 | 35 | 63 | 61 | 55 | 61 | 87 | 115 | 119 | 91 | 127 | 119 | 112 | 115 | 115 |
| Surface technology, coating | 1,325 | 38 | 51 | 62 | 57 | 57 | 58 | 50 | 45 | 40 | 48 | 43 | 36 | 66 | 61 | 74 | 79 | 79 | 82 | 87 | 103 | 108 |
| Telecommunications | 1,259 | 33 | 29 | 24 | 37 | 50 | 41 | 59 | 42 | 56 | 54 | 49 | 55 | 62 | 62 | 84 | 70 | 78 | 85 | 86 | 96 | 106 |
| Audio-visual technology | 1,073 | 50 | 42 | 32 | 44 | 38 | 41 | 38 | 35 | 52 | 39 | 36 | 37 | 44 | 40 | 67 | 70 | 55 | 74 | 77 | 88 | 74 |
| Environmental technology | 961 | 41 | 37 | 41 | 36 | 46 | 35 | 38 | 25 | 43 | 33 | 25 | 42 | 41 | 46 | 44 | 58 | 72 | 59 | 56 | 77 | 65 |
| Basic communication processes | 916 | 23 | 20 | 20 | 14 | 20 | 24 | 42 | 47 | 41 | 48 | 51 | 53 | 49 | 64 | 51 | 61 | 57 | 54 | 63 | 53 | 61 |
| Engines, pumps, turbines | 751 | 20 | 26 | 23 | 27 | 25 | 31 | 23 | 24 | 29 | 27 | 30 | 34 | 42 | 37 | 44 | 42 | 49 | 43 | 63 | 49 | 60 |
| Control | 686 | 24 | 18 | 20 | 19 | 23 | 24 | 20 | 19 | 31 | 24 | 14 | 21 | 33 | 31 | 37 | 49 | 47 | 41 | 54 | 69 | 68 |
| Food chemistry | 648 | 44 | 49 | 43 | 33 | 28 | 27 | 19 | 17 | 26 | 18 | 11 | 19 | 26 | 21 | 35 | 35 | 36 | 40 | 41 | 39 | 42 |
| Transport | 476 | 7 | 22 | 16 | 18 | 16 | 14 | 21 | 19 | 19 | 17 | 14 | 10 | 25 | 28 | 24 | 34 | 33 | 33 | 29 | 30 | 48 |
| Civil engineering | 441 | 17 | 20 | 22 | 14 | 19 | 15 | 20 | 18 | 9 | 15 | 10 | 12 | 17 | 23 | 19 | 29 | 27 | 32 | 35 | 31 | 37 |
| Mechanical elements | 431 | 15 | 16 | 19 | 18 | 19 | 17 | 19 | 14 | 18 | 18 | 11 | 9 | 17 | 20 | 23 | 30 | 29 | 26 | 26 | 39 | 30 |
| Textile and paper machines | 425 | 20 | 15 | 13 | 14 | 20 | 14 | 21 | 12 | 19 | 19 | 14 | 12 | 20 | 21 | 21 | 33 | 25 | 23 | 33 | 25 | 30 |
| Machine tools | 413 | 21 | 24 | 13 | 16 | 19 | 19 | 22 | 13 | 18 | 19 | 14 | 19 | 18 | 23 | 21 | 24 | 30 | 20 | 18 | 22 | 18 |
| IT methods for management | 301 | 8 | 6 | 6 | 6 | 2 | 5 | 3 | 10 | 14 | 12 | 15 | 13 | 21 | 26 | 22 | 26 | 34 | 15 | 18 | 18 | 20 |
| Thermal processes and apparatus | 276 | 13 | 11 | 7 | 11 | 10 | 15 | 14 | 10 | 11 | 10 | 8 | 8 | 12 | 10 | 9 | 17 | 19 | 15 | 19 | 19 | 28 |
| Other consumer goods | 272 | 12 | 13 | 11 | 6 | 9 | 7 | 8 | 5 | 5 | 13 | 4 | 6 | 12 | 15 | 16 | 18 | 17 | 18 | 26 | 30 | 20 |
| Handling | 217 | 9 | 7 | 3 | 5 | 7 | 5 | 5 | 5 | 4 | 6 | 4 | 1 | 9 | 8 | 14 | 16 | 18 | 20 | 21 | 25 | 26 |
| Furniture, games | 178 | 6 | 5 | 7 | 6 | 4 | 6 | 7 | 5 | 5 | 7 | 4 | 5 | 6 | 6 | 15 | 12 | 14 | 11 | 16 | 17 | 17 |

TABLE S8-2

## U.S. university utility patent awards, by technology area: 1998–2018

(Number)

| Technology area | 1998–2018 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Unclassified | 433 | 5 | 6 | 9 | 9 | 5 | 9 | 12 | 20 | 19 | 8 | 16 | 17 | 29 | 38 | 36 | 27 | 33 | 27 | 29 | 41 | 38 |

IT = information technology.

**Note(s)**

Patents are allocated according to patent inventorship information. Data include institutions affiliated with academic institutions, such as university and alumni organizations, foundations, university associations, and affiliated hospitals. Universities vary in how patents are assigned (e.g., to boards of regents, individual campuses, or entities with or without affiliation with the university). Patents are classified under the World Intellectual Property Organization (WIPO) classification of patents, which classifies International Patent Classification (IPC) codes under 35 technical fields. IPC reformed codes take into account changes that were made to the WIPO classification in 2006 under the eighth version of the classification and were used to prepare these data. However, because PatentsView only provides the original IPC codes as they appeared on patents and not the IPC reformed codes, current Cooperative Patent Classification codes on patents were converted back to the most recent IPC classification to prepare these statistics. Fractional counts of patents were assigned to each technological field on patents to assign the proper weight of a patent to the corresponding technological fields under the classification. For instance, a patent that is classified under five different technological fields will see each of its technological fields receive a 0.2 count of the patent, so that the patent accounts for a count of 1.0 across all technological fields. Patents were also fractionally allocated among regions, countries, or economies based on the proportion of residences of all assignees. As such, data across technical fields sum up to the total number of granted academic patents in the United States. Data across technical fields also sum up to the total number of patents granted by the U.S. Patent and Trademark Office.

**Source(s)**

Science-Metrix; PatentsView, USPTO, accessed June 2019.

*Science and Engineering Indicators*

TABLE S8-3

## Regions, countries, or economies in patent and trademark data

(Regions, countries, or economies)

| North America | Central and South America | Europe | Asia | Middle East | Africa | Australia and Oceania |
|---|---|---|---|---|---|---|
| Canada | Argentina | EU | China | Israel | South Africa | Australia |
| Mexico | Brazil | Austria | Mainland China | All others | All others | New Zealand |
| Puerto Rico | All others | Belgium | Hong Kong | Armenia | Algeria | All others |
| United States | Antigua and Barbuda | Denmark | Macau | Azerbaijan | Angola | Cook Islands |
| All others | Bahamas, The | Finland | India | Bahrain | Benin | Fiji |
| Greenland | Barbados | France | Japan | Iran | Burkina Faso | Kiribati |
| | Belize | Germany | Malaysia | Iraq | Cameroon | Marshall Islands |
| | Bolivia | Hungary | Singapore | Jordan | Chad | Nauru |
| | Chile | Ireland | South Korea | Kuwait | Congo, Democratic Republic of the | Palau |
| | Colombia | Italy | Taiwan | Lebanon | Congo, Republic of the | Samoa |
| | Costa Rica | Netherlands | All others | Oman | Côte d'Ivoire | Solomon Islands |
| | Cuba | Spain | Afghanistan | Qatar | Djibouti | Vanuatu |
| | Dominica | Sweden | Bangladesh | Saudi Arabia | Egypt | |
| | Dominican Republic | United Kingdom | Brunei | Syria | Eritrea | |
| | Ecuador | All others | Burma | United Arab Emirates | Eswatini | |
| | El Salvador | Bulgaria | Cambodia | Yemen | Ethiopia | |
| | Grenada | Croatia | Georgia | | Gabon | |
| | Guatemala | Cyprus | Indonesia | | Gambia, The | |
| | Guyana | Czechia | Kazakhstan | | Ghana | |
| | Haiti | Estonia | Kyrgyzstan | | Guinea | |
| | Honduras | Greece | Laos | | Kenya | |
| | Jamaica | Latvia | Nepal | | Liberia | |
| | Nicaragua | Lithuania | North Korea | | Libya | |
| | Panama | Luxembourg | Pakistan | | Madagascar | |
| | Paraguay | Malta | Papua New Guinea | | Mali | |
| | Peru | Poland | Philippines | | Mauritius | |
| | Saint Kitts and Nevis | Portugal | Sri Lanka | | Morocco | |
| | Saint Lucia | Romania | Tajikistan | | Namibia | |
| | Saint Vincent and the Grenadines | Slovakia | Thailand | | Niger | |
| | Suriname | Slovenia | Uzbekistan | | Nigeria | |
| | Trinidad and Tobago | Other Europe | Vietnam | | Rwanda | |
| | Uruguay | Former Soviet Union | | | Senegal | |
| | Venezuela | Belarus | | | Seychelles | |
| | | Moldova | | | Sierra Leone | |
| | | Ukraine | | | Tanzania | |
| | | Norway | | | Togo | |

TABLE S8-3

## Regions, countries, or economies in patent and trademark data

(Regions, countries, or economies)

| North America | Central and South America | Europe | Asia | Middle East | Africa | Australia and Oceania |
|---|---|---|---|---|---|---|
| | | Russia | | | Tunisia | |
| | | Switzerland | | | Uganda | |
| | | All others | | | Zambia | |
| | | Albania | | | Zimbabwe | |
| | | Andorra | | | | |
| | | Bosnia and Herzegovina | | | | |
| | | Iceland | | | | |
| | | Liechtenstein | | | | |
| | | Macedonia | | | | |
| | | Monaco | | | | |
| | | Montenegro | | | | |
| | | San Marino | | | | |
| | | Serbia | | | | |
| | | Turkey | | | | |
| | | Vatican City | | | | |

EU = European Union; USPTO = U.S. Patent and Trademark Office.

**Source(s)**

Science-Metrix; PatentsView, USPTO, accessed June 2019.

*Science and Engineering Indicators*

TABLE SB-4

## USPTO patents and patent families granted, by region, country, or economy: 1998–2018

(Number)

| Region, country, or economy | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| World | 147,576 | 277,564 | 153,592 | 314,454 | 157,595 | 266,166 | 166,158 | 248,980 | 167,400 | 245,560 | 169,077 | 274,493 | 164,384 | 295,870 | 143,891 | 305,833 | 173,822 | 362,101 | 157,331 | 382,920 | 157,788 | 363,851 | 167,463 | 374,766 | 219,848 | 413,662 | 224,871 | 479,973 | 253,633 | 549,778 | 278,518 | 573,229 | 301,643 | 585,523 | 299,382 | 579,049 | 304,126 | 659,434 | 320,003 | 677,380 | 308,853 | 676,256 |
| North America | 83,066 | 61,730 | 86,941 | 60,639 | 88,258 | 58,511 | 91,061 | 56,029 | 90,215 | 52,885 | 91,143 | 52,039 | 87,455 | 49,544 | 77,316 | 41,735 | 93,051 | 48,211 | 92,571 | 41,762 | 80,600 | 39,864 | 85,695 | 41,666 | 112,189 | 51,384 | 113,272 | 47,706 | 126,383 | 52,660 | 139,857 | 54,806 | 151,267 | 58,021 | 147,434 | 55,117 | 149,945 | 53,594 | 157,657 | 52,577 | 150,751 | 48,645 |
| Canada | 2,976 | 2,447 | 3,218 | 2,587 | 3,401 | 2,442 | 3,594 | 2,430 | 3,448 | 2,226 | 3,448 | 2,188 | 3,395 | 2,139 | 2,921 | 1,873 | 3,603 | 2,026 | 3,341 | 2,046 | 3,375 | 2,195 | 3,670 | 2,271 | 4,856 | 2,567 | 5,052 | 2,391 | 5,758 | 2,694 | 6,533 | 2,927 | 7,032 | 3,206 | 6,735 | 2,876 | 6,503 | 2,756 | 6,937 | 2,723 | 6,603 | 2,426 |
| Mexico | 65 | 48 | 80 | 42 | 79 | 44 | 90 | 53 | 108 | 70 | 91 | 51 | 91 | 74 | 82 | 56 | 72 | 35 | 59 | 28 | 64 | 36 | 64 | 31 | 101 | 43 | 103 | 37 | 135 | 55 | 164 | 53 | 185 | 56 | 182 | 91 | 238 | 471 | 295 | 526 | 341 | 464 |
| Puerto Rico | 20 | 14 | 24 | 4 | 26 | 0 | 12 | 0 | 13 | 0 | 27 | 0 | 18 | 0 | 25 | 0 | 27 | 0 | 30 | 0 | 15 | 0 | 26 | 0 | 17 | 0 | 26 | 0 | 37 | 0 | 22 | 0 | 41 | 0 | 33 | 0 | 46 | 0 | 33 | 0 | 42 | 0 |
| United States | 80,004 | 59,221 | 83,619 | 58,006 | 84,751 | 56,025 | 87,365 | 53,545 | 86,646 | 50,589 | 87,577 | 49,800 | 83,952 | 47,332 | 74,288 | 39,805 | 89,349 | 46,149 | 79,140 | 39,689 | 77,144 | 37,632 | 81,947 | 39,363 | 107,206 | 48,734 | 108,091 | 45,279 | 120,454 | 49,911 | 133,136 | 51,827 | 144,008 | 54,759 | 140,484 | 52,150 | 143,158 | 50,367 | 150,392 | 49,328 | 143,765 | 45,755 |
| All others | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1,143 |
| Central and South America | 197 | 114 | 253 | 170 | 238 | 242 | 255 | 196 | 240 | 193 | 277 | 177 | 222 | 246 | 157 | 182 | 237 | 206 | 201 | 175 | 208 | 271 | 240 | 522 | 319 | 510 | 390 | 615 | 407 | 552 | 498 | 588 | 613 | 583 | 602 | 657 | 569 | 705 | 658 | 798 | 639 | 1,241 |
| Argentina | 42 | 22 | 48 | 29 | 55 | 33 | 50 | 27 | 54 | 25 | 61 | 23 | 47 | 25 | 27 | 16 | 42 | 18 | 41 | 31 | 35 | 22 | 47 | 31 | 47 | 36 | 60 | 29 | 68 | 22 | 83 | 26 | 77 | 24 | 75 | 25 | 90 | 29 | 91 | 35 | 88 | 28 |
| Brazil | 73 | 28 | 98 | 52 | 102 | 149 | 116 | 103 | 99 | 114 | 132 | 103 | 106 | 162 | 75 | 109 | 130 | 140 | 92 | 102 | 101 | 195 | 111 | 445 | 181 | 428 | 223 | 535 | 201 | 451 | 261 | 493 | 352 | 490 | 337 | 550 | 318 | 626 | 398 | 704 | 389 | 1,143 |
| All others | 82 | 64 | 107 | 90 | 80 | 60 | 90 | 67 | 87 | 54 | 84 | 51 | 69 | 58 | 55 | 56 | 65 | 48 | 68 | 43 | 72 | 54 | 82 | 46 | 91 | 46 | 106 | 51 | 138 | 80 | 154 | 68 | 183 | 69 | 190 | 62 | 162 | 50 | 169 | 59 | 162 | 71 |
| Europe | 24,747 | 65,526 | 25,570 | 63,875 | 27,101 | 62,169 | 29,385 | 58,608 | 29,175 | 61,724 | 28,887 | 69,357 | 26,860 | 79,893 | 22,765 | 70,092 | 26,347 | 70,802 | 23,727 | 73,065 | 23,722 | 75,336 | 24,147 | 77,082 | 33,135 | 72,379 | 33,473 | 69,891 | 39,097 | 76,660 | 44,407 | 74,805 | 48,747 | 78,040 | 48,586 | 72,639 | 49,115 | 68,982 | 51,855 | 76,186 | 50,145 | 72,528 |
| EU | 22,997 | 44,465 | 23,791 | 46,563 | 25,228 | 45,836 | 27,338 | 43,428 | 27,245 | 43,802 | 26,972 | 44,250 | 25,069 | 51,343 | 21,315 | 46,822 | 24,996 | 47,804 | 22,161 | 49,871 | 22,031 | 48,069 | 22,385 | 45,811 | 30,742 | 46,026 | 30,926 | 45,444 | 36,239 | 50,379 | 40,985 | 49,538 | 44,997 | 50,697 | 44,589 | 46,199 | 44,993 | 45,520 | 47,517 | 51,211 | 45,934 | 48,861 |
| Austria | 398 | 1,116 | 488 | 1,110 | 520 | 1,078 | 584 | 1,188 | 588 | 532 | 567 | 595 | 1,305 | 546 | 961 | 452 | 1,071 | 560 | 1,752 | 454 | 1,240 | 456 | 1,288 | 509 | 1,183 | 740 | 1,278 | 760 | 1,349 | 871 | 1,603 | 1,014 | 1,410 | 1,213 | 1,318 | 1,180 | 1,620 | 1,367 | 1,587 | 1,543 | 1,617 | 1,419 | 1,665 |
| Belgium | 699 | 369 | 655 | 326 | 707 | 305 | 738 | 309 | 725 | 342 | 636 | 325 | 630 | 324 | 530 | 325 | 621 | 409 | 532 | 349 | 517 | 343 | 601 | 343 | 831 | 326 | 810 | 359 | 882 | 368 | 1,064 | 363 | 1,205 | 366 | 1,155 | 391 | 1,238 | 437 | 1,304 | 401 | 1,298 | 1,134 |
| Denmark | 397 | 214 | 487 | 255 | 436 | 240 | 489 | 271 | 450 | 290 | 527 | 351 | 426 | 306 | 373 | 296 | 443 | 289 | 396 | 313 | 397 | 232 | 612 | 285 | 737 | 245 | 857 | 372 | 923 | 485 | 1,065 | 414 | 1,012 | 501 | 1,084 | 494 | 1,121 | 505 | 1,122 | 454 | 1,164 |
| Finland | 599 | 983 | 653 | 924 | 618 | 1,040 | 743 | 1,074 | 824 | 1,096 | 868 | 1,349 | 924 | 1,320 | 726 | 1,275 | 955 | 942 | 858 | 858 | 824 | 966 | 866 | 1,004 | 1,143 | 1,056 | 960 | 937 | 1,040 | 1,029 | 1,363 | 1,187 | 1,386 | 1,281 | 1,513 | 1,186 | 1,616 | 1,113 | 1,453 | 1,020 | 1,143 | 1,162 |
| France | 3,691 | 9,861 | 3,827 | 9,517 | 3,839 | 8,968 | 4,067 | 9,085 | 4,039 | 8,348 | 3,879 | 9,682 | 3,406 | 9,509 | 2,903 | 8,702 | 3,463 | 11,068 | 3,152 | 10,046 | 3,185 | 9,554 | 3,167 | 9,752 | 4,479 | 9,239 | 4,558 | 9,289 | 5,394 | 11,932 | 6,148 | 10,776 | 6,723 | 11,276 | 6,597 | 11,608 | 6,465 | 11,483 | 6,836 | 11,130 | 6,519 | 11,349 |
| Germany | 9,109 | 13,230 | 9,363 | 12,783 | 10,255 | 12,699 | 11,276 | 12,931 | 11,309 | 14,026 | 11,462 | 13,846 | 10,784 | 13,733 | 9,040 | 15,873 | 10,052 | 16,675 | 9,081 | 15,457 | 8,952 | 13,664 | 9,017 | 11,817 | 12,387 | 12,193 | 11,930 | 10,643 | 13,889 | 12,342 | 15,572 | 12,882 | 16,589 | 13,678 | 16,588 | 13,129 | 15,975 | 13,846 | 16,924 | 13,619 | 17,603 | 13,968 |
| Hungary | 51 | 170 | 42 | 165 | 39 | 149 | 59 | 166 | 49 | 195 | 74 | 213 | 51 | 131 | 58 | 104 | 186 | 90 | 151 | 94 | 174 | 85 | 193 | 136 | 50 | 103 | 73 | 96 | 150 | 159 | 170 | 178 | 138 | 180 | 148 | 137 | 108 | 148 | 137 | 108 | 147 | 313 |
| Ireland | 75 | 306 | 96 | 195 | 129 | 111 | 142 | 70 | 126 | 77 | 163 | 122 | 185 | 102 | 158 | 104 | 186 | 90 | 151 | 94 | 174 | 85 | 193 | 110 | 278 | 118 | 328 | 140 | 356 | 176 | 432 | 281 | 506 | 266 | 508 | 308 | 590 | 310 | 612 | 284 | 690 | 313 |
| Italy | 1,601 | 6,450 | 1,505 | 9,368 | 1,703 | 9,999 | 1,728 | 6,982 | 1,760 | 7,043 | 1,723 | 5,523 | 1,605 | 12,778 | 1,316 | 6,681 | 1,496 | 5,362 | 1,318 | 10,209 | 1,369 | 10,337 | 1,377 | 9,388 | 1,842 | 9,188 | 1,922 | 9,486 | 2,167 | 8,970 | 2,531 | 8,820 | 2,653 | 8,342 | 2,686 | 4,433 | 2,712 | 1,066 | 2,751 | 7,244 | 2,862 | 5,755 |
| Netherlands | 1,251 | 2,256 | 1,265 | 2,241 | 1,269 | 2,235 | 1,329 | 2,256 | 1,392 | 2,097 | 1,330 | 1,964 | 1,286 | 2,034 | 1,005 | 1,977 | 1,339 | 2,008 | 1,273 | 2,040 | 1,324 | 2,056 | 1,318 | 1,887 | 1,660 | 1,861 | 1,766 | 2,017 | 1,963 | 2,530 | 1,684 | 2,425 | 1,414 | 2,600 | 1,876 | 2,752 | 2,173 | 2,738 | 1,270 | 2,738 | 1,270 | 2,738 |
| Spain | 257 | 1,600 | 239 | 1,760 | 275 | 1,644 | 276 | 1,692 | 323 | 1,088 | 325 | 1,643 | 273 | 1,697 | 274 | 2,348 | 313 | 1,957 | 282 | 2,349 | 317 | 2,079 | 339 | 2,361 | 436 | 2,494 | 492 | 2,690 | 673 | 2,676 | 738 | 2,838 | 805 | 3,031 | 850 | 2,407 | 795 | 2,331 | 891 | 2,714 | 898 | 2,041 |
| Sweden | 1,222 | 2,181 | 1,405 | 2,347 | 1,583 | 2,003 | 1,746 | 2,170 | 1,668 | 2,336 | 1,511 | 2,423 | 1,286 | 2,743 | 1,132 | 1,747 | 1,251 | 1,496 | 1,068 | 1,342 | 1,065 | 1,405 | 1,010 | 1,419 | 1,436 | 1,634 | 1,715 | 1,388 | 2,090 | 1,439 | 2,301 | 1,138 | 2,775 | 1,082 | 2,664 | 1,236 | 2,863 | 1,208 | 3,049 | 1,565 | 2,835 | 1,483 |
| United Kingdom | 3,507 | 2,111 | 3,606 | 2,190 | 3,696 | 2,343 | 3,989 | 2,242 | 3,859 | 2,606 | 3,661 | 2,895 | 3,478 | 3,064 | 3,169 | 3,200 | 3,629 | 2,739 | 3,311 | 2,040 | 3,120 | 2,060 | 3,237 | 2,196 | 4,394 | 2,425 | 4,375 | 2,911 | 5,343 | 3,222 | 5,926 | 2,989 | 6,604 | 3,011 | 6,506 | 3,316 | 6,603 | 3,534 | 6,804 | 3,454 | 6,737 | 3,319 |
| All others | 129 | 3,628 | 148 | 3,381 | 159 | 3,025 | 172 | 2,991 | 187 | 2,992 | 208 | 2,588 | 189 | 2,642 | 188 | 3,089 | 233 | 2,852 | 236 | 3,399 | 265 | 3,772 | 307 | 3,967 | 412 | 3,729 | 466 | 3,791 | 592 | 4,250 | 693 | 4,422 | 806 | 4,892 | 872 | 4,346 | 1,008 | 5,906 | 1,135 | 5,386 | 1,154 | 4,983 |
| Other Europe | 1,750 | 23,061 | 1,789 | 17,313 | 1,873 | 16,333 | 2,047 | 15,180 | 1,932 | 17,923 | 1,915 | 25,127 | 1,791 | 28,550 | 1,450 | 23,260 | 1,751 | 22,998 | 1,565 | 23,194 | 1,691 | 27,268 | 1,762 | 29,891 | 2,393 | 26,352 | 2,548 | 24,446 | 2,859 | 26,281 | 3,422 | 25,268 | 3,749 | 27,343 | 3,997 | 26,480 | 3,172 | 23,462 | 4,338 | 24,974 | 4,211 | 23,661 |
| Former Soviet Union | 29 | 815 | 26 | 550 | 22 | 488 | 33 | 729 | 33 | 1,121 | 30 | 2,834 | 25 | 8,118 | 24 | 2,221 | 33 | 1,701 | 30 | 2,812 | 33 | 2,889 | 27 | 3,016 | 29 | 2,699 | 35 | 2,379 | 58 | 1,952 | 53 | 2,194 | 66 | 2,171 | 78 | 2,031 | 92 | 1,747 | 95 | 1,619 | 76 | 1,467 |
| Norway | 194 | 436 | 227 | 435 | 247 | 393 | 266 | 501 | 249 | 517 | 258 | 518 | 247 | 31 | 223 | 517 | 239 | 539 | 243 | 449 | 263 | 422 | 267 | 418 | 391 | 507 | 369 | 466 | 445 | 440 | 479 | 548 | 549 | 545 | 616 | 529 | 609 | 584 | 605 | 583 | 600 | 580 |
| Russia | 212 | 13,826 | 204 | 15,293 | 201 | 14,398 | 255 | 12,699 | 220 | 15,128 | 223 | 20,598 | 188 | 19,071 | 167 | 19,494 | 199 | 19,432 | 201 | 18,727 | 200 | 22,556 | 216 | 26,455 | 307 | 21,834 | 331 | 20,532 | 365 | 22,656 | 439 | 21,283 | 474 | 23,238 | 498 | 22,643 | 557 | 19,780 | 569 | 21,158 | 565 | 20,046 |
| Switzerland | 1,278 | 923 | 1,286 | 966 | 1,343 | 970 | 1,428 | 1,178 | 1,366 | 1,067 | 1,335 | 1,103 | 1,267 | 981 | 991 | 862 | 1,212 | 1,270 | 1,033 | 1,091 | 1,126 | 1,254 | 1,193 | 1,247 | 1,584 | 1,147 | 1,713 | 950 | 1,882 | 1,074 | 2,303 | 1,082 | 2,464 | 1,235 | 2,577 | 1,118 | 2,631 | 1,198 | 2,769 | 1,462 | 2,692 | 1,410 |
| All others | 36 | 51 | 47 | 69 | 60 | 84 | 66 | 74 | 64 | 89 | 70 | 74 | 64 | 68 | 44 | 62 | 69 | 57 | 59 | 115 | 70 | 147 | 58 | 135 | 82 | 165 | 99 | 120 | 110 | 159 | 148 | 161 | 197 | 154 | 228 | 160 | 233 | 152 | 300 | 152 | 278 | 163 |
| Asia | 37,798 | 147,861 | 39,063 | 186,044 | 40,182 | 141,703 | 43,271 | 131,432 | 45,529 | 128,032 | 46,342 | 150,555 | 47,538 | 163,133 | 41,503 | 190,127 | 51,308 | 239,680 | 48,184 | 265,292 | 50,497 | 245,491 | 54,412 | 252,795 | 70,165 | 286,417 | 73,319 | 358,660 | 83,041 | 416,026 | 88,216 | 439,106 | 94,763 | 444,583 | 96,382 | 445,988 | 98,010 | 531,195 | 102,597 | 544,255 | 100,058 | 550,576 |

TABLE S8-4

## USPTO patents and patent families granted, by region, country, or economy: 1998–2018

(Number)

| Region, country, or economy | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| China | 254 | 1,928 | 266 | 2,454 | 326 | 5,876 | 461 | 6,549 | 561 | 5,663 | 614 | 11,156 | 740 | 17,757 | 744 | 19,647 | 1,057 | 25,315 | 1,193 | 29,908 | 1,606 | 43,521 | 2,043 | 63,070 | 3,215 | 72,964 | 3,720 | 104,541 | 5,359 | 141,055 | 6,680 | 147,860 | 8,123 | 157,183 | 9,021 | 236,588 | 11,439 | 294,233 | 14,286 | 314,027 | 15,477 | 334,022 |
| India | 90 | 57 | 118 | 73 | 141 | 74 | 187 | 106 | 265 | 169 | 354 | 257 | 369 | 262 | 401 | 256 | 511 | 341 | 566 | 390 | 651 | 414 | 709 | 389 | 1,144 | 598 | 1,277 | 700 | 1,756 | 921 | 2,456 | 1,362 | 3,073 | 1,648 | 3,457 | 1,698 | 3,767 | 1,850 | 4,271 | 1,901 | 4,315 | 1,886 |
| Japan | 30,887 | 121,611 | 31,161 | 128,342 | 31,362 | 103,210 | 33,278 | 99,515 | 34,913 | 96,130 | 35,567 | 98,910 | 35,441 | 99,675 | 30,381 | 99,899 | 36,870 | 106,707 | 33,410 | 127,391 | 33,725 | 130,678 | 35,557 | 139,279 | 44,978 | 152,795 | 46,337 | 172,248 | 50,899 | 179,163 | 52,271 | 178,866 | 54,318 | 171,734 | 52,809 | 116,928 | 50,169 | 136,250 | 50,074 | 124,707 | 47,904 | 118,535 |
| Malaysia | 24 | 20 | 31 | 15 | 44 | 31 | 34 | 34 | 58 | 47 | 48 | 65 | 85 | 99 | 94 | 145 | 123 | 242 | 171 | 403 | 159 | 317 | 156 | 367 | 200 | 340 | 177 | 447 | 213 | 435 | 222 | 441 | 268 | 519 | 267 | 489 | 275 | 513 | 270 | 606 | 252 | 538 |
| Singapore | 123 | 99 | 149 | 113 | 226 | 149 | 307 | 258 | 420 | 271 | 438 | 231 | 457 | 193 | 345 | 164 | 412 | 197 | 391 | 211 | 406 | 210 | 436 | 238 | 616 | 274 | 650 | 282 | 805 | 300 | 793 | 320 | 933 | 356 | 961 | 351 | 989 | 356 | 1,023 | 360 | 974 | 344 |
| South Korea | 3,269 | 19,609 | 3,567 | 49,864 | 3,332 | 25,207 | 3,548 | 14,942 | 3,792 | 16,815 | 3,952 | 30,093 | 4,429 | 34,321 | 4,365 | 58,560 | 5,901 | 93,070 | 6,299 | 93,911 | 7,544 | 61,266 | 8,775 | 39,841 | 11,669 | 48,345 | 12,254 | 68,027 | 13,236 | 79,156 | 14,556 | 89,574 | 16,529 | 91,019 | 17,963 | 68,210 | 19,576 | 75,939 | 20,815 | 82,848 | 19,901 | 81,433 |
| Taiwan | 3,110 | 4,421 | 3,718 | 5,088 | 4,705 | 7,083 | 5,397 | 9,950 | 5,444 | 8,835 | 5,299 | 9,739 | 5,951 | 10,735 | 5,115 | 11,343 | 6,390 | 13,699 | 6,104 | 12,941 | 6,345 | 8,986 | 6,666 | 9,489 | 8,235 | 10,984 | 8,794 | 12,273 | 10,638 | 14,834 | 11,077 | 20,510 | 11,342 | 21,898 | 11,688 | 21,509 | 11,576 | 21,825 | 11,606 | 19,543 | 10,994 | 13,608 |
| All others | 41 | 116 | 51 | 95 | 46 | 73 | 57 | 77 | 76 | 102 | 69 | 103 | 64 | 92 | 59 | 113 | 83 | 108 | 50 | 136 | 61 | 100 | 71 | 123 | 108 | 116 | 111 | 142 | 134 | 161 | 162 | 174 | 176 | 226 | 216 | 215 | 221 | 229 | 252 | 263 | 241 | 209 |
| Middle East | 781 | 442 | 792 | 433 | 841 | 676 | 1,022 | 659 | 1,094 | 659 | 1,236 | 694 | 1,089 | 619 | 980 | 563 | 1,274 | 582 | 1,163 | 553 | 1,250 | 646 | 1,478 | 594 | 1,937 | 726 | 2,123 | 788 | 2,752 | 1,092 | 3,406 | 1,255 | 3,988 | 1,386 | 4,182 | 1,534 | 4,357 | 1,643 | 4,898 | 1,796 | 4,956 | 1,713 |
| Israel | 755 | 381 | 757 | 373 | 789 | 385 | 983 | 427 | 1,046 | 460 | 1,189 | 513 | 1,053 | 494 | 936 | 406 | 1,217 | 458 | 1,111 | 390 | 1,183 | 440 | 1,413 | 516 | 1,839 | 585 | 1,976 | 571 | 2,482 | 746 | 3,008 | 866 | 3,486 | 1,033 | 3,631 | 1,104 | 3,713 | 1,177 | 4,100 | 1,271 | 4,038 | 1,237 |
| All others | 26 | 61 | 35 | 61 | 52 | 291 | 39 | 232 | 48 | 199 | 47 | 181 | 35 | 124 | 44 | 157 | 57 | 124 | 52 | 163 | 67 | 206 | 66 | 78 | 98 | 140 | 147 | 217 | 269 | 346 | 398 | 390 | 502 | 352 | 551 | 430 | 644 | 466 | 798 | 525 | 918 | 475 |
| Africa | 119 | 527 | 125 | 565 | 130 | 458 | 137 | 464 | 129 | 542 | 136 | 584 | 124 | 521 | 114 | 441 | 129 | 545 | 99 | 514 | 108 | 589 | 112 | 585 | 151 | 467 | 155 | 308 | 188 | 367 | 223 | 322 | 234 | 383 | 228 | 195 | 251 | 265 | 264 | 258 | 246 | 177 |
| South Africa | 115 | 385 | 110 | 377 | 112 | 232 | 119 | 240 | 112 | 219 | 111 | 262 | 102 | 290 | 90 | 304 | 109 | 279 | 78 | 259 | 90 | 387 | 90 | 355 | 121 | 282 | 120 | 96 | 140 | 131 | 163 | 75 | 154 | 99 | 161 | 97 | 181 | 119 | 187 | 139 | 152 | 29 |
| All others | 4 | 141 | 15 | 188 | 19 | 227 | 18 | 224 | 17 | 323 | 25 | 322 | 22 | 232 | 24 | 136 | 21 | 265 | 21 | 255 | 18 | 202 | 22 | 230 | 30 | 185 | 35 | 212 | 48 | 237 | 60 | 247 | 80 | 283 | 67 | 98 | 70 | 146 | 77 | 119 | 94 | 147 |
| Australia and Oceania | 842 | 655 | 827 | 660 | 819 | 830 | 1,012 | 1,334 | 1,010 | 1,336 | 1,048 | 971 | 1,094 | 1,435 | 1,052 | 1,350 | 1,472 | 1,362 | 1,382 | 1,480 | 1,400 | 1,540 | 1,374 | 1,448 | 1,944 | 1,736 | 2,129 | 1,958 | 1,754 | 2,321 | 1,893 | 2,210 | 2,014 | 2,475 | 1,935 | 2,878 | 1,832 | 2,912 | 2,028 | 1,498 | 2,010 | 1,356 |
| Australia | 722 | 626 | 709 | 616 | 710 | 802 | 882 | 1,316 | 861 | 1,317 | 909 | 934 | 957 | 1,412 | 929 | 1,326 | 1,334 | 1,325 | 1,271 | 1,445 | 1,295 | 1,517 | 1,242 | 1,424 | 1,770 | 1,700 | 1,943 | 1,910 | 1,530 | 2,270 | 1,643 | 2,132 | 1,753 | 2,416 | 1,667 | 2,836 | 1,561 | 2,863 | 1,709 | 1,462 | 1,680 | 1,318 |
| New Zealand | 118 | 28 | 117 | 35 | 109 | 27 | 129 | 19 | 147 | 19 | 137 | 35 | 135 | 23 | 122 | 24 | 137 | 37 | 111 | 35 | 104 | 23 | 132 | 25 | 171 | 32 | 185 | 48 | 223 | 50 | 250 | 77 | 260 | 56 | 267 | 40 | 270 | 47 | 314 | 33 | 328 | 37 |
| All others | 1 | 2 | 1 | 9 | 0 | 1 | 1 | 0 | 1 | 0 | 2 | 2 | 2 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 3 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 3 | 1 | 2 | 2 | 2 | 5 | 3 | 3 | 2 |
| Unclassified | 27 | 708 | 22 | 2,066 | 26 | 1,577 | 15 | 258 | 9 | 190 | 8 | 116 | 2 | 479 | 4 | 1,344 | 4 | 715 | 4 | 78 | 4 | 114 | 4 | 74 | 7 | 84 | 10 | 47 | 11 | 100 | 19 | 136 | 17 | 52 | 33 | 41 | 46 | 139 | 44 | 12 | 47 | 20 |

EU = European Union; USPTO = U.S. Patent and Trademark Office.

**Note(s)**

USPTO patents are allocated according to patent inventorship information. USPTO patents are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named inventors. Patents are classified under the World Intellectual Property Organization (WIPO) classification of patents, which classifies International Patent Classification (IPC) codes under 35 technical fields. IPC reformed codes take into account changes that were made to the WIPO classification in 2006 under the eighth version of the classification and were used to prepare these data. However, because PatentsView only provides the original IPC codes as they appeared on patents and not the IPC reformed codes, current Cooperative Patent Classification codes on patents were converted back to the most recent IPC classification to prepare these statistics. Fractional counts of patents were assigned to each technological field on patents to assign the proper weight of a patent to the corresponding technological fields under the classification. International Patent Documentation (INPADOC) patent families across all patent offices covered in the Worldwide Patent Statistical Database (PATSTAT) are counted according to the year of the first granted patent in the patent family. Patent families are allocated according to patent inventorship information found on the priority patent of the INPADOC patent families. To account for missing ownership information in PATSTAT for some offices, a method designed by de Rassenfosse et al. (2012) is used to fill in missing information on priority patents using information in successive filings within the patent families (see technical documentation for details). Patent families are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named inventors. Because of data coverage issues for some patent offices in PATSTAT, statistics for some countries may be underestimated partially for some years or across the whole trend. Countries with identified issues include India (missing data) and South Africa (no data for 2018). For Italy, because of data gaps regarding information on granted patents, patent applications are used instead, which slightly overestimates Italy's output and creates a small shift in the year for which its output is accounted. The EU includes 28 member countries. China includes Hong Kong.

**Source(s)**

Science-Metrix; PATSTAT, accessed April 2019; PatentsView, USPTO, accessed June 2019.

TABLE SB-5

## USPTO patents and patent families granted in electrical machinery, apparatus, energy, by region, country, or economy: 1998–2018

(Number)

| Region, country, or economy | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| World | 8,363 | 16,171 | 9,031 | 18,478 | 9,763 | 16,260 | 10,297 | 15,803 | 10,559 | 16,026 | 10,585 | 17,507 | 11,007 | 17,938 | 9,362 | 18,365 | 10,745 | 22,786 | 9,638 | 25,377 | 9,780 | 23,468 | 10,624 | 23,888 | 13,475 | 27,215 | 13,636 | 32,921 | 14,966 | 38,231 | 16,136 | 41,533 | 17,719 | 42,408 | 18,929 | 40,536 | 20,225 | 48,703 | 21,697 | 52,841 | 21,020 | 51,652 |
| North America | 4,048 | 3,196 | 4,354 | 3,231 | 4,564 | 3,240 | 4,739 | 3,181 | 4,590 | 2,994 | 4,517 | 2,830 | 4,749 | 2,912 | 4,043 | 2,293 | 4,580 | 2,632 | 4,058 | 2,298 | 4,010 | 2,169 | 4,284 | 2,316 | 5,145 | 2,547 | 5,182 | 2,328 | 5,410 | 2,335 | 6,055 | 2,485 | 6,451 | 2,580 | 6,646 | 2,584 | 7,231 | 2,768 | 7,740 | 2,834 | 7,470 | 2,591 |
| Canada | 132 | 123 | 137 | 119 | 146 | 117 | 160 | 114 | 143 | 101 | 169 | 107 | 188 | 122 | 182 | 108 | 189 | 101 | 201 | 114 | 174 | 91 | 209 | 106 | 235 | 106 | 239 | 100 | 249 | 118 | 277 | 128 | 282 | 140 | 265 | 101 | 272 | 105 | 352 | 119 | 316 | 98 |
| Mexico | 4 | 2 | 4 | 2 | 4 | 3 | 6 | 2 | 5 | 3 | 9 | 5 | 7 | 8 | 8 | 6 | 7 | 2 | 5 | 1 | 8 | 5 | 6 | 3 | 13 | 7 | 7 | 6 | 11 | 7 | 14 | 6 | 17 | 7 | 12 | 8 | 22 | 27 | 26 | 31 | 20 | 17 |
| Puerto Rico | 0 | 0 | 1 | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 2 | 0 | 2 | 0 | 5 | 0 | 2 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 4 | 0 | 1 | 0 | 0 | 0 | 5 | 0 | 2 | 0 | 2 | 0 | 2 | 0 | 3 | 0 |
| United States | 3,911 | 3,072 | 4,212 | 3,110 | 4,414 | 3,121 | 4,571 | 3,065 | 4,440 | 2,890 | 4,338 | 2,718 | 4,553 | 2,782 | 3,848 | 2,179 | 4,382 | 2,529 | 3,849 | 2,183 | 3,826 | 2,073 | 4,068 | 2,207 | 4,896 | 2,433 | 4,933 | 2,223 | 5,149 | 2,210 | 5,763 | 2,350 | 6,148 | 2,433 | 6,366 | 2,474 | 6,936 | 2,635 | 7,360 | 2,684 | 7,131 | 2,477 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Central and South America | 2 | 2 | 5 | 3 | 8 | 15 | 15 | 9 | 11 | 8 | 8 | 3 | 6 | 8 | 8 | 2 | 4 | 10 | 9 | 5 | 9 | 13 | 14 | 14 | 13 | 18 | 18 | 23 | 16 | 16 | 26 | 18 | 18 | 16 | 23 | 34 | 23 | 28 | 28 | 24 | 36 | 39 |
| Argentina | 1 | 0 | 0 | 1 | 4 | 1 | 3 | 2 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 3 | 0 | 0 | 1 | 1 | 3 | 4 | 1 | 1 | 3 | 1 | 2 | 2 | 0 | 1 | 2 | 1 | 1 | 0 | 4 | 1 | 4 | 2 |
| Brazil | 0 | 1 | 3 | 1 | 0 | 10 | 8 | 4 | 8 | 6 | 7 | 3 | 6 | 7 | 7 | 2 | 4 | 10 | 5 | 3 | 8 | 10 | 9 | 12 | 10 | 7 | 15 | 22 | 10 | 14 | 20 | 15 | 13 | 13 | 16 | 27 | 14 | 8 | 25 | 13 | 34 | 33 |
| All others | 2 | 1 | 1 | 1 | 4 | 4 | 4 | 3 | 2 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 2 | 0 | 1 | 2 | 4 | 1 | 5 | 4 | 1 | 1 | 4 | 1 | 4 | 1 | 5 | 2 | 6 | 6 | 8 | 3 | 6 | 1 | 6 | 4 |
| Europe | 1,392 | 3,218 | 1,545 | 3,198 | 1,675 | 3,242 | 1,615 | 2,999 | 1,653 | 3,032 | 1,608 | 3,293 | 1,613 | 3,605 | 1,361 | 3,241 | 1,456 | 3,274 | 1,216 | 3,073 | 1,290 | 3,309 | 1,357 | 3,248 | 1,870 | 3,289 | 1,899 | 2,979 | 2,158 | 3,459 | 2,444 | 3,355 | 2,696 | 3,761 | 2,876 | 3,719 | 3,156 | 3,832 | 3,520 | 4,295 | 3,381 | 4,380 |
| Austria | 1,302 | 2,477 | 1,439 | 2,592 | 1,563 | 2,623 | 1,516 | 2,504 | 1,561 | 2,438 | 1,512 | 2,409 | 1,506 | 2,590 | 1,276 | 2,357 | 1,374 | 2,424 | 1,130 | 2,191 | 1,282 | 2,220 | 1,272 | 2,200 | 1,781 | 2,242 | 1,788 | 2,235 | 2,042 | 2,574 | 2,274 | 2,502 | 2,540 | 2,814 | 2,713 | 2,722 | 2,972 | 3,000 | 3,315 | 3,427 | 3,146 | 3,413 |
| Belgium | 17 | 59 | 20 | 54 | 27 | 63 | 20 | 58 | 25 | 78 | 28 | 52 | 39 | 87 | 32 | 53 | 27 | 60 | 37 | 102 | 21 | 92 | 38 | 81 | 32 | 67 | 44 | 69 | 56 | 72 | 97 | 94 | 60 | 94 | 80 | 116 | 90 | 139 | 129 | 127 | 152 | 149 |
| Denmark | 28 | 26 | 30 | 19 | 41 | 18 | 26 | 20 | 20 | 28 | 27 | 14 | 20 | 18 | 23 | 14 | 12 | 16 | 20 | 9 | 19 | 14 | 20 | 20 | 29 | 13 | 23 | 6 | 28 | 17 | 24 | 11 | 45 | 11 | 35 | 12 | 48 | 20 | 40 | 32 | 52 | 37 |
| Finland | 10 | 10 | 7 | 9 | 20 | 8 | 21 | 14 | 18 | 13 | 20 | 23 | 17 | 22 | 18 | 19 | 15 | 13 | 12 | 15 | 22 | 19 | 23 | 17 | 42 | 23 | 41 | 15 | 48 | 21 | 51 | 33 | 69 | 31 | 60 | 23 | 71 | 30 | 60 | 36 | 58 | 27 |
| France | 15 | 39 | 26 | 32 | 26 | 39 | 22 | 42 | 35 | 57 | 28 | 52 | 31 | 71 | 28 | 64 | 42 | 52 | 31 | 45 | 23 | 58 | 27 | 49 | 48 | 60 | 38 | 64 | 37 | 94 | 60 | 94 | 80 | 116 | 90 | 139 | 129 | 127 | 152 | 149 | 142 | 156 |
| Germany | 230 | 677 | 282 | 594 | 279 | 572 | 246 | 647 | 284 | 535 | 205 | 607 | 187 | 587 | 149 | 438 | 183 | 607 | 150 | 535 | 144 | 499 | 176 | 541 | 260 | 478 | 227 | 499 | 237 | 625 | 284 | 722 | 319 | 841 | 346 | 816 | 381 | 813 | 405 | 839 | 435 | 938 |
| Hungary | 575 | 910 | 623 | 895 | 709 | 941 | 709 | 949 | 681 | 1,009 | 706 | 907 | 780 | 949 | 636 | 1,010 | 687 | 1,065 | 547 | 1,011 | 592 | 963 | 623 | 880 | 878 | 876 | 863 | 797 | 925 | 992 | 1,021 | 911 | 1,054 | 978 | 1,222 | 990 | 1,281 | 1,044 | 1,482 | 1,096 | 1,315 | 1,149 |
| Ireland | 9 | 7 | 6 | 6 | 6 | 7 | 5 | 4 | 6 | 10 | 11 | 18 | 6 | 11 | 7 | 9 | 3 | 3 | 2 | 5 | 3 | 5 | 7 | 9 | 6 | 8 | 6 | 8 | 11 | 7 | 15 | 12 | 20 | 9 | 16 | 11 | 19 | 9 | 20 | 14 | 20 | 8 |
| Italy | 8 | 14 | 6 | 13 | 12 | 8 | 13 | 4 | 13 | 4 | 11 | 8 | 11 | 7 | 9 | 5 | 15 | 11 | 5 | 2 | 8 | 4 | 6 | 5 | 6 | 4 | 11 | 7 | 16 | 7 | 15 | 12 | 20 | 9 | 16 | 11 | 19 | 9 | 20 | 14 | 20 | 8 |
| Netherlands | 78 | 238 | 62 | 363 | 102 | 390 | 85 | 207 | 106 | 182 | 103 | 38 | 154 | 106 | 361 | 96 | 180 | 90 | 46 | 73 | 42 | 81 | 38 | 106 | 106 | 112 | 110 | 159 | 124 | 126 | 153 | 40 | 167 | 51 | 165 | 55 | 164 | 69 | 210 | 234 | 195 | 234 |
| Spain | 124 | 57 | 128 | 82 | 110 | 93 | 108 | 86 | 119 | 78 | 142 | 76 | 92 | 71 | 59 | 78 | 68 | 88 | 74 | 78 | 78 | 73 | 60 | 79 | 76 | 64 | 110 | 91 | 158 | 79 | 168 | 76 | 188 | 68 | 207 | 60 | 244 | 92 | 265 | 94 | 294 | 82 |
| Sweden | 4 | 85 | 8 | 96 | 14 | 49 | 14 | 77 | 17 | 56 | 17 | 76 | 21 | 65 | 16 | 89 | 20 | 76 | 12 | 96 | 12 | 80 | 23 | 103 | 24 | 107 | 19 | 129 | 21 | 121 | 32 | 129 | 33 | 167 | 30 | 104 | 36 | 116 | 40 | 138 | 52 | 114 |
| United Kingdom | 44 | 75 | 58 | 124 | 58 | 99 | 71 | 131 | 76 | 116 | 56 | 121 | 59 | 96 | 51 | 56 | 53 | 61 | 37 | 54 | 32 | 73 | 48 | 58 | 49 | 73 | 80 | 56 | 110 | 55 | 96 | 51 | 125 | 53 | 107 | 55 | 111 | 58 | 111 | 79 | 95 | 79 |
| All others | 153 | 96 | 178 | 117 | 153 | 150 | 167 | 121 | 152 | 130 | 144 | 142 | 135 | 124 | 149 | 157 | 137 | 121 | 126 | 78 | 124 | 97 | 133 | 118 | 186 | 104 | 172 | 129 | 204 | 184 | 266 | 168 | 322 | 192 | 315 | 180 | 347 | 205 | 360 | 195 | 360 | 215 |
| Other Europe | 8 | 184 | 6 | 189 | 6 | 186 | 10 | 143 | 9 | 141 | 14 | 153 | 9 | 158 | 12 | 183 | 14 | 160 | 17 | 167 | 21 | 168 | 17 | 216 | 26 | 250 | 26 | 199 | 38 | 186 | 39 | 192 | 42 | 230 | 58 | 212 | 60 | 351 | 78 | 345 | 72 | 260 |
| Former Soviet Union | 90 | 741 | 107 | 607 | 111 | 619 | 99 | 495 | 92 | 504 | 96 | 854 | 106 | 1,015 | 85 | 884 | 83 | 850 | 86 | 883 | 90 | 1,109 | 85 | 1,048 | 89 | 1,046 | 111 | 744 | 116 | 886 | 170 | 853 | 156 | 947 | 163 | 997 | 184 | 832 | 205 | 867 | 206 | 763 |
| Norway | 1 | 29 | 1 | 17 | 1 | 27 | 0 | 30 | 4 | 45 | 2 | 119 | 3 | 275 | 3 | 83 | 2 | 69 | 3 | 121 | 3 | 150 | 3 | 167 | 3 | 136 | 2 | 112 | 6 | 84 | 2 | 112 | 1 | 96 | 2 | 63 | 2 | 81 | 2 | 60 | 3 | 56 |
| Russia | 6 | 22 | 9 | 14 | 8 | 15 | 7 | 15 | 3 | 21 | 6 | 15 | 8 | 9 | 10 | 29 | 6 | 15 | 9 | 18 | 12 | 12 | 9 | 18 | 11 | 21 | 11 | 11 | 19 | 15 | 16 | 20 | 15 | 20 | 21 | 16 | 29 | 25 | 28 | 24 | 28 | 36 |
| Switzerland | 9 | 646 | 14 | 515 | 18 | 507 | 16 | 379 | 13 | 469 | 15 | 661 | 12 | 682 | 18 | 718 | 9 | 678 | 11 | 672 | 13 | 859 | 8 | 754 | 14 | 806 | 13 | 551 | 11 | 711 | 18 | 653 | 11 | 732 | 16 | 839 | 23 | 635 | 26 | 668 | 26 | 792 |
| All others | 73 | 41 | 82 | 60 | 83 | 65 | 73 | 67 | 70 | 57 | 73 | 57 | 80 | 45 | 52 | 51 | 64 | 86 | 62 | 58 | 61 | 76 | 63 | 94 | 59 | 77 | 83 | 60 | 77 | 66 | 127 | 57 | 123 | 86 | 114 | 70 | 121 | 75 | 136 | 106 | 149 | 76 |
| Asia | 2 | 4 | 0 | 1 | 2 | 4 | 3 | 2 | 1 | 1 | 1 | 1 | 3 | 3 | 3 | 4 | 1 | 3 | 1 | 14 | 2 | 12 | 3 | 14 | 2 | 6 | 2 | 10 | 2 | 9 | 7 | 12 | 6 | 13 | 9 | 8 | 10 | 16 | 13 | 9 | 9 | 8 |
| | 2,863 | 9,684 | 3,080 | 11,884 | 3,460 | 9,558 | 3,855 | 9,526 | 4,228 | 9,889 | 4,372 | 11,306 | 4,566 | 11,309 | 3,882 | 12,710 | 4,617 | 16,788 | 4,286 | 19,925 | 4,385 | 17,897 | 4,898 | 18,226 | 6,350 | 21,245 | 6,441 | 27,449 | 7,271 | 32,251 | 7,467 | 35,533 | 8,424 | 35,892 | 9,205 | 34,017 | 9,619 | 41,884 | 10,181 | 45,516 | 9,901 | 44,540 |

**TABLE SB-5**

## USPTO patents and patent families granted in electrical machinery, apparatus, energy, by region, country, or economy: 1998–2018

(Number)

| | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Region, country, or economy | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| China | 33 | 94 | 30 | 113 | 50 | 263 | 89 | 209 | 110 | 296 | 106 | 457 | 133 | 794 | 126 | 749 | 172 | 1,019 | 171 | 1,487 | 268 | 2,485 | 327 | 3,769 | 555 | 4,284 | 614 | 6,186 | 726 | 8,823 | 781 | 9,191 | 840 | 9,954 | 949 | 15,408 | 1,160 | 20,610 | 1,358 | 23,952 | 1,571 | 25,600 |
| India | 2 | 2 | 1 | 1 | 1 | 1 | 7 | 3 | 9 | 4 | 3 | 2 | 14 | 6 | 21 | 15 | 10 | 14 | 13 | 18 | 14 | 13 | 14 | 14 | 34 | 26 | 37 | 26 | 51 | 37 | 53 | 38 | 71 | 39 | 80 | 39 | 79 | 39 | 110 | 59 | 94 | 44 |
| Japan | 2,229 | 8,160 | 2,376 | 8,623 | 2,539 | 7,335 | 2,832 | 7,604 | 3,144 | 7,822 | 3,286 | 8,260 | 3,170 | 7,415 | 2,691 | 7,397 | 3,066 | 7,447 | 2,715 | 8,855 | 2,643 | 9,693 | 2,861 | 10,236 | 3,609 | 11,865 | 3,536 | 13,875 | 4,044 | 15,172 | 3,983 | 17,203 | 4,514 | 16,544 | 4,815 | 11,041 | 5,061 | 12,827 | 5,393 | 12,333 | 5,144 | 11,109 |
| Malaysia | 0 | 0 | 4 | 2 | 4 | 1 | 3 | 3 | 5 | 2 | 4 | 4 | 4 | 6 | 7 | 6 | 10 | 19 | 15 | 19 | 11 | 13 | 11 | 20 | 10 | 22 | 9 | 24 | 10 | 23 | 8 | 23 | 10 | 24 | 13 | 20 | 18 | 33 | 13 | 22 | 13 | 24 |
| Singapore | 7 | 5 | 11 | 5 | 11 | 5 | 14 | 3 | 19 | 11 | 16 | 7 | 19 | 9 | 16 | 11 | 16 | 9 | 19 | 13 | 25 | 18 | 29 | 14 | 38 | 16 | 35 | 12 | 45 | 16 | 41 | 15 | 48 | 25 | 56 | 23 | 59 | 26 | 79 | 36 | 62 | 30 |
| South Korea | 276 | 1,064 | 294 | 2,799 | 222 | 1,490 | 234 | 977 | 305 | 1,049 | 359 | 1,803 | 464 | 2,137 | 370 | 3,567 | 467 | 6,940 | 495 | 8,312 | 575 | 4,798 | 718 | 3,221 | 934 | 3,897 | 920 | 6,038 | 954 | 6,450 | 1,222 | 6,842 | 1,596 | 6,791 | 1,867 | 5,253 | 1,933 | 6,240 | 1,968 | 7,284 | 1,886 | 6,430 |
| Taiwan | 315 | 358 | 363 | 338 | 633 | 461 | 674 | 724 | 632 | 702 | 591 | 764 | 758 | 935 | 647 | 958 | 865 | 1,332 | 854 | 1,213 | 843 | 870 | 931 | 935 | 1,162 | 1,129 | 1,285 | 1,282 | 1,435 | 1,722 | 1,371 | 2,212 | 1,332 | 2,494 | 1,414 | 2,219 | 1,297 | 2,096 | 1,240 | 1,802 | 1,113 | 1,284 |
| All others | 1 | 2 | 2 | 4 | 1 | 2 | 2 | 2 | 3 | 4 | 6 | 9 | 5 | 7 | 3 | 5 | 11 | 8 | 5 | 8 | 5 | 8 | 8 | 15 | 8 | 8 | 5 | 6 | 7 | 7 | 8 | 10 | 7 | 21 | 10 | 15 | 13 | 12 | 19 | 27 | 18 | 18 |
| Middle East | 17 | 7 | 23 | 13 | 31 | 23 | 30 | 22 | 41 | 19 | 42 | 22 | 28 | 15 | 35 | 17 | 38 | 20 | 41 | 16 | 44 | 16 | 36 | 14 | 47 | 18 | 47 | 14 | 69 | 25 | 82 | 22 | 76 | 22 | 105 | 27 | 126 | 32 | 143 | 43 | 147 | 51 |
| Israel | 16 | 6 | 21 | 11 | 28 | 11 | 28 | 13 | 38 | 16 | 38 | 13 | 27 | 14 | 30 | 13 | 36 | 17 | 40 | 13 | 41 | 12 | 35 | 11 | 41 | 14 | 45 | 12 | 61 | 13 | 72 | 14 | 62 | 12 | 90 | 14 | 106 | 18 | 117 | 25 | 117 | 30 |
| All others | 1 | 1 | 2 | 2 | 3 | 11 | 3 | 9 | 3 | 3 | 4 | 9 | 1 | 2 | 4 | 4 | 3 | 2 | 1 | 3 | 3 | 4 | 2 | 3 | 5 | 4 | 2 | 2 | 7 | 11 | 10 | 8 | 13 | 10 | 15 | 13 | 20 | 14 | 25 | 19 | 30 | 21 |
| Africa | 7 | 18 | 7 | 17 | 4 | 18 | 7 | 14 | 8 | 21 | 6 | 14 | 6 | 18 | 8 | 14 | 9 | 9 | 3 | 8 | 6 | 16 | 6 | 16 | 12 | 29 | 7 | 14 | 5 | 13 | 7 | 14 | 3 | 21 | 5 | 3 | 12 | 11 | 10 | 7 | 9 | 5 |
| South Africa | 7 | 14 | 6 | 11 | 4 | 11 | 6 | 5 | 7 | 10 | 5 | 5 | 6 | 11 | 8 | 10 | 9 | 7 | 3 | 6 | 6 | 13 | 5 | 13 | 11 | 20 | 7 | 1 | 5 | 2 | 5 | 1 | 2 | 6 | 4 | 2 | 8 | 3 | 9 | 4 | 4 | 0 |
| All others | 0 | 5 | 1 | 7 | 0 | 7 | 1 | 9 | 1 | 11 | 1 | 9 | 0 | 7 | 0 | 4 | 0 | 2 | 0 | 2 | 0 | 3 | 1 | 3 | 1 | 9 | 0 | 13 | 0 | 10 | 1 | 13 | 1 | 14 | 1 | 1 | 3 | 8 | 2 | 3 | 5 | 5 |
| Australia and Oceania | 32 | 18 | 17 | 24 | 18 | 26 | 35 | 42 | 28 | 45 | 32 | 36 | 38 | 50 | 25 | 43 | 39 | 37 | 26 | 38 | 36 | 47 | 30 | 53 | 37 | 62 | 42 | 114 | 36 | 125 | 54 | 101 | 50 | 116 | 67 | 151 | 56 | 138 | 73 | 110 | 87 | 46 |
| Australia | 22 | 18 | 12 | 24 | 12 | 26 | 26 | 42 | 21 | 44 | 28 | 35 | 31 | 48 | 20 | 42 | 35 | 37 | 23 | 37 | 32 | 47 | 25 | 51 | 30 | 62 | 35 | 111 | 29 | 124 | 40 | 101 | 39 | 113 | 52 | 149 | 38 | 135 | 46 | 108 | 61 | 43 |
| New Zealand | 10 | 0 | 5 | 0 | 6 | 0 | 9 | 0 | 6 | 1 | 4 | 1 | 7 | 2 | 5 | 1 | 4 | 1 | 3 | 1 | 4 | 0 | 5 | 2 | 7 | 1 | 7 | 3 | 7 | 1 | 14 | 1 | 11 | 3 | 14 | 2 | 18 | 3 | 26 | 3 | 26 | 3 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| Unclassified | 2 | 28 | 0 | 107 | 3 | 138 | 1 | 10 | 0 | 18 | 0 | 2 | 1 | 21 | 1 | 45 | 0 | 17 | 0 | 14 | 0 | 1 | 0 | 3 | 1 | 7 | 0 | 0 | 1 | 7 | 2 | 3 | 1 | 0 | 3 | 2 | 2 | 10 | 6 | 0 | 1 | 0 |

EU = European Union; USPTO = U.S. Patent and Trademark Office.

**Note(s)**

USPTO patents are allocated according to patent inventorship information. USPTO patents are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named inventors. Patents are classified under the World Intellectual Property Organization (WIPO) classification of patents, which classifies International Patent Classification (IPC) codes under 35 technical fields. IPC reformed codes take into account changes that were made to the WIPO classification in 2006 under the eighth version of the classification and were used to prepare these data. However, because PatentsView only provides the original IPC codes as they appeared on patents and not the IPC reformed codes, current Cooperative Patent Classification codes on patents were converted back to the most recent IPC classification to prepare these statistics. Fractional counts of patents were assigned to each technological field on patents to assign the proper weight of a patent to the corresponding technological fields under the classification. International Patent Documentation (INPADOC) patent families across all patent offices covered in the Worldwide Patent Statistical Database (PATSTAT) are counted according to the year of the first granted patent in the patent family. Patent families are allocated according to patent inventorship information found on the priority patent of the INPADOC patent families. To account for missing ownership information in PATSTAT for some offices, a method designed by de Rassenfosse et al. (2012) is used to fill in missing information on priority patents using information in successive filings within the patent families (see technical documentation for details). Patent families are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named inventors. Because of data coverage issues for some patent offices in PATSTAT, statistics for some countries may be underestimated partially for some years or across the whole trend. Countries with identified issues include India (missing data) and South Africa (no data for 2018). For Italy, because of data gaps regarding information on granted patents, patent applications are used instead, which slightly overestimates Italy's output and creates a small shift in the year for which its output is accounted. The EU includes 28 member countries. China includes Hong Kong.

**Source(s)**

Science-Metrix; PATSTAT, accessed April 2019; PatentsView, USPTO, accessed June 2019.

TABLE SB-6

## USPTO patents and patent families granted in audio-visual technology, by region, country, or economy: 1998–2018

(Number)

| Region, country, or economy | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| World | 8,086 | 15,587 | 7,815 | 18,919 | 7,976 | 13,506 | 8,389 | 10,867 | 8,570 | 10,735 | 9,123 | 12,182 | 9,588 | 13,408 | 8,184 | 15,282 | 10,852 | 20,158 | 9,743 | 21,219 | 9,965 | 17,830 | 10,614 | 18,227 | 12,782 | 19,725 | 13,309 | 21,819 | 15,995 | 22,597 | 14,943 | 21,778 | 15,592 | 20,592 | 15,222 | 16,923 | 15,372 | 18,305 | 15,798 | 19,152 | 15,030 | 19,440 |
| North America | 3,402 | 2,580 | 3,344 | 2,419 | 3,556 | 2,460 | 3,651 | 2,323 | 3,572 | 2,198 | 3,796 | 2,363 | 3,803 | 2,401 | 3,263 | 1,973 | 4,071 | 2,340 | 3,496 | 1,949 | 3,311 | 1,754 | 3,494 | 1,852 | 4,053 | 2,065 | 4,140 | 2,109 | 4,954 | 2,710 | 4,916 | 2,616 | 5,876 | 3,087 | 5,916 | 2,766 | 5,940 | 2,453 | 5,973 | 2,384 | 5,501 | 2,040 |
| Canada | 82 | 80 | 83 | 70 | 93 | 73 | 84 | 64 | 89 | 71 | 96 | 74 | 97 | 78 | 84 | 58 | 121 | 72 | 101 | 72 | 123 | 79 | 109 | 80 | 141 | 110 | 159 | 81 | 193 | 110 | 213 | 111 | 259 | 138 | 288 | 134 | 266 | 121 | 234 | 104 | 217 | 75 |
| Mexico | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 2 | 0 | 1 | 1 | 1 | 4 | 3 | 4 | 1 | 2 | 2 | 0 | 2 | 0 | 2 | 2 | 2 | 2 | 2 | 6 | 3 | 3 | 2 | 3 | 2 | 4 | 2 | 10 | 6 | 7 | 6 | 11 | 10 |
| Puerto Rico | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 |
| United States | 3,320 | 2,500 | 3,259 | 2,349 | 3,462 | 2,386 | 3,566 | 2,258 | 3,481 | 2,125 | 3,699 | 2,288 | 3,704 | 2,322 | 3,175 | 1,912 | 3,945 | 2,267 | 3,391 | 1,877 | 3,186 | 1,675 | 3,384 | 1,772 | 3,910 | 1,952 | 3,979 | 2,026 | 4,755 | 2,597 | 4,700 | 2,503 | 5,614 | 2,947 | 5,624 | 2,631 | 5,663 | 2,327 | 5,731 | 2,273 | 5,272 | 1,954 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Central and South America | 1 | 0 | 3 | 1 | 2 | 5 | 6 | 4 | 2 | 5 | 2 | 0 | 3 | 6 | 4 | 5 | 4 | 5 | 2 | 6 | 2 | 4 | 3 | 4 | 1 | 3 | 4 | 4 | 4 | 5 | 5 | 6 | 6 | 7 | 4 | 8 | 8 | 9 | 9 | 9 | 8 | 14 |
| Argentina | 0 | 0 | 2 | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 0 |
| Brazil | 1 | 0 | 0 | 0 | 0 | 3 | 2 | 2 | 2 | 5 | 1 | 0 | 2 | 5 | 2 | 2 | 3 | 4 | 2 | 5 | 1 | 3 | 2 | 4 | 0 | 3 | 3 | 4 | 4 | 4 | 3 | 5 | 4 | 6 | 3 | 3 | 4 | 8 | 6 | 8 | 6 | 14 |
| All others | 0 | 0 | 1 | 1 | 2 | 2 | 2 | 1 | 0 | 0 | 0 | 0 | 2 | 2 | 2 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 0 | 1 | 1 | 1 | 2 | 0 | 2 | 1 | 2 | 1 | 3 | 0 | 3 | 1 | 1 | 0 |
| Europe | 644 | 1,011 | 639 | 1,038 | 691 | 992 | 754 | 918 | 729 | 1,019 | 747 | 1,206 | 758 | 1,204 | 656 | 1,249 | 821 | 1,197 | 728 | 1,057 | 687 | 1,035 | 707 | 968 | 922 | 900 | 979 | 916 | 1,306 | 1,019 | 1,276 | 902 | 1,265 | 954 | 1,317 | 992 | 1,517 | 1,015 | 1,621 | 1,097 | 1,650 | 1,073 |
| EU | 616 | 838 | 606 | 882 | 643 | 857 | 717 | 816 | 696 | 890 | 692 | 1,007 | 704 | 1,005 | 614 | 1,062 | 768 | 989 | 669 | 857 | 626 | 795 | 637 | 736 | 834 | 723 | 882 | 729 | 1,200 | 856 | 1,173 | 758 | 1,158 | 786 | 1,176 | 803 | 1,353 | 864 | 1,475 | 932 | 1,518 | 903 |
| Austria | 11 | 14 | 9 | 13 | 17 | 14 | 15 | 18 | 18 | 24 | 10 | 29 | 23 | 12 | 21 | 9 | 13 | 15 | 33 | 14 | 13 | 8 | 8 | 20 | 9 | 20 | 17 | 11 | 21 | 17 | 26 | 26 | 31 | 26 | 23 | 15 | 35 | 32 | 40 | 29 | 53 | 28 |
| Belgium | 16 | 4 | 15 | 6 | 12 | 8 | 17 | 6 | 21 | 13 | 14 | 9 | 25 | 4 | 4 | 13 | 24 | 11 | 17 | 8 | 14 | 11 | 13 | 5 | 17 | 9 | 20 | 6 | 27 | 8 | 8 | 29 | 40 | 10 | 34 | 11 | 39 | 16 | 45 | 17 | 40 | 14 |
| Denmark | 6 | 5 | 11 | 2 | 4 | 2 | 6 | 5 | 7 | 3 | 11 | 6 | 24 | 14 | 13 | 13 | 26 | 8 | 19 | 8 | 25 | 4 | 21 | 6 | 26 | 6 | 37 | 9 | 72 | 24 | 60 | 21 | 72 | 21 | 66 | 18 | 95 | 25 | 88 | 37 | 103 | 35 |
| Finland | 11 | 13 | 10 | 19 | 8 | 18 | 20 | 21 | 13 | 24 | 20 | 30 | 26 | 39 | 23 | 49 | 26 | 24 | 30 | 24 | 27 | 34 | 30 | 37 | 47 | 31 | 34 | 30 | 51 | 38 | 71 | 32 | 58 | 48 | 77 | 40 | 87 | 55 | 98 | 51 | 103 | 50 |
| France | 86 | 233 | 94 | 200 | 81 | 190 | 91 | 170 | 99 | 233 | 85 | 284 | 92 | 225 | 93 | 252 | 92 | 246 | 90 | 222 | 83 | 199 | 86 | 205 | 116 | 173 | 117 | 177 | 161 | 219 | 178 | 193 | 171 | 196 | 153 | 209 | 182 | 221 | 216 | 205 | 197 | 226 |
| Germany | 189 | 252 | 187 | 292 | 230 | 264 | 234 | 282 | 220 | 333 | 217 | 317 | 196 | 299 | 184 | 362 | 230 | 367 | 200 | 323 | 195 | 298 | 188 | 256 | 254 | 260 | 268 | 208 | 406 | 245 | 251 | 344 | 244 | 317 | 244 | 312 | 222 | 372 | 238 | 409 | 240 | 453 |
| Hungary | 0 | 6 | 0 | 0 | 0 | 6 | 0 | 5 | 1 | 6 | 1 | 3 | 1 | 1 | 0 | 1 | 0 | 6 | 0 | 1 | 2 | 2 | 2 | 1 | 2 | 2 | 4 | 1 | 1 | 1 | 2 | 1 | 1 | 4 | 3 | 3 | 3 | 1 | 4 | 1 | 4 | 2 |
| Ireland | 5 | 12 | 3 | 10 | 6 | 4 | 7 | 3 | 7 | 3 | 7 | 2 | 5 | 1 | 5 | 0 | 8 | 3 | 8 | 2 | 8 | 1 | 7 | 3 | 9 | 3 | 10 | 6 | 15 | 4 | 21 | 7 | 18 | 9 | 17 | 8 | 22 | 9 | 23 | 7 | 24 | 9 |
| Italy | 21 | 62 | 17 | 78 | 27 | 89 | 28 | 44 | 29 | 39 | 31 | 33 | 19 | 84 | 25 | 44 | 31 | 17 | 21 | 17 | 20 | 10 | 15 | 14 | 21 | 20 | 26 | 26 | 27 | 22 | 26 | 8 | 35 | 8 | 42 | 7 | 43 | 9 | 50 | 54 | 45 | 54 |
| Netherlands | 122 | 66 | 106 | 58 | 100 | 57 | 110 | 64 | 108 | 59 | 126 | 44 | 130 | 58 | 85 | 55 | 147 | 62 | 120 | 51 | 103 | 66 | 108 | 41 | 133 | 32 | 139 | 38 | 127 | 39 | 142 | 34 | 113 | 23 | 86 | 30 | 111 | 47 | 117 | 41 | 98 | 27 |
| Spain | 1 | 31 | 3 | 49 | 8 | 27 | 8 | 36 | 3 | 13 | 5 | 35 | 4 | 38 | 6 | 42 | 4 | 34 | 2 | 35 | 1 | 31 | 4 | 31 | 6 | 33 | 7 | 34 | 6 | 36 | 9 | 32 | 7 | 22 | 11 | 26 | 15 | 16 | 11 | 29 | 16 | 20 |
| Sweden | 15 | 39 | 22 | 43 | 21 | 40 | 35 | 41 | 32 | 43 | 25 | 50 | 25 | 55 | 27 | 40 | 29 | 31 | 21 | 22 | 20 | 27 | 30 | 18 | 44 | 36 | 51 | 38 | 74 | 49 | 65 | 32 | 83 | 38 | 110 | 55 | 108 | 53 | 142 | 53 | 148 | 44 |
| United Kingdom | 131 | 70 | 125 | 81 | 126 | 111 | 139 | 89 | 129 | 83 | 120 | 138 | 143 | 136 | 124 | 130 | 129 | 108 | 121 | 102 | 114 | 53 | 119 | 64 | 135 | 74 | 140 | 105 | 192 | 109 | 195 | 96 | 201 | 101 | 198 | 100 | 198 | 109 | 195 | 103 | 196 | 94 |
| All others | 1 | 32 | 3 | 21 | 2 | 27 | 8 | 31 | 5 | 28 | 0 | 34 | 2 | 31 | 5 | 46 | 5 | 38 | 5 | 29 | 6 | 42 | 6 | 34 | 7 | 34 | 8 | 35 | 15 | 32 | 15 | 34 | 23 | 44 | 25 | 37 | 26 | 41 | 29 | 60 | 29 | 45 |
| Other Europe | 28 | 172 | 33 | 157 | 48 | 135 | 36 | 103 | 33 | 129 | 55 | 199 | 54 | 200 | 42 | 187 | 53 | 221 | 60 | 200 | 71 | 233 | 88 | 177 | 97 | 187 | 106 | 162 | 102 | 144 | 107 | 168 | 142 | 189 | 164 | 141 | 156 | 146 | 165 | 142 | 170 | 120 |
| Former Soviet Union | 2 | 7 | 0 | 8 | 0 | 4 | 0 | 7 | 0 | 7 | 2 | 19 | 0 | 48 | 0 | 16 | 1 | 32 | 1 | 12 | 1 | 19 | 3 | 15 | 0 | 13 | 1 | 15 | 0 | 11 | 0 | 9 | 0 | 14 | 2 | 7 | 3 | 7 | 3 | 10 | 4 | 7 |
| Norway | 7 | 10 | 13 | 17 | 14 | 12 | 8 | 14 | 3 | 10 | 6 | 16 | 9 | 5 | 9 | 19 | 8 | 17 | 13 | 9 | 8 | 9 | 12 | 11 | 23 | 8 | 8 | 10 | 29 | 15 | 20 | 7 | 26 | 9 | 31 | 19 | 32 | 16 | 21 | 13 | 23 | 10 |
| Russia | 3 | 141 | 4 | 112 | 4 | 106 | 4 | 62 | 5 | 87 | 9 | 141 | 4 | 123 | 4 | 132 | 5 | 122 | 5 | 152 | 6 | 162 | 4 | 166 | 5 | 116 | 10 | 113 | 9 | 98 | 13 | 98 | 11 | 109 | 10 | 115 | 21 | 98 | 19 | 97 | 19 | 119 |
| Switzerland | 16 | 14 | 15 | 18 | 28 | 12 | 23 | 19 | 19 | 24 | 23 | 36 | 22 | 40 | 23 | 29 | 20 | 38 | 35 | 39 | 27 | 45 | 44 | 51 | 38 | 57 | 35 | 75 | 46 | 63 | 37 | 66 | 25 | 65 | 30 | 91 | 39 | 98 | 26 | 93 | 41 | 77 |
| All others | 0 | 0 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 5 | 0 | 3 | 2 | 5 | 3 | 3 | 6 | 2 | 3 | 4 | 5 | 5 | 8 | 9 | 10 | 5 | 10 | 5 | 9 | 3 |
| Asia | 3,997 | 11,948 | 3,790 | 15,410 | 3,691 | 9,993 | 3,897 | 7,563 | 4,195 | 7,440 | 4,516 | 8,548 | 4,938 | 9,710 | 4,201 | 11,964 | 5,855 | 16,553 | 5,427 | 18,149 | 5,869 | 14,987 | 6,303 | 15,336 | 7,674 | 16,689 | 8,039 | 18,714 | 9,577 | 18,770 | 8,575 | 18,169 | 8,277 | 16,438 | 7,812 | 13,044 | 7,730 | 14,719 | 7,983 | 15,574 | 7,665 | 16,241 |

**TABLE SB-6**

## USPTO patents and patent families granted in audio-visual technology, by region, country, or economy: 1998–2018

(Number)

| | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Region, country, or economy | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| China | 13 | 24 | 10 | 32 | 22 | 90 | 20 | 82 | 31 | 69 | 41 | 209 | 48 | 400 | 54 | 514 | 79 | 696 | 86 | 854 | 125 | 1,700 | 169 | 2,639 | 199 | 2,804 | 236 | 3,266 | 407 | 3,712 | 493 | 3,235 | 514 | 2,873 | 585 | 4,075 | 858 | 4,875 | 1,153 | 6,583 | 1,322 | 8,302 |
| India | 0 | 0 | 0 | 1 | 1 | 2 | 0 | 1 | 3 | 2 | 4 | 3 | 7 | 8 | 6 | 4 | 11 | 10 | 9 | 9 | 14 | 11 | 20 | 10 | 28 | 15 | 35 | 22 | 68 | 26 | 68 | 49 | 97 | 63 | 88 | 50 | 102 | 52 | 111 | 56 | 123 | 62 |
| Japan | 3,292 | 8,922 | 3,136 | 8,319 | 3,055 | 6,552 | 3,200 | 6,076 | 3,411 | 5,960 | 3,697 | 5,992 | 3,952 | 6,536 | 3,303 | 6,301 | 4,428 | 6,816 | 3,909 | 8,448 | 3,985 | 8,624 | 4,257 | 9,903 | 5,026 | 10,331 | 5,258 | 10,770 | 5,909 | 10,442 | 5,162 | 9,315 | 4,884 | 7,839 | 4,257 | 4,761 | 3,811 | 5,232 | 3,703 | 4,822 | 3,441 | 4,466 |
| Malaysia | 4 | 1 | 4 | 2 | 3 | 4 | 4 | 2 | 2 | 2 | 3 | 3 | 2 | 4 | 3 | 9 | 9 | 15 | 8 | 22 | 14 | 18 | 8 | 16 | 15 | 14 | 8 | 10 | 7 | 17 | 22 | 18 | 22 | 21 | 16 | 12 | 17 | 18 | 12 | 15 | 18 | 15 |
| Singapore | 10 | 5 | 14 | 11 | 21 | 10 | 26 | 11 | 41 | 11 | 65 | 12 | 92 | 8 | 48 | 13 | 61 | 19 | 37 | 21 | 57 | 29 | 47 | 26 | 75 | 29 | 56 | 23 | 103 | 33 | 76 | 29 | 88 | 32 | 104 | 35 | 98 | 26 | 86 | 27 | 83 | 28 |
| South Korea | 530 | 2,816 | 488 | 6,851 | 406 | 3,069 | 405 | 1,023 | 404 | 883 | 386 | 1,649 | 442 | 1,979 | 419 | 4,135 | 719 | 7,711 | 788 | 7,625 | 1,045 | 3,787 | 1,135 | 1,939 | 1,402 | 2,358 | 1,417 | 3,312 | 1,706 | 3,089 | 1,610 | 3,359 | 1,703 | 3,700 | 1,793 | 2,527 | 1,898 | 2,901 | 2,081 | 2,840 | 1,841 | 2,597 |
| Taiwan | 145 | 181 | 138 | 194 | 180 | 263 | 239 | 368 | 298 | 507 | 318 | 676 | 392 | 774 | 368 | 986 | 543 | 1,285 | 586 | 1,164 | 625 | 814 | 662 | 798 | 923 | 1,133 | 1,014 | 1,301 | 1,364 | 1,446 | 1,127 | 2,155 | 954 | 1,901 | 942 | 1,572 | 922 | 1,599 | 823 | 1,223 | 827 | 763 |
| All others | 3 | 1 | 0 | 1 | 2 | 3 | 2 | 1 | 6 | 6 | 2 | 3 | 3 | 1 | 1 | 1 | 5 | 2 | 4 | 5 | 3 | 4 | 6 | 4 | 6 | 5 | 15 | 10 | 13 | 6 | 18 | 8 | 15 | 11 | 27 | 11 | 24 | 16 | 13 | 9 | 9 | 7 |
| Middle East | 27 | 15 | 24 | 13 | 25 | 16 | 45 | 19 | 38 | 17 | 30 | 16 | 42 | 18 | 25 | 16 | 44 | 13 | 34 | 13 | 42 | 14 | 45 | 14 | 73 | 13 | 82 | 22 | 110 | 32 | 116 | 36 | 113 | 39 | 121 | 46 | 125 | 36 | 149 | 50 | 133 | 36 |
| Israel | 26 | 14 | 23 | 12 | 24 | 15 | 45 | 15 | 37 | 15 | 30 | 14 | 42 | 18 | 25 | 16 | 44 | 12 | 34 | 10 | 42 | 14 | 44 | 13 | 73 | 12 | 78 | 19 | 108 | 28 | 111 | 31 | 108 | 35 | 117 | 43 | 119 | 31 | 141 | 46 | 126 | 33 |
| All others | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 5 | 1 | 2 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 1 | 1 | 0 | 1 | 4 | 3 | 2 | 4 | 5 | 6 | 5 | 4 | 4 | 3 | 6 | 5 | 8 | 4 | 7 | 3 |
| Africa | 2 | 5 | 2 | 10 | 1 | 13 | 2 | 14 | 1 | 21 | 2 | 15 | 3 | 12 | 2 | 8 | 2 | 5 | 1 | 3 | 4 | 4 | 3 | 8 | 2 | 10 | 1 | 6 | 5 | 10 | 4 | 5 | 3 | 5 | 4 | 2 | 4 | 2 | 4 | 3 | 5 | 3 |
| South Africa | 2 | 2 | 1 | 2 | 1 | 4 | 1 | 5 | 1 | 4 | 2 | 5 | 3 | 5 | 1 | 5 | 2 | 3 | 1 | 3 | 4 | 3 | 3 | 8 | 1 | 6 | 1 | 2 | 0 | 1 | 3 | 1 | 0 | 1 | 2 | 1 | 2 | 1 | 3 | 0 | 3 | 1 |
| All others | 0 | 3 | 1 | 7 | 1 | 9 | 0 | 9 | 0 | 17 | 0 | 10 | 0 | 7 | 1 | 3 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 4 | 0 | 5 | 5 | 5 | 8 | 4 | 2 | 5 | 2 | 1 | 2 | 2 | 1 | 2 | 2 | 2 |
| Australia and Oceania | 13 | 19 | 14 | 15 | 10 | 21 | 34 | 25 | 33 | 35 | 31 | 32 | 39 | 51 | 32 | 41 | 56 | 41 | 55 | 41 | 50 | 30 | 58 | 44 | 57 | 45 | 63 | 48 | 39 | 52 | 51 | 44 | 51 | 60 | 46 | 69 | 47 | 69 | 59 | 36 | 69 | 33 |
| Australia | 11 | 19 | 12 | 14 | 9 | 19 | 34 | 25 | 27 | 35 | 29 | 32 | 37 | 51 | 30 | 41 | 53 | 40 | 54 | 39 | 47 | 30 | 53 | 44 | 55 | 45 | 62 | 47 | 35 | 52 | 43 | 40 | 49 | 59 | 37 | 67 | 40 | 68 | 52 | 35 | 63 | 31 |
| New Zealand | 1 | 0 | 2 | 1 | 2 | 2 | 0 | 0 | 6 | 0 | 2 | 1 | 2 | 1 | 2 | 0 | 3 | 1 | 1 | 2 | 3 | 1 | 5 | 1 | 2 | 0 | 1 | 1 | 5 | 1 | 8 | 4 | 2 | 1 | 9 | 1 | 7 | 1 | 7 | 1 | 6 | 2 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Unclassified | 0 | 9 | 0 | 12 | 0 | 6 | 0 | 1 | 0 | 0 | 0 | 2 | 0 | 6 | 0 | 26 | 0 | 5 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 2 | 1 | 1 | 0 | 1 | 0 |

EU = European Union; USPTO = U.S. Patent and Trademark Office.

**Note(s)**

USPTO patents are allocated according to patent inventorship information. USPTO patents are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named inventors. Patents are classified under the World Intellectual Property Organization (WIPO) classification of patents, which classifies International Patent Classification (IPC) codes under 35 technical fields. IPC reformed codes take into account changes that were made to the WIPO classification in 2006 under the eighth version of the classification and were used to prepare these data. However, because PatentsView only provides the original IPC codes as they appeared on patents and not the IPC reformed codes, current Cooperative Patent Classification codes on patents were converted back to the most recent IPC classification to prepare these statistics. Fractional counts of patents were assigned to each technological field on patents to assign the proper weight of a patent to the corresponding technological fields under the classification. International Patent Documentation (INPADOC) patent families across all patent offices covered in the Worldwide Patent Statistical Database (PATSTAT) are counted according to the year of the first granted patent in the patent family. Patent families are allocated according to patent inventorship information found on the priority patent of the INPADOC patent families. To account for missing ownership information in PATSTAT for some offices, a method designed by de Rassenfosse et al. (2012) is used to fill in missing information on priority patents using information in successive filings within the patent families (see technical documentation for details). Patent families are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named inventors. Because of data coverage issues for some patent offices in PATSTAT, statistics for some countries may be underestimated partially for some years or across the whole trend. Countries with identified issues include India (missing data) and South Africa (no data for 2018). For Italy, because of data gaps regarding information on granted patents, patent applications are used instead, which slightly overestimates Italy's output and creates a small shift in the year for which its output is accounted. The EU includes 28 member countries. China includes Hong Kong.

**Source(s)**

Science-Metrix; PATSTAT, accessed April 2019; PatentsView, USPTO, accessed June 2019.

*Science and Engineering Indicators*

TABLE 5B-7

## USPTO patents and patent families granted in telecommunications, by region, country, or economy: 1998–2018

(Number)

| Region, country, or economy | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| World | 5,028 | 9,024 | 5,450 | 11,648 | 5,492 | 10,497 | 5,727 | 9,095 | 5,878 | 8,635 | 6,032 | 9,910 | 6,508 | 10,872 | 5,989 | 11,304 | 8,305 | 17,294 |
| North America | 2,599 | 2,179 | 2,945 | 2,393 | 2,998 | 2,403 | 3,150 | 2,348 | 3,189 | 2,254 | 3,174 | 2,205 | 3,531 | 2,422 | 3,193 | 2,108 | 4,394 | 2,946 |
| Canada | 114 | 108 | 154 | 124 | 161 | 134 | 169 | 155 | 147 | 118 | 157 | 108 | 183 | 138 | 175 | 112 | 246 | 164 |
| Mexico | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 1 | 5 | 4 | 3 | 2 | 2 | 1 |
| Puerto Rico | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| United States | 2,485 | 2,071 | 2,788 | 2,268 | 2,835 | 2,267 | 2,981 | 2,192 | 3,041 | 2,135 | 3,015 | 2,096 | 3,343 | 2,280 | 3,015 | 1,994 | 4,145 | 2,781 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Central and South America | 1 | 2 | 3 | 2 | 2 | 5 | 0 | 0 | 2 | 3 | 0 | 4 | 1 | 6 | 0 | 1 | 1 | 3 |
| Argentina | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Brazil | 1 | 1 | 2 | 0 | 1 | 4 | 0 | 0 | 1 | 1 | 0 | 4 | 0 | 6 | 0 | 1 | 1 | 2 |
| All others | 0 | 1 | 2 | 2 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Europe | 620 | 1,188 | 727 | 1,299 | 765 | 1,406 | 857 | 1,318 | 894 | 1,307 | 925 | 1,576 | 928 | 1,718 | 820 | 1,501 | 1,090 | 1,601 |
| EU-28 | 607 | 909 | 702 | 1,099 | 742 | 1,217 | 829 | 1,167 | 864 | 1,101 | 897 | 1,289 | 885 | 1,375 | 784 | 1,215 | 1,044 | 1,304 |
| Austria | 9 | 9 | 8 | 8 | 8 | 15 | 3 | 24 | 6 | 17 | 13 | 18 | 10 | 19 | 17 | 19 | 13 | 38 |
| Belgium | 32 | 8 | 17 | 11 | 12 | 9 | 14 | 12 | 8 | 7 | 15 | 11 | 19 | 12 | 19 | 15 | 24 | 19 |
| Denmark | 2 | 3 | 13 | 7 | 12 | 10 | 13 | 14 | 16 | 9 | 17 | 12 | 12 | 12 | 14 | 13 | 20 | 18 |
| Finland | 70 | 71 | 82 | 99 | 94 | 139 | 97 | 145 | 109 | 108 | 131 | 150 | 119 | 161 | 101 | 115 | 138 | 90 |
| France | 91 | 189 | 114 | 214 | 117 | 255 | 139 | 235 | 137 | 222 | 129 | 337 | 134 | 289 | 108 | 281 | 163 | 372 |
| Germany | 131 | 260 | 139 | 238 | 149 | 229 | 198 | 283 | 206 | 265 | 242 | 283 | 262 | 334 | 234 | 350 | 297 | 388 |
| Hungary | 1 | 2 | 1 | 6 | 1 | 1 | 1 | 2 | 0 | 3 | 6 | 5 | 1 | 9 | 6 | 6 | 1 | 2 |
| Ireland | 3 | 6 | 2 | 9 | 3 | 4 | 4 | 2 | 4 | 3 | 5 | 7 | 11 | 9 | 6 | 6 | 9 | 7 |
| Italy | 24 | 81 | 6 | 143 | 16 | 160 | 20 | 62 | 19 | 58 | 26 | 42 | 30 | 109 | 28 | 60 | 37 | 28 |
| Netherlands | 52 | 31 | 48 | 42 | 33 | 48 | 27 | 33 | 27 | 28 | 21 | 27 | 34 | 20 | 19 | 27 | 30 | 34 |
| Spain | 7 | 45 | 3 | 48 | 5 | 33 | 6 | 30 | 3 | 11 | 10 | 35 | 7 | 32 | 9 | 45 | 23 | 34 |
| Sweden | 63 | 96 | 99 | 137 | 130 | 166 | 131 | 180 | 146 | 197 | 125 | 166 | 70 | 139 | 78 | 63 | 85 | 82 |
| United Kingdom | 120 | 75 | 159 | 108 | 161 | 127 | 174 | 116 | 180 | 145 | 156 | 174 | 173 | 205 | 144 | 187 | 198 | 162 |
| All others | 1 | 34 | 1 | 31 | 1 | 20 | 2 | 28 | 2 | 28 | 2 | 21 | 4 | 27 | 0 | 34 | 5 | 28 |
| Other Europe | 13 | 278 | 25 | 199 | 23 | 190 | 28 | 152 | 30 | 207 | 29 | 287 | 43 | 343 | 36 | 286 | 46 | 267 |
| Former Soviet Union | 0 | 5 | 0 | 3 | 0 | 2 | 1 | 2 | 0 | 0 | 5 | 0 | 18 | 0 | 0 | 16 | 0 | 6 |
| Norway | 1 | 6 | 1 | 7 | 2 | 8 | 3 | 6 | 6 | 9 | 7 | 12 | 6 | 7 | 5 | 11 | 8 | 12 |
| Russia | 2 | 257 | 5 | 179 | 3 | 163 | 7 | 128 | 4 | 179 | 2 | 243 | 8 | 261 | 6 | 240 | 7 | 255 |
| Switzerland | 10 | 10 | 18 | 10 | 16 | 15 | 15 | 12 | 17 | 12 | 18 | 14 | 22 | 14 | 23 | 19 | 27 | 22 |
| All others | 0 | 0 | 1 | 1 | 2 | 2 | 2 | 3 | 3 | 1 | 2 | 1 | 7 | 3 | 2 | 1 | 4 | 2 |
| Asia | 1,749 | 5,602 | 1,726 | 7,899 | 1,668 | 6,609 | 1,654 | 5,350 | 1,714 | 4,980 | 1,836 | 6,043 | 1,931 | 6,629 | 1,873 | 7,604 | 2,638 | 12,628 |

| Region, country, or economy | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| World | 6,913 | 16,674 | 7,060 | 13,434 | 7,215 | 12,939 | 8,561 | 14,953 | 9,183 | 16,957 | 11,340 | 17,652 | 12,108 | 16,537 | 12,530 | 16,172 | 11,740 | 13,893 |
| North America | 3,583 | 2,373 | 3,452 | 2,301 | 3,557 | 2,379 | 4,137 | 2,806 | 4,490 | 2,732 | 5,284 | 3,304 | 5,778 | 3,094 | 5,997 | 2,882 | 5,534 | 2,317 |
| Canada | 206 | 144 | 193 | 168 | 225 | 153 | 252 | 191 | 306 | 177 | 393 | 214 | 438 | 225 | 456 | 244 | 393 | 187 |
| Mexico | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 2 | 1 | 3 | 1 | 2 |
| Puerto Rico | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 1 | 0 | 1 | 0 |
| United States | 3,376 | 2,229 | 3,258 | 2,133 | 3,331 | 2,225 | 3,884 | 2,615 | 4,184 | 2,555 | 4,888 | 3,089 | 5,337 | 2,868 | 5,537 | 2,637 | 5,137 | 2,129 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| Central and South America | 1 | 1 | 4 | 6 | 6 | 6 | 5 | 4 | 7 | 5 | 7 | 3 | 5 | 5 | 18 | 10 | 14 | 6 |
| Argentina | 0 | 1 | 0 | 0 | 3 | 2 | 0 | 0 | 2 | 2 | 2 | 1 | 2 | 0 | 3 | 0 | 2 | 1 |
| Brazil | 1 | 0 | 3 | 6 | 2 | 4 | 3 | 2 | 4 | 3 | 3 | 1 | 2 | 5 | 13 | 9 | 8 | 4 |
| All others | 0 | 0 | 1 | 0 | 1 | 0 | 3 | 1 | 1 | 0 | 4 | 2 | 1 | 0 | 3 | 1 | 3 | 1 |
| Europe | 827 | 1,162 | 1,022 | 1,214 | 987 | 1,180 | 1,242 | 1,366 | 1,365 | 1,165 | 1,498 | 1,241 | 1,471 | 1,095 | 1,488 | 1,152 | 1,496 | 1,226 |
| EU-28 | 842 | 936 | 843 | 976 | 906 | 943 | 894 | 1,190 | 1,058 | 1,314 | 901 | 1,441 | 975 | 1,401 | 767 | 1,402 | 853 | 1,402 |
| Austria | 12 | 19 | 18 | 16 | 14 | 13 | 20 | 17 | 11 | 17 | 30 | 25 | 19 | 17 | 35 | 29 | 26 | 18 |
| Belgium | 18 | 13 | 21 | 19 | 17 | 7 | 17 | 15 | 14 | 15 | 13 | 13 | 24 | 17 | 27 | 22 | 30 | 16 |
| Denmark | 15 | 23 | 15 | 18 | 11 | 14 | 13 | 13 | 12 | 9 | 26 | 15 | 33 | 16 | 44 | 11 | 27 | 11 |
| Finland | 76 | 110 | 88 | 116 | 90 | 123 | 81 | 112 | 62 | 98 | 117 | 30 | 25 | 19 | 17 | 35 | 29 | 26 |
| France | 111 | 203 | 142 | 193 | 132 | 229 | 180 | 259 | 196 | 196 | 183 | 226 | 215 | 154 | 204 | 250 | 216 | 242 |
| Germany | 257 | 343 | 217 | 284 | 218 | 215 | 256 | 244 | 210 | 211 | 273 | 272 | 282 | 263 | 359 | 251 | 304 | 208 |
| Hungary | 1 | 3 | 1 | 3 | 2 | 2 | 3 | 2 | 2 | 1 | 4 | 2 | 2 | 2 | 6 | 1 | 2 | 1 |
| Ireland | 5 | 7 | 9 | 8 | 10 | 8 | 17 | 11 | 14 | 10 | 22 | 13 | 20 | 9 | 23 | 13 | 36 | 17 |
| Italy | 31 | 34 | 44 | 48 | 37 | 29 | 49 | 37 | 47 | 45 | 55 | 46 | 75 | 23 | 78 | 19 | 65 | 10 |
| Netherlands | 37 | 30 | 46 | 28 | 26 | 30 | 33 | 32 | 41 | 32 | 59 | 46 | 68 | 15 | 62 | 28 | 66 | 16 |
| Spain | 18 | 39 | 26 | 30 | 18 | 23 | 15 | 41 | 27 | 31 | 45 | 48 | 41 | 54 | 37 | 54 | 47 | 24 |
| Sweden | 56 | 54 | 65 | 54 | 68 | 65 | 127 | 80 | 128 | 81 | 151 | 75 | 175 | 63 | 215 | 69 | 211 | 54 |
| United Kingdom | 167 | 126 | 152 | 101 | 147 | 96 | 150 | 106 | 167 | 106 | 212 | 139 | 231 | 109 | 242 | 117 | 240 | 117 |
| All others | 5 | 39 | 6 | 34 | 12 | 41 | 14 | 39 | 19 | 45 | 23 | 48 | 25 | 36 | 20 | 58 | 27 | 51 |
| Other Europe | 6 | 34 | 33 | 331 | 31 | 319 | 46 | 308 | 44 | 286 | 51 | 309 | 51 | 264 | 57 | 266 | 69 | 327 |
| Former Soviet Union | 1 | 17 | 0 | 19 | 0 | 26 | 0 | 33 | 4 | 28 | 4 | 9 | 2 | 6 | 0 | 23 | 2 | 26 |
| Norway | 6 | 10 | 6 | 6 | 3 | 4 | 7 | 9 | 7 | 3 | 5 | 6 | 5 | 4 | 0 | 7 | 3 | 8 |
| Russia | 8 | 273 | 6 | 286 | 10 | 270 | 10 | 247 | 11 | 240 | 12 | 263 | 13 | 226 | 18 | 223 | 28 | 287 |
| Switzerland | 13 | 20 | 20 | 19 | 17 | 18 | 27 | 14 | 20 | 13 | 29 | 15 | 31 | 11 | 29 | 13 | 27 | 7 |
| All others | 2 | 1 | 1 | 2 | 1 | 2 | 1 | 5 | 2 | 2 | 2 | 0 | 1 | 0 | 3 | 4 | 4 | 4 |
| Asia | 2,315 | 12,846 | 2,591 | 9,771 | 2,680 | 9,282 | 3,215 | 10,805 | 3,490 | 12,931 | 4,596 | 12,863 | 4,740 | 12,152 | 4,751 | 11,909 | 4,476 | 10,355 |

| Region, country, or economy | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|
| | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| World | 11,147 | 14,094 | 11,650 | 13,577 | 11,016 | 14,074 |
| North America | 5,191 | 2,037 | 5,385 | 1,983 | 5,026 | 1,724 |
| Canada | 349 | 163 | 322 | 160 | 265 | 130 |
| Mexico | 10 | 11 | 6 | 7 | 7 | 4 |
| Puerto Rico | 1 | 0 | 1 | 0 | 0 | 0 |
| United States | 4,831 | 1,863 | 5,056 | 1,816 | 4,753 | 1,590 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 |
| Central and South America | 11 | 6 | 14 | 13 | 15 | 12 |
| Argentina | 3 | 0 | 3 | 0 | 4 | 0 |
| Brazil | 6 | 5 | 7 | 11 | 7 | 9 |
| All others | 3 | 1 | 4 | 2 | 4 | 2 |
| Europe | 1,488 | 1,152 | 1,496 | 1,226 | 1,381 | 1,211 |
| EU-28 | 1,402 | 853 | 1,402 | 894 | 1,295 | 871 |
| Austria | 27 | 20 | 37 | 29 | 31 | 28 |
| Belgium | 37 | 32 | 20 | 31 | 27 | 29 |
| Denmark | 37 | 13 | 45 | 16 | 24 | 12 |
| Finland | 52 | 94 | 54 | 91 | 41 | 73 |
| France | 204 | 250 | 216 | 242 | 178 | 252 |
| Germany | 304 | 233 | 311 | 235 | 317 | 268 |
| Hungary | 6 | 3 | 5 | 3 | 3 | 0 |
| Ireland | 20 | 18 | 34 | 17 | 33 | 22 |
| Italy | 66 | 17 | 71 | 52 | 58 | 41 |
| Netherlands | 66 | 20 | 60 | 18 | 73 | 18 |
| Spain | 35 | 24 | 36 | 24 | 38 | 24 |
| Sweden | 231 | 40 | 209 | 43 | 186 | 26 |
| United Kingdom | 218 | 89 | 220 | 91 | 197 | 85 |
| All others | 33 | 51 | 34 | 43 | 36 | 32 |
| Other Europe | 86 | 300 | 93 | 332 | 86 | 341 |
| Former Soviet Union | 2 | 20 | 3 | 14 | 3 | 9 |
| Norway | 3 | 4 | 7 | 5 | 6 | 5 |
| Russia | 33 | 258 | 40 | 295 | 29 | 304 |
| Switzerland | 37 | 12 | 40 | 16 | 41 | 21 |
| All others | 6 | 6 | 3 | 3 | 7 | 1 |
| Asia | 4,224 | 10,791 | 4,506 | 10,269 | 4,324 | 11,036 |

TABLE S8-7

## USPTO patents and patent families granted in telecommunications, by region, country, or economy: 1998–2018

(Number)

| Region, country, or economy | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| China | 7 | 18 | 7 | 27 | 8 | 96 | 7 | 71 | 3 | 71 | 12 | 246 | 20 | 618 | 23 | 604 | 41 | 733 | 40 | 764 | 59 | 1,448 |
| India | 1 | 0 | 1 | 0 | 1 | 1 | 2 | 1 | 3 | 1 | 2 | 2 | 6 | 6 | 7 | 7 | 10 | 11 | 18 | 17 | 21 | 23 |
| Japan | 1,522 | 4,219 | 1,452 | 4,927 | 1,401 | 4,299 | 1,365 | 3,964 | 1,412 | 3,644 | 1,451 | 3,767 | 1,543 | 3,661 | 1,473 | 3,720 | 2,004 | 3,728 | 1,613 | 4,463 | 1,753 | 4,839 |
| Malaysia | 0 | 1 | 2 | 2 | 1 | 2 | 3 | 3 | 1 | 2 | 0 | 5 | 3 | 5 | 1 | 6 | 1 | 8 | 4 | 11 | 4 | 4 |
| Singapore | 4 | 1 | 3 | 3 | 5 | 1 | 10 | 7 | 13 | 9 | 10 | 7 | 12 | 5 | 10 | 9 | 15 | 7 | 12 | 13 | 10 | 7 |
| South Korea | 139 | 1,242 | 172 | 2,804 | 159 | 2,006 | 154 | 1,007 | 156 | 952 | 201 | 1,548 | 179 | 1,860 | 211 | 2,633 | 316 | 7,402 | 339 | 7,063 | 412 | 3,170 |
| Taiwan | 76 | 119 | 87 | 134 | 91 | 201 | 111 | 298 | 124 | 301 | 160 | 469 | 168 | 474 | 148 | 624 | 248 | 739 | 290 | 513 | 332 | 277 |
| All others | 0 | 2 | 2 | 1 | 2 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 3 |
| Middle East | 34 | 25 | 35 | 18 | 38 | 25 | 43 | 29 | 43 | 40 | 66 | 43 | 77 | 55 | 58 | 42 | 95 | 56 | 77 | 45 | 77 | 55 |
| Israel | 33 | 23 | 34 | 18 | 38 | 21 | 42 | 28 | 43 | 35 | 65 | 42 | 77 | 55 | 58 | 40 | 94 | 55 | 76 | 42 | 77 | 51 |
| All others | 1 | 2 | 0 | 1 | 0 | 3 | 1 | 1 | 1 | 5 | 0 | 1 | 0 | 0 | 1 | 2 | 1 | 1 | 1 | 2 | 0 | 4 |
| Africa | 2 | 8 | 0 | 11 | 2 | 8 | 2 | 10 | 3 | 8 | 1 | 12 | 3 | 7 | 3 | 6 | 3 | 8 | 3 | 9 | 2 | 7 |
| South Africa | 2 | 4 | 0 | 7 | 1 | 3 | 2 | 3 | 3 | 1 | 1 | 9 | 3 | 6 | 1 | 2 | 2 | 5 | 2 | 6 | 2 | 6 |
| All others | 0 | 4 | 0 | 4 | 1 | 5 | 1 | 6 | 0 | 7 | 0 | 4 | 0 | 1 | 2 | 3 | 1 | 3 | 1 | 3 | 0 | 0 |
| Australia and Oceania | 24 | 14 | 15 | 11 | 19 | 25 | 19 | 38 | 33 | 43 | 30 | 27 | 38 | 28 | 41 | 37 | 84 | 50 | 55 | 25 | 60 | 24 |
| Australia | 17 | 12 | 13 | 10 | 15 | 25 | 14 | 36 | 29 | 42 | 21 | 24 | 36 | 27 | 38 | 35 | 79 | 49 | 54 | 25 | 57 | 23 |
| New Zealand | 7 | 3 | 1 | 0 | 3 | 0 | 5 | 2 | 4 | 0 | 9 | 3 | 1 | 0 | 3 | 2 | 5 | 1 | 1 | 1 | 3 | 1 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Unclassified | 0 | 6 | 0 | 16 | 2 | 16 | 2 | 2 | 0 | 1 | 0 | 0 | 0 | 6 | 0 | 6 | 0 | 2 | 0 | 0 | 0 | 1 |

| Region, country, or economy | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| China | 94 | 2,345 | 165 | 2,435 | 242 | 2,981 | 387 | 3,502 | 394 | 3,510 | 543 | 3,477 | 504 | 4,329 | 531 | 4,500 | 710 | 4,743 | 721 | 5,912 |
| India | 16 | 20 | 24 | 38 | 34 | 34 | 61 | 59 | 84 | 60 | 100 | 66 | 123 | 75 | 123 | 77 | 152 | 72 | 148 | 76 |
| Japan | 1,786 | 4,956 | 2,100 | 5,505 | 2,159 | 6,427 | 2,804 | 6,165 | 2,781 | 5,479 | 2,708 | 4,799 | 2,460 | 3,294 | 2,106 | 3,592 | 2,140 | 3,164 | 2,066 | 2,996 |
| Malaysia | 6 | 7 | 3 | 10 | 5 | 10 | 6 | 11 | 5 | 8 | 5 | 20 | 11 | 20 | 14 | 23 | 10 | 20 | 8 | 23 |
| Singapore | 13 | 11 | 12 | 10 | 15 | 6 | 32 | 11 | 24 | 10 | 23 | 9 | 19 | 8 | 23 | 7 | 20 | 5 | 21 | 10 |
| South Korea | 441 | 1,656 | 566 | 2,437 | 625 | 3,031 | 820 | 2,542 | 973 | 2,350 | 918 | 2,841 | 925 | 1,921 | 986 | 1,839 | 1,055 | 1,786 | 1,010 | 1,657 |
| Taiwan | 324 | 285 | 345 | 368 | 409 | 436 | 479 | 570 | 475 | 731 | 450 | 691 | 431 | 701 | 437 | 748 | 413 | 476 | 345 | 359 |
| All others | 0 | 3 | 1 | 3 | 1 | 6 | 5 | 3 | 4 | 4 | 4 | 5 | 3 | 7 | 4 | 5 | 4 | 4 | 5 | 3 |
| Middle East | 82 | 66 | 101 | 74 | 108 | 57 | 157 | 69 | 182 | 74 | 213 | 72 | 198 | 73 | 181 | 63 | 193 | 65 | 210 | 67 |
| Israel | 82 | 64 | 99 | 72 | 106 | 52 | 151 | 64 | 177 | 66 | 197 | 63 | 183 | 60 | 170 | 55 | 173 | 52 | 194 | 58 |
| All others | 0 | 2 | 2 | 2 | 3 | 6 | 5 | 5 | 5 | 8 | 15 | 9 | 15 | 12 | 11 | 8 | 20 | 13 | 16 | 8 |
| Africa | 2 | 11 | 3 | 12 | 2 | 6 | 5 | 4 | 3 | 4 | 6 | 5 | 8 | 4 | 4 | 3 | 9 | 5 | 6 | 7 |
| South Africa | 2 | 10 | 3 | 10 | 1 | 1 | 1 | 0 | 1 | 1 | 3 | 0 | 5 | 1 | 2 | 0 | 4 | 1 | 2 | 1 |
| All others | 0 | 2 | 0 | 2 | 1 | 5 | 4 | 3 | 1 | 3 | 3 | 5 | 3 | 3 | 2 | 3 | 5 | 4 | 4 | 6 |
| Australia and Oceania | 61 | 33 | 77 | 38 | 96 | 45 | 48 | 42 | 36 | 43 | 47 | 52 | 39 | 45 | 45 | 38 | 47 | 16 | 50 | 18 |
| Australia | 59 | 32 | 75 | 37 | 90 | 44 | 42 | 40 | 32 | 41 | 41 | 51 | 36 | 43 | 44 | 37 | 44 | 16 | 44 | 16 |
| New Zealand | 2 | 1 | 3 | 1 | 6 | 2 | 6 | 2 | 4 | 1 | 7 | 1 | 3 | 1 | 1 | 1 | 4 | 0 | 6 | 2 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Unclassified | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 2 | 1 | 2 | 4 | 1 | 0 | 3 | 0 |

EU = European Union; USPTO = U.S. Patent and Trademark Office.

**Note(s)**

USPTO patents are allocated according to patent inventorship information. USPTO patents are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named inventors. Patents are classified under the World Intellectual Property Organization (WIPO) classification of patents, which classifies International Patent Classification (IPC) codes under 35 technical fields. IPC reformed codes take into account changes that were made to the WIPO classification in 2006 under the eighth version of the classification and were used to prepare these data. However, because PatentsView only provides the original IPC codes as they appeared on patents and not the IPC reformed codes, current Cooperative Patent Classification codes on patents were converted back to the most recent IPC classification to prepare these statistics. Fractional counts of patents were assigned to each technological field on patents to assign the proper weight of a patent to the corresponding technological fields under the classification. International Patent Documentation (INPADOC) patent families across all patent offices covered in the Worldwide Patent Statistical Database (PATSTAT) are counted according to the year of the first granted patent in the patent family. Patent families are allocated according to patent inventorship information found on the priority patent of the INPADOC patent families. To account for missing ownership information in PATSTAT for some offices, a method designed by de Rassenfosse et al. (2012) is used to fill in missing information on priority patents using information in successive filings within the patent families (see technical documentation for details). Patent families are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named inventors. Because of data coverage issues for some patent offices in PATSTAT, statistics for some countries may be underestimated partially for some years or across the whole trend. Countries with identified issues include India (missing data) and South Africa (no data for 2018). For Italy, because of data gaps regarding information on granted patents, patent applications are used instead, which slightly overestimates Italy's output and creates a small shift in the year for which its output is accounted. The EU includes 28 member countries. China includes Hong Kong.

**Source(s)**

Science-Metrix; PATSTAT, accessed April 2019; PatentsView, USPTO, accessed June 2019.

TABLE S8-8

## USPTO patents and patent families granted in digital communication, by region, country, or economy: 1998–2018

(Number)

| Region, country, or economy | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| World | 3,102 | 4,231 | 3,630 | 5,592 | 4,237 | 5,780 | 4,428 | 4,912 | 4,819 | 4,946 | 5,299 | 6,605 | 6,438 | 8,090 | 6,320 | 8,062 | 9,824 | 11,194 | 9,004 | 11,619 | 10,355 | 11,564 | 12,006 | 13,348 | 16,207 | 15,219 | 17,676 | 18,521 | 21,068 | 21,054 | 23,948 | 20,913 | 28,396 | 23,372 | 27,914 | 24,329 | 28,835 | 26,155 | 30,220 | 27,941 | 29,245 | 32,155 |
| North America | 1,925 | 1,375 | 2,266 | 1,618 | 2,745 | 1,822 | 2,819 | 1,726 | 2,996 | 1,839 | 3,302 | 1,979 | 4,142 | 2,392 | 4,055 | 2,145 | 6,309 | 2,459 | 5,660 | 2,123 | 6,385 | 2,282 | 7,482 | 2,448 | 9,875 | 2,848 | 10,384 | 2,664 | 11,993 | 3,304 | 13,397 | 3,635 | 16,035 | 4,700 | 16,073 | 5,348 | 15,835 | 5,454 | 16,437 | 5,387 | 15,878 | 5,264 |
| Canada | 78 | 63 | 127 | 100 | 147 | 108 | 149 | 116 | 146 | 108 | 169 | 124 | 212 | 141 | 193 | 106 | 303 | 130 | 290 | 165 | 379 | 193 | 424 | 208 | 582 | 208 | 654 | 214 | 826 | 254 | 983 | 300 | 1,137 | 354 | 1,020 | 347 | 873 | 307 | 901 | 302 | 844 | 286 |
| Mexico | 0 | 0 | 1 | 1 | 1 | 1 | 2 | 1 | 3 | 2 | 3 | 2 | 2 | 1 | 3 | 3 | 2 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 2 | 0 | 1 | 0 | 1 | 1 | 1 | 2 | 5 | 5 | 7 | 7 | 7 | 8 |
| Puerto Rico | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 2 | 0 |
| United States | 1,847 | 1,312 | 2,138 | 1,517 | 2,597 | 1,714 | 2,668 | 1,610 | 2,847 | 1,729 | 3,130 | 1,853 | 3,927 | 2,249 | 3,859 | 2,037 | 6,004 | 2,329 | 5,369 | 1,958 | 6,005 | 2,089 | 7,058 | 2,240 | 9,293 | 2,640 | 9,730 | 2,450 | 11,164 | 3,050 | 12,413 | 3,335 | 14,895 | 4,346 | 15,051 | 4,999 | 14,956 | 5,143 | 15,528 | 5,078 | 15,025 | 4,970 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Central and South America | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 2 | 2 | 2 | 1 | 4 | 1 | 4 | 1 | 5 | 0 | 8 | 2 | 9 | 3 | 9 | 4 | 15 | 3 | 26 | 3 | 30 | 11 | 31 | 12 | 33 | 15 | 41 | 14 | 44 | 18 |
| Argentina | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 1 | 0 | 0 | 1 | 1 | 3 | 0 | 1 | 0 | 4 | 0 | 8 | 0 | 6 | 1 | 6 | 2 | 8 | 2 | 5 | 1 | 7 | 0 |
| Brazil | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 3 | 1 | 3 | 1 | 2 | 0 | 6 | 3 | 7 | 1 | 12 | 2 | 17 | 8 | 20 | 8 | 18 | 10 | 28 | 12 | 31 | 15 |
| All others | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 3 | 1 | 1 | 0 | 2 | 0 | 3 | 0 | 4 | 2 | 2 | 1 | 4 | 2 | 6 | 1 | 6 | 2 | 4 | 2 | 6 | 3 | 8 | 2 | 7 | 3 |
| Europe | 441 | 512 | 527 | 613 | 593 | 781 | 632 | 872 | 741 | 894 | 849 | 1,234 | 969 | 1,301 | 937 | 1,458 | 1,360 | 1,371 | 1,220 | 1,200 | 1,406 | 1,162 | 1,478 | 1,047 | 2,037 | 1,083 | 2,296 | 1,119 | 2,775 | 1,444 | 3,255 | 1,328 | 4,003 | 1,538 | 3,751 | 1,562 | 4,033 | 1,652 | 4,113 | 1,742 | 3,823 | 1,799 |
| EU | 426 | 472 | 505 | 558 | 578 | 741 | 610 | 829 | 717 | 841 | 819 | 1,138 | 935 | 1,207 | 900 | 1,348 | 1,308 | 1,275 | 1,169 | 1,097 | 1,339 | 1,069 | 1,406 | 933 | 1,897 | 989 | 2,186 | 1,024 | 2,648 | 1,307 | 3,126 | 1,230 | 3,826 | 1,410 | 3,551 | 1,401 | 3,798 | 1,480 | 3,849 | 1,537 | 3,580 | 1,594 |
| Austria | 0 | 5 | 2 | 7 | 3 | 6 | 3 | 9 | 7 | 12 | 7 | 14 | 7 | 22 | 6 | 20 | 13 | 33 | 5 | 20 | 10 | 16 | 18 | 9 | 24 | 12 | 23 | 11 | 28 | 20 | 32 | 15 | 38 | 24 | 36 | 20 | 41 | 21 | 43 | 27 | 44 | 19 |
| Belgium | 12 | 6 | 8 | 3 | 7 | 5 | 9 | 10 | 11 | 6 | 13 | 7 | 23 | 19 | 26 | 29 | 29 | 31 | 19 | 31 | 29 | 29 | 39 | 18 | 44 | 24 | 51 | 25 | 54 | 28 | 55 | 27 | 68 | 33 | 65 | 24 | 79 | 40 | 63 | 52 | 60 | 41 |
| Denmark | 0 | 0 | 3 | 3 | 2 | 3 | 2 | 3 | 5 | 5 | 12 | 10 | 8 | 10 | 16 | 15 | 26 | 22 | 21 | 20 | 16 | 16 | 22 | 8 | 26 | 12 | 33 | 5 | 37 | 9 | 44 | 21 | 37 | 8 | 57 | 15 | 37 | 4 | 40 | 11 | 35 | 12 |
| Finland | 65 | 68 | 97 | 95 | 87 | 157 | 98 | 176 | 133 | 137 | 159 | 192 | 221 | 210 | 152 | 139 | 258 | 108 | 255 | 92 | 270 | 82 | 260 | 93 | 333 | 75 | 286 | 66 | 326 | 90 | 372 | 127 | 534 | 173 | 387 | 140 | 410 | 108 | 383 | 87 | 300 | 80 |
| France | 77 | 86 | 82 | 117 | 95 | 164 | 99 | 147 | 109 | 190 | 120 | 296 | 135 | 302 | 128 | 353 | 194 | 310 | 186 | 265 | 236 | 277 | 194 | 226 | 303 | 211 | 341 | 242 | 385 | 323 | 440 | 253 | 504 | 301 | 431 | 283 | 434 | 325 | 464 | 357 | 403 | 385 |
| Germany | 72 | 136 | 77 | 133 | 106 | 139 | 114 | 128 | 128 | 131 | 154 | 177 | 191 | 170 | 196 | 195 | 409 | 312 | 404 | 260 | 361 | 292 | 351 | 351 | 261 | 462 | 296 | 503 | 268 | 523 | 341 | 616 | 318 | 749 | 319 | 689 | 397 | 317 | 690 | 325 | 678 | 334 | 662 | 401 |
| Hungary | 0 | 1 | 0 | 2 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 6 | 5 | 3 | 3 | 3 | 5 | 3 | 5 | 2 | 9 | 4 | 7 | 4 | 11 | 2 | 14 | 3 | 23 | 3 | 26 | 5 | 45 | 9 | 7 | 5 | 52 | 7 | 49 | 5 | 28 | 4 |
| Ireland | 1 | 3 | 1 | 7 | 3 | 6 | 12 | 9 | 11 | 12 | 12 | 25 | 24 | 14 | 11 | 17 | 15 | 4 | 12 | 7 | 18 | 6 | 14 | 5 | 32 | 8 | 40 | 6 | 40 | 13 | 45 | 14 | 67 | 20 | 71 | 33 | 100 | 48 | 105 | 51 | 131 | 64 |
| Italy | 4 | 22 | 1 | 22 | 8 | 37 | 5 | 40 | 11 | 33 | 13 | 19 | 15 | 26 | 11 | 17 | 32 | 15 | 27 | 23 | 39 | 27 | 49 | 31 | 64 | 28 | 104 | 38 | 120 | 46 | 137 | 36 | 124 | 24 | 111 | 26 | 105 | 16 | 22 | 79 | 116 | 99 | 99 | 57 |
| Netherlands | 23 | 19 | 29 | 30 | 29 | 17 | 22 | 27 | 28 | 23 | 27 | 15 | 34 | 16 | 46 | 25 | 58 | 29 | 37 | 26 | 54 | 31 | 63 | 28 | 79 | 30 | 97 | 26 | 107 | 30 | 130 | 30 | 160 | 29 | 137 | 34 | 160 | 49 | 155 | 49 | 153 | 39 |
| Spain | 5 | 14 | 2 | 7 | 2 | 11 | 4 | 12 | 5 | 7 | 3 | 14 | 8 | 18 | 6 | 26 | 9 | 29 | 18 | 23 | 17 | 24 | 18 | 34 | 22 | 41 | 27 | 65 | 60 | 60 | 82 | 64 | 84 | 70 | 76 | 46 | 69 | 40 | 76 | 50 | 63 | 48 |
| Sweden | 78 | 71 | 99 | 81 | 127 | 115 | 123 | 181 | 145 | 156 | 133 | 164 | 124 | 142 | 119 | 76 | 116 | 63 | 81 | 37 | 86 | 36 | 98 | 49 | 157 | 61 | 241 | 65 | 402 | 71 | 483 | 66 | 691 | 83 | 657 | 82 | 770 | 88 | 799 | 115 | 720 | 75 |
| United Kingdom | 88 | 39 | 97 | 46 | 107 | 74 | 117 | 80 | 119 | 99 | 133 | 180 | 161 | 213 | 173 | 206 | 236 | 211 | 228 | 172 | 255 | 148 | 248 | 143 | 348 | 155 | 384 | 183 | 475 | 234 | 583 | 218 | 727 | 271 | 705 | 334 | 733 | 347 | 728 | 246 | 713 | 298 |
| All others | 0 | 2 | 1 | 4 | 1 | 5 | 0 | 7 | 1 | 8 | 4 | 6 | 2 | 15 | 4 | 12 | 6 | 15 | 11 | 15 | 10 | 20 | 21 | 26 | 30 | 34 | 32 | 22 | 65 | 32 | 66 | 32 | 90 | 47 | 85 | 42 | 117 | 57 | 150 | 74 | 169 | 71 |
| Other Europe | 15 | 41 | 23 | 55 | 15 | 40 | 22 | 43 | 24 | 53 | 30 | 96 | 35 | 94 | 38 | 110 | 52 | 96 | 50 | 103 | 66 | 93 | 72 | 114 | 100 | 94 | 111 | 95 | 126 | 137 | 129 | 98 | 177 | 128 | 200 | 127 | 235 | 172 | 254 | 205 | 243 | 234 |
| Former Soviet Union | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 5 | 1 | 6 | 8 | 1 | 1 | 0 | 2 | 2 | 6 | 1 | 5 | 0 | 4 | 2 | 8 | 1 | 3 | 2 | 15 | 4 | 5 | 4 | 11 | 5 | 9 | 6 | 8 | 12 | 6 | 11 |
| Norway | 3 | 3 | 1 | 4 | 1 | 7 | 5 | 6 | 6 | 14 | 7 | 14 | 6 | 8 | 8 | 19 | 5 | 9 | 9 | 14 | 10 | 10 | 13 | 11 | 15 | 6 | 8 | 5 | 13 | 5 | 9 | 6 | 22 | 7 | 27 | 11 | 36 | 11 | 23 | 6 | 35 | 9 |
| Russia | 1 | 30 | 2 | 42 | 2 | 24 | 2 | 24 | 2 | 30 | 1 | 67 | 4 | 62 | 2 | 76 | 6 | 63 | 7 | 63 | 16 | 58 | 14 | 76 | 21 | 61 | 31 | 65 | 41 | 92 | 35 | 64 | 45 | 82 | 55 | 101 | 58 | 98 | 70 | 126 | 57 | 134 |
| Switzerland | 10 | 7 | 16 | 6 | 9 | 6 | 8 | 11 | 12 | 5 | 20 | 10 | 21 | 16 | 23 | 13 | 39 | 21 | 30 | 19 | 37 | 19 | 44 | 22 | 59 | 18 | 66 | 20 | 67 | 23 | 74 | 21 | 91 | 22 | 98 | 34 | 121 | 48 | 142 | 58 | 127 | 49 |
| All others | 1 | 0 | 4 | 2 | 3 | 3 | 5 | 1 | 4 | 3 | 3 | 0 | 2 | 4 | 2 | 4 | 1 | 2 | 1 | 3 | 1 | 2 | 1 | 1 | 2 | 1 | 4 | 1 | 4 | 1 | 4 | 1 | 7 | 2 | 15 | 6 | 14 | 7 | 18 | 8 | 12 | 7 |
| Asia | 694 | 2,312 | 787 | 3,328 | 848 | 3,133 | 905 | 2,254 | 993 | 2,131 | 1,037 | 3,313 | 1,201 | 4,303 | 1,177 | 4,371 | 1,954 | 7,271 | 1,943 | 8,217 | 2,349 | 8,027 | 2,759 | 9,737 | 3,897 | 11,158 | 4,591 | 14,636 | 5,813 | 16,158 | 6,719 | 15,796 | 7,655 | 16,875 | 7,384 | 17,137 | 8,186 | 18,720 | 8,785 | 20,509 | 8,650 | 24,770 |

**TABLE S8-8**

## USPTO patents and patent families granted in digital communication, by region, country, or economy: 1998–2018

(Number)

| | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Region, country, or economy | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| China | 2 | 4 | 4 | 9 | 5 | 17 | 3 | 42 | 3 | 27 | 6 | 211 | 10 | 521 | 18 | 504 | 58 | 722 | 48 | 1,264 | 84 | 3,373 | 149 | 5,137 | 332 | 5,988 | 481 | 7,800 | 751 | 9,502 | 1,110 | 8,564 | 1,569 | 9,506 | 1,526 | 11,409 | 2,033 | 12,384 | 2,386 | 14,647 | 2,495 | 19,236 |
| India | 0 | 0 | 0 | 1 | 1 | 0 | 4 | 3 | 6 | 4 | 12 | 10 | 18 | 15 | 22 | 16 | 38 | 16 | 55 | 27 | 83 | 43 | 84 | 35 | 174 | 55 | 185 | 55 | 271 | 77 | 371 | 134 | 550 | 193 | 656 | 284 | 792 | 349 | 886 | 382 | 962 | 424 |
| Japan | 597 | 1,576 | 658 | 1,887 | 693 | 1,692 | 722 | 1,586 | 773 | 1,481 | 824 | 1,837 | 884 | 1,922 | 864 | 1,910 | 1,375 | 2,042 | 1,247 | 2,484 | 1,365 | 2,219 | 1,550 | 2,719 | 1,993 | 3,186 | 2,207 | 4,002 | 2,589 | 3,991 | 2,751 | 4,024 | 2,772 | 3,531 | 2,414 | 2,278 | 2,255 | 2,429 | 2,277 | 2,252 | 2,046 | 2,253 |
| Malaysia | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 2 | 2 | 1 | 4 | 2 | 4 | 3 | 3 | 4 | 1 | 5 | 5 | 7 | 6 | 7 | 11 | 7 | 16 | 8 | 27 | 15 | 25 | 9 | 37 | 28 | 42 | 11 | 34 | 13 | 32 |
| Singapore | 2 | 2 | 3 | 2 | 5 | 2 | 3 | 3 | 15 | 7 | 10 | 3 | 10 | 5 | 6 | 5 | 15 | 4 | 19 | 7 | 14 | 4 | 35 | 14 | 35 | 6 | 38 | 4 | 41 | 7 | 31 | 7 | 42 | 6 | 40 | 9 | 45 | 16 | 48 | 14 | 45 | 17 |
| South Korea | 80 | 686 | 101 | 1,378 | 117 | 1,377 | 150 | 518 | 160 | 505 | 153 | 1,059 | 215 | 1,587 | 206 | 1,623 | 350 | 4,122 | 417 | 4,160 | 623 | 2,236 | 750 | 1,625 | 1,092 | 1,708 | 1,358 | 2,552 | 1,681 | 2,241 | 1,950 | 2,541 | 2,167 | 2,988 | 2,217 | 2,474 | 2,524 | 2,882 | 2,587 | 2,729 | 2,551 | 2,459 |
| Taiwan | 13 | 43 | 19 | 51 | 25 | 45 | 21 | 102 | 35 | 108 | 30 | 193 | 61 | 250 | 57 | 310 | 114 | 360 | 153 | 270 | 176 | 145 | 182 | 178 | 260 | 204 | 315 | 206 | 466 | 317 | 487 | 489 | 525 | 614 | 513 | 635 | 501 | 610 | 576 | 442 | 528 | 343 |
| All others | 0 | 1 | 1 | 0 | 3 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 2 | 1 | 1 | 0 | 3 | 2 | 1 | 2 | 2 | 5 | 3 | 5 | 3 | 5 | 2 | 5 | 7 | 7 | 31 | 11 | 15 | 12 | 7 | 10 | 8 | 8 | 13 | 9 | 9 | 6 |
| Middle East | 32 | 23 | 44 | 24 | 38 | 32 | 59 | 39 | 76 | 54 | 94 | 62 | 103 | 69 | 117 | 55 | 147 | 63 | 126 | 40 | 142 | 51 | 214 | 70 | 303 | 86 | 296 | 61 | 361 | 84 | 429 | 96 | 529 | 147 | 558 | 159 | 594 | 198 | 678 | 234 | 699 | 238 |
| Israel | 32 | 23 | 43 | 24 | 38 | 32 | 58 | 38 | 75 | 54 | 93 | 60 | 102 | 69 | 116 | 55 | 146 | 62 | 125 | 39 | 141 | 50 | 212 | 65 | 297 | 83 | 287 | 57 | 344 | 71 | 405 | 87 | 505 | 133 | 528 | 143 | 564 | 186 | 642 | 216 | 664 | 222 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 2 | 1 | 1 | 1 | 1 | 1 | 3 | 5 | 6 | 3 | 9 | 4 | 17 | 12 | 24 | 9 | 24 | 14 | 29 | 15 | 30 | 12 | 36 | 18 | 35 | 16 |
| Africa | 2 | 1 | 1 | 2 | 2 | 1 | 1 | 2 | 1 | 3 | 1 | 2 | 3 | 7 | 3 | 5 | 2 | 6 | 2 | 4 | 3 | 12 | 1 | 7 | 6 | 6 | 4 | 3 | 6 | 4 | 9 | 7 | 11 | 6 | 12 | 5 | 30 | 14 | 32 | 17 | 25 | 10 |
| South Africa | 2 | 1 | 1 | 1 | 2 | 0 | 0 | 0 | 1 | 1 | 0 | 2 | 2 | 6 | 2 | 4 | 1 | 5 | 1 | 3 | 2 | 10 | 0 | 7 | 3 | 5 | 2 | 1 | 3 | 1 | 4 | 3 | 6 | 2 | 9 | 4 | 20 | 11 | 18 | 11 | 11 | 3 |
| All others | 0 | 0 | 0 | 2 | 0 | 0 | 1 | 1 | 0 | 2 | 2 | 1 | 5 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 3 | 1 | 2 | 2 | 4 | 3 | 5 | 4 | 5 | 4 | 3 | 1 | 10 | 3 | 14 | 6 | 14 | 7 |
| Australia and Oceania | 7 | 5 | 6 | 4 | 9 | 10 | 12 | 18 | 9 | 23 | 15 | 14 | 17 | 16 | 29 | 26 | 47 | 21 | 50 | 33 | 66 | 30 | 63 | 36 | 78 | 34 | 96 | 34 | 104 | 57 | 113 | 48 | 130 | 95 | 108 | 105 | 123 | 98 | 127 | 39 | 123 | 56 |
| Australia | 5 | 5 | 6 | 4 | 9 | 10 | 11 | 18 | 8 | 23 | 13 | 14 | 17 | 15 | 27 | 24 | 44 | 21 | 48 | 31 | 64 | 30 | 59 | 35 | 72 | 34 | 88 | 32 | 95 | 54 | 105 | 46 | 122 | 93 | 98 | 102 | 116 | 97 | 116 | 37 | 112 | 54 |
| New Zealand | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 2 | 0 | 1 | 0 | 3 | 2 | 3 | 1 | 1 | 2 | 2 | 0 | 4 | 0 | 6 | 0 | 8 | 2 | 9 | 3 | 8 | 2 | 9 | 2 | 9 | 3 | 7 | 2 | 11 | 2 | 10 | 2 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| Unclassified | 0 | 2 | 0 | 1 | 1 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 2 | 4 | 0 | 2 | 4 | 6 | 0 | 3 | 1 |

EU = European Union; USPTO = U.S. Patent and Trademark Office.

**Note(s)**

USPTO patents are allocated according to patent inventorship information. USPTO patents are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named inventors. Patents are classified under the World Intellectual Property Organization (WIPO) classification of patents, which classifies International Patent Classification (IPC) codes under 35 technical fields. IPC reformed codes take into account changes that were made to the WIPO classification in 2006 under the eighth version of the classification and were used to prepare these data. However, because PatentsView only provides the original IPC codes as they appeared on patents and not the IPC reformed codes, current Cooperative Patent Classification codes on patents were converted back to the most recent IPC classification to prepare these statistics. Fractional counts of patents were assigned to each technological field on patents to assign the proper weight of a patent to the corresponding technological fields under the classification. International Patent Documentation (INPADOC) patent families across all patent offices covered in the Worldwide Patent Statistical Database (PATSTAT) are counted according to the year of the first granted patent in the patent family. Patent families are allocated according to patent inventorship information found on the priority patent of the INPADOC patent families. To account for missing ownership information in PATSTAT for some offices, a method designed by de Rassenfosse et al. (2012) is used to fill in missing information on priority patents using information in successive filings within the patent families (see technical documentation for details). Patent families are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named inventors. Because of data coverage issues for some patent offices in PATSTAT, statistics for some countries may be underestimated partially for some years or across the whole trend. Countries with identified issues include India (missing data) and South Africa (no data for 2018). For Italy, because of data gaps regarding information on granted patents, patent applications are used instead, which slightly overestimates Italy's output and creates a small shift in the year for which its output is accounted. The EU includes 28 member countries. China includes Hong Kong.

**Source(s)**

Science-Metrix; PATSTAT, accessed April 2019; PatentsView, USPTO, accessed June 2019.

TABLE SB-9

## USPTO patents and patent families granted in basic communication processes, by region, country, or economy: 1998–2018

(Number)

| Region, country, or economy | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| World | 2,621 | 4,161 | 2,722 | 4,704 | 3,005 | 4,073 | 3,291 | 4,114 | 3,444 | 3,992 | 3,554 | 4,099 | 3,622 | 4,012 | 3,253 | 3,995 | 4,268 | 4,432 | 4,093 | 4,552 | 3,956 | 3,898 | 4,189 | 4,148 | 4,777 | 4,731 | 4,525 | 4,990 | 4,516 | 4,982 | 4,971 | 5,098 | 5,047 | 4,918 | 4,645 | 4,382 | 4,644 | 4,921 | 4,335 | 5,025 | 3,724 | 4,612 |
| North America | 1,340 | 1,154 | 1,401 | 1,130 | 1,603 | 1,220 | 1,795 | 1,307 | 1,869 | 1,330 | 1,949 | 1,339 | 1,896 | 1,339 | 1,691 | 1,068 | 2,116 | 1,354 | 2,046 | 1,296 | 1,841 | 1,076 | 1,900 | 1,055 | 2,137 | 1,192 | 1,954 | 952 | 1,940 | 911 | 2,193 | 1,080 | 2,187 | 1,053 | 2,051 | 890 | 1,982 | 919 | 1,923 | 838 | 1,594 | 644 |
| Canada | 37 | 27 | 39 | 38 | 61 | 48 | 62 | 51 | 59 | 39 | 62 | 32 | 74 | 51 | 67 | 27 | 62 | 36 | 76 | 41 | 67 | 38 | 57 | 37 | 89 | 47 | 82 | 37 | 93 | 45 | 129 | 70 | 128 | 56 | 121 | 57 | 96 | 40 | 104 | 44 | 72 | 25 |
| Mexico | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 0 | 2 | 1 | 2 | 3 | 3 | 3 | 6 | 2 |
| Puerto Rico | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| United States | 1,303 | 1,127 | 1,362 | 1,092 | 1,543 | 1,172 | 1,733 | 1,256 | 1,810 | 1,291 | 1,887 | 1,307 | 1,822 | 1,289 | 1,623 | 1,041 | 2,055 | 1,317 | 1,970 | 1,254 | 1,774 | 1,037 | 1,843 | 1,018 | 2,046 | 1,145 | 1,870 | 914 | 1,846 | 865 | 2,061 | 1,009 | 2,057 | 997 | 1,928 | 833 | 1,883 | 875 | 1,816 | 788 | 1,522 | 616 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Central and South America | 2 | 2 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 0 | 1 | 1 | 2 | 1 | 3 | 4 | 5 | 3 | 3 | 4 | 5 | 2 | 3 | 7 | 6 | 6 | 4 | 6 | 3 | 4 | 5 | 8 | 6 |
| Argentina | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 0 | 1 | 0 | 1 | 1 | 2 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 4 | 0 |
| Brazil | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 3 | 4 | 2 | 1 | 3 | 4 | 0 | 1 | 6 | 5 | 4 | 4 | 4 | 3 | 3 | 1 | 5 | 4 |
| All others | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 2 | 1 | 1 | 0 | 1 | 1 |
| Europe | 376 | 583 | 387 | 478 | 417 | 513 | 454 | 547 | 482 | 551 | 574 | 664 | 523 | 666 | 488 | 667 | 697 | 721 | 590 | 596 | 573 | 656 | 600 | 597 | 681 | 659 | 644 | 664 | 674 | 682 | 742 | 723 | 810 | 757 | 737 | 694 | 775 | 649 | 673 | 623 | 627 | 646 |
| EU | 359 | 412 | 370 | 393 | 401 | 421 | 435 | 450 | 469 | 452 | 557 | 498 | 505 | 487 | 465 | 479 | 658 | 538 | 566 | 400 | 545 | 394 | 573 | 370 | 641 | 407 | 589 | 421 | 622 | 422 | 684 | 458 | 751 | 493 | 671 | 437 | 700 | 407 | 633 | 416 | 584 | 452 |
| Austria | 4 | 5 | 6 | 9 | 7 | 2 | 6 | 8 | 8 | 5 | 24 | 16 | 23 | 26 | 18 | 24 | 34 | 42 | 34 | 26 | 20 | 41 | 18 | 42 | 31 | 56 | 45 | 43 | 35 | 32 | 28 | 32 | 25 | 49 | 45 | 43 | 40 | 47 | 2 | 51 | 39 | 44 |
| Belgium | 2 | 3 | 3 | 1 | 6 | 1 | 7 | 3 | 7 | 2 | 6 | 2 | 8 | 1 | 6 | 1 | 7 | 9 | 8 | 6 | 7 | 8 | 3 | 9 | 4 | 14 | 6 | 10 | 5 | 1 | 11 | 5 | 10 | 3 | 13 | 6 | 13 | 6 | 10 | 4 | 16 | 9 |
| Denmark | 1 | 2 | 5 | 1 | 3 | 3 | 4 | 3 | 8 | 4 | 8 | 4 | 11 | 4 | 5 | 6 | 15 | 9 | 7 | 5 | 16 | 5 | 10 | 7 | 10 | 2 | 12 | 3 | 13 | 8 | 8 | 4 | 14 | 4 | 11 | 2 | 7 | 4 | 13 | 4 | 17 | 4 |
| Finland | 23 | 26 | 21 | 14 | 12 | 21 | 27 | 37 | 35 | 29 | 41 | 27 | 25 | 29 | 28 | 20 | 29 | 21 | 26 | 16 | 13 | 16 | 30 | 16 | 20 | 16 | 20 | 11 | 13 | 6 | 22 | 16 | 21 | 15 | 18 | 11 | 21 | 20 | 12 | 6 | 21 | 10 |
| France | 68 | 81 | 82 | 69 | 80 | 74 | 65 | 88 | 71 | 65 | 74 | 98 | 86 | 83 | 68 | 92 | 87 | 90 | 87 | 75 | 81 | 76 | 90 | 55 | 94 | 56 | 89 | 76 | 134 | 82 | 148 | 102 | 118 | 61 | 126 | 61 | 113 | 54 | 93 | 56 | 87 | 77 |
| Germany | 90 | 127 | 93 | 119 | 111 | 135 | 107 | 142 | 117 | 163 | 175 | 146 | 145 | 163 | 146 | 173 | 215 | 208 | 186 | 160 | 196 | 155 | 194 | 135 | 209 | 152 | 162 | 147 | 157 | 158 | 176 | 158 | 193 | 187 | 198 | 177 | 208 | 147 | 179 | 136 | 165 | 163 |
| Hungary | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 0 | 1 | 1 | 1 | 2 | 0 |
| Ireland | 7 | 10 | 3 | 4 | 5 | 2 | 6 | 3 | 5 | 3 | 13 | 8 | 11 | 6 | 14 | 9 | 18 | 5 | 19 | 5 | 18 | 9 | 8 | 3 | 13 | 4 | 18 | 7 | 16 | 8 | 19 | 4 | 29 | 16 | 26 | 13 | 21 | 16 | 18 | 13 | 22 | 12 |
| Italy | 43 | 51 | 30 | 70 | 46 | 69 | 53 | 46 | 49 | 34 | 39 | 37 | 33 | 56 | 25 | 27 | 42 | 22 | 33 | 22 | 33 | 25 | 39 | 17 | 41 | 20 | 30 | 23 | 33 | 19 | 39 | 13 | 59 | 16 | 45 | 10 | 53 | 13 | 48 | 49 | 44 | 29 |
| Netherlands | 38 | 11 | 30 | 8 | 34 | 11 | 38 | 13 | 49 | 13 | 54 | 8 | 45 | 10 | 29 | 5 | 59 | 12 | 58 | 9 | 45 | 5 | 41 | 12 | 47 | 11 | 61 | 7 | 58 | 10 | 75 | 19 | 71 | 20 | 53 | 19 | 57 | 26 | 40 | 19 | 41 | 23 |
| Spain | 0 | 10 | 1 | 6 | 2 | 1 | 3 | 3 | 0 | 3 | 1 | 6 | 1 | 6 | 1 | 6 | 1 | 7 | 2 | 8 | 3 | 9 | 7 | 8 | 5 | 15 | 2 | 10 | 4 | 4 | 8 | 11 | 6 | 11 | 5 | 6 | 5 | 5 | 7 | 7 | 7 | 7 |
| Sweden | 19 | 27 | 28 | 29 | 34 | 34 | 46 | 38 | 41 | 40 | 36 | 49 | 35 | 33 | 32 | 11 | 37 | 16 | 24 | 7 | 24 | 15 | 29 | 15 | 29 | 17 | 45 | 25 | 39 | 23 | 42 | 17 | 46 | 10 | 28 | 8 | 42 | 12 | 40 | 8 | 26 | 4 |
| United Kingdom | 62 | 38 | 65 | 43 | 60 | 51 | 72 | 51 | 79 | 55 | 90 | 75 | 76 | 67 | 78 | 73 | 97 | 82 | 82 | 41 | 61 | 44 | 78 | 53 | 82 | 45 | 81 | 52 | 88 | 43 | 89 | 57 | 107 | 59 | 91 | 59 | 106 | 61 | 83 | 44 | 83 | 56 |
| All others | 1 | 22 | 2 | 21 | 1 | 16 | 1 | 16 | 1 | 16 | 3 | 14 | 2 | 11 | 4 | 16 | 6 | 22 | 8 | 23 | 6 | 18 | 14 | 19 | 10 | 15 | 16 | 20 | 18 | 19 | 14 | 27 | 25 | 44 | 12 | 24 | 14 | 29 | 20 | 25 | 9 | 24 |
| Other Europe | 17 | 170 | 17 | 85 | 17 | 92 | 20 | 96 | 14 | 99 | 17 | 166 | 18 | 179 | 23 | 188 | 38 | 183 | 24 | 196 | 28 | 262 | 27 | 227 | 39 | 253 | 56 | 243 | 52 | 260 | 59 | 265 | 59 | 264 | 66 | 257 | 68 | 216 | 58 | 213 | 44 | 194 |
| Former Soviet Union | 1 | 4 | 0 | 2 | 0 | 1 | 1 | 1 | 0 | 3 | 3 | 0 | 2 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 2 | 1 | 5 | 1 | 5 | 2 | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 1 |
| Norway | 2 | 1 | 1 | 3 | 1 | 0 | 4 | 3 | 3 | 3 | 2 | 3 | 1 | 2 | 1 | 3 | 6 | 4 | 6 | 7 | 1 | 1 | 1 | 1 | 8 | 5 | 5 | 2 | 7 | 5 | 9 | 6 | 8 | 3 | 11 | 4 | 12 | 8 | 5 | 4 | 6 | 1 |
| Russia | 5 | 156 | 4 | 74 | 4 | 78 | 6 | 85 | 2 | 90 | 3 | 147 | 2 | 134 | 4 | 158 | 3 | 152 | 3 | 158 | 6 | 227 | 4 | 184 | 6 | 207 | 7 | 201 | 16 | 224 | 7 | 216 | 6 | 204 | 9 | 223 | 9 | 175 | 10 | 178 | 6 | 160 |
| Switzerland | 9 | 8 | 12 | 5 | 12 | 13 | 10 | 6 | 9 | 4 | 12 | 6 | 15 | 6 | 18 | 11 | 28 | 19 | 15 | 12 | 21 | 17 | 22 | 23 | 25 | 7 | 39 | 15 | 21 | 11 | 35 | 16 | 42 | 17 | 39 | 19 | 40 | 21 | 30 | 12 | 30 | 15 |
| All others | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 2 | 0 | 0 | 0 | 0 | 3 | 2 | 2 | 1 | 2 | 1 | 1 | 1 | 4 | 2 | 3 | 4 | 9 | 6 | 1 | 1 |
| Asia | 869 | 2,383 | 913 | 3,054 | 955 | 2,285 | 1,014 | 2,218 | 1,061 | 2,081 | 983 | 2,059 | 1,166 | 1,977 | 1,025 | 2,212 | 1,400 | 2,325 | 1,404 | 2,626 | 1,488 | 2,133 | 1,640 | 2,452 | 1,895 | 2,839 | 1,863 | 3,339 | 1,839 | 3,351 | 1,939 | 3,257 | 1,945 | 3,061 | 1,761 | 2,760 | 1,797 | 3,306 | 1,654 | 3,518 | 1,418 | 3,281 |

TABLE S8-9

## USPTO patents and patent families granted in basic communication processes, by region, country, or economy: 1998–2018

(Number)

| Region, country, or economy | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| China | 2 | 9 | 5 | 5 | 4 | 25 | 5 | 20 | 7 | 32 | 9 | 76 | 8 | 130 | 10 | 116 | 20 | 114 | 20 | 163 | 42 | 209 | 41 | 610 | 67 | 607 | 75 | 746 | 112 | 947 | 123 | 902 | 148 | 857 | 157 | 1,084 | 196 | 1,526 | 184 | 2,061 | 188 | 1,891 |
| India | 1 | 1 | 3 | 2 | 3 | 3 | 6 | 7 | 9 | 6 | 19 | 13 | 18 | 10 | 36 | 21 | 37 | 23 | 37 | 18 | 40 | 15 | 48 | 23 | 76 | 34 | 49 | 24 | 60 | 34 | 92 | 62 | 99 | 67 | 97 | 55 | 135 | 102 | 102 | 51 | 84 | 43 |
| Japan | 694 | 1,803 | 729 | 1,813 | 739 | 1,680 | 806 | 1,787 | 855 | 1,659 | 756 | 1,463 | 876 | 1,287 | 713 | 1,055 | 907 | 1,182 | 853 | 1,443 | 886 | 1,256 | 916 | 1,320 | 966 | 1,506 | 1,016 | 1,721 | 988 | 1,598 | 1,014 | 1,525 | 953 | 1,358 | 886 | 908 | 819 | 791 | 723 | 737 | 623 | 808 |
| Malaysia | 0 | 0 | 1 | 1 | 4 | 3 | 1 | 1 | 3 | 3 | 1 | 1 | 2 | 5 | 5 | 5 | 6 | 9 | 11 | 10 | 8 | 7 | 5 | 6 | 11 | 12 | 11 | 8 | 11 | 9 | 10 | 11 | 17 | 18 | 10 | 13 | 10 | 11 | 20 | 20 | 12 | 15 |
| Singapore | 10 | 10 | 6 | 6 | 16 | 15 | 10 | 8 | 10 | 7 | 12 | 6 | 17 | 12 | 10 | 6 | 19 | 12 | 28 | 15 | 23 | 8 | 34 | 10 | 38 | 17 | 25 | 8 | 22 | 11 | 21 | 7 | 31 | 9 | 29 | 9 | 22 | 8 | 27 | 14 | 18 | 7 |
| South Korea | 109 | 480 | 119 | 1,162 | 128 | 487 | 128 | 245 | 115 | 239 | 116 | 341 | 136 | 334 | 144 | 722 | 225 | 796 | 235 | 755 | 277 | 467 | 319 | 278 | 386 | 314 | 379 | 440 | 333 | 433 | 343 | 354 | 347 | 379 | 302 | 292 | 319 | 457 | 345 | 426 | 262 | 357 |
| Taiwan | 52 | 79 | 49 | 66 | 59 | 73 | 56 | 149 | 62 | 136 | 70 | 158 | 109 | 200 | 106 | 286 | 186 | 190 | 218 | 221 | 211 | 169 | 274 | 206 | 351 | 348 | 307 | 388 | 313 | 319 | 335 | 396 | 349 | 372 | 278 | 396 | 294 | 412 | 248 | 207 | 229 | 158 |
| All others | 1 | 1 | 0 | 0 | 2 | 0 | 2 | 2 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 3 | 0 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 4 | 3 | 3 | 2 |
| Middle East | 26 | 24 | 17 | 20 | 23 | 23 | 24 | 21 | 23 | 19 | 32 | 29 | 27 | 18 | 35 | 27 | 39 | 18 | 36 | 25 | 32 | 25 | 37 | 29 | 51 | 26 | 45 | 25 | 52 | 26 | 81 | 29 | 83 | 34 | 74 | 22 | 72 | 35 | 69 | 33 | 59 | 28 |
| Israel | 26 | 24 | 17 | 19 | 23 | 22 | 24 | 21 | 22 | 18 | 31 | 28 | 26 | 17 | 33 | 26 | 38 | 18 | 36 | 25 | 31 | 25 | 35 | 27 | 50 | 26 | 43 | 20 | 49 | 20 | 73 | 21 | 71 | 27 | 67 | 15 | 64 | 29 | 60 | 28 | 55 | 27 |
| All others | 0 | 0 | 0 | 1 | 0 | 2 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 2 | 2 | 0 | 1 | 2 | 5 | 2 | 5 | 8 | 8 | 11 | 7 | 7 | 7 | 8 | 7 | 9 | 5 | 4 | 0 |
| Africa | 0 | 1 | 1 | 2 | 3 | 2 | 1 | 1 | 0 | 3 | 1 | 1 | 1 | 0 | 1 | 2 | 0 | 2 | 1 | 2 | 2 | 1 | 0 | 1 | 0 | 2 | 4 | 1 | 2 | 1 | 2 | 2 | 5 | 0 | 6 | 4 | 3 | 1 | 4 | 3 | 5 | 4 |
| South Africa | 0 | 0 | 0 | 0 | 2 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 2 | 0 | 1 | 2 | 1 | 0 | 1 | 0 | 1 | 2 | 0 | 1 | 0 | 2 | 0 | 1 | 0 | 2 | 0 | 1 | 0 | 1 | 0 | 1 | 1 |
| All others | 0 | 1 | 1 | 2 | 1 | 1 | 1 | 0 | 0 | 3 | 1 | 1 | 0 | 2 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 2 | 1 | 2 | 5 | 2 | 2 | 4 | 0 | 5 | 4 | 2 | 1 | 2 | 3 | 4 | 4 |
| Australia and Oceania | 8 | 2 | 4 | 2 | 3 | 2 | 2 | 3 | 7 | 6 | 14 | 6 | 9 | 7 | 12 | 6 | 14 | 8 | 16 | 7 | 19 | 5 | 11 | 10 | 9 | 8 | 11 | 5 | 6 | 7 | 12 | 5 | 10 | 7 | 10 | 7 | 9 | 6 | 8 | 5 | 12 | 2 |
| Australia | 5 | 2 | 4 | 2 | 3 | 1 | 2 | 3 | 5 | 5 | 12 | 5 | 8 | 6 | 10 | 6 | 13 | 7 | 14 | 7 | 17 | 5 | 9 | 10 | 6 | 5 | 8 | 3 | 5 | 5 | 10 | 4 | 9 | 7 | 8 | 7 | 9 | 6 | 7 | 5 | 11 | 2 |
| New Zealand | 3 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 2 | 1 | 3 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 3 | 1 | 2 | 0 | 2 | 0 | 3 | 3 | 3 | 3 | 1 | 2 | 1 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 1 | 1 | 1 | 0 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Unclassified | 0 | 13 | 0 | 19 | 0 | 28 | 1 | 17 | 1 | 2 | 0 | 1 | 0 | 2 | 0 | 13 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 2 | 0 | 0 | 0 | 0 |

EU = European Union; USPTO = U.S. Patent and Trademark Office.

**Note(s)**

USPTO patents are allocated according to patent inventorship information. USPTO patents are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named inventors. Patents are classified under the World Intellectual Property Organization (WIPO) classification of patents, which classifies International Patent Classification (IPC) codes under 35 technical fields. IPC reformed codes take into account changes that were made to the WIPO classification in 2006 under the eighth version of the classification and were used to prepare these data. However, because PatentsView only provides the original IPC codes as they appeared on patents and not the IPC reformed codes, current Cooperative Patent Classification codes on patents were converted back to the most recent IPC classification to prepare these statistics. Fractional counts of patents were assigned to each technological field on patents to assign the proper weight of a patent to the corresponding technological fields under the classification. International Patent Documentation (INPADOC) patent families across all patent offices covered in the Worldwide Patent Statistical Database (PATSTAT) are counted according to the year of the first granted patent in the patent family. Patent families are allocated according to patent inventorship information found on the priority patent of the INPADOC patent families. To account for missing ownership information in PATSTAT for some offices, a method designed by de Rassenfosse et al. (2012) is used to fill in missing information on priority patents using information in successive filings within the patent families (see technical documentation for details). Patent families are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named inventors. Because of data coverage issues for some patent offices in PATSTAT, statistics for some countries may be underestimated partially for some years or across the whole trend. Countries with identified issues include India (missing data) and South Africa (no data for 2018). For Italy, because of data gaps regarding information on granted patents, patent applications are used instead, which slightly overestimates Italy's output and creates a small shift in the year for which its output is accounted. The EU includes 28 member countries. China includes Hong Kong.

**Source(s)**

Science-Metrix; PATSTAT, accessed April 2019; PatentsView, USPTO, accessed June 2019.

TABLE S8-10

## USPTO patents and patent families granted in computer technology, by region, country, or economy: 1998–2018

(Number)

| Region, country, or economy | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| World | 11,841 | 15,097 | 12,170 | 17,219 | 11,914 | 14,414 | 12,715 | 14,093 | 12,905 | 13,771 | 13,665 | 15,886 | 14,662 | 17,711 | 13,630 | 18,406 | 19,076 | 24,102 |
| North America | 7,455 | 6,108 | 7,737 | 6,081 | 7,595 | 5,666 | 8,082 | 5,781 | 8,116 | 5,688 | 8,682 | 6,142 | 9,207 | 6,551 | 8,498 | 6,052 | 11,903 | 8,666 |
| Canada | 115 | 96 | 127 | 97 | 144 | 111 | 164 | 121 | 182 | 140 | 192 | 124 | 209 | 139 | 178 | 150 | 319 | 179 |
| Mexico | 0 | 0 | 1 | 0 | 2 | 1 | 2 | 1 | 0 | 0 | 1 | 2 | 3 | 3 | 5 | 5 | 3 | 1 |
| Puerto Rico | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 |
| United States | 7,339 | 6,012 | 7,609 | 5,983 | 7,449 | 5,553 | 7,916 | 5,659 | 7,934 | 5,547 | 8,489 | 6,015 | 8,995 | 6,409 | 8,314 | 5,897 | 11,580 | 8,486 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Central and South America | 3 | 2 | 4 | 2 | 2 | 3 | 4 | 2 | 3 | 2 | 4 | 4 | 5 | 5 | 5 | 6 | 8 | 6 |
| Argentina | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 2 | 2 |
| Brazil | 2 | 1 | 4 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 1 | 3 | 3 | 3 |
| All others | 1 | 0 | 0 | 1 | 1 | 1 | 2 | 1 | 2 | 1 | 2 | 2 | 2 | 2 | 4 | 4 | 2 | 1 |
| Europe | 815 | 944 | 848 | 1,026 | 871 | 1,073 | 1,031 | 1,260 | 1,098 | 1,287 | 1,099 | 1,716 | 1,337 | 1,715 | 1,250 | 1,778 | 1,722 | 1,804 |
| EU-28 | 772 | 736 | 798 | 843 | 839 | 918 | 976 | 1,101 | 1,040 | 1,116 | 1,032 | 1,464 | 1,260 | 1,423 | 1,189 | 1,505 | 1,634 | 1,549 |
| Austria | 7 | 11 | 8 | 13 | 12 | 19 | 19 | 15 | 8 | 17 | 26 | 16 | 25 | 13 | 18 | 20 | 26 | 36 |
| Belgium | 10 | 12 | 11 | 10 | 21 | 8 | 24 | 6 | 14 | 7 | 14 | 5 | 24 | 10 | 10 | 7 | 31 | 13 |
| Denmark | 2 | 4 | 9 | 4 | 8 | 4 | 11 | 7 | 15 | 4 | 15 | 10 | 13 | 9 | 11 | 7 | 17 | 15 |
| Finland | 15 | 13 | 15 | 22 | 17 | 24 | 22 | 23 | 24 | 23 | 32 | 47 | 44 | 59 | 36 | 70 | 73 | 73 |
| France | 173 | 199 | 171 | 218 | 169 | 236 | 175 | 384 | 214 | 269 | 212 | 436 | 246 | 342 | 200 | 388 | 314 | 401 |
| Germany | 192 | 238 | 197 | 212 | 225 | 227 | 259 | 253 | 310 | 328 | 291 | 378 | 395 | 389 | 377 | 446 | 485 | 561 |
| Hungary | 1 | 0 | 0 | 2 | 1 | 1 | 3 | 0 | 0 | 4 | 2 | 3 | 3 | 1 | 1 | 2 | 2 | 2 |
| Ireland | 4 | 13 | 6 | 19 | 11 | 11 | 20 | 9 | 10 | 11 | 15 | 21 | 20 | 10 | 18 | 14 | 20 | 10 |
| Italy | 99 | 70 | 77 | 127 | 83 | 144 | 102 | 92 | 91 | 103 | 80 | 121 | 77 | 175 | 95 | 86 | 98 | 51 |
| Netherlands | 40 | 35 | 49 | 45 | 45 | 39 | 54 | 51 | 53 | 52 | 84 | 45 | 62 | 33 | 44 | 43 | 77 | 38 |
| Spain | 4 | 22 | 4 | 24 | 5 | 26 | 4 | 26 | 3 | 8 | 7 | 26 | 9 | 23 | 12 | 28 | 19 | 33 |
| Sweden | 23 | 26 | 38 | 44 | 43 | 44 | 61 | 84 | 53 | 83 | 46 | 98 | 45 | 78 | 44 | 53 | 66 | 43 |
| United Kingdom | 200 | 86 | 208 | 93 | 196 | 120 | 224 | 111 | 240 | 186 | 244 | 233 | 289 | 249 | 310 | 315 | 396 | 245 |
| All others | 2 | 11 | 3 | 13 | 2 | 19 | 2 | 29 | 4 | 20 | 3 | 26 | 5 | 24 | 10 | 8 | 23 | 11 |
| Other Europe | 43 | 208 | 50 | 183 | 32 | 155 | 55 | 159 | 58 | 171 | 67 | 252 | 78 | 293 | 62 | 273 | 88 | 255 |
| Former Soviet Union | 1 | 5 | 1 | 3 | 1 | 2 | 1 | 6 | 0 | 3 | 0 | 8 | 1 | 5 | 1 | 25 | 2 | 9 |
| Norway | 5 | 8 | 6 | 11 | 6 | 7 | 6 | 12 | 7 | 11 | 5 | 14 | 11 | 8 | 9 | 15 | 10 | 10 |
| Russia | 20 | 180 | 25 | 153 | 9 | 137 | 17 | 114 | 15 | 139 | 30 | 174 | 18 | 158 | 12 | 214 | 31 | 204 |
| Switzerland | 17 | 15 | 18 | 16 | 15 | 8 | 27 | 25 | 33 | 17 | 29 | 25 | 44 | 24 | 40 | 16 | 42 | 29 |
| All others | 0 | 0 | 0 | 0 | 0 | 1 | 3 | 2 | 3 | 2 | 2 | 1 | 4 | 1 | 1 | 2 | 3 | 2 |
| Asia | 3,447 | 7,943 | 3,449 | 9,993 | 3,296 | 7,537 | 3,424 | 6,914 | 3,505 | 6,635 | 3,638 | 7,853 | 3,856 | 9,238 | 3,638 | 10,375 | 5,069 | 13,399 |

| Region, country, or economy | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| World | 17,559 | 24,358 | 19,074 | 25,158 | 20,845 | 27,585 | 26,546 | 31,344 | 27,146 | 35,569 | 32,608 | 41,333 | 36,699 | 42,483 | 40,851 | 44,586 | 41,281 | 42,971 |
| North America | 10,574 | 7,485 | 11,339 | 8,059 | 12,553 | 9,264 | 15,906 | 11,549 | 15,828 | 10,876 | 18,352 | 12,702 | 20,576 | 13,208 | 23,315 | 14,275 | 23,041 | 12,459 |
| Canada | 327 | 217 | 379 | 287 | 462 | 364 | 706 | 496 | 738 | 449 | 886 | 553 | 1,031 | 554 | 1,115 | 652 | 1,032 | 539 |
| Mexico | 1 | 1 | 1 | 0 | 2 | 1 | 1 | 3 | 4 | 4 | 5 | 7 | 5 | 3 | 1 | 5 | 2 | 7 |
| Puerto Rico | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 2 | 0 | 1 | 0 | 3 | 0 |
| United States | 10,246 | 7,268 | 10,959 | 7,771 | 12,090 | 8,898 | 15,196 | 11,049 | 15,085 | 10,421 | 17,458 | 12,144 | 19,541 | 12,653 | 22,192 | 13,620 | 21,998 | 11,913 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Central and South America | 8 | 10 | 7 | 9 | 9 | 11 | 15 | 12 | 17 | 17 | 17 | 20 | 23 | 25 | 32 | 27 | 53 | 34 |
| Argentina | 1 | 0 | 0 | 0 | 2 | 1 | 1 | 1 | 3 | 3 | 3 | 4 | 4 | 6 | 5 | 4 | 10 | 7 |
| Brazil | 4 | 6 | 4 | 7 | 6 | 8 | 12 | 8 | 12 | 11 | 11 | 6 | 15 | 18 | 20 | 18 | 34 | 22 |
| All others | 2 | 3 | 3 | 2 | 1 | 1 | 2 | 3 | 2 | 3 | 4 | 5 | 3 | 3 | 7 | 5 | 10 | 5 |
| Europe | 1,728 | 1,702 | 1,851 | 1,780 | 2,065 | 1,898 | 2,695 | 2,264 | 2,600 | 2,267 | 3,249 | 2,577 | 3,689 | 2,672 | 4,182 | 2,971 | 4,403 | 3,061 |
| EU-28 | 1,638 | 1,388 | 1,751 | 1,477 | 1,947 | 1,582 | 2,533 | 1,917 | 2,407 | 1,841 | 2,983 | 2,075 | 3,369 | 2,238 | 3,793 | 2,480 | 3,929 | 2,473 |
| Austria | 22 | 25 | 21 | 41 | 26 | 28 | 41 | 30 | 32 | 34 | 39 | 26 | 41 | 31 | 58 | 36 | 63 | 38 |
| Belgium | 25 | 18 | 25 | 18 | 29 | 23 | 43 | 25 | 41 | 22 | 52 | 36 | 61 | 31 | 65 | 28 | 58 | 26 |
| Denmark | 17 | 15 | 17 | 14 | 12 | 15 | 28 | 19 | 36 | 19 | 41 | 23 | 41 | 20 | 34 | 18 | 49 | 16 |
| Finland | 78 | 57 | 70 | 74 | 93 | 78 | 105 | 103 | 97 | 73 | 101 | 90 | 129 | 99 | 168 | 142 | 191 | 114 |
| France | 445 | 340 | 286 | 324 | 297 | 366 | 422 | 364 | 357 | 429 | 480 | 508 | 566 | 543 | 613 | 522 | 587 | 538 |
| Germany | 560 | 512 | 633 | 560 | 661 | 536 | 907 | 696 | 791 | 550 | 929 | 677 | 600 | 1,001 | 653 | 1,110 | 732 | 1,188 |
| Hungary | 1 | 4 | 2 | 3 | 2 | 4 | 3 | 3 | 5 | 0 | 8 | 5 | 5 | 8 | 5 | 8 | 10 | 15 |
| Ireland | 18 | 11 | 15 | 10 | 29 | 18 | 41 | 21 | 44 | 25 | 63 | 39 | 76 | 45 | 75 | 48 | 103 | 67 |
| Italy | 100 | 61 | 111 | 79 | 104 | 67 | 119 | 79 | 132 | 68 | 169 | 79 | 199 | 75 | 203 | 72 | 209 | 59 |
| Netherlands | 112 | 48 | 76 | 42 | 101 | 33 | 113 | 56 | 117 | 51 | 117 | 49 | 137 | 47 | 164 | 52 | 141 | 63 |
| Spain | 22 | 36 | 22 | 39 | 26 | 49 | 31 | 53 | 37 | 62 | 55 | 76 | 55 | 84 | 52 | 88 | 56 | 88 |
| Sweden | 72 | 46 | 62 | 39 | 60 | 50 | 89 | 58 | 113 | 57 | 157 | 67 | 171 | 65 | 192 | 80 | 237 | 80 |
| United Kingdom | 390 | 208 | 387 | 207 | 457 | 239 | 530 | 314 | 539 | 357 | 697 | 399 | 792 | 451 | 908 | 519 | 876 | 573 |
| All others | 11 | 31 | 23 | 43 | 41 | 77 | 62 | 94 | 63 | 85 | 78 | 77 | 92 | 87 | 134 | 156 | 140 | 190 |
| Other Europe | 90 | 313 | 100 | 303 | 119 | 315 | 162 | 347 | 193 | 427 | 266 | 501 | 320 | 434 | 389 | 491 | 474 | 588 |
| Former Soviet Union | 1 | 30 | 2 | 25 | 3 | 40 | 3 | 45 | 5 | 5 | 38 | 9 | 8 | 12 | 37 | 27 | 39 | 31 |
| Norway | 19 | 13 | 21 | 22 | 18 | 27 | 18 | 28 | 30 | 21 | 43 | 24 | 41 | 27 | 33 | 27 | 58 | 34 |
| Russia | 22 | 239 | 27 | 223 | 29 | 203 | 58 | 236 | 72 | 325 | 86 | 363 | 93 | 276 | 116 | 338 | 131 | 407 |
| Switzerland | 43 | 27 | 46 | 28 | 56 | 42 | 78 | 35 | 81 | 37 | 111 | 65 | 159 | 83 | 199 | 83 | 236 | 98 |
| All others | 4 | 5 | 5 | 4 | 3 | 4 | 6 | 3 | 5 | 5 | 17 | 11 | 15 | 12 | 15 | 4 | 19 | 9 |
| Asia | 4,898 | 14,955 | 5,498 | 15,068 | 5,818 | 16,155 | 7,399 | 17,179 | 8,025 | 22,030 | 10,119 | 25,489 | 11,373 | 25,937 | 12,060 | 26,547 | 12,387 | 26,614 |

| Region, country, or economy | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|
| | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| World | 42,967 | 50,810 | 42,540 | 57,261 | 40,298 | 58,197 |
| North America | 24,047 | 12,072 | 23,369 | 10,809 | 21,820 | 9,677 |
| Canada | 1,017 | 514 | 950 | 473 | 903 | 444 |
| Mexico | 15 | 19 | 12 | 20 | 19 | 19 |
| Puerto Rico | 3 | 0 | 0 | 0 | 2 | 0 |
| United States | 23,012 | 11,539 | 22,406 | 10,316 | 20,895 | 9,214 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 |
| Central and South America | 51 | 37 | 66 | 41 | 68 | 45 |
| Argentina | 9 | 6 | 6 | 1 | 6 | 1 |
| Brazil | 22 | 31 | 24 | 47 | 34 | 48 |
| All others | 12 | 7 | 13 | 6 | 14 | 5 |
| Europe | 4,621 | 3,251 | 4,645 | 3,477 | 4,613 | 3,541 |
| EU-28 | 2,632 | 2,629 | 4,129 | 2,674 | 4,056 | 2,797 |
| Austria | 67 | 39 | 78 | 51 | 60 | 49 |
| Belgium | 65 | 25 | 72 | 38 | 73 | 64 |
| Denmark | 46 | 18 | 54 | 22 | 52 | 15 |
| Finland | 202 | 130 | 203 | 106 | 164 | 85 |
| France | 600 | 655 | 542 | 684 | 570 | 717 |
| Germany | 1,188 | 662 | 1,185 | 657 | 1,176 | 624 |
| Hungary | 8 | 14 | 7 | 12 | 5 | 18 |
| Ireland | 101 | 64 | 108 | 58 | 138 | 80 |
| Italy | 224 | 214 | 176 | 219 | 146 | 146 |
| Netherlands | 146 | 57 | 144 | 78 | 157 | 64 |
| Spain | 73 | 83 | 71 | 63 | 70 | 75 |
| Sweden | 280 | 91 | 305 | 95 | 273 | 86 |
| United Kingdom | 941 | 607 | 939 | 503 | 881 | 556 |
| All others | 190 | 168 | 210 | 171 | 208 | 175 |
| Other Europe | 474 | 588 | 489 | 515 | 803 | 557 |
| Former Soviet Union | 41 | 32 | 29 | 29 | 21 | 32 |
| Norway | 55 | 33 | 63 | 42 | 72 | 37 |
| Russia | 142 | 397 | 138 | 598 | 170 | 535 |
| Switzerland | 237 | 110 | 258 | 112 | 261 | 130 |
| All others | 22 | 10 | 27 | 12 | 33 | 9 |
| Asia | 12,788 | 34,635 | 12,953 | 42,169 | 12,361 | 44,181 |

**TABLE S8-10**

## USPTO patents and patent families granted in computer technology, by region, country, or economy: 1998–2018

(Number)

| Region, country, or economy | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| China | 9 | 33 | 11 | 68 | 13 | 141 | 26 | 196 | 33 | 263 | 34 | 634 | 49 | 1,019 | 55 | 1,067 | 119 | 1,448 | 158 | 2,096 | 250 | 3,220 | 348 | 4,211 | 444 | 4,092 | 521 | 5,530 | 836 | 8,130 | 1,103 | 7,530 | 1,123 | 7,033 | 1,304 | 10,817 | 1,765 | 17,988 | 2,097 | 26,687 | 2,261 | 30,154 |
| India | 3 | 3 | 6 | 5 | 10 | 4 | 18 | 13 | 15 | 12 | 40 | 28 | 42 | 35 | 57 | 49 | 101 | 87 | 121 | 107 | 172 | 141 | 215 | 155 | 368 | 277 | 443 | 361 | 565 | 450 | 854 | 696 | 1,097 | 838 | 1,270 | 818 | 1,291 | 810 | 1,418 | 793 | 1,386 | 783 |
| Japan | 2,860 | 6,545 | 2,741 | 6,674 | 2,525 | 5,369 | 2,625 | 5,139 | 2,696 | 4,677 | 2,801 | 4,523 | 2,831 | 5,048 | 2,589 | 4,819 | 3,518 | 5,208 | 3,207 | 6,486 | 3,415 | 7,097 | 3,379 | 7,991 | 4,166 | 8,857 | 4,482 | 11,089 | 5,416 | 11,409 | 5,776 | 10,914 | 5,821 | 10,364 | 5,405 | 7,251 | 4,973 | 8,269 | 4,864 | 7,562 | 4,343 | 6,979 |
| Malaysia | 1 | 1 | 1 | 0 | 2 | 0 | 1 | 1 | 2 | 1 | 4 | 5 | 3 | 14 | 10 | 23 | 12 | 22 | 20 | 26 | 22 | 18 | 28 | 28 | 31 | 33 | 21 | 30 | 36 | 50 | 34 | 60 | 35 | 74 | 36 | 57 | 46 | 65 | 45 | 73 | 46 | 70 |
| Singapore | 12 | 11 | 21 | 15 | 15 | 7 | 18 | 14 | 29 | 14 | 28 | 11 | 31 | 10 | 22 | 8 | 43 | 19 | 27 | 12 | 44 | 20 | 45 | 28 | 49 | 18 | 53 | 26 | 80 | 30 | 81 | 35 | 97 | 43 | 103 | 46 | 120 | 61 | 110 | 56 | 120 | 63 |
| South Korea | 373 | 1,026 | 436 | 2,878 | 474 | 1,596 | 445 | 884 | 379 | 904 | 352 | 1,715 | 392 | 1,985 | 441 | 3,270 | 644 | 5,122 | 721 | 4,841 | 828 | 3,583 | 1,005 | 2,661 | 1,423 | 2,708 | 1,475 | 3,792 | 1,703 | 3,806 | 1,878 | 4,340 | 2,193 | 5,191 | 2,475 | 4,390 | 2,942 | 4,623 | 2,902 | 4,703 | 2,790 | 4,541 |
| Taiwan | 186 | 323 | 233 | 351 | 255 | 418 | 291 | 667 | 350 | 764 | 377 | 936 | 507 | 1,127 | 461 | 1,137 | 631 | 1,493 | 640 | 1,383 | 764 | 988 | 791 | 1,077 | 912 | 1,188 | 1,015 | 1,192 | 1,471 | 1,601 | 1,630 | 2,347 | 1,676 | 2,987 | 1,778 | 3,219 | 1,625 | 2,799 | 1,488 | 2,271 | 1,372 | 1,574 |
| All others | 2 | 1 | 1 | 2 | 2 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 2 | 1 | 1 | 2 | 2 | 4 | 1 | 7 | 4 | 5 | 6 | 15 | 10 | 12 | 14 | 16 | 17 | 17 | 17 | 17 | 15 | 24 | 20 | 29 | 24 | 43 | 19 |
| Middle East | 99 | 70 | 102 | 73 | 110 | 79 | 120 | 66 | 129 | 85 | 174 | 112 | 177 | 116 | 160 | 97 | 220 | 128 | 197 | 114 | 239 | 131 | 255 | 159 | 337 | 190 | 443 | 226 | 656 | 363 | 826 | 436 | 1,022 | 531 | 1,149 | 575 | 1,170 | 583 | 1,234 | 618 | 1,190 | 588 |
| Israel | 98 | 70 | 101 | 71 | 109 | 78 | 118 | 66 | 126 | 81 | 173 | 110 | 175 | 115 | 159 | 97 | 214 | 126 | 194 | 112 | 236 | 126 | 251 | 153 | 329 | 180 | 436 | 217 | 630 | 337 | 791 | 399 | 990 | 500 | 1,113 | 546 | 1,109 | 545 | 1,172 | 584 | 1,135 | 563 |
| All others | 1 | 0 | 1 | 2 | 1 | 1 | 2 | 0 | 3 | 4 | 1 | 2 | 2 | 1 | 1 | 0 | 6 | 2 | 3 | 1 | 3 | 5 | 4 | 6 | 9 | 10 | 7 | 9 | 26 | 26 | 35 | 38 | 32 | 31 | 36 | 30 | 61 | 38 | 62 | 33 | 55 | 25 |
| Africa | 0 | 8 | 2 | 10 | 3 | 9 | 4 | 7 | 6 | 11 | 3 | 15 | 5 | 17 | 7 | 20 | 6 | 23 | 6 | 16 | 6 | 18 | 6 | 9 | 9 | 7 | 10 | 11 | 18 | 19 | 20 | 13 | 33 | 20 | 33 | 20 | 39 | 27 | 36 | 25 | 33 | 20 |
| South Africa | 0 | 8 | 1 | 8 | 3 | 6 | 3 | 6 | 4 | 6 | 2 | 11 | 3 | 13 | 7 | 20 | 4 | 21 | 3 | 11 | 4 | 17 | 3 | 7 | 5 | 5 | 4 | 1 | 5 | 7 | 6 | 4 | 12 | 7 | 15 | 9 | 22 | 17 | 24 | 15 | 15 | 5 |
| All others | 0 | 0 | 0 | 2 | 0 | 3 | 1 | 1 | 2 | 5 | 0 | 4 | 2 | 5 | 0 | 1 | 3 | 3 | 3 | 4 | 2 | 1 | 3 | 1 | 3 | 2 | 6 | 10 | 13 | 12 | 15 | 10 | 21 | 12 | 18 | 11 | 17 | 10 | 12 | 10 | 18 | 15 |
| Australia and Oceania | 22 | 13 | 26 | 16 | 36 | 29 | 51 | 62 | 47 | 64 | 64 | 43 | 76 | 60 | 73 | 52 | 147 | 67 | 148 | 77 | 133 | 92 | 138 | 90 | 184 | 143 | 223 | 139 | 194 | 163 | 190 | 189 | 205 | 212 | 211 | 206 | 245 | 203 | 233 | 122 | 209 | 144 |
| Australia | 20 | 12 | 23 | 14 | 32 | 25 | 48 | 61 | 46 | 63 | 57 | 40 | 71 | 60 | 69 | 50 | 138 | 59 | 139 | 72 | 122 | 88 | 126 | 86 | 168 | 137 | 210 | 133 | 172 | 152 | 171 | 177 | 187 | 200 | 190 | 200 | 221 | 192 | 214 | 119 | 193 | 136 |
| New Zealand | 2 | 1 | 3 | 3 | 4 | 4 | 3 | 1 | 1 | 0 | 7 | 3 | 4 | 1 | 4 | 2 | 9 | 8 | 9 | 5 | 11 | 4 | 12 | 4 | 16 | 6 | 13 | 6 | 22 | 10 | 19 | 12 | 17 | 11 | 20 | 6 | 24 | 9 | 18 | 2 | 16 | 7 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| Unclassified | 1 | 8 | 1 | 17 | 2 | 18 | 0 | 2 | 0 | 0 | 1 | 0 | 0 | 8 | 0 | 25 | 0 | 9 | 1 | 0 | 0 | 2 | 0 | 1 | 1 | 0 | 0 | 3 | 2 | 1 | 2 | 1 | 3 | 2 | 4 | 2 | 6 | 2 | 5 | 2 | 4 | 2 |

EU = European Union; USPTO = U.S. Patent and Trademark Office.

**Note(s)**

USPTO patents are allocated according to patent inventorship information. USPTO patents are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named inventors. Patents are classified under the World Intellectual Property Organization (WIPO) classification of patents, which classifies International Patent Classification (IPC) codes under 35 technical fields. IPC reformed codes take into account changes that were made to the WIPO classification in 2006 under the eighth version of the classification and were used to prepare these data. However, because PatentsView only provides the original IPC codes as they appeared on patents and not the IPC reformed codes, current Cooperative Patent Classification codes on patents were converted back to the most recent IPC classification to prepare these statistics. Fractional counts of patents were assigned to each technological field on patents to assign the proper weight of a patent to the corresponding technological fields under the classification. International Patent Documentation (INPADOC) patent families across all patent offices covered in the Worldwide Patent Statistical Database (PATSTAT) are counted according to the year of the first granted patent in the patent family. Patent families are allocated according to patent inventorship information found on the priority patent of the INPADOC patent families. To account for missing ownership information in PATSTAT for some offices, a method designed by de Rassenfosse et al. (2012) is used to fill in missing information on priority patents using information in successive filings within the patent families (see technical documentation for details). Patent families are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named inventors. Because of data coverage issues for some patent offices in PATSTAT, statistics for some countries may be underestimated partially for some years or across the whole trend. Countries with identified issues include India (missing data) and South Africa (no data for 2018). For Italy, because of data gaps regarding information on granted patents, patent applications are used instead, which slightly overestimates Italy's output and creates a small shift in the year for which its output is accounted. The EU includes 28 member countries. China includes Hong Kong.

**Source(s)**

Science-Metrix; PATSTAT, accessed April 2019; PatentsView, USPTO, accessed June 2019.

TABLE S8-11

## USPTO patents and patent families granted in IT methods for management, by region, country, or economy: 1998–2018

(Number)

| Region, country, or economy | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| World | 651 | 686 | 832 | 770 | 959 | 797 | 867 | 722 | 965 | 843 | 1,108 | 1,068 | 1,197 | 1,126 | 1,542 | 1,451 | 2,381 | 1,875 | 2,368 | 2,871 | 2,940 | 3,085 | 3,509 | 2,925 | 6,044 | 3,844 | 6,137 | 4,630 | 7,233 | 5,697 | 8,073 | 6,253 | 7,505 | 6,587 | 4,668 | 5,547 | 4,373 | 7,727 | 5,685 | 8,749 | 5,778 | 9,211 |
| North America | 532 | 314 | 655 | 373 | 772 | 410 | 699 | 327 | 772 | 367 | 869 | 396 | 928 | 361 | 1,183 | 475 | 1,817 | 461 | 1,828 | 469 | 2,290 | 627 | 2,815 | 634 | 4,942 | 1,174 | 5,025 | 1,086 | 5,929 | 1,332 | 6,675 | 1,612 | 6,077 | 1,550 | 3,652 | 1,068 | 3,379 | 1,034 | 4,483 | 1,366 | 4,537 | 1,384 |
| Canada | 9 | 5 | 12 | 6 | 17 | 8 | 14 | 5 | 17 | 8 | 12 | 12 | 21 | 8 | 29 | 14 | 35 | 8 | 42 | 11 | 66 | 23 | 76 | 23 | 123 | 31 | 139 | 29 | 169 | 28 | 190 | 48 | 186 | 39 | 140 | 40 | 117 | 45 | 158 | 60 | 135 | 45 |
| Mexico | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 2 | 1 | 1 | 1 | 1 | 0 | 3 | 1 | 3 | 2 | 4 | 2 | 2 | 0 | 4 | 1 | 2 | 0 | 2 | 1 | 2 | 2 | 2 | 2 |
| Puerto Rico | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| United States | 523 | 309 | 643 | 367 | 754 | 401 | 685 | 322 | 756 | 359 | 857 | 385 | 906 | 353 | 1,153 | 460 | 1,781 | 453 | 1,784 | 457 | 2,223 | 604 | 2,737 | 610 | 4,816 | 1,143 | 4,881 | 1,055 | 5,754 | 1,302 | 6,482 | 1,564 | 5,887 | 1,509 | 3,508 | 1,028 | 3,260 | 988 | 4,323 | 1,304 | 4,398 | 1,337 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Central and South America | 1 | 1 | 0 | 0 | 1 | 1 | 2 | 0 | 2 | 1 | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 0 | 3 | 0 | 2 | 1 | 7 | 4 | 8 | 2 | 10 | 4 | 7 | 1 | 10 | 4 | 14 | 4 | 9 | 3 | 12 | 4 | 12 | 4 | 15 | 8 |
| Argentina | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 2 | 0 | 2 | 0 | 2 | 0 | 2 | 1 | 3 | 1 | 2 | 0 | 1 | 1 |
| Brazil | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 2 | 0 | 1 | 1 | 4 | 4 | 6 | 2 | 7 | 3 | 3 | 1 | 6 | 4 | 10 | 3 | 5 | 3 | 9 | 3 | 9 | 3 | 11 | 5 |
| All others | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 3 | 1 | 2 | 0 | 1 | 0 | 2 | 1 | 2 | 0 | 3 | 1 | 2 | 0 | 1 | 0 | 2 | 0 | 3 | 2 |
| Europe | 34 | 46 | 51 | 49 | 61 | 85 | 54 | 103 | 65 | 132 | 67 | 151 | 78 | 146 | 111 | 173 | 165 | 164 | 176 | 160 | 240 | 176 | 290 | 189 | 515 | 187 | 488 | 181 | 590 | 222 | 659 | 262 | 654 | 278 | 419 | 268 | 383 | 318 | 432 | 450 | 429 | 463 |
| EU | 33 | 34 | 50 | 39 | 58 | 71 | 53 | 87 | 60 | 114 | 64 | 131 | 76 | 126 | 105 | 139 | 153 | 128 | 157 | 136 | 220 | 145 | 268 | 149 | 483 | 163 | 455 | 154 | 554 | 186 | 613 | 225 | 598 | 236 | 391 | 233 | 352 | 270 | 387 | 373 | 392 | 380 |
| Austria | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 2 | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 3 | 2 | 1 | 3 | 2 | 6 | 2 | 4 | 3 | 4 | 3 | 6 | 2 | 6 | 3 | 5 | 1 | 3 | 2 | 7 | 3 | 4 | 4 |
| Belgium | 0 | 0 | 1 | 1 | 1 | 0 | 2 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 2 | 1 | 1 | 1 | 3 | 1 | 5 | 1 | 5 | 1 | 5 | 1 | 8 | 1 | 9 | 3 | 12 | 1 | 7 | 2 | 10 | 2 | 6 | 3 | 12 | 13 | 16 | 33 |
| Denmark | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 2 | 2 | 2 | 0 | 5 | 1 | 0 | 1 | 4 | 0 | 15 | 2 | 4 | 1 | 7 | 2 | 9 | 2 | 4 | 1 | 2 | 1 | 4 | 1 | 7 | 3 | 6 | 2 |
| Finland | 0 | 0 | 1 | 1 | 2 | 4 | 1 | 3 | 4 | 4 | 5 | 6 | 6 | 19 | 10 | 10 | 14 | 8 | 9 | 4 | 12 | 7 | 10 | 5 | 18 | 6 | 18 | 6 | 20 | 11 | 27 | 6 | 29 | 10 | 28 | 18 | 25 | 11 | 23 | 12 | 17 | 8 |
| France | 11 | 11 | 10 | 11 | 9 | 15 | 10 | 26 | 12 | 22 | 6 | 41 | 15 | 31 | 18 | 39 | 18 | 22 | 23 | 33 | 29 | 31 | 25 | 26 | 50 | 24 | 55 | 24 | 71 | 28 | 61 | 30 | 64 | 27 | 48 | 39 | 44 | 57 | 48 | 59 | 48 | 81 |
| Germany | 6 | 6 | 13 | 3 | 15 | 8 | 11 | 12 | 10 | 18 | 12 | 15 | 19 | 13 | 25 | 27 | 43 | 25 | 51 | 20 | 78 | 22 | 98 | 24 | 191 | 40 | 170 | 31 | 203 | 53 | 225 | 75 | 190 | 60 | 114 | 52 | 90 | 60 | 83 | 54 | 85 | 59 |
| Hungary | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 3 | 1 | 2 | 1 | 1 | 0 | 1 | 0 | 1 | 1 |
| Ireland | 0 | 4 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 2 | 0 | 2 | 1 | 3 | 0 | 4 | 1 | 8 | 1 | 9 | 1 | 13 | 3 | 17 | 2 | 16 | 4 | 16 | 6 | 33 | 15 | 25 | 13 | 27 | 12 | 32 | 16 | 31 | 11 |
| Italy | 1 | 1 | 0 | 2 | 3 | 15 | 1 | 7 | 2 | 7 | 3 | 4 | 2 | 8 | 2 | 4 | 4 | 14 | 4 | 19 | 4 | 19 | 7 | 17 | 14 | 17 | 19 | 11 | 20 | 2 | 26 | 6 | 23 | 1 | 15 | 2 | 14 | 7 | 97 | 12 | 97 | 74 |
| Netherlands | 1 | 2 | 4 | 9 | 8 | 14 | 2 | 21 | 5 | 35 | 1 | 29 | 2 | 20 | 5 | 20 | 9 | 22 | 5 | 20 | 7 | 24 | 8 | 16 | 19 | 9 | 13 | 16 | 16 | 15 | 12 | 19 | 9 | 20 | 11 | 23 | 6 | 25 | 13 | 33 | 10 | 20 |
| Spain | 0 | 1 | 1 | 2 | 0 | 1 | 0 | 3 | 1 | 1 | 0 | 2 | 1 | 1 | 0 | 3 | 1 | 5 | 2 | 5 | 2 | 9 | 2 | 9 | 4 | 11 | 10 | 12 | 13 | 10 | 6 | 13 | 16 | 28 | 7 | 18 | 12 | 22 | 6 | 20 | 7 | 15 |
| Sweden | 4 | 3 | 2 | 3 | 3 | 7 | 5 | 8 | 3 | 8 | 9 | 12 | 2 | 8 | 7 | 5 | 10 | 6 | 7 | 2 | 11 | 4 | 10 | 5 | 18 | 15 | 17 | 5 | 17 | 6 | 16 | 7 | 24 | 9 | 17 | 3 | 18 | 8 | 13 | 9 | 15 | 11 |
| United Kingdom | 8 | 4 | 16 | 4 | 14 | 6 | 18 | 3 | 21 | 13 | 26 | 18 | 23 | 22 | 29 | 23 | 45 | 16 | 39 | 16 | 60 | 12 | 81 | 21 | 121 | 23 | 107 | 28 | 137 | 32 | 169 | 41 | 155 | 43 | 91 | 47 | 88 | 42 | 105 | 32 | 123 | 42 |
| All others | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 2 | 0 | 2 | 0 | 2 | 0 | 2 | 4 | 2 | 2 | 7 | 4 | 10 | 3 | 10 | 6 | 20 | 9 | 11 | 12 | 13 | 19 | 16 | 35 | 29 | 15 | 16 | 11 | 11 | 15 | 19 | 24 | 21 | 17 | 17 |
| Other Europe | 1 | 1 | 1 | 10 | 2 | 14 | 2 | 16 | 5 | 18 | 3 | 20 | 2 | 20 | 6 | 34 | 11 | 37 | 18 | 25 | 20 | 41 | 22 | 40 | 32 | 24 | 33 | 27 | 36 | 36 | 46 | 37 | 56 | 42 | 28 | 35 | 31 | 48 | 45 | 77 | 37 | 84 |
| Former Soviet Union | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 2 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 10 | 0 | 2 | 0 | 2 | 3 | 4 | 7 | 4 | 0 | 3 | 0 | 2 | 1 | 2 | 1 | 1 | 1 | 1 |
| Norway | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 2 | 2 | 0 | 4 | 0 | 1 | 1 | 3 | 2 | 1 | 3 | 2 | 1 | 2 | 1 | 2 | 2 | 3 | 2 | 3 | 4 | 3 | 7 | 3 | 6 | 1 | 2 | 2 | 2 | 2 | 3 | 1 | 7 | 3 |
| Russia | 0 | 9 | 0 | 8 | 0 | 11 | 1 | 12 | 1 | 13 | 1 | 13 | 0 | 14 | 1 | 24 | 2 | 28 | 3 | 16 | 2 | 22 | 3 | 21 | 3 | 13 | 2 | 16 | 4 | 24 | 4 | 21 | 12 | 24 | 6 | 22 | 7 | 35 | 9 | 61 | 6 | 71 |
| Switzerland | 0 | 1 | 0 | 2 | 2 | 2 | 1 | 2 | 2 | 3 | 3 | 2 | 2 | 1 | 5 | 6 | 7 | 6 | 13 | 5 | 15 | 5 | 17 | 7 | 25 | 7 | 28 | 6 | 26 | 5 | 29 | 7 | 37 | 13 | 19 | 8 | 20 | 9 | 30 | 12 | 21 | 8 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 2 | 1 | 4 | 1 | 2 | 2 | 1 | 0 | 1 | 1 | 2 | 1 | 0 |
| Asia | 77 | 322 | 117 | 344 | 108 | 293 | 98 | 284 | 112 | 340 | 149 | 514 | 168 | 609 | 216 | 791 | 358 | 1,177 | 313 | 2,176 | 349 | 2,204 | 326 | 2,021 | 456 | 2,393 | 469 | 3,243 | 570 | 4,009 | 586 | 4,254 | 614 | 4,603 | 475 | 4,046 | 494 | 6,210 | 619 | 6,764 | 663 | 7,210 |

**TABLE S8-11**

## USPTO patents and patent families granted in IT methods for management, by region, country, or economy: 1998–2018

(Number)

| Region, country, or economy | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| China | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 2 | 1 | 9 | 1 | 4 | 3 | 4 | 4 | 15 | 5 | 29 | 5 | 41 | 10 | 76 | 23 | 80 | 36 | 114 | 49 | 177 | 65 | 173 | 82 | 235 | 56 | 485 | 72 | 1,312 | 115 | 1,850 | 111 | 2,296 |
| India | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 4 | 4 | 9 | 8 | 10 | 3 | 9 | 4 | 17 | 5 | 24 | 6 | 46 | 11 | 61 | 10 | 92 | 27 | 140 | 43 | 153 | 42 | 113 | 43 | 133 | 53 | 158 | 71 | 187 | 79 |
| Japan | 72 | 281 | 111 | 277 | 102 | 242 | 88 | 250 | 102 | 267 | 125 | 309 | 137 | 368 | 175 | 476 | 294 | 531 | 260 | 890 | 286 | 930 | 248 | 1,234 | 316 | 1,333 | 278 | 1,673 | 319 | 2,000 | 262 | 2,222 | 254 | 2,209 | 190 | 1,452 | 183 | 1,855 | 209 | 1,898 | 221 | 2,070 |
| Malaysia | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 1 | 0 | 1 | 0 | 2 | 1 | 4 | 3 | 3 | 1 | 1 | 2 | 2 | 2 | 2 | 4 | 0 | 3 | 1 | 1 | 1 | 8 | 2 | 4 |
| Singapore | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 1 | 1 | 3 | 2 | 2 | 0 | 2 | 0 | 3 | 1 | 4 | 2 | 4 | 1 | 3 | 1 | 9 | 2 | 5 | 4 | 10 | 2 | 16 | 2 | 10 | 4 | 10 | 3 | 8 | 7 | 12 | 5 |
| South Korea | 1 | 38 | 1 | 62 | 4 | 50 | 6 | 29 | 2 | 49 | 9 | 167 | 10 | 204 | 4 | 282 | 11 | 604 | 10 | 1,211 | 18 | 1,183 | 18 | 652 | 41 | 909 | 57 | 1,380 | 66 | 1,707 | 70 | 1,696 | 73 | 1,909 | 82 | 1,726 | 75 | 2,573 | 95 | 2,585 | 102 | 2,442 |
| Taiwan | 3 | 3 | 3 | 3 | 0 | 1 | 3 | 5 | 6 | 20 | 11 | 27 | 14 | 27 | 23 | 21 | 33 | 22 | 24 | 41 | 18 | 42 | 19 | 51 | 21 | 54 | 25 | 64 | 34 | 90 | 33 | 115 | 32 | 201 | 20 | 330 | 17 | 411 | 27 | 342 | 23 | 310 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 1 | 0 | 1 | 0 | 2 | 1 | 3 | 1 | 1 | 1 | 4 | 2 | 6 | 1 | 3 | 2 | 3 | 2 | 4 | 3 | 6 | 3 | 4 | 3 |
| Middle East | 4 | 0 | 5 | 1 | 8 | 3 | 7 | 2 | 8 | 2 | 9 | 3 | 7 | 2 | 12 | 3 | 18 | 4 | 14 | 3 | 23 | 4 | 31 | 8 | 45 | 7 | 57 | 11 | 72 | 16 | 79 | 18 | 82 | 24 | 76 | 26 | 68 | 19 | 90 | 25 | 81 | 20 |
| Israel | 4 | 0 | 5 | 1 | 8 | 3 | 7 | 1 | 8 | 2 | 9 | 3 | 7 | 2 | 12 | 3 | 18 | 4 | 14 | 3 | 21 | 4 | 30 | 7 | 40 | 6 | 52 | 10 | 68 | 13 | 73 | 16 | 75 | 21 | 70 | 23 | 65 | 18 | 80 | 21 | 73 | 18 |
| All others | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 2 | 0 | 1 | 1 | 5 | 1 | 6 | 1 | 4 | 3 | 6 | 2 | 7 | 3 | 6 | 3 | 2 | 1 | 10 | 4 | 7 | 2 |
| Africa | 1 | 1 | 0 | 0 | 1 | 0 | 3 | 2 | 1 | 0 | 2 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 3 | 3 | 2 | 7 | 5 | 7 | 8 | 5 | 12 | 5 | 7 | 4 | 9 | 10 | 5 | 0 | 7 | 4 | 6 | 3 | 6 | 3 |
| South Africa | 1 | 1 | 0 | 0 | 1 | 0 | 3 | 1 | 1 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 2 | 2 | 2 | 6 | 4 | 4 | 8 | 4 | 11 | 3 | 5 | 1 | 7 | 3 | 4 | 0 | 4 | 1 | 4 | 1 | 4 | 1 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 3 | 0 | 1 | 1 | 2 | 2 | 3 | 3 | 7 | 0 | 0 | 3 | 3 | 2 | 2 | 3 | 2 |
| Australia and Oceania | 2 | 2 | 4 | 4 | 8 | 6 | 5 | 5 | 5 | 1 | 10 | 3 | 15 | 7 | 19 | 7 | 21 | 67 | 35 | 63 | 33 | 70 | 38 | 62 | 72 | 74 | 80 | 100 | 54 | 112 | 55 | 99 | 54 | 118 | 33 | 136 | 31 | 138 | 42 | 138 | 46 | 123 |
| Australia | 1 | 2 | 4 | 4 | 8 | 5 | 3 | 5 | 3 | 1 | 8 | 3 | 14 | 6 | 16 | 7 | 21 | 67 | 33 | 63 | 32 | 70 | 36 | 62 | 67 | 74 | 74 | 99 | 50 | 112 | 49 | 98 | 47 | 116 | 26 | 135 | 28 | 137 | 35 | 137 | 41 | 121 |
| New Zealand | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 3 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 3 | 0 | 5 | 0 | 6 | 1 | 4 | 0 | 6 | 0 | 7 | 2 | 6 | 1 | 3 | 0 | 7 | 1 | 5 | 1 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Unclassified | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 |

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**Source(s)**

Science-Metrix; PATSTAT, accessed April 2019; PatentsView, USPTO, accessed June 2019.

TABLE S8-12

## USPTO patents and patent families granted in semiconductors, by region, country, or economy: 1998–2018

(Number)

| Region, country, or economy | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| World | 5,721 | 12,276 | 7,155 | 16,312 | 8,505 | 14,334 | 10,131 | 14,260 | 10,518 | 12,680 | 10,608 | 13,043 | 10,742 | 12,507 | 9,311 | 14,578 | 10,033 | 19,389 | 9,566 | 19,913 | 9,201 | 16,619 | 10,354 | 15,393 | 14,153 | 17,378 | 14,415 | 20,497 | 13,849 | 21,821 | 15,829 | 21,820 | 17,897 | 22,332 | 18,393 | 19,324 | 18,988 | 22,362 | 19,117 | 22,038 | 17,477 | 19,901 |
| North America | 2,462 | 1,836 | 3,099 | 2,256 | 3,782 | 2,547 | 4,443 | 2,777 | 4,578 | 2,742 | 4,597 | 2,675 | 4,463 | 2,513 | 3,881 | 2,080 | 3,948 | 2,156 | 3,712 | 1,956 | 3,367 | 1,737 | 3,448 | 1,813 | 4,626 | 2,359 | 4,476 | 1,989 | 4,290 | 1,749 | 4,877 | 2,059 | 5,592 | 2,329 | 5,545 | 2,335 | 5,782 | 2,518 | 5,691 | 2,338 | 5,095 | 1,868 |
| Canada | 20 | 17 | 21 | 14 | 25 | 13 | 25 | 17 | 25 | 17 | 35 | 18 | 40 | 27 | 29 | 21 | 32 | 17 | 31 | 25 | 31 | 21 | 39 | 30 | 54 | 28 | 64 | 34 | 55 | 28 | 66 | 25 | 79 | 32 | 73 | 24 | 76 | 25 | 67 | 20 | 53 | 16 |
| Mexico | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 1 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 6 | 2 | 3 | 0 | 1 |
| Puerto Rico | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| United States | 2,442 | 1,819 | 3,078 | 2,241 | 3,756 | 2,535 | 4,417 | 2,799 | 4,551 | 2,724 | 4,561 | 2,657 | 4,423 | 2,486 | 3,851 | 2,059 | 3,935 | 2,139 | 3,679 | 1,929 | 3,335 | 1,716 | 3,408 | 1,782 | 4,572 | 2,331 | 4,411 | 1,954 | 4,233 | 1,721 | 4,810 | 2,034 | 5,512 | 2,296 | 5,470 | 2,311 | 5,705 | 2,487 | 5,622 | 2,314 | 5,041 | 1,852 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Central and South America | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 2 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 3 | 2 | 2 | 1 | 2 | 3 | 2 | 2 | 1 | 3 | 3 | 7 |
| Argentina | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 1 |
| Brazil | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 2 | 1 | 0 | 1 | 3 | 0 | 2 | 1 | 2 | 2 | 6 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 |
| Europe | 353 | 541 | 416 | 542 | 473 | 471 | 646 | 589 | 708 | 704 | 779 | 801 | 800 | 702 | 725 | 857 | 762 | 1,014 | 721 | 1,028 | 674 | 924 | 781 | 939 | 1,147 | 1,047 | 1,177 | 1,022 | 1,214 | 1,104 | 1,421 | 1,089 | 1,590 | 1,238 | 1,668 | 1,152 | 1,703 | 1,170 | 1,676 | 1,213 | 1,494 | 1,257 |
| EU | 341 | 421 | 400 | 446 | 453 | 406 | 614 | 513 | 673 | 610 | 754 | 669 | 774 | 568 | 702 | 736 | 736 | 861 | 698 | 848 | 656 | 754 | 750 | 680 | 1,115 | 848 | 1,140 | 857 | 1,175 | 903 | 1,361 | 896 | 1,527 | 991 | 1,609 | 933 | 1,637 | 993 | 1,606 | 985 | 1,427 | 1,013 |
| Austria | 4 | 7 | 13 | 12 | 6 | 13 | 11 | 11 | 9 | 18 | 16 | 16 | 14 | 21 | 11 | 34 | 13 | 24 | 23 | 32 | 18 | 37 | 29 | 31 | 42 | 32 | 57 | 41 | 65 | 50 | 79 | 47 | 105 | 71 | 128 | 91 | 164 | 98 | 186 | 104 | 149 | 77 |
| Belgium | 2 | 3 | 7 | 2 | 11 | 3 | 19 | 3 | 19 | 9 | 37 | 9 | 35 | 7 | 22 | 2 | 29 | 9 | 22 | 2 | 31 | 8 | 39 | 5 | 61 | 13 | 56 | 13 | 64 | 13 | 70 | 10 | 62 | 22 | 83 | 21 | 108 | 41 | 102 | 45 | 88 | 42 |
| Denmark | 0 | 1 | 1 | 3 | 0 | 0 | 2 | 0 | 2 | 1 | 3 | 1 | 4 | 1 | 2 | 1 | 5 | 4 | 1 | 0 | 2 | 2 | 3 | 2 | 7 | 4 | 4 | 1 | 3 | 2 | 5 | 0 | 5 | 3 | 1 | 3 | 2 | 1 | 5 | 1 | 4 | 1 |
| Finland | 5 | 6 | 4 | 2 | 5 | 2 | 5 | 2 | 6 | 4 | 4 | 4 | 4 | 0 | 4 | 12 | 11 | 10 | 11 | 9 | 13 | 7 | 10 | 11 | 14 | 9 | 14 | 14 | 14 | 8 | 12 | 4 | 16 | 10 | 17 | 11 | 23 | 10 | 23 | 5 | 21 | 8 |
| France | 51 | 85 | 69 | 88 | 64 | 70 | 96 | 119 | 93 | 119 | 101 | 217 | 111 | 109 | 99 | 178 | 123 | 144 | 116 | 152 | 94 | 150 | 131 | 133 | 169 | 150 | 185 | 207 | 193 | 223 | 241 | 240 | 255 | 215 | 266 | 175 | 251 | 246 | 267 | 226 | 238 | 352 |
| Germany | 141 | 197 | 166 | 196 | 196 | 192 | 252 | 241 | 301 | 354 | 347 | 286 | 402 | 277 | 396 | 394 | 386 | 542 | 382 | 546 | 352 | 437 | 366 | 373 | 612 | 490 | 587 | 418 | 597 | 423 | 659 | 397 | 770 | 488 | 769 | 471 | 739 | 441 | 715 | 413 | 639 | 369 |
| Hungary | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 0 |
| Ireland | 4 | 5 | 3 | 3 | 1 | 2 | 7 | 6 | 3 | 2 | 4 | 0 | 4 | 3 | 3 | 2 | 6 | 4 | 4 | 2 | 8 | 3 | 6 | 2 | 6 | 1 | 11 | 8 | 10 | 5 | 14 | 6 | 14 | 7 | 7 | 4 | 17 | 8 | 13 | 6 | 16 | 9 |
| Italy | 57 | 40 | 61 | 80 | 64 | 56 | 96 | 45 | 87 | 46 | 80 | 38 | 54 | 57 | 37 | 33 | 39 | 25 | 29 | 31 | 34 | 30 | 38 | 20 | 40 | 33 | 51 | 27 | 47 | 31 | 74 | 23 | 96 | 26 | 106 | 26 | 93 | 18 | 87 | 66 | 52 | 52 |
| Netherlands | 28 | 15 | 29 | 15 | 26 | 19 | 42 | 17 | 55 | 12 | 63 | 23 | 45 | 17 | 36 | 24 | 43 | 41 | 35 | 24 | 34 | 15 | 32 | 20 | 58 | 34 | 69 | 38 | 71 | 38 | 76 | 45 | 70 | 34 | 73 | 20 | 99 | 34 | 79 | 28 | 69 | 20 |
| Spain | 0 | 5 | 1 | 5 | 2 | 5 | 1 | 6 | 3 | 2 | 2 | 3 | 0 | 4 | 2 | 8 | 2 | 8 | 1 | 9 | 3 | 10 | 1 | 13 | 2 | 12 | 2 | 11 | 4 | 8 | 5 | 21 | 5 | 18 | 6 | 12 | 5 | 15 | 4 | 11 | 5 | 10 |
| Sweden | 21 | 22 | 26 | 22 | 35 | 25 | 33 | 36 | 28 | 21 | 20 | 28 | 8 | 24 | 14 | 6 | 14 | 7 | 7 | 8 | 9 | 7 | 13 | 6 | 12 | 13 | 16 | 13 | 17 | 11 | 15 | 5 | 22 | 6 | 25 | 11 | 24 | 10 | 17 | 5 | 15 | 8 |
| United Kingdom | 28 | 13 | 27 | 13 | 36 | 14 | 47 | 16 | 62 | 16 | 76 | 37 | 85 | 34 | 67 | 28 | 61 | 30 | 66 | 14 | 62 | 24 | 77 | 31 | 86 | 29 | 82 | 49 | 81 | 39 | 103 | 56 | 93 | 45 | 117 | 45 | 96 | 28 | 96 | 40 | 86 | 35 |
| All others | 0 | 21 | 1 | 9 | 1 | 13 | 2 | 12 | 3 | 7 | 1 | 9 | 2 | 10 | 0 | 14 | 4 | 13 | 1 | 15 | 3 | 29 | 3 | 35 | 6 | 29 | 4 | 18 | 9 | 41 | 8 | 42 | 8 | 44 | 11 | 42 | 16 | 44 | 12 | 41 | 9 | 31 |
| Other Europe | 12 | 16 | 16 | 96 | 20 | 65 | 32 | 76 | 35 | 93 | 25 | 131 | 26 | 134 | 23 | 121 | 26 | 153 | 23 | 180 | 18 | 169 | 31 | 259 | 31 | 198 | 37 | 165 | 39 | 201 | 60 | 194 | 63 | 247 | 60 | 219 | 66 | 177 | 69 | 228 | 67 | 244 |
| Former Soviet Union | 0 | 8 | 1 | 4 | 1 | 1 | 0 | 3 | 1 | 8 | 1 | 15 | 1 | 4 | 1 | 2 | 2 | 0 | 13 | 0 | 22 | 0 | 20 | 0 | 29 | 0 | 30 | 0 | 26 | 1 | 15 | 0 | 13 | 1 | 16 | 1 | 13 | 0 | 10 | 1 | 18 | 2 |
| Norway | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 2 | 1 | 0 | 1 | 4 | 1 | 2 | 2 | 2 | 1 | 2 | 2 | 1 | 2 | 1 | 3 | 1 | 3 | 2 | 3 | 1 | 2 | 3 | 3 | 1 | 8 | 4 | 4 | 1 | 4 | 1 | 4 | 2 | 4 |
| Russia | 4 | 104 | 3 | 87 | 6 | 57 | 10 | 63 | 6 | 78 | 3 | 102 | 2 | 88 | 3 | 96 | 3 | 121 | 2 | 140 | 3 | 134 | 2 | 205 | 3 | 154 | 4 | 123 | 4 | 172 | 3 | 167 | 6 | 216 | 4 | 190 | 4 | 152 | 5 | 185 | 3 | 210 |
| Switzerland | 8 | 8 | 12 | 5 | 12 | 5 | 20 | 8 | 26 | 7 | 20 | 13 | 20 | 4 | 17 | 4 | 20 | 17 | 19 | 15 | 14 | 14 | 27 | 21 | 27 | 11 | 30 | 13 | 32 | 12 | 53 | 10 | 48 | 13 | 53 | 13 | 57 | 21 | 56 | 19 | | |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 0 | 1 | 1 | 2 | 1 | 3 | 2 | 4 | 1 | 3 | 2 | 3 | 1 |
| Asia | 2,894 | 9,885 | 3,621 | 13,450 | 4,229 | 11,195 | 5,009 | 10,857 | 5,203 | 9,203 | 5,194 | 9,548 | 5,441 | 9,257 | 4,668 | 11,610 | 5,275 | 16,198 | 5,102 | 16,915 | 5,131 | 13,918 | 6,091 | 12,623 | 8,332 | 13,950 | 8,713 | 17,463 | 8,293 | 18,903 | 9,484 | 18,638 | 10,643 | 18,733 | 11,116 | 15,806 | 11,425 | 18,637 | 11,659 | 18,460 | 10,819 | 16,744 |

TABLE S8-12

## USPTO patents and patent families granted in semiconductors, by region, country, or economy: 1998–2018

(Number)

| Region, country, or economy | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| China | 2 | 13 | 9 | 33 | 5 | 55 | 12 | 47 | 26 | 44 | 32 | 143 | 48 | 396 | 57 | 558 | 69 | 677 | 105 | 905 | 109 | 1,473 | 121 | 2,203 | 179 | 1,909 | 191 | 2,236 | 239 | 3,151 | 372 | 2,909 | 500 | 2,469 | 640 | 4,562 | 832 | 6,248 | 1,131 | 7,128 | 1,061 | 6,817 |
| India | 1 | 0 | 1 | 1 | 2 | 0 | 2 | 1 | 2 | 1 | 5 | 5 | 4 | 4 | 1 | 2 | 3 | 4 | 5 | 5 | 4 | 2 | 3 | 3 | 6 | 4 | 5 | 7 | 14 | 8 | 22 | 16 | 18 | 13 | 15 | 14 | 37 | 25 | 34 | 29 | 40 | 21 |
| Japan | 1,867 | 6,966 | 2,218 | 6,694 | 2,384 | 5,273 | 2,730 | 5,634 | 3,099 | 4,863 | 3,248 | 4,797 | 3,358 | 4,231 | 2,826 | 4,043 | 3,078 | 4,134 | 2,836 | 5,738 | 2,684 | 5,541 | 3,211 | 6,130 | 4,408 | 7,096 | 4,545 | 8,217 | 4,292 | 8,989 | 4,769 | 9,237 | 5,009 | 8,852 | 4,931 | 5,231 | 4,561 | 5,883 | 4,446 | 5,242 | 4,036 | 4,476 |
| Malaysia | 1 | 1 | 3 | 1 | 4 | 5 | 11 | 11 | 17 | 18 | 11 | 8 | 24 | 15 | 27 | 29 | 32 | 30 | 48 | 44 | 32 | 30 | 34 | 23 | 53 | 37 | 53 | 42 | 47 | 39 | 40 | 32 | 63 | 53 | 81 | 67 | 54 | 45 | 55 | 55 | 46 | 42 |
| Singapore | 30 | 21 | 40 | 30 | 69 | 61 | 125 | 143 | 163 | 131 | 148 | 101 | 134 | 77 | 102 | 55 | 122 | 59 | 117 | 55 | 100 | 45 | 102 | 60 | 200 | 113 | 245 | 139 | 251 | 122 | 269 | 130 | 275 | 135 | 255 | 130 | 249 | 115 | 237 | 103 | 210 | 90 |
| South Korea | 451 | 1,947 | 516 | 5,390 | 544 | 3,230 | 621 | 1,326 | 705 | 1,773 | 686 | 2,345 | 748 | 2,605 | 732 | 4,990 | 952 | 9,505 | 1,056 | 8,743 | 1,221 | 5,725 | 1,647 | 3,209 | 2,231 | 3,793 | 2,342 | 5,541 | 2,001 | 5,095 | 2,188 | 4,181 | 2,559 | 4,427 | 2,747 | 2,932 | 2,846 | 3,304 | 2,745 | 3,261 | 2,495 | 3,556 |
| Taiwan | 542 | 936 | 829 | 1,299 | 1,215 | 2,567 | 1,504 | 3,691 | 1,379 | 2,364 | 1,049 | 2,136 | 1,108 | 1,921 | 909 | 1,925 | 1,001 | 1,783 | 923 | 1,413 | 970 | 1,094 | 960 | 991 | 1,229 | 989 | 1,312 | 1,268 | 1,408 | 1,489 | 1,803 | 2,125 | 2,202 | 2,274 | 2,418 | 2,858 | 2,820 | 3,001 | 2,976 | 2,621 | 2,899 | 1,725 |
| All others | 0 | 0 | 6 | 2 | 5 | 2 | 5 | 4 | 12 | 9 | 17 | 13 | 17 | 9 | 14 | 9 | 18 | 7 | 13 | 11 | 11 | 8 | 12 | 5 | 26 | 9 | 21 | 14 | 20 | 9 | 20 | 9 | 17 | 10 | 28 | 13 | 27 | 17 | 35 | 21 | 32 | 17 |
| Middle East | 10 | 6 | 13 | 9 | 16 | 10 | 30 | 22 | 24 | 13 | 27 | 10 | 26 | 17 | 24 | 12 | 18 | 11 | 22 | 7 | 20 | 8 | 22 | 9 | 29 | 11 | 23 | 8 | 35 | 9 | 33 | 10 | 47 | 15 | 44 | 14 | 56 | 19 | 68 | 20 | 51 | 17 |
| Israel | 10 | 5 | 13 | 9 | 16 | 10 | 30 | 18 | 23 | 13 | 26 | 10 | 25 | 14 | 22 | 11 | 18 | 9 | 21 | 7 | 19 | 7 | 21 | 9 | 29 | 11 | 20 | 5 | 31 | 7 | 29 | 7 | 44 | 13 | 37 | 11 | 46 | 13 | 59 | 14 | 38 | 11 |
| All others | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 4 | 1 | 0 | 1 | 0 | 1 | 4 | 2 | 1 | 1 | 3 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 3 | 3 | 4 | 2 | 4 | 3 | 4 | 2 | 8 | 3 | 10 | 6 | 9 | 6 | 13 | 6 |
| Africa | 0 | 1 | 1 | 2 | 2 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 2 | 2 | 0 | 2 | 3 | 4 | 7 | 4 | 3 | 2 | 4 | 2 | 3 | 1 | 1 | 3 |
| South Africa | 0 | 1 | 1 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 2 | 0 | 0 | 0 | 1 | 0 | 5 | 0 | 2 | 0 | 4 | 0 | 1 | 0 | 0 | 0 |
| All others | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 2 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 2 | 0 | 2 | 2 | 4 | 2 | 4 | 1 | 2 | 0 | 2 | 2 | 1 | 0 | 3 |
| Australia and Oceania | 3 | 1 | 4 | 1 | 3 | 4 | 2 | 4 | 5 | 8 | 9 | 5 | 12 | 7 | 11 | 7 | 9 | 4 | 8 | 4 | 8 | 3 | 12 | 6 | 16 | 7 | 23 | 11 | 16 | 14 | 9 | 17 | 16 | 12 | 15 | 10 | 14 | 11 | 17 | 3 | 13 | 4 |
| Australia | 2 | 1 | 4 | 1 | 2 | 3 | 2 | 4 | 3 | 8 | 8 | 5 | 11 | 7 | 11 | 7 | 9 | 4 | 8 | 4 | 8 | 3 | 11 | 6 | 16 | 7 | 23 | 11 | 15 | 14 | 8 | 17 | 14 | 11 | 14 | 8 | 14 | 11 | 16 | 3 | 12 | 4 |
| New Zealand | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 1 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| Unclassified | 0 | 4 | 0 | 53 | 0 | 107 | 0 | 8 | 0 | 7 | 1 | 1 | 0 | 7 | 0 | 12 | 0 | 5 | 1 | 2 | 0 | 27 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 38 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 2 | 2 | 0 | 1 | 0 |

EU = European Union; USPTO = U.S. Patent and Trademark Office.

**Note(s)**

USPTO patents are allocated according to patent inventorship information. USPTO patents are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named inventors. Patents are classified under the World Intellectual Property Organization (WIPO) classification of patents, which classifies International Patent Classification (IPC) codes under 35 technical fields. IPC reformed codes take into account changes that were made to the WIPO classification in 2006 under the eighth version of the classification and were used to prepare these data. However, because PatentsView only provides the original IPC codes as they appeared on patents and not the IPC reformed codes, current Cooperative Patent Classification codes on patents were converted back to the most recent IPC classification to prepare these statistics. Fractional counts of patents were assigned to each technological field on patents to assign the proper weight of a patent to the corresponding technological fields under the classification. International Patent Documentation (INPADOC) patent families across all patent offices covered in the Worldwide Patent Statistical Database (PATSTAT) are counted according to the year of the first granted patent in the patent family. Patent families are allocated according to patent inventorship information found on the priority patent of the INPADOC patent families. To account for missing ownership information in PATSTAT for some offices, a method designed by de Rassenfosse et al. (2012) is used to fill in missing information on priority patents using information in successive filings within the patent families (see technical documentation for details). Patent families are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named inventors. Because of data coverage issues for some patent offices in PATSTAT, statistics for some countries may be underestimated partially for some years or across the whole trend. Countries with identified issues include India (missing data) and South Africa (no data for 2018). For Italy, because of data gaps regarding information on granted patents, patent applications are used instead, which slightly overestimates Italy's output and creates a small shift in the year for which its output is accounted. The EU includes 28 member countries. China includes Hong Kong.

**Source(s)**

Science-Metrix; PATSTAT, accessed April 2019; PatentsView, USPTO, accessed June 2019.

TABLE S8-13

## USPTO patents and patent families granted in optics, by region, country, or economy: 1998–2018

(Number)

| Region, country, or economy | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| World | 7,796 | 11,995 | 7,374 | 12,977 | 7,414 | 10,510 | 7,706 | 9,954 | 7,937 | 10,368 | 8,725 | 11,375 | 9,281 | 11,535 | 8,095 | 11,920 | 9,286 | 14,247 | 8,388 | 16,315 | 8,573 | 15,589 | 8,787 | 15,054 | 10,506 | 17,029 | 10,378 | 19,479 | 10,470 | 21,188 | 11,018 | 21,438 | 11,891 | 19,871 | 11,969 | 15,340 | 11,692 | 17,282 | 11,575 | 17,028 | 10,989 | 16,002 |
| North America | 2,826 | 2,199 | 2,814 | 2,122 | 2,746 | 1,993 | 2,986 | 2,026 | 3,140 | 1,978 | 3,480 | 2,155 | 3,528 | 2,048 | 3,114 | 1,588 | 3,304 | 1,648 | 2,862 | 1,463 | 2,703 | 1,340 | 2,568 | 1,240 | 2,923 | 1,361 | 2,594 | 1,137 | 2,641 | 1,100 | 2,736 | 1,055 | 2,894 | 1,063 | 2,865 | 986 | 2,922 | 950 | 3,002 | 883 | 2,791 | 789 |
| Canada | 102 | 81 | 78 | 72 | 92 | 67 | 90 | 62 | 107 | 75 | 136 | 96 | 125 | 69 | 104 | 57 | 111 | 51 | 100 | 72 | 104 | 76 | 109 | 75 | 131 | 81 | 125 | 75 | 129 | 72 | 120 | 70 | 142 | 83 | 127 | 72 | 139 | 68 | 154 | 71 | 136 | 43 |
| Mexico | 0 | 0 | 2 | 1 | 0 | 0 | 1 | 1 | 4 | 3 | 2 | 2 | 1 | 2 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 4 | 2 | 3 | 1 | 5 | 1 | 5 | 1 | 6 | 6 | 6 | 7 | 6 | 1 |
| Puerto Rico | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| United States | 2,724 | 2,117 | 2,734 | 2,049 | 2,653 | 1,925 | 2,894 | 1,962 | 3,029 | 1,901 | 3,342 | 2,057 | 3,401 | 1,977 | 3,008 | 1,529 | 3,192 | 1,595 | 2,760 | 1,389 | 2,599 | 1,263 | 2,458 | 1,164 | 2,792 | 1,280 | 2,468 | 1,062 | 2,508 | 1,026 | 2,613 | 984 | 2,747 | 980 | 2,733 | 913 | 2,777 | 876 | 2,840 | 804 | 2,649 | 745 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Central and South America | 1 | 2 | 2 | 2 | 2 | 2 | 3 | 1 | 2 | 4 | 1 | 0 | 2 | 3 | 1 | 1 | 2 | 1 | 0 | 1 | 1 | 1 | 1 | 3 | 1 | 0 | 1 | 0 | 2 | 3 | 4 | 4 | 3 | 3 | 5 | 3 | 4 | 3 | 6 | 5 | 5 | 15 |
| Argentina | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Brazil | 0 | 0 | 1 | 0 | 2 | 2 | 2 | 1 | 1 | 3 | 1 | 0 | 0 | 3 | 0 | 0 | 2 | 0 | 0 | 1 | 1 | 1 | 1 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 3 | 3 | 3 | 2 | 3 | 2 | 2 | 3 | 3 | 4 | 3 | 13 |
| All others | 0 | 0 | 2 | 2 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 3 | 2 | 1 | 0 | 2 | 0 | 2 | 1 |
| Europe | 780 | 948 | 719 | 868 | 791 | 788 | 851 | 732 | 817 | 850 | 927 | 1,021 | 991 | 1,086 | 806 | 944 | 959 | 1,008 | 824 | 941 | 915 | 973 | 817 | 915 | 932 | 881 | 860 | 806 | 887 | 792 | 1,032 | 768 | 1,106 | 758 | 1,103 | 840 | 1,090 | 856 | 1,242 | 1,017 | 1,097 | 1,013 |
| EU | 740 | 708 | 670 | 728 | 747 | 638 | 798 | 583 | 765 | 696 | 870 | 833 | 914 | 840 | 743 | 751 | 901 | 812 | 784 | 744 | 866 | 766 | 775 | 652 | 876 | 678 | 813 | 626 | 847 | 624 | 966 | 580 | 1,043 | 570 | 1,033 | 605 | 1,021 | 674 | 1,169 | 785 | 1,033 | 791 |
| Austria | 6 | 8 | 8 | 9 | 13 | 22 | 13 | 10 | 10 | 12 | 10 | 10 | 12 | 11 | 9 | 11 | 13 | 20 | 8 | 14 | 8 | 12 | 6 | 13 | 14 | 17 | 16 | 14 | 13 | 19 | 13 | 11 | 16 | 16 | 17 | 16 | 19 | 15 | 19 | 14 | 23 | 23 |
| Belgium | 92 | 24 | 77 | 33 | 83 | 25 | 61 | 20 | 43 | 21 | 41 | 27 | 31 | 18 | 20 | 10 | 29 | 10 | 20 | 8 | 20 | 14 | 14 | 14 | 24 | 13 | 18 | 11 | 18 | 9 | 22 | 10 | 30 | 12 | 30 | 12 | 38 | 12 | 44 | 25 | 45 | 6 |
| Denmark | 5 | 2 | 4 | 1 | 4 | 1 | 8 | 1 | 6 | 2 | 12 | 12 | 16 | 6 | 11 | 4 | 6 | 3 | 13 | 3 | 9 | 5 | 13 | 3 | 6 | 1 | 9 | 2 | 6 | 0 | 10 | 3 | 10 | 2 | 15 | 4 | 15 | 4 | 9 | 3 | 9 | 3 |
| Finland | 2 | 7 | 5 | 3 | 3 | 3 | 9 | 8 | 3 | 3 | 5 | 5 | 8 | 8 | 13 | 11 | 17 | 7 | 14 | 15 | 9 | 9 | 13 | 14 | 21 | 17 | 9 | 7 | 11 | 5 | 12 | 5 | 18 | 14 | 19 | 12 | 24 | 12 | 24 | 12 | 24 | 19 |
| France | 118 | 201 | 99 | 193 | 110 | 122 | 120 | 130 | 90 | 169 | 127 | 260 | 114 | 217 | 80 | 161 | 79 | 187 | 64 | 156 | 58 | 202 | 76 | 156 | 94 | 162 | 93 | 180 | 110 | 175 | 122 | 165 | 129 | 145 | 125 | 153 | 119 | 181 | 152 | 170 | 127 | 214 |
| Germany | 242 | 206 | 237 | 196 | 258 | 193 | 302 | 216 | 324 | 249 | 359 | 264 | 391 | 302 | 341 | 335 | 350 | 354 | 289 | 325 | 339 | 253 | 291 | 203 | 327 | 232 | 312 | 214 | 340 | 225 | 392 | 227 | 416 | 212 | 423 | 243 | 405 | 265 | 458 | 308 | 385 | 299 |
| Hungary | 3 | 1 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 2 | 2 | 1 | 6 | 4 | 8 | 3 | 4 | 3 | 4 | 0 | 3 | 3 | 2 | 2 | 1 | 0 | 3 | 2 | 1 | 2 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 1 |
| Ireland | 1 | 2 | 1 | 1 | 1 | 0 | 1 | 0 | 2 | 1 | 4 | 1 | 4 | 2 | 7 | 1 | 4 | 1 | 2 | 0 | 6 | 0 | 4 | 0 | 4 | 1 | 5 | 1 | 2 | 0 | 4 | 2 | 5 | 2 | 5 | 2 | 4 | 1 | 4 | 3 | 6 | 1 |
| Italy | 37 | 91 | 31 | 113 | 25 | 117 | 38 | 55 | 24 | 53 | 47 | 45 | 44 | 100 | 32 | 44 | 34 | 14 | 31 | 8 | 22 | 15 | 35 | 15 | 24 | 12 | 27 | 18 | 31 | 23 | 32 | 8 | 22 | 3 | 30 | 8 | 4 | 36 | 11 | 37 | 63 | 38 |
| Netherlands | 61 | 28 | 51 | 26 | 41 | 16 | 47 | 16 | 66 | 26 | 73 | 28 | 100 | 36 | 82 | 33 | 209 | 80 | 209 | 107 | 252 | 131 | 210 | 98 | 212 | 97 | 190 | 61 | 170 | 36 | 200 | 36 | 233 | 35 | 213 | 20 | 204 | 34 | 207 | 44 | 213 | 33 |
| Spain | 1 | 17 | 2 | 16 | 2 | 7 | 5 | 15 | 1 | 14 | 2 | 9 | 13 | 2 | 8 | 3 | 19 | 4 | 12 | 5 | 20 | 4 | 22 | 4 | 23 | 3 | 25 | 4 | 26 | 8 | 24 | 9 | 27 | 6 | 29 | 9 | 20 | 9 | 19 | 16 | 22 | 13 |
| Sweden | 18 | 28 | 25 | 28 | 41 | 45 | 34 | 47 | 31 | 39 | 29 | 59 | 37 | 54 | 26 | 18 | 32 | 15 | 28 | 12 | 25 | 16 | 25 | 20 | 29 | 19 | 29 | 15 | 22 | 19 | 27 | 8 | 30 | 14 | 29 | 13 | 21 | 14 | 31 | 14 | 25 | 14 |
| United Kingdom | 154 | 67 | 129 | 72 | 160 | 55 | 155 | 48 | 161 | 87 | 158 | 84 | 148 | 51 | 115 | 66 | 119 | 59 | 87 | 39 | 96 | 37 | 80 | 48 | 102 | 56 | 93 | 47 | 106 | 42 | 109 | 38 | 120 | 39 | 99 | 44 | 122 | 53 | 143 | 51 | 108 | 54 |
| All others | 1 | 24 | 0 | 37 | 1 | 26 | 4 | 20 | 3 | 15 | 2 | 22 | 4 | 20 | 6 | 27 | 10 | 33 | 8 | 38 | 14 | 27 | 4 | 37 | 6 | 23 | 6 | 28 | 9 | 45 | 11 | 42 | 11 | 56 | 15 | 52 | 12 | 50 | 16 | 51 | 13 | 46 |
| Other Europe | 40 | 240 | 49 | 140 | 44 | 150 | 54 | 149 | 53 | 154 | 57 | 188 | 77 | 246 | 63 | 193 | 58 | 196 | 40 | 197 | 50 | 227 | 42 | 263 | 56 | 203 | 46 | 180 | 40 | 168 | 66 | 187 | 64 | 187 | 71 | 236 | 69 | 182 | 73 | 232 | 64 | 222 |
| Former Soviet Union | 1 | 18 | 0 | 5 | 0 | 5 | 2 | 8 | 1 | 7 | 2 | 23 | 3 | 56 | 1 | 17 | 3 | 11 | 1 | 34 | 1 | 26 | 0 | 31 | 3 | 23 | 2 | 15 | 0 | 14 | 0 | 15 | 2 | 17 | 3 | 22 | 3 | 19 | 1 | 16 | 1 | 12 |
| Norway | 1 | 2 | 1 | 5 | 1 | 2 | 0 | 2 | 4 | 6 | 4 | 5 | 6 | 3 | 8 | 7 | 5 | 6 | 4 | 3 | 4 | 4 | 1 | 4 | 3 | 0 | 2 | 1 | 5 | 2 | 4 | 1 | 8 | 2 | 2 | 6 | 3 | 2 | 3 | 0 | 3 | 1 |
| Russia | 10 | 203 | 10 | 116 | 5 | 126 | 10 | 113 | 8 | 125 | 8 | 134 | 15 | 160 | 17 | 147 | 15 | 154 | 7 | 133 | 10 | 173 | 6 | 208 | 13 | 162 | 7 | 150 | 7 | 133 | 13 | 149 | 10 | 159 | 12 | 194 | 12 | 142 | 7 | 193 | 6 | 186 |
| Switzerland | 25 | 16 | 37 | 14 | 36 | 18 | 40 | 25 | 39 | 16 | 43 | 26 | 53 | 27 | 37 | 22 | 34 | 22 | 27 | 25 | 32 | 21 | 33 | 18 | 35 | 16 | 35 | 11 | 29 | 18 | 47 | 22 | 44 | 9 | 51 | 13 | 47 | 20 | 59 | 23 | 53 | 24 |
| All others | 2 | 2 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 3 | 0 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 1 | 2 | 0 | 0 | 1 | 1 | 0 | 0 | 2 | 0 | 4 | 0 | 3 | 0 | 1 | 0 |
| Asia | 4,144 | 8,817 | 3,791 | 9,904 | 3,831 | 7,684 | 3,801 | 7,155 | 3,911 | 7,492 | 4,230 | 8,157 | 4,683 | 8,368 | 4,114 | 9,352 | 4,933 | 11,564 | 4,628 | 13,870 | 4,879 | 13,247 | 5,320 | 12,877 | 6,551 | 14,753 | 6,834 | 17,491 | 6,860 | 19,259 | 7,154 | 19,567 | 7,784 | 17,995 | 7,884 | 13,472 | 7,562 | 15,420 | 7,187 | 15,088 | 6,951 | 14,152 |

TABLE S8-13

## USPTO patents and patent families granted in optics, by region, country, or economy: 1998–2018

(Number)

| | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Region, country, or economy | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| China | 8 | 16 | 11 | 23 | 11 | 46 | 15 | 68 | 22 | 78 | 30 | 172 | 35 | 362 | 27 | 473 | 27 | 560 | 38 | 795 | 45 | 1,732 | 42 | 2,006 | 83 | 1,957 | 105 | 2,417 | 125 | 2,682 | 165 | 2,230 | 304 | 2,522 | 458 | 3,877 | 611 | 4,289 | 906 | 4,970 | 1,009 | 5,001 |
| India | 2 | 2 | 0 | 0 | 1 | 1 | 0 | 0 | 2 | 0 | 3 | 1 | 1 | 1 | 6 | 5 | 0 | 1 | 6 | 4 | 4 | 2 | 2 | 2 | 2 | 2 | 7 | 5 | 4 | 3 | 11 | 4 | 7 | 4 | 9 | 2 | 12 | 3 | 16 | 5 | 15 | 5 |
| Japan | 3,785 | 8,124 | 3,387 | 8,190 | 3,448 | 6,297 | 3,354 | 6,172 | 3,431 | 6,477 | 3,628 | 6,534 | 3,931 | 5,995 | 3,358 | 5,776 | 3,984 | 6,284 | 3,680 | 7,908 | 3,716 | 8,151 | 4,026 | 8,485 | 4,947 | 9,837 | 5,152 | 11,572 | 5,191 | 12,214 | 5,458 | 11,705 | 5,802 | 10,841 | 5,683 | 6,377 | 5,301 | 7,865 | 4,532 | 6,635 | 4,352 | 5,928 |
| Malaysia | 2 | 2 | 1 | 1 | 2 | 3 | 1 | 2 | 2 | 2 | 0 | 2 | 1 | 1 | 5 | 5 | 1 | 5 | 3 | 6 | 4 | 6 | 3 | 6 | 3 | 1 | 2 | 2 | 2 | 6 | 1 | 5 | 5 | 13 | 4 | 9 | 2 | 3 | 3 | 9 | 2 | 6 |
| Singapore | 3 | 3 | 4 | 4 | 4 | 6 | 8 | 6 | 8 | 5 | 10 | 7 | 19 | 7 | 22 | 7 | 12 | 6 | 12 | 7 | 13 | 11 | 13 | 6 | 21 | 11 | 17 | 6 | 18 | 7 | 14 | 4 | 12 | 7 | 27 | 9 | 22 | 8 | 23 | 6 | 18 | 5 |
| South Korea | 251 | 540 | 273 | 1,535 | 234 | 1,144 | 252 | 596 | 246 | 607 | 308 | 1,003 | 412 | 1,331 | 447 | 2,415 | 581 | 3,817 | 578 | 4,114 | 723 | 2,850 | 734 | 1,654 | 905 | 2,103 | 933 | 2,441 | 869 | 3,030 | 824 | 3,866 | 903 | 2,778 | 925 | 1,647 | 903 | 2,031 | 1,001 | 2,243 | 905 | 2,446 |
| Taiwan | 92 | 129 | 116 | 150 | 134 | 187 | 172 | 311 | 200 | 323 | 252 | 435 | 282 | 669 | 248 | 669 | 327 | 890 | 309 | 1,034 | 374 | 493 | 500 | 717 | 587 | 840 | 614 | 1,045 | 649 | 1,315 | 677 | 1,748 | 748 | 1,829 | 773 | 1,549 | 705 | 1,216 | 701 | 1,217 | 640 | 756 |
| All others | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 2 | 0 | 0 | 0 | 1 | 2 | 1 | 0 | 1 | 0 | 1 | 2 | 0 | 3 | 3 | 3 | 2 | 2 | 4 | 4 | 3 | 2 | 5 | 2 | 6 | 5 | 5 | 3 | 8 | 5 |
| Middle East | 33 | 13 | 28 | 7 | 27 | 11 | 48 | 14 | 47 | 16 | 64 | 22 | 47 | 17 | 40 | 11 | 50 | 14 | 48 | 9 | 49 | 13 | 58 | 10 | 69 | 20 | 49 | 14 | 63 | 16 | 68 | 16 | 79 | 26 | 81 | 16 | 92 | 21 | 106 | 18 | 121 | 21 |
| Israel | 33 | 11 | 28 | 7 | 27 | 9 | 47 | 12 | 47 | 14 | 63 | 20 | 46 | 17 | 39 | 11 | 50 | 12 | 48 | 8 | 49 | 12 | 57 | 9 | 68 | 19 | 48 | 14 | 61 | 12 | 67 | 15 | 75 | 22 | 75 | 12 | 86 | 17 | 99 | 15 | 117 | 17 |
| All others | 1 | 1 | 0 | 0 | 1 | 2 | 1 | 2 | 0 | 2 | 1 | 2 | 1 | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 2 | 4 | 1 | 1 | 3 | 4 | 6 | 4 | 5 | 4 | 7 | 3 | 5 | 4 |
| Africa | 1 | 4 | 1 | 2 | 0 | 2 | 0 | 4 | 0 | 5 | 1 | 4 | 1 | 3 | 2 | 3 | 0 | 2 | 1 | 4 | 0 | 3 | 0 | 2 | 1 | 1 | 2 | 1 | 0 | 0 | 1 | 1 | 3 | 1 | 4 | 0 | 1 | 2 | 4 | 0 | 3 | 2 |
| South Africa | 1 | 4 | 1 | 1 | 0 | 2 | 0 | 1 | 0 | 4 | 0 | 2 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 2 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 2 | 0 | 3 | 1 |
| All others | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 3 | 0 | 2 | 1 | 3 | 1 | 2 | 1 | 3 | 0 | 0 | 1 | 2 | 2 | 0 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 0 | 0 | 1 | 2 | 1 | 2 | 0 | 0 | 2 | 2 | 0 | 1 | 1 |
| Australia and Oceania | 10 | 9 | 18 | 9 | 16 | 6 | 15 | 19 | 18 | 19 | 21 | 10 | 28 | 9 | 19 | 10 | 38 | 10 | 24 | 13 | 25 | 11 | 22 | 8 | 30 | 13 | 38 | 22 | 17 | 17 | 23 | 23 | 20 | 24 | 27 | 23 | 20 | 20 | 28 | 17 | 20 | 10 |
| Australia | 9 | 8 | 17 | 9 | 15 | 6 | 15 | 19 | 17 | 18 | 18 | 9 | 28 | 9 | 17 | 10 | 36 | 9 | 23 | 12 | 23 | 11 | 20 | 7 | 25 | 12 | 37 | 22 | 15 | 17 | 18 | 20 | 19 | 24 | 23 | 23 | 16 | 20 | 23 | 17 | 18 | 10 |
| New Zealand | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 3 | 1 | 0 | 1 | 2 | 0 | 2 | 1 | 1 | 1 | 2 | 0 | 2 | 1 | 5 | 1 | 1 | 0 | 2 | 0 | 4 | 3 | 1 | 0 | 4 | 0 | 4 | 0 | 5 | 0 | 2 | 0 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Unclassified | 0 | 5 | 0 | 63 | 0 | 25 | 1 | 3 | 1 | 4 | 1 | 5 | 1 | 2 | 0 | 12 | 0 | 1 | 1 | 14 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 0 | 1 | 1 |

EU = European Union; USPTO = U.S. Patent and Trademark Office.

**Note(s)**

USPTO patents are allocated according to patent inventorship information. USPTO patents are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named inventors. Patents are classified under the World Intellectual Property Organization (WIPO) classification of patents, which classifies International Patent Classification (IPC) codes under 35 technical fields. IPC reformed codes take into account changes that were made to the WIPO classification in 2006 under the eighth version of the classification and were used to prepare these data. However, because PatentsView only provides the original IPC codes as they appeared on patents and not the IPC reformed codes, current Cooperative Patent Classification codes on patents were converted back to the most recent IPC classification to prepare these statistics. Fractional counts of patents were assigned to each technological field on patents to assign the proper weight of a patent to the corresponding technological fields under the classification. International Patent Documentation (INPADOC) patent families across all patent offices covered in the Worldwide Patent Statistical Database (PATSTAT) are counted according to the year of the first granted patent in the patent family. Patent families are allocated according to patent inventorship information found on the priority patent of the INPADOC patent families. To account for missing ownership information in PATSTAT for some offices, a method designed by de Rassenfosse et al. (2012) is used to fill in missing information on priority patents using information in successive filings within the patent families (see technical documentation for details). Patent families are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named inventors. Because of data coverage issues for some patent offices in PATSTAT, statistics for some countries may be underestimated partially for some years or across the whole trend. Countries with identified issues include India (missing data) and South Africa (no data for 2018). For Italy, because of data gaps regarding information on granted patents, patent applications are used instead, which slightly overestimates Italy's output and creates a small shift in the year for which its output is accounted. The EU includes 28 member countries. China includes Hong Kong.

**Source(s)**

Science-Metrix; PATSTAT, accessed April 2019; PatentsView, USPTO, accessed June 2019.

TABLE SB-14

## USPTO patents and patent families granted in measurement, by region, country, or economy: 1998–2018

(Number)

| Region, country, or economy | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| World | 6,516 | 12,940 | 6,371 | 14,652 | 6,802 | 12,568 | 7,232 | 12,091 | 7,898 | 12,153 | 8,538 | 13,386 | 8,304 | 14,040 | 7,462 | 14,368 |
| North America | 3,825 | 3,008 | 3,841 | 2,768 | 4,004 | 2,718 | 4,155 | 2,660 | 4,415 | 2,693 | 4,823 | 2,844 | 4,667 | 2,630 | 4,188 | 2,245 |
| Canada | 133 | 106 | 134 | 105 | 125 | 91 | 136 | 94 | 139 | 87 | 163 | 109 | 172 | 93 | 135 | 67 |
| Mexico | 0 | 0 | 3 | 2 | 0 | 0 | 2 | 1 | 3 | 2 | 8 | 7 | 8 | 8 | 8 | 6 |
| Puerto Rico | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 1 | 0 |
| United States | 3,691 | 2,901 | 3,703 | 2,660 | 3,879 | 2,626 | 4,017 | 2,565 | 4,273 | 2,603 | 4,650 | 2,728 | 4,486 | 2,528 | 4,044 | 2,172 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Central and South America | 7 | 3 | 5 | 3 | 4 | 8 | 7 | 8 | 3 | 3 | 7 | 9 | 5 | 9 | 4 | 6 |
| Argentina | 1 | 0 | 0 | 0 | 1 | 2 | 1 | 0 | 0 | 0 | 3 | 1 | 2 | 1 | 0 | 0 |
| Brazil | 3 | 1 | 3 | 2 | 2 | 5 | 3 | 5 | 2 | 2 | 3 | 6 | 1 | 4 | 2 | 4 |
| All others | 3 | 2 | 1 | 1 | 1 | 2 | 3 | 2 | 2 | 1 | 1 | 2 | 2 | 4 | 1 | 2 |
| Europe | 1,196 | 3,598 | 1,103 | 3,048 | 1,287 | 3,107 | 1,417 | 2,968 | 1,587 | 3,240 | 1,692 | 3,490 | 1,607 | 4,007 | 1,445 | 3,926 |
| EU | 1,067 | 2,144 | 1,008 | 2,040 | 1,159 | 2,043 | 1,283 | 2,014 | 1,420 | 1,985 | 1,509 | 1,974 | 1,435 | 2,133 | 1,287 | 2,179 |
| Austria | 16 | 44 | 17 | 35 | 16 | 33 | 17 | 35 | 28 | 47 | 24 | 54 | 30 | 43 | 24 | 48 |
| Belgium | 12 | 9 | 15 | 12 | 11 | 10 | 16 | 11 | 18 | 9 | 15 | 10 | 10 | 16 | 10 | 17 |
| Denmark | 13 | 8 | 13 | 19 | 12 | 11 | 11 | 15 | 12 | 8 | 16 | 10 | 21 | 7 | 20 | 12 |
| Finland | 26 | 55 | 24 | 39 | 39 | 36 | 27 | 41 | 43 | 62 | 50 | 67 | 67 | 47 | 81 | 34 |
| France | 190 | 441 | 157 | 419 | 175 | 398 | 174 | 385 | 164 | 309 | 187 | 329 | 154 | 425 | 160 | 426 |
| Germany | 487 | 889 | 467 | 825 | 541 | 833 | 622 | 890 | 706 | 961 | 786 | 913 | 727 | 919 | 652 | 1,002 |
| Hungary | 1 | 12 | 4 | 4 | 1 | 6 | 3 | 6 | 1 | 2 | 2 | 6 | 2 | 12 | 2 | 6 |
| Ireland | 1 | 13 | 7 | 9 | 8 | 5 | 2 | 1 | 6 | 4 | 13 | 7 | 10 | 3 | 3 | 1 |
| Italy | 44 | 134 | 42 | 156 | 44 | 187 | 62 | 109 | 58 | 106 | 62 | 64 | 63 | 151 | 46 | 92 |
| Netherlands | 52 | 79 | 44 | 68 | 53 | 80 | 52 | 73 | 66 | 64 | 66 | 62 | 57 | 60 | 45 | 64 |
| Spain | 3 | 67 | 1 | 72 | 6 | 50 | 4 | 69 | 9 | 25 | 3 | 79 | 3 | 49 | 9 | 66 |
| Sweden | 49 | 75 | 57 | 93 | 68 | 84 | 76 | 101 | 77 | 92 | 67 | 93 | 55 | 111 | 56 | 71 |
| United Kingdom | 166 | 116 | 156 | 102 | 178 | 137 | 212 | 121 | 219 | 126 | 206 | 133 | 240 | 149 | 211 | 170 |
| All others | 7 | 203 | 3 | 188 | 8 | 173 | 6 | 157 | 15 | 169 | 11 | 147 | 11 | 112 | 9 | 149 |
| Other Europe | 129 | 1,454 | 95 | 1,008 | 128 | 1,064 | 135 | 955 | 167 | 1,256 | 182 | 1,515 | 173 | 1,874 | 158 | 1,747 |
| Former Soviet Union | 0 | 52 | 2 | 14 | 1 | 25 | 1 | 32 | 2 | 53 | 3 | 37 | 34 | 28 | 22 | 50 |
| Norway | 11 | 29 | 15 | 13 | 16 | 27 | 15 | 22 | 20 | 29 | 31 | 34 | 28 | 22 | 30 | 33 |
| Russia | 18 | 1,279 | 10 | 928 | 10 | 926 | 21 | 787 | 20 | 1,077 | 22 | 1,208 | 14 | 1,229 | 9 | 1,472 |
| Switzerland | 98 | 92 | 67 | 53 | 95 | 82 | 94 | 110 | 120 | 96 | 123 | 94 | 129 | 85 | 116 | 85 |
| All others | 2 | 1 | 2 | 1 | 4 | 4 | 2 | 4 | 4 | 1 | 4 | 2 | 0 | 2 | 1 | 2 |
| Asia | 1,402 | 6,205 | 1,349 | 8,619 | 1,411 | 6,491 | 1,545 | 6,338 | 1,778 | 6,113 | 1,904 | 6,973 | 1,897 | 7,260 | 1,712 | 7,827 |

| Region, country, or economy | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| World | 8,911 | 14,991 | 8,644 | 15,839 | 8,789 | 16,661 | 8,801 | 18,122 | 10,188 | 20,557 | 9,773 | 25,615 | 10,649 | 29,456 | 11,453 | 31,466 |
| North America | 4,693 | 2,844 | 4,668 | 2,413 | 4,689 | 2,394 | 4,596 | 2,275 | 5,078 | 2,432 | 4,950 | 2,189 | 5,210 | 2,241 | 5,518 | 2,227 |
| Canada | 150 | 80 | 161 | 76 | 159 | 93 | 164 | 90 | 184 | 96 | 186 | 78 | 202 | 97 | 237 | 123 |
| Mexico | 9 | 6 | 6 | 4 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 1 | 3 | 1 |
| Puerto Rico | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 2 | 0 | 1 | 0 |
| United States | 4,872 | 2,551 | 4,521 | 2,333 | 4,526 | 2,299 | 4,429 | 2,185 | 4,890 | 2,335 | 4,761 | 2,111 | 5,003 | 2,143 | 5,277 | 2,102 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Central and South America | 10 | 8 | 11 | 4 | 10 | 12 | 8 | 14 | 14 | 13 | 11 | 16 | 15 | 14 | 16 | 16 |
| Argentina | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 5 | 3 | 5 | 3 | 3 | 3 | 0 | 2 |
| Brazil | 4 | 5 | 6 | 1 | 7 | 10 | 3 | 10 | 7 | 9 | 4 | 11 | 8 | 13 | 8 | 12 |
| All others | 6 | 3 | 2 | 2 | 1 | 1 | 3 | 1 | 2 | 2 | 2 | 1 | 4 | 1 | 6 | 2 |
| Europe | 1,673 | 4,055 | 1,672 | 4,133 | 1,698 | 4,212 | 1,663 | 4,431 | 2,108 | 4,317 | 2,029 | 4,033 | 2,313 | 4,428 | 2,641 | 4,534 |
| EU | 1,490 | 2,294 | 1,477 | 2,303 | 1,466 | 2,125 | 1,436 | 2,099 | 1,820 | 2,294 | 1,788 | 2,191 | 2,021 | 2,489 | 2,321 | 2,519 |
| Austria | 35 | 65 | 31 | 62 | 29 | 91 | 31 | 65 | 47 | 63 | 50 | 101 | 46 | 102 | 67 | 78 |
| Belgium | 17 | 14 | 24 | 12 | 20 | 8 | 13 | 4 | 18 | 7 | 27 | 7 | 31 | 12 | 32 | 9 |
| Denmark | 12 | 27 | 6 | 21 | 13 | 13 | 8 | 16 | 11 | 24 | 9 | 30 | 11 | 24 | 12 | 26 |
| Finland | 43 | 35 | 44 | 55 | 48 | 61 | 50 | 61 | 65 | 44 | 43 | 43 | 54 | 36 | 54 | 30 |
| France | 181 | 475 | 198 | 486 | 213 | 477 | 183 | 535 | 251 | 531 | 261 | 476 | 308 | 622 | 382 | 549 |
| Germany | 730 | 1,136 | 729 | 1,146 | 716 | 898 | 668 | 765 | 830 | 899 | 797 | 799 | 892 | 901 | 989 | 1,065 |
| Hungary | 1 | 7 | 1 | 2 | 2 | 3 | 2 | 3 | 1 | 8 | 1 | 8 | 2 | 5 | 3 | 6 |
| Ireland | 11 | 6 | 13 | 3 | 8 | 2 | 13 | 5 | 17 | 5 | 11 | 4 | 10 | 8 | 7 | 15 |
| Italy | 55 | 23 | 60 | 28 | 59 | 39 | 53 | 34 | 74 | 65 | 84 | 115 | 83 | 74 | 118 | 32 |
| Netherlands | 50 | 58 | 57 | 77 | 73 | 83 | 72 | 72 | 77 | 66 | 90 | 81 | 108 | 66 | 114 | 67 |
| Spain | 10 | 77 | 7 | 69 | 15 | 68 | 17 | 83 | 13 | 113 | 23 | 131 | 25 | 107 | 24 | 143 |
| Sweden | 74 | 70 | 65 | 53 | 59 | 55 | 57 | 55 | 75 | 68 | 75 | 50 | 86 | 59 | 97 | 65 |
| United Kingdom | 232 | 164 | 214 | 114 | 198 | 132 | 239 | 145 | 303 | 166 | 272 | 145 | 325 | 166 | 360 | 156 |
| All others | 18 | 157 | 14 | 213 | 15 | 198 | 22 | 271 | 24 | 250 | 22 | 221 | 28 | 319 | 37 | 295 |
| Other Europe | 183 | 1,761 | 195 | 1,800 | 231 | 2,086 | 228 | 2,332 | 289 | 2,023 | 241 | 1,842 | 292 | 1,939 | 320 | 2,015 |
| Former Soviet Union | 4 | 109 | 5 | 245 | 5 | 252 | 2 | 248 | 2 | 218 | 4 | 204 | 6 | 165 | 5 | 193 |
| Norway | 32 | 51 | 33 | 33 | 54 | 41 | 43 | 46 | 60 | 56 | 60 | 47 | 56 | 37 | 66 | 41 |
| Russia | 17 | 1,485 | 20 | 1,411 | 14 | 1,604 | 19 | 1,833 | 23 | 1,574 | 16 | 1,463 | 22 | 1,576 | 30 | 1,631 |
| Switzerland | 125 | 114 | 134 | 107 | 153 | 186 | 160 | 200 | 200 | 166 | 158 | 122 | 200 | 157 | 213 | 145 |
| All others | 5 | 1 | 3 | 4 | 6 | 4 | 3 | 6 | 4 | 3 | 3 | 6 | 4 | 9 | 6 | 4 |
| Asia | 2,061 | 8,134 | 2,120 | 9,205 | 2,239 | 9,932 | 2,369 | 11,340 | 2,797 | 13,683 | 2,604 | 19,264 | 2,902 | 22,626 | 3,040 | 24,554 |

| Region, country, or economy | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| World | 12,109 | 32,911 | 12,384 | 34,850 | 13,113 | 38,972 | 14,413 | 44,560 | 13,893 | 45,235 |
| North America | 5,723 | 2,328 | 5,826 | 2,298 | 6,168 | 2,352 | 6,720 | 2,364 | 6,353 | 2,204 |
| Canada | 213 | 245 | 232 | 110 | 269 | 126 | 287 | 107 | 300 | 109 |
| Mexico | 4 | 3 | 6 | 5 | 7 | 37 | 6 | 27 | 9 | 15 |
| Puerto Rico | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 1 | 0 |
| United States | 5,474 | 2,200 | 5,588 | 2,183 | 5,890 | 2,189 | 6,426 | 2,227 | 6,043 | 2,080 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Central and South America | 18 | 19 | 18 | 25 | 15 | 34 | 41 | 77 | 33 | 87 |
| Argentina | 6 | 3 | 2 | 1 | 3 | 3 | 11 | 8 | 5 | 3 |
| Brazil | 9 | 14 | 10 | 21 | 8 | 30 | 23 | 67 | 19 | 81 |
| All others | 2 | 2 | 6 | 4 | 3 | 1 | 7 | 3 | 8 | 3 |
| Europe | 2,916 | 4,889 | 2,905 | 5,028 | 3,126 | 4,718 | 3,439 | 5,383 | 3,263 | 5,143 |
| EU | 2,572 | 2,586 | 2,512 | 2,552 | 2,685 | 2,896 | 3,024 | 3,033 | 2,873 | 2,791 |
| Austria | 70 | 74 | 83 | 119 | 111 | 121 | 123 | 126 | 104 | 129 |
| Belgium | 9 | 9 | 42 | 15 | 41 | 16 | 60 | 32 | 51 | 34 |
| Denmark | 38 | 10 | 36 | 22 | 37 | 13 | 46 | 16 | 44 | 17 |
| Finland | 60 | 55 | 62 | 46 | 77 | 47 | 98 | 62 | 74 | 47 |
| France | 622 | 415 | 598 | 424 | 619 | 497 | 671 | 430 | 604 | |
| Germany | 1,074 | 1,077 | 1,042 | 1,005 | 1,088 | 1,090 | 1,274 | 961 | 1,265 | 1,120 |
| Hungary | 1 | 4 | 6 | 4 | 5 | 7 | 8 | 4 | 3 | |
| Ireland | 7 | 7 | 15 | 8 | 26 | 14 | 23 | 7 | 19 | 6 |
| Italy | 119 | 27 | 126 | 35 | 120 | 40 | 102 | 220 | 145 | 184 |
| Netherlands | 150 | 63 | 143 | 50 | 151 | 79 | 164 | 94 | 160 | 53 |
| Spain | 29 | 130 | 26 | 133 | 29 | 101 | 26 | 97 | 22 | 83 |
| Sweden | 117 | 57 | 97 | 70 | 114 | 74 | 113 | 73 | 103 | 63 |
| United Kingdom | 388 | 170 | 380 | 134 | 419 | 196 | 406 | 205 | 392 | 155 |
| All others | 31 | 279 | 41 | 310 | 42 | 482 | 66 | 460 | 58 | 292 |
| Other Europe | 340 | 2,303 | 393 | 2,475 | 441 | 1,821 | 414 | 2,350 | 389 | 2,352 |
| Former Soviet Union | 3 | 218 | 2 | 181 | 9 | 119 | 9 | 110 | 3 | 106 |
| Norway | 70 | 51 | 83 | 52 | 68 | 46 | 77 | 37 | 59 | 33 |
| Russia | 38 | 1,820 | 26 | 2,061 | 35 | 1,465 | 40 | 1,880 | 34 | 1,942 |
| Switzerland | 222 | 210 | 272 | 177 | 321 | 191 | 275 | 318 | 279 | 266 |
| All others | 5 | 9 | 5 | 9 | 8 | 1 | 13 | 5 | 15 | 4 |
| Asia | 3,211 | 25,519 | 3,353 | 27,355 | 3,520 | 31,697 | 3,854 | 36,593 | 3,886 | 37,664 |

**TABLE SB-14**

## USPTO patents and patent families granted in measurement, by region, country, or economy: 1998–2018

(Number)

| Region, country, or economy | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| China | 3 | 82 | 2 | 62 | 9 | 129 | 9 | 159 | 17 | 176 | 16 | 446 | 30 | 762 | 30 | 844 | 41 | 978 | 59 | 1,247 | 93 | 2,035 | 130 | 3,765 | 174 | 5,006 | 154 | 8,042 | 202 | 9,741 | 217 | 10,280 | 262 | 12,021 | 297 | 18,063 | 341 | 21,574 | 437 | 26,085 | 536 | 27,338 |
| India | 2 | 1 | 1 | 1 | 2 | 2 | 1 | 0 | 8 | 6 | 12 | 8 | 16 | 8 | 14 | 8 | 12 | 9 | 28 | 18 | 30 | 21 | 22 | 18 | 29 | 16 | 29 | 19 | 48 | 26 | 72 | 40 | 89 | 57 | 94 | 59 | 94 | 55 | 126 | 67 | 134 | 59 |
| Japan | 1,230 | 5,542 | 1,177 | 6,551 | 1,188 | 5,631 | 1,297 | 5,478 | 1,490 | 5,141 | 1,609 | 5,285 | 1,562 | 5,028 | 1,337 | 5,030 | 1,656 | 4,805 | 1,635 | 5,380 | 1,687 | 5,819 | 1,757 | 5,790 | 2,024 | 6,450 | 1,833 | 8,160 | 1,963 | 8,824 | 2,070 | 8,906 | 2,136 | 8,183 | 2,097 | 5,110 | 2,137 | 6,068 | 2,195 | 5,592 | 2,197 | 5,817 |
| Malaysia | 0 | 0 | 1 | 0 | 4 | 4 | 2 | 2 | 3 | 2 | 6 | 5 | 6 | 6 | 7 | 7 | 21 | 11 | 25 | 22 | 23 | 23 | 18 | 15 | 17 | 18 | 12 | 19 | 12 | 28 | 11 | 23 | 9 | 28 | 16 | 25 | 14 | 26 | 18 | 31 | 11 | 28 |
| Singapore | 8 | 3 | 9 | 7 | 15 | 7 | 19 | 9 | 22 | 15 | 24 | 15 | 19 | 10 | 20 | 8 | 13 | 8 | 20 | 11 | 23 | 14 | 17 | 9 | 21 | 7 | 21 | 12 | 27 | 11 | 23 | 11 | 29 | 16 | 31 | 15 | 44 | 17 | 63 | 25 | 68 | 20 |
| South Korea | 92 | 461 | 73 | 1,841 | 77 | 540 | 82 | 413 | 95 | 541 | 89 | 857 | 111 | 990 | 132 | 1,487 | 147 | 1,767 | 174 | 1,922 | 189 | 1,701 | 203 | 1,403 | 246 | 1,832 | 256 | 2,600 | 315 | 3,411 | 315 | 4,175 | 333 | 3,955 | 471 | 2,984 | 509 | 3,150 | 611 | 3,915 | 563 | 3,760 |
| Taiwan | 67 | 112 | 83 | 154 | 116 | 177 | 132 | 273 | 135 | 225 | 144 | 352 | 152 | 451 | 170 | 439 | 170 | 553 | 177 | 596 | 192 | 317 | 219 | 337 | 281 | 348 | 298 | 406 | 330 | 579 | 327 | 1,109 | 345 | 1,247 | 341 | 1,084 | 372 | 799 | 396 | 865 | 370 | 630 |
| All others | 2 | 5 | 2 | 3 | 0 | 0 | 3 | 4 | 8 | 8 | 3 | 4 | 2 | 6 | 2 | 5 | 1 | 4 | 2 | 9 | 3 | 3 | 2 | 2 | 5 | 7 | 1 | 6 | 5 | 6 | 4 | 10 | 7 | 11 | 6 | 15 | 9 | 8 | 8 | 14 | 5 | 12 |
| Middle East | 46 | 21 | 38 | 22 | 59 | 37 | 68 | 46 | 80 | 53 | 67 | 36 | 69 | 38 | 67 | 36 | 83 | 35 | 84 | 31 | 98 | 39 | 98 | 29 | 118 | 39 | 103 | 39 | 133 | 45 | 137 | 55 | 147 | 52 | 195 | 58 | 194 | 70 | 260 | 91 | 264 | 89 |
| Israel | 45 | 18 | 38 | 20 | 59 | 25 | 68 | 36 | 76 | 33 | 64 | 27 | 67 | 31 | 59 | 25 | 78 | 30 | 77 | 22 | 91 | 33 | 91 | 25 | 109 | 29 | 90 | 26 | 111 | 24 | 113 | 33 | 108 | 24 | 148 | 30 | 142 | 40 | 204 | 57 | 192 | 46 |
| All others | 0 | 3 | 0 | 2 | 1 | 12 | 1 | 10 | 4 | 20 | 3 | 9 | 1 | 7 | 8 | 11 | 5 | 5 | 7 | 9 | 6 | 6 | 7 | 5 | 9 | 10 | 13 | 13 | 23 | 21 | 25 | 22 | 39 | 29 | 47 | 28 | 53 | 30 | 56 | 35 | 72 | 43 |
| Africa | 4 | 10 | 6 | 16 | 5 | 10 | 3 | 11 | 2 | 7 | 1 | 8 | 4 | 15 | 2 | 10 | 5 | 6 | 8 | 7 | 3 | 7 | 3 | 8 | 1 | 10 | 3 | 8 | 4 | 15 | 11 | 11 | 10 | 25 | 8 | 7 | 10 | 6 | 17 | 4 | 10 | 12 |
| South Africa | 4 | 4 | 5 | 10 | 5 | 3 | 3 | 3 | 2 | 2 | 1 | 2 | 3 | 4 | 0 | 3 | 5 | 3 | 5 | 2 | 2 | 6 | 2 | 7 | 1 | 5 | 1 | 2 | 1 | 3 | 4 | 0 | 5 | 3 | 3 | 1 | 7 | 0 | 10 | 1 | 6 | 1 |
| All others | 0 | 5 | 1 | 6 | 0 | 7 | 1 | 8 | 0 | 4 | 0 | 6 | 1 | 11 | 2 | 7 | 0 | 3 | 3 | 5 | 1 | 2 | 1 | 1 | 0 | 5 | 2 | 6 | 3 | 13 | 7 | 11 | 4 | 23 | 5 | 7 | 3 | 6 | 7 | 3 | 4 | 11 |
| Australia and Oceania | 36 | 23 | 27 | 20 | 31 | 22 | 36 | 34 | 33 | 37 | 44 | 25 | 54 | 30 | 34 | 26 | 49 | 46 | 62 | 38 | 54 | 47 | 64 | 24 | 71 | 53 | 73 | 62 | 71 | 85 | 90 | 62 | 84 | 77 | 77 | 78 | 78 | 71 | 80 | 49 | 82 | 33 |
| Australia | 30 | 19 | 16 | 14 | 23 | 19 | 28 | 32 | 26 | 37 | 37 | 20 | 46 | 27 | 36 | 28 | 45 | 43 | 55 | 34 | 44 | 44 | 53 | 23 | 63 | 51 | 62 | 57 | 56 | 75 | 69 | 39 | 67 | 69 | 59 | 73 | 62 | 67 | 61 | 46 | 61 | 30 |
| New Zealand | 5 | 4 | 10 | 5 | 8 | 3 | 8 | 2 | 7 | 1 | 6 | 4 | 7 | 3 | 8 | 1 | 4 | 3 | 7 | 4 | 9 | 3 | 11 | 1 | 8 | 2 | 11 | 6 | 15 | 10 | 20 | 23 | 17 | 9 | 18 | 5 | 17 | 4 | 19 | 3 | 21 | 2 |
| All others | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Unclassified | 0 | 73 | 1 | 156 | 0 | 175 | 0 | 25 | 0 | 7 | 1 | 3 | 0 | 51 | 0 | 289 | 0 | 70 | 0 | 7 | 0 | 17 | 0 | 0 | 0 | 9 | 1 | 4 | 0 | 1 | 0 | 8 | 1 | 0 | 1 | 2 | 2 | 24 | 2 | 1 | 3 | 4 |

EU = European Union; USPTO = U.S. Patent and Trademark Office.

**Note(s)**

USPTO patents are allocated according to patent inventorship information. USPTO patents are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named inventors. Patents are classified under the World Intellectual Property Organization (WIPO) classification of patents, which classifies International Patent Classification (IPC) codes under 35 technical fields. IPC reformed codes take into account changes that were made to the WIPO classification in 2006 under the eighth version of the classification and were used to prepare these data. However, because PatentsView only provides the original IPC codes as they appeared on patents and not the IPC reformed codes, current Cooperative Patent Classification codes on patents were converted back to the most recent IPC classification to prepare these statistics. Fractional counts of patents were assigned to each technological field on patents to assign the proper weight of a patent to the corresponding technological fields under the classification. International Patent Documentation (INPADOC) patent families across all patent offices covered in the Worldwide Patent Statistical Database (PATSTAT) are counted according to the year of the first granted patent in the patent family. Patent families are allocated according to patent inventorship information found on the priority patent of the INPADOC patent families. To account for missing ownership information in PATSTAT for some offices, a method designed by de Rassenfosse et al. (2012) is used to fill in missing information on priority patents using information in successive filings within the patent families (see technical documentation for details). Patent families are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named inventors. Because of data coverage issues for some patent offices in PATSTAT, statistics for some countries may be underestimated partially for some years or across the whole trend. Countries with identified issues include India (missing data) and South Africa (no data for 2018). For Italy, because of data gaps regarding information on granted patents, patent applications are used instead, which slightly overestimates Italy's output and creates a small shift in the year for which its output is accounted. The EU includes 28 member countries. China includes Hong Kong.

**Source(s)**

Science-Metrix; PATSTAT, accessed April 2019; PatentsView, USPTO, accessed June 2019.

TABLE SB-15

## USPTO patents and patent families granted in analysis of biological materials, by region, country, or economy: 1998–2018

(Number)

| Region, country, or economy | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| World | 1,049 | 1,287 | 939 | 1,253 | 853 | 1,111 | 960 | 1,009 | 881 | 1,138 | 874 | 1,257 | 865 | 1,458 | 708 | 1,310 | 952 | 1,360 | 981 | 1,501 |
| North America | 725 | 462 | 657 | 398 | 573 | 306 | 659 | 311 | 593 | 249 | 605 | 254 | 596 | 214 | 498 | 146 | 637 | 154 | 662 | 135 |
| Canada | 36 | 23 | 36 | 19 | 33 | 13 | 36 | 15 | 31 | 12 | 38 | 19 | 34 | 16 | 19 | 8 | 34 | 10 | 35 | 10 |
| Mexico | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Puerto Rico | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| United States | 689 | 439 | 619 | 379 | 540 | 293 | 623 | 296 | 562 | 237 | 567 | 235 | 561 | 197 | 479 | 138 | 603 | 143 | 627 | 125 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Central and South America | 4 | 2 | 0 | 1 | 2 | 2 | 3 | 0 | 2 | 1 | 3 | 1 | 4 | 1 | 2 | 3 | 4 | 1 | 1 | 0 |
| Argentina | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| Brazil | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 2 | 1 | 2 | 0 | 1 | 2 | 2 | 0 | 0 | 0 |
| All others | 2 | 1 | 0 | 0 | 1 | 1 | 2 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 1 | 1 | 0 |
| Europe | 201 | 538 | 178 | 525 | 194 | 523 | 190 | 390 | 184 | 527 | 178 | 623 | 165 | 765 | 125 | 601 | 179 | 578 | 187 | 597 |
| EU | 184 | 204 | 163 | 197 | 182 | 219 | 177 | 194 | 173 | 205 | 167 | 215 | 150 | 240 | 118 | 200 | 170 | 213 | 173 | 195 |
| Austria | 5 | 6 | 2 | 7 | 3 | 5 | 4 | 9 | 4 | 8 | 3 | 6 | 3 | 5 | 1 | 4 | 1 | 7 | 4 | 4 |
| Belgium | 6 | 1 | 8 | 2 | 4 | 0 | 4 | 2 | 3 | 2 | 10 | 1 | 6 | 4 | 3 | 1 | 10 | 2 | 8 | 2 |
| Denmark | 7 | 3 | 4 | 4 | 8 | 3 | 6 | 3 | 10 | 1 | 9 | 0 | 6 | 1 | 6 | 1 | 4 | 1 | 6 | 0 |
| Finland | 5 | 3 | 13 | 4 | 9 | 6 | 9 | 10 | 6 | 10 | 7 | 5 | 9 | 4 | 4 | 6 | 5 | 2 | 2 | 1 |
| France | 28 | 37 | 22 | 52 | 30 | 42 | 23 | 38 | 25 | 46 | 22 | 55 | 18 | 60 | 22 | 43 | 33 | 60 | 25 | 69 |
| Germany | 62 | 81 | 59 | 54 | 58 | 84 | 67 | 72 | 57 | 82 | 54 | 70 | 53 | 76 | 31 | 72 | 52 | 71 | 54 | 60 |
| Hungary | 0 | 1 | 1 | 0 | 0 | 2 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| Ireland | 0 | 1 | 0 | 0 | 2 | 2 | 2 | 1 | 2 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 3 | 0 | 1 | 1 |
| Italy | 6 | 4 | 4 | 17 | 5 | 14 | 3 | 10 | 4 | 10 | 6 | 5 | 4 | 21 | 3 | 8 | 4 | 2 | 4 | 1 |
| Netherlands | 7 | 12 | 6 | 10 | 10 | 12 | 6 | 10 | 4 | 7 | 8 | 5 | 8 | 4 | 5 | 4 | 3 | 9 | 8 | 4 |
| Spain | 2 | 5 | 1 | 13 | 1 | 14 | 1 | 10 | 2 | 3 | 3 | 13 | 1 | 9 | 1 | 26 | 1 | 20 | 3 | 14 |
| Sweden | 9 | 9 | 6 | 6 | 16 | 9 | 11 | 8 | 14 | 9 | 11 | 14 | 13 | 9 | 10 | 7 | 11 | 6 | 17 | 5 |
| United Kingdom | 45 | 12 | 35 | 10 | 37 | 14 | 37 | 12 | 37 | 12 | 33 | 17 | 31 | 15 | 31 | 11 | 42 | 8 | 40 | 9 |
| All others | 1 | 28 | 1 | 15 | 1 | 11 | 1 | 11 | 0 | 18 | 0 | 19 | 1 | 19 | 1 | 15 | 1 | 23 | 1 | 23 |
| Other Europe | 17 | 334 | 16 | 328 | 12 | 304 | 13 | 196 | 11 | 322 | 10 | 407 | 15 | 525 | 7 | 401 | 9 | 365 | 14 | 402 |
| Former Soviet Union | 1 | 15 | 0 | 10 | 0 | 7 | 0 | 8 | 0 | 10 | 1 | 43 | 3 | 0 | 0 | 19 | 0 | 9 | 0 | 25 |
| Norway | 6 | 2 | 2 | 0 | 2 | 2 | 4 | 1 | 1 | 1 | 2 | 3 | 3 | 0 | 2 | 0 | 0 | 1 | 4 | 4 |
| Russia | 0 | 313 | 3 | 313 | 1 | 291 | 1 | 181 | 1 | 310 | 4 | 358 | 1 | 388 | 0 | 380 | 0 | 350 | 3 | 364 |
| Switzerland | 10 | 3 | 11 | 5 | 6 | 3 | 7 | 5 | 8 | 2 | 4 | 2 | 11 | 3 | 4 | 1 | 7 | 5 | 6 | 6 |
| All others | 0 | 0 | 0 | 0 | 2 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 2 |
| Asia | 95 | 269 | 87 | 305 | 68 | 258 | 87 | 290 | 82 | 342 | 72 | 365 | 84 | 465 | 70 | 547 | 107 | 616 | 112 | 757 |

| Region, country, or economy | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| World | 1,031 | 1,516 | 1,526 | 1,657 | 1,522 | 1,930 | 1,529 | 2,276 | 1,713 | 2,560 | 1,739 | 2,797 | 1,763 | 3,425 | 1,779 | 3,423 | 2,049 | 3,351 | 2,134 | 3,300 | | |
| North America | 660 | 114 | 670 | 115 | 969 | 137 | 952 | 123 | 945 | 96 | 1,031 | 92 | 997 | 89 | 1,032 | 124 | 1,036 | 125 | 1,219 | 134 | 1,215 | 124 |
| Canada | 33 | 6 | 28 | 5 | 47 | 7 | 44 | 6 | 48 | 3 | 47 | 6 | 39 | 1 | 51 | 8 | 46 | 6 | 48 | 8 | 64 | 8 |
| Mexico | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 2 | 0 | 1 | 5 | 2 | 7 | 1 | 7 |
| Puerto Rico | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| United States | 627 | 107 | 641 | 110 | 921 | 130 | 906 | 117 | 897 | 93 | 984 | 86 | 955 | 87 | 979 | 116 | 989 | 114 | 1,169 | 119 | 1,150 | 110 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Central and South America | 1 | 1 | 1 | 0 | 1 | 1 | 3 | 2 | 3 | 3 | 6 | 3 | 6 | 2 | 6 | 2 | 3 | 5 | 6 | 7 | 5 | 12 |
| Argentina | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| Brazil | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 1 | 1 | 2 | 1 | 5 | 3 | 6 | 2 | 11 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 3 | 0 | 1 | 1 | 4 | 0 | 1 | 0 | 3 | 0 | 2 | 1 |
| Europe | 178 | 654 | 189 | 621 | 302 | 569 | 301 | 691 | 298 | 729 | 356 | 772 | 408 | 726 | 367 | 849 | 370 | 712 | 434 | 864 | 457 | 755 |
| EU | 154 | 175 | 176 | 206 | 286 | 186 | 282 | 217 | 272 | 239 | 333 | 237 | 380 | 205 | 336 | 230 | 333 | 247 | 392 | 256 | 412 | 211 |
| Austria | 3 | 13 | 3 | 5 | 8 | 6 | 5 | 5 | 12 | 3 | 9 | 3 | 11 | 4 | 9 | 3 | 7 | 8 | 11 | 8 | 10 | 4 |
| Belgium | 9 | 1 | 9 | 1 | 11 | 1 | 14 | 1 | 9 | 1 | 10 | 3 | 19 | 1 | 14 | 1 | 14 | 1 | 18 | 3 | 12 | 4 |
| Denmark | 4 | 0 | 1 | 0 | 8 | 1 | 10 | 0 | 8 | 0 | 11 | 1 | 11 | 1 | 11 | 0 | 9 | 1 | 12 | 0 | 8 | 1 |
| Finland | 5 | 5 | 6 | 5 | 9 | 2 | 6 | 1 | 10 | 2 | 5 | 2 | 6 | 4 | 11 | 5 | 9 | 5 | 7 | 4 | 13 | 5 |
| France | 29 | 46 | 26 | 53 | 41 | 42 | 38 | 41 | 38 | 74 | 54 | 61 | 65 | 56 | 55 | 53 | 58 | 71 | 71 | 60 | 70 | 46 |
| Germany | 51 | 66 | 43 | 110 | 43 | 103 | 56 | 91 | 57 | 114 | 54 | 110 | 46 | 98 | 53 | 98 | 42 | 108 | 41 | 130 | 59 | 59 |
| Hungary | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 2 | 0 | 1 | 0 | 1 | 2 | 1 | 2 | 0 | 0 | 0 |
| Ireland | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 2 | 0 | 5 | 1 | 3 | 0 | 3 | 0 | 2 | 0 | 1 | 0 | 4 | 1 | 1 |
| Italy | 7 | 1 | 6 | 1 | 10 | 8 | 12 | 8 | 11 | 9 | 13 | 2 | 17 | 1 | 14 | 1 | 15 | 6 | 32 | 16 | 21 | 5 |
| Netherlands | 9 | 5 | 11 | 5 | 13 | 4 | 15 | 9 | 12 | 9 | 23 | 7 | 25 | 6 | 15 | 8 | 31 | 14 | 26 | 5 | 27 | 12 |
| Spain | 6 | 15 | 6 | 27 | 3 | 29 | 3 | 30 | 4 | 30 | 4 | 32 | 7 | 29 | 9 | 31 | 11 | 28 | 14 | 21 | 15 | 12 |
| Sweden | 11 | 6 | 11 | 6 | 16 | 9 | 21 | 4 | 20 | 4 | 18 | 7 | 27 | 6 | 18 | 10 | 26 | 5 | 23 | 7 | 27 | 7 |
| United Kingdom | 33 | 11 | 29 | 15 | 50 | 8 | 49 | 14 | 49 | 9 | 68 | 11 | 74 | 11 | 66 | 13 | 61 | 16 | 72 | 15 | 71 | 10 |
| All others | 1 | 18 | 2 | 40 | 5 | 30 | 4 | 47 | 4 | 46 | 7 | 48 | 7 | 40 | 3 | 51 | 7 | 56 | 8 | 49 | 9 | 36 |
| Other Europe | 13 | 479 | 13 | 415 | 16 | 383 | 19 | 474 | 26 | 490 | 24 | 536 | 28 | 520 | 31 | 619 | 37 | 465 | 42 | 608 | 45 | 543 |
| Former Soviet Union | 1 | 26 | 0 | 18 | 0 | 22 | 0 | 36 | 1 | 27 | 0 | 40 | 0 | 33 | 0 | 37 | 2 | 31 | 1 | 32 | 1 | 32 |
| Norway | 4 | 2 | 4 | 3 | 1 | 2 | 4 | 1 | 8 | 1 | 5 | 2 | 5 | 3 | 5 | 2 | 6 | 4 | 7 | 2 | 7 | 1 |
| Russia | 2 | 447 | 1 | 391 | 3 | 352 | 1 | 435 | 1 | 460 | 4 | 502 | 3 | 473 | 3 | 575 | 4 | 416 | 3 | 569 | 5 | 501 |
| Switzerland | 6 | 5 | 7 | 3 | 11 | 7 | 14 | 2 | 15 | 4 | 14 | 4 | 17 | 4 | 20 | 8 | 25 | 7 | 27 | 6 | 31 | 8 |
| All others | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 2 | 0 | 2 | 1 | 2 | 0 | 3 | 0 | 1 | 1 |
| Asia | 144 | 769 | 225 | 937 | 237 | 1,096 | 250 | 1,432 | 274 | 1,669 | 287 | 1,954 | 306 | 2,411 | 314 | 2,546 | 324 | 2,328 | 386 | 2,389 | | |

TABLE S8-15

## USPTO patents and patent families granted in analysis of biological materials, by region, country, or economy: 1998–2018

(Number)

| | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Region, country, or economy | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| China | 0 | 4 | 0 | 5 | 0 | 13 | 2 | 23 | 2 | 14 | 2 | 60 | 2 | 97 | 0 | 114 | 2 | 147 | 4 | 141 | 9 | 126 | 6 | 234 | 18 | 268 | 11 | 372 | 23 | 606 | 18 | 766 | 27 | 1,088 | 26 | 1,685 | 31 | 1,891 | 39 | 1,518 | 59 | 1,590 |
| India | 2 | 0 | 2 | 1 | 1 | 1 | 2 | 0 | 2 | 0 | 3 | 3 | 1 | 2 | 2 | 2 | 3 | 2 | 1 | 3 | 3 | 1 | 4 | 1 | 5 | 3 | 4 | 2 | 4 | 3 | 10 | 2 | 8 | 1 | 5 | 4 | 10 | 1 | 15 | 3 | 16 | 2 |
| Japan | 85 | 248 | 75 | 255 | 59 | 213 | 73 | 228 | 69 | 300 | 56 | 238 | 67 | 293 | 59 | 281 | 91 | 278 | 92 | 354 | 115 | 348 | 107 | 373 | 155 | 459 | 170 | 414 | 175 | 401 | 167 | 398 | 167 | 374 | 177 | 293 | 180 | 257 | 175 | 260 | 195 | 234 |
| Malaysia | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 3 | 1 | 3 | 0 | 0 | 1 | 5 | 0 | 1 | 1 | 4 | 1 | 2 | 3 | 5 | 1 | 2 |
| Singapore | 2 | 1 | 3 | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 2 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 3 | 0 | 1 | 0 | 1 | 0 | 2 | 0 | 5 | 0 | 9 | 0 | 12 | 1 | 9 | 0 | 11 | 1 | 11 | 1 | 14 | 1 |
| South Korea | 3 | 11 | 5 | 37 | 4 | 23 | 1 | 27 | 2 | 14 | 3 | 50 | 3 | 51 | 3 | 123 | 6 | 158 | 8 | 234 | 10 | 158 | 13 | 136 | 27 | 177 | 28 | 269 | 25 | 370 | 36 | 420 | 43 | 393 | 53 | 324 | 55 | 320 | 57 | 471 | 68 | 504 |
| Taiwan | 2 | 5 | 3 | 6 | 3 | 8 | 6 | 10 | 5 | 12 | 5 | 14 | 10 | 20 | 5 | 26 | 3 | 29 | 5 | 23 | 15 | 30 | 11 | 22 | 18 | 26 | 20 | 36 | 18 | 50 | 31 | 76 | 29 | 92 | 34 | 99 | 24 | 73 | 24 | 67 | 33 | 52 |
| All others | 0 | 2 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 1 | 2 | 0 | 2 | 0 | 1 | 0 | 2 | 2 | 3 | 0 | 3 | 1 | 1 | 2 | 2 | 1 | 3 | 1 | 3 |
| Middle East | 12 | 5 | 6 | 4 | 9 | 5 | 10 | 4 | 8 | 3 | 8 | 4 | 5 | 3 | 6 | 2 | 13 | 3 | 7 | 3 | 13 | 5 | 15 | 5 | 16 | 2 | 15 | 8 | 17 | 2 | 28 | 3 | 17 | 2 | 32 | 5 | 35 | 7 | 41 | 10 | 40 | 10 |
| Israel | 12 | 3 | 6 | 4 | 8 | 2 | 10 | 3 | 8 | 2 | 8 | 2 | 4 | 2 | 6 | 2 | 12 | 1 | 6 | 3 | 11 | 3 | 14 | 5 | 14 | 1 | 14 | 2 | 14 | 1 | 25 | 1 | 11 | 0 | 27 | 3 | 25 | 1 | 25 | 2 | 22 | 2 |
| All others | 0 | 1 | 0 | 0 | 1 | 3 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 2 | 2 | 1 | 0 | 1 | 1 | 1 | 0 | 2 | 1 | 1 | 7 | 3 | 1 | 3 | 2 | 6 | 2 | 5 | 3 | 10 | 6 | 16 | 8 | 18 | 8 |
| Africa | 0 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 1 | 3 | 0 | 0 | 1 | 1 | 0 | 1 | 2 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 4 | 1 | 0 | 0 | 3 | 1 | 0 | 1 | 0 | 2 | 3 | 2 | 1 |
| South Africa | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 2 | 0 |
| All others | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 3 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 3 | 0 | 1 |
| Australia and Oceania | 12 | 3 | 10 | 8 | 7 | 5 | 10 | 12 | 11 | 14 | 9 | 10 | 10 | 8 | 7 | 10 | 9 | 7 | 12 | 9 | 8 | 11 | 12 | 4 | 13 | 10 | 14 | 10 | 15 | 11 | 17 | 18 | 25 | 21 | 19 | 32 | 20 | 27 | 22 | 6 | 27 | 8 |
| Australia | 10 | 3 | 10 | 7 | 7 | 5 | 9 | 12 | 9 | 14 | 9 | 10 | 7 | 8 | 4 | 9 | 8 | 7 | 10 | 9 | 8 | 11 | 10 | 4 | 11 | 10 | 12 | 10 | 13 | 10 | 15 | 18 | 19 | 20 | 17 | 32 | 17 | 27 | 18 | 6 | 21 | 8 |
| New Zealand | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 3 | 0 | 2 | 1 | 1 | 0 | 2 | 0 | 1 | 0 | 2 | 0 | 2 | 0 | 2 | 0 | 1 | 0 | 2 | 0 | 6 | 1 | 2 | 0 | 2 | 0 | 4 | 1 | 6 | 0 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Unclassified | 0 | 7 | 0 | 11 | 0 | 10 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 |

EU = European Union; USPTO = U.S. Patent and Trademark Office.

**Note(s)**

USPTO patents are allocated according to patent inventorship information. USPTO patents are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named inventors. Patents are classified under the World Intellectual Property Organization (WIPO) classification of patents, which classifies International Patent Classification (IPC) codes under 35 technical fields. IPC reformed codes take into account changes that were made to the WIPO classification in 2006 under the eighth version of the classification and were used to prepare these data. However, because PatentsView only provides the original IPC codes as they appeared on patents and not the IPC reformed codes, current Cooperative Patent Classification codes on patents were converted back to the most recent IPC classification to prepare these statistics. Fractional counts of patents were assigned to each technological field on patents to assign the proper weight of a patent to the corresponding technological fields under the classification. International Patent Documentation (INPADOC) patent families across all patent offices covered in the Worldwide Patent Statistical Database (PATSTAT) are counted according to the year of the first granted patent in the patent family. Patent families are allocated according to patent inventorship information found on the priority patent of the INPADOC patent families. To account for missing ownership information in PATSTAT for some offices, a method designed by de Rassenfosse et al. (2012) is used to fill in missing information on priority patents using information in successive filings within the patent families (see technical documentation for details). Patent families are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named inventors. Because of data coverage issues for some patent offices in PATSTAT, statistics for some countries may be underestimated partially for some years or across the whole trend. Countries with identified issues include India (missing data) and South Africa (no data for 2018). For Italy, because of data gaps regarding information on granted patents, patent applications are used instead, which slightly overestimates Italy's output and creates a small shift in the year for which its output is accounted. The EU includes 28 member countries. China includes Hong Kong.

**Source(s)**

Science-Metrix; PATSTAT, accessed April 2019; PatentsView, USPTO, accessed June 2019.

TABLE SB-16

## USPTO patents and patent families granted in control, by region, country, or economy: 1998–2018

(Number)

| Region, country, or economy | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| World | 2,474 | 5,516 | 2,580 | 5,912 | 2,644 | 4,927 | 2,621 | 4,654 | 2,631 | 4,494 | 2,822 | 5,231 | 2,969 | 5,553 | 2,650 | 5,218 | 3,351 | 5,989 | 2,812 | 6,208 | 2,814 | 5,998 | 2,886 | 6,785 | 3,769 | 7,621 | 3,896 | 8,964 | 4,771 | 10,700 | 5,279 | 10,903 | 5,647 | 11,469 | 5,419 | 11,235 | 5,855 | 14,213 | 6,864 | 16,454 | 7,235 | 17,084 |
| North America | 1,519 | 1,199 | 1,574 | 1,166 | 1,615 | 1,152 | 1,589 | 1,032 | 1,577 | 948 | 1,748 | 1,018 | 1,851 | 1,033 | 1,624 | 852 | 2,088 | 1,079 | 1,726 | 912 | 1,785 | 1,007 | 1,822 | 957 | 2,373 | 1,140 | 2,478 | 1,100 | 2,910 | 1,235 | 3,327 | 1,221 | 3,487 | 1,362 | 3,258 | 1,248 | 3,529 | 1,284 | 4,083 | 1,542 | 4,208 | 1,561 |
| Canada | 54 | 44 | 62 | 49 | 54 | 38 | 54 | 38 | 62 | 39 | 45 | 30 | 61 | 41 | 49 | 31 | 65 | 39 | 45 | 33 | 58 | 41 | 55 | 46 | 79 | 51 | 81 | 42 | 85 | 47 | 133 | 64 | 136 | 64 | 113 | 47 | 119 | 53 | 152 | 69 | 170 | 79 |
| Mexico | 2 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 3 | 3 | 2 | 1 | 3 | 1 | 3 | 3 | 3 | 1 | 0 | 2 | 1 | 2 | 3 | 3 | 13 | 4 | 9 | 9 | 12 |
| Puerto Rico | 2 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 3 | 0 | 1 | 0 | 0 | 0 |
| United States | 1,462 | 1,154 | 1,511 | 1,116 | 1,559 | 1,113 | 1,535 | 994 | 1,513 | 907 | 1,701 | 987 | 1,789 | 991 | 1,573 | 820 | 2,020 | 1,040 | 1,680 | 879 | 1,726 | 966 | 1,763 | 908 | 2,290 | 1,088 | 2,394 | 1,057 | 2,821 | 1,185 | 3,194 | 1,157 | 3,349 | 1,297 | 3,142 | 1,199 | 3,404 | 1,218 | 3,926 | 1,464 | 4,029 | 1,470 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Central and South America | 4 | 2 | 3 | 3 | 4 | 6 | 3 | 9 | 1 | 7 | 5 | 4 | 6 | 2 | 3 | 5 | 9 | 4 | 3 | 6 | 2 | 7 | 4 | 10 | 6 | 6 | 9 | 12 | 10 | 8 | 8 | 7 | 8 | 5 | 13 | 13 | 12 | 15 | 16 | 18 | 21 | 23 |
| Argentina | 1 | 0 | 1 | 1 | 1 | 2 | 1 | 2 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 3 | 1 | 3 | 1 | 1 | 1 | 2 | 1 | 3 | 1 |
| Brazil | 2 | 1 | 0 | 0 | 3 | 4 | 1 | 5 | 0 | 6 | 2 | 2 | 2 | 3 | 1 | 4 | 5 | 4 | 1 | 2 | 0 | 6 | 2 | 9 | 3 | 6 | 6 | 10 | 8 | 7 | 4 | 5 | 4 | 5 | 9 | 11 | 9 | 12 | 9 | 16 | 14 | 20 |
| All others | 1 | 1 | 2 | 2 | 0 | 0 | 1 | 1 | 0 | 1 | 2 | 2 | 2 | 1 | 1 | 0 | 2 | 0 | 3 | 4 | 2 | 1 | 1 | 2 | 2 | 0 | 3 | 2 | 1 | 1 | 3 | 2 | 1 | 0 | 1 | 1 | 2 | 2 | 5 | 2 | 4 | 2 |
| Europe | 350 | 1,158 | 363 | 1,135 | 393 | 1,104 | 402 | 1,003 | 437 | 1,005 | 420 | 1,241 | 424 | 1,433 | 417 | 1,190 | 476 | 1,232 | 377 | 1,137 | 410 | 1,103 | 384 | 1,098 | 510 | 1,077 | 526 | 1,063 | 696 | 1,205 | 738 | 1,107 | 831 | 1,156 | 773 | 1,189 | 858 | 1,187 | 987 | 1,458 | 1,028 | 1,396 |
| EU | 328 | 880 | 339 | 925 | 372 | 897 | 370 | 832 | 410 | 797 | 399 | 924 | 402 | 1,034 | 395 | 878 | 448 | 881 | 353 | 785 | 386 | 728 | 475 | 708 | 491 | 725 | 655 | 808 | 687 | 796 | 773 | 798 | 721 | 770 | 802 | 867 | 924 | 1,000 | 1,034 | 1,356 | 1,000 | 1,298 |
| Austria | 2 | 11 | 7 | 20 | 12 | 13 | 10 | 17 | 7 | 38 | 24 | 10 | 18 | 10 | 21 | 6 | 22 | 10 | 39 | 5 | 28 | 11 | 32 | 11 | 23 | 12 | 30 | 15 | 40 | 25 | 54 | 30 | 37 | 32 | 42 | 28 | 41 | 38 | 39 | 45 | 36 | 38 |
| Belgium | 4 | 6 | 4 | 5 | 7 | 4 | 8 | 7 | 5 | 2 | 2 | 3 | 3 | 4 | 4 | 4 | 8 | 6 | 3 | 5 | 4 | 4 | 5 | 3 | 3 | 6 | 3 | 4 | 3 | 8 | 1 | 7 | 2 | 9 | 2 | 7 | 4 | 13 | 5 | 16 | 7 | 17 |
| Denmark | 4 | 3 | 6 | 4 | 5 | 1 | 1 | 9 | 5 | 5 | 6 | 10 | 4 | 4 | 4 | 8 | 6 | 4 | 1 | 3 | 3 | 5 | 4 | 3 | 4 | 8 | 7 | 4 | 4 | 6 | 7 | 8 | 10 | 4 | 6 | 7 | 8 | 11 | 5 | 14 | 10 | 16 |
| Finland | 4 | 10 | 3 | 7 | 5 | 4 | 8 | 12 | 7 | 16 | 3 | 23 | 8 | 28 | 5 | 19 | 12 | 18 | 10 | 12 | 5 | 13 | 7 | 19 | 7 | 18 | 10 | 12 | 5 | 17 | 16 | 27 | 19 | 22 | 12 | 24 | 23 | 18 | 25 | 16 | 26 | 18 |
| France | 57 | 187 | 54 | 182 | 51 | 180 | 45 | 184 | 63 | 188 | 58 | 238 | 55 | 225 | 55 | 221 | 48 | 239 | 48 | 156 | 61 | 160 | 55 | 183 | 93 | 159 | 94 | 126 | 139 | 159 | 146 | 171 | 148 | 172 | 118 | 175 | 122 | 230 | 126 | 188 | 117 | 186 |
| Germany | 140 | 266 | 137 | 249 | 147 | 253 | 156 | 249 | 172 | 245 | 184 | 261 | 194 | 284 | 192 | 245 | 217 | 290 | 146 | 300 | 164 | 270 | 157 | 206 | 197 | 198 | 179 | 199 | 151 | 241 | 242 | 266 | 275 | 256 | 275 | 218 | 277 | 247 | 323 | 268 | 350 | 296 |
| Hungary | 1 | 4 | 1 | 3 | 0 | 1 | 0 | 3 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 2 | 2 | 8 | 0 | 2 | 1 | 2 | 0 | 2 | 0 | 2 | 0 | 3 | 4 | 4 | 4 | 6 | 0 | 4 | 1 | 0 | 2 | 2 | 3 | 3 | 2 | 1 |
| Ireland | 3 | 7 | 3 | 7 | 2 | 4 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 4 | 7 | 8 | 3 | 6 | 5 | 4 | 2 | 11 | 8 | 7 | 3 | 6 | 3 | 4 | 4 | 4 | 6 | 12 | 7 | 10 | 5 | 13 | 8 | 15 | 8 | 19 | 12 |
| Italy | 18 | 115 | 18 | 164 | 26 | 182 | 29 | 79 | 22 | 64 | 23 | 69 | 19 | 162 | 19 | 74 | 23 | 15 | 17 | 14 | 20 | 10 | 15 | 16 | 17 | 38 | 20 | 53 | 38 | 45 | 34 | 16 | 47 | 11 | 42 | 17 | 46 | 22 | 50 | 50 | 49 | 101 |
| Netherlands | 16 | 52 | 15 | 52 | 16 | 44 | 14 | 48 | 12 | 62 | 12 | 37 | 13 | 45 | 11 | 43 | 16 | 47 | 11 | 40 | 15 | 42 | 11 | 41 | 12 | 35 | 13 | 42 | 17 | 32 | 25 | 35 | 22 | 24 | 25 | 22 | 33 | 17 | 47 | 38 | 44 | 21 |
| Spain | 7 | 80 | 4 | 69 | 6 | 56 | 5 | 62 | 8 | 26 | 4 | 75 | 5 | 41 | 4 | 67 | 2 | 64 | 2 | 70 | 5 | 53 | 5 | 53 | 7 | 65 | 5 | 78 | 8 | 74 | 15 | 77 | 18 | 96 | 20 | 76 | 13 | 60 | 19 | 57 | 18 | 55 |
| Sweden | 15 | 24 | 16 | 37 | 22 | 36 | 19 | 36 | 16 | 42 | 18 | 52 | 19 | 62 | 17 | 37 | 25 | 31 | 22 | 26 | 16 | 28 | 14 | 27 | 20 | 33 | 28 | 31 | 34 | 30 | 32 | 39 | 35 | 35 | 38 | 43 | 43 | 46 | 54 | 46 | 61 | 40 |
| United Kingdom | 56 | 57 | 67 | 67 | 71 | 66 | 71 | 57 | 87 | 61 | 74 | 87 | 67 | 104 | 72 | 84 | 74 | 76 | 74 | 65 | 69 | 51 | 68 | 56 | 90 | 57 | 102 | 63 | 104 | 68 | 108 | 63 | 124 | 58 | 108 | 70 | 138 | 68 | 145 | 85 | 151 | 85 |
| All others | 0 | 60 | 2 | 59 | 1 | 53 | 3 | 69 | 8 | 54 | 3 | 44 | 2 | 51 | 3 | 41 | 3 | 42 | 6 | 62 | 7 | 56 | 3 | 59 | 3 | 58 | 9 | 69 | 18 | 72 | 21 | 47 | 23 | 67 | 31 | 68 | 30 | 98 | 43 | 112 | 41 | 76 |
| Other Europe | 22 | 278 | 24 | 209 | 21 | 207 | 32 | 171 | 26 | 209 | 21 | 316 | 22 | 400 | 22 | 311 | 28 | 350 | 24 | 351 | 25 | 365 | 20 | 398 | 36 | 369 | 35 | 339 | 41 | 397 | 51 | 311 | 58 | 358 | 52 | 420 | 56 | 300 | 63 | 434 | 77 | 440 |
| Former Soviet Union | 1 | 11 | 1 | 4 | 3 | 5 | 2 | 11 | 1 | 15 | 0 | 47 | 0 | 106 | 1 | 28 | 1 | 24 | 0 | 43 | 0 | 48 | 0 | 45 | 0 | 38 | 0 | 26 | 1 | 32 | 1 | 30 | 1 | 36 | 1 | 27 | 0 | 33 | 2 | 21 | 1 | 23 |
| Norway | 1 | 6 | 5 | 6 | 4 | 5 | 4 | 7 | 5 | 11 | 2 | 8 | 4 | 5 | 2 | 18 | 7 | 15 | 7 | 17 | 5 | 7 | 3 | 15 | 7 | 11 | 8 | 13 | 8 | 8 | 9 | 10 | 10 | 9 | 8 | 8 | 8 | 8 | 7 | 7 | 16 | 14 |
| Russia | 1 | 240 | 1 | 177 | 2 | 179 | 3 | 125 | 2 | 165 | 3 | 232 | 1 | 259 | 4 | 243 | 3 | 273 | 2 | 271 | 3 | 272 | 2 | 313 | 3 | 300 | 2 | 277 | 3 | 340 | 5 | 247 | 7 | 284 | 5 | 367 | 8 | 253 | 7 | 373 | 8 | 374 |
| Switzerland | 20 | 19 | 16 | 21 | 12 | 15 | 23 | 28 | 18 | 18 | 16 | 29 | 16 | 29 | 15 | 22 | 17 | 37 | 15 | 19 | 17 | 34 | 14 | 20 | 25 | 16 | 23 | 20 | 26 | 15 | 33 | 21 | 38 | 25 | 34 | 14 | 36 | 23 | 44 | 29 | 48 | 27 |
| All others | 0 | 1 | 1 | 2 | 1 | 3 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 2 | 0 | 2 | 1 | 3 | 0 | 5 | 2 | 4 | 1 | 3 | 3 | 1 | 3 | 3 | 2 | 4 | 3 | 4 | 4 | 2 | 3 | 5 | 4 | 2 |
| Asia | 571 | 3,104 | 602 | 3,538 | 590 | 2,588 | 582 | 2,551 | 576 | 2,492 | 596 | 2,924 | 629 | 3,020 | 560 | 3,099 | 717 | 3,602 | 638 | 4,107 | 563 | 3,832 | 613 | 4,660 | 786 | 5,331 | 778 | 6,723 | 1,004 | 8,163 | 1,033 | 8,476 | 1,140 | 8,856 | 1,200 | 8,681 | 1,291 | 11,636 | 1,539 | 13,366 | 1,761 | 14,007 |

TABLE S8-16

## USPTO patents and patent families granted in control, by region, country, or economy: 1998–2018

(Number)

| Region, country, or economy | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| China | 5 | 17 | 2 | 16 | 2 | 34 | 4 | 34 | 9 | 46 | 5 | 99 | 6 | 154 | 7 | 124 | 11 | 182 | 21 | 198 | 21 | 534 | 16 | 1,290 | 38 | 1,377 | 38 | 1,848 | 48 | 2,430 | 55 | 2,541 | 95 | 3,117 | 104 | 4,827 | 111 | 6,959 | 188 | 8,769 | 244 | 8,954 |
| India | 0 | 0 | 1 | 0 | 1 | 1 | 2 | 2 | 4 | 2 | 1 | 1 | 6 | 3 | 6 | 2 | 7 | 8 | 7 | 3 | 7 | 5 | 13 | 8 | 17 | 10 | 26 | 18 | 20 | 15 | 48 | 32 | 64 | 39 | 55 | 35 | 80 | 59 | 118 | 74 | 132 | 67 |
| Japan | 479 | 2,831 | 498 | 2,802 | 480 | 2,208 | 481 | 2,227 | 480 | 2,170 | 480 | 2,212 | 504 | 2,194 | 433 | 2,184 | 557 | 2,348 | 481 | 2,584 | 412 | 2,414 | 435 | 2,672 | 552 | 2,934 | 528 | 3,426 | 693 | 4,121 | 698 | 3,916 | 675 | 3,690 | 700 | 2,279 | 733 | 2,876 | 835 | 2,594 | 972 | 3,029 |
| Malaysia | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 2 | 7 | 0 | 2 | 1 | 2 | 1 | 4 | 1 | 3 | 1 | 3 | 3 | 6 | 3 | 9 | 2 | 8 | 2 | 9 | 2 | 16 | 3 | 12 |
| Singapore | 2 | 2 | 2 | 2 | 5 | 3 | 3 | 2 | 3 | 1 | 4 | 3 | 5 | 2 | 7 | 2 | 3 | 4 | 3 | 2 | 6 | 4 | 8 | 7 | 9 | 8 | 11 | 6 | 7 | 6 | 7 | 7 | 8 | 5 | 17 | 8 | 19 | 13 | 24 | 12 | 22 | 12 |
| South Korea | 44 | 197 | 63 | 667 | 53 | 268 | 56 | 202 | 32 | 159 | 49 | 445 | 40 | 483 | 42 | 656 | 48 | 852 | 59 | 1,058 | 46 | 682 | 66 | 525 | 74 | 776 | 91 | 1,204 | 95 | 1,268 | 106 | 1,478 | 148 | 1,479 | 179 | 1,091 | 200 | 1,322 | 213 | 1,497 | 238 | 1,661 |
| Taiwan | 39 | 53 | 36 | 50 | 49 | 73 | 37 | 83 | 47 | 114 | 54 | 164 | 66 | 180 | 65 | 129 | 87 | 204 | 66 | 254 | 70 | 191 | 74 | 154 | 89 | 220 | 82 | 215 | 137 | 317 | 115 | 491 | 140 | 509 | 140 | 425 | 139 | 389 | 154 | 402 | 145 | 269 |
| All others | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 2 | 1 | 1 | 4 | 3 | 0 | 2 | 0 | 0 | 1 | 2 | 6 | 2 | 1 | 2 | 2 | 3 | 1 | 7 | 7 | 7 | 3 | 8 | 6 | 9 | 5 | 2 | 5 | 2 |
| Middle East | 15 | 10 | 17 | 10 | 20 | 15 | 20 | 9 | 16 | 6 | 23 | 8 | 25 | 13 | 16 | 7 | 25 | 13 | 25 | 12 | 18 | 10 | 24 | 13 | 28 | 16 | 38 | 15 | 33 | 21 | 42 | 23 | 62 | 25 | 70 | 30 | 63 | 23 | 97 | 29 | 101 | 37 |
| Israel | 15 | 9 | 16 | 9 | 17 | 11 | 19 | 7 | 15 | 4 | 23 | 6 | 23 | 12 | 15 | 6 | 22 | 11 | 22 | 8 | 17 | 9 | 23 | 11 | 25 | 12 | 31 | 11 | 26 | 13 | 30 | 13 | 48 | 14 | 56 | 17 | 52 | 15 | 77 | 20 | 80 | 22 |
| All others | 0 | 1 | 1 | 1 | 3 | 4 | 1 | 2 | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 1 | 3 | 2 | 3 | 4 | 1 | 1 | 1 | 2 | 4 | 4 | 7 | 4 | 6 | 8 | 9 | 10 | 7 | 13 | 8 | 4 | 8 | 8 | 7 | 4 | 12 | 12 |
| Africa | 5 | 19 | 4 | 23 | 1 | 10 | 7 | 15 | 5 | 9 | 3 | 11 | 3 | 7 | 2 | 10 | 3 | 4 | 3 | 6 | 2 | 7 | 3 | 8 | 4 | 6 | 3 | 7 | 7 | 7 | 9 | 10 | 7 | 13 | 8 | 4 | 8 | 8 | 7 | 4 | 12 | 12 |
| South Africa | 5 | 12 | 4 | 10 | 1 | 5 | 6 | 10 | 5 | 3 | 3 | 7 | 3 | 7 | 2 | 9 | 3 | 2 | 3 | 5 | 2 | 7 | 3 | 7 | 4 | 5 | 3 | 2 | 6 | 3 | 8 | 2 | 4 | 3 | 6 | 1 | 5 | 0 | 4 | 1 | 8 | 0 |
| All others | 0 | 7 | 0 | 13 | 0 | 5 | 1 | 5 | 0 | 6 | 0 | 5 | 0 | 6 | 0 | 9 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 5 | 1 | 4 | 1 | 8 | 3 | 10 | 1 | 2 | 3 | 8 | 3 | 3 | 4 | 12 |
| Australia and Oceania | 9 | 11 | 15 | 12 | 21 | 18 | 18 | 36 | 20 | 22 | 26 | 24 | 32 | 33 | 28 | 38 | 33 | 37 | 39 | 27 | 33 | 31 | 36 | 38 | 60 | 43 | 63 | 45 | 111 | 61 | 118 | 59 | 111 | 51 | 96 | 70 | 93 | 57 | 134 | 37 | 104 | 48 |
| Australia | 9 | 11 | 13 | 11 | 20 | 17 | 16 | 35 | 17 | 21 | 25 | 24 | 29 | 33 | 26 | 38 | 30 | 36 | 34 | 27 | 31 | 31 | 33 | 37 | 57 | 43 | 60 | 44 | 106 | 58 | 115 | 55 | 107 | 50 | 88 | 70 | 88 | 55 | 126 | 37 | 95 | 45 |
| New Zealand | 0 | 0 | 1 | 1 | 1 | 0 | 2 | 1 | 3 | 1 | 1 | 0 | 3 | 1 | 3 | 1 | 2 | 1 | 5 | 0 | 2 | 1 | 3 | 1 | 3 | 0 | 3 | 2 | 4 | 3 | 4 | 4 | 4 | 2 | 7 | 1 | 5 | 2 | 8 | 0 | 9 | 2 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| Unclassified | 1 | 13 | 1 | 25 | 1 | 34 | 1 | 0 | 0 | 3 | 1 | 1 | 0 | 5 | 0 | 17 | 0 | 18 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 2 | 1 | 0 | 1 | 3 | 0 | 1 | 0 | 1 | 0 | 2 | 2 | 1 | 0 | 0 | 0 |

EU = European Union; USPTO = U.S. Patent and Trademark Office.

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**Source(s)**

Science-Metrix; PATSTAT, accessed April 2019; PatentsView, USPTO, accessed June 2019.

TABLE SB-17

## USPTO patents and patent families granted in medical technology, by region, country, or country: 1998–2018

(Number)

| Region, country, or economy | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| World | 8,131 | 10,216 | 7,884 | 9,899 | 8,019 | 9,527 | 8,200 | 8,172 | 8,184 | 8,150 | 9,109 | 10,293 | 7,401 | 10,751 | 6,181 | 9,582 | 7,244 | 10,313 | 6,606 | 10,309 | 6,036 | 10,452 | 6,952 | 11,583 | 11,192 | 13,315 | 12,361 | 14,265 | 14,790 | 16,309 | 17,099 | 17,008 | 17,977 | 17,532 | 16,992 | 17,381 | 17,335 | 19,284 | 18,523 | 20,933 | 17,908 | 20,745 |
| North America | 6,140 | 4,045 | 5,959 | 3,634 | 5,950 | 3,465 | 5,981 | 3,046 | 5,716 | 2,786 | 6,509 | 2,979 | 5,260 | 2,254 | 4,436 | 1,810 | 5,168 | 1,905 | 4,672 | 1,679 | 4,148 | 1,407 | 4,865 | 1,624 | 7,914 | 2,502 | 8,889 | 2,403 | 10,371 | 2,606 | 11,833 | 2,636 | 12,278 | 2,443 | 11,451 | 2,335 | 11,750 | 2,203 | 12,484 | 2,086 | 11,675 | 1,904 |
| Canada | 127 | 104 | 111 | 74 | 126 | 75 | 163 | 101 | 141 | 85 | 182 | 102 | 122 | 65 | 106 | 50 | 111 | 58 | 100 | 46 | 96 | 47 | 104 | 34 | 164 | 62 | 180 | 45 | 194 | 45 | 251 | 51 | 250 | 58 | 271 | 69 | 269 | 51 | 337 | 71 | 301 | 68 |
| Mexico | 6 | 5 | 2 | 1 | 3 | 3 | 3 | 1 | 3 | 0 | 4 | 1 | 7 | 3 | 5 | 1 | 4 | 0 | 2 | 0 | 6 | 1 | 1 | 2 | 4 | 2 | 6 | 0 | 7 | 1 | 12 | 2 | 9 | 2 | 9 | 4 | 9 | 28 | 13 | 24 | 6 | 21 |
| Puerto Rico | 4 | 2 | 4 | 1 | 3 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 4 | 0 | 0 | 0 | 1 | 0 | 5 | 0 | 2 | 0 | 1 | 0 | 5 | 0 | 5 | 0 | 3 | 0 | 4 | 0 | 7 | 0 | 3 | 0 | 6 | 0 | 4 | 0 | 3 | 0 |
| United States | 6,003 | 3,935 | 5,841 | 3,558 | 5,818 | 3,387 | 5,815 | 2,944 | 5,572 | 2,701 | 6,320 | 2,876 | 5,127 | 2,186 | 4,325 | 1,759 | 5,052 | 1,846 | 4,564 | 1,632 | 4,045 | 1,358 | 4,760 | 1,588 | 7,741 | 2,438 | 8,697 | 2,359 | 10,166 | 2,560 | 11,566 | 2,582 | 12,011 | 2,383 | 11,167 | 2,262 | 11,466 | 2,124 | 12,130 | 1,991 | 11,365 | 1,815 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Central and South America | 25 | 14 | 38 | 22 | 30 | 24 | 30 | 14 | 35 | 22 | 38 | 17 | 16 | 14 | 23 | 12 | 12 | 16 | 9 | 8 | 9 | 15 | 21 | 36 | 18 | 26 | 36 | 26 | 42 | 12 | 55 | 20 | 53 | 19 | 50 | 25 | 34 | 20 | 55 | 27 | 46 | 57 |
| Argentina | 11 | 4 | 16 | 9 | 11 | 7 | 12 | 5 | 15 | 5 | 16 | 3 | 9 | 2 | 10 | 2 | 3 | 2 | 4 | 2 | 1 | 1 | 11 | 5 | 5 | 4 | 10 | 0 | 13 | 1 | 16 | 2 | 13 | 1 | 10 | 2 | 12 | 2 | 11 | 2 | 14 | 5 |
| Brazil | 7 | 4 | 8 | 5 | 8 | 10 | 8 | 6 | 8 | 11 | 12 | 8 | 2 | 8 | 6 | 10 | 6 | 11 | 1 | 5 | 4 | 7 | 2 | 25 | 8 | 18 | 15 | 18 | 17 | 7 | 17 | 12 | 24 | 11 | 22 | 15 | 7 | 17 | 21 | 18 | 17 | 46 |
| All others | 7 | 6 | 14 | 9 | 10 | 6 | 10 | 3 | 3 | 12 | 5 | 10 | 6 | 6 | 5 | 7 | 0 | 3 | 3 | 4 | 2 | 4 | 7 | 5 | 5 | 4 | 11 | 8 | 15 | 4 | 22 | 6 | 16 | 7 | 17 | 7 | 16 | 1 | 23 | 7 | 15 | 6 |
| Europe | 1,189 | 3,670 | 1,153 | 3,776 | 1,297 | 3,662 | 1,361 | 2,828 | 1,354 | 3,419 | 1,443 | 4,436 | 1,216 | 5,149 | 951 | 3,872 | 1,052 | 3,836 | 1,035 | 3,618 | 957 | 3,726 | 1,104 | 4,118 | 1,830 | 3,588 | 1,826 | 3,267 | 2,363 | 3,908 | 2,833 | 3,449 | 3,105 | 3,252 | 2,923 | 3,645 | 2,984 | 3,283 | 3,120 | 4,144 | 3,097 | 3,789 |
| EU | 1,085 | 1,934 | 1,049 | 2,053 | 1,164 | 1,944 | 1,226 | 1,663 | 1,219 | 1,620 | 1,308 | 1,712 | 1,091 | 2,000 | 849 | 1,886 | 941 | 1,652 | 928 | 1,567 | 840 | 1,501 | 975 | 1,546 | 1,629 | 1,623 | 1,591 | 1,617 | 2,078 | 1,951 | 2,505 | 1,817 | 2,734 | 1,711 | 2,515 | 1,749 | 2,629 | 1,890 | 2,741 | 2,132 | 2,720 | 1,886 |
| Austria | 12 | 26 | 23 | 44 | 21 | 44 | 20 | 45 | 20 | 37 | 29 | 45 | 26 | 34 | 19 | 36 | 23 | 56 | 12 | 22 | 17 | 57 | 26 | 57 | 30 | 53 | 39 | 47 | 50 | 50 | 59 | 53 | 76 | 38 | 65 | 49 | 75 | 55 | 79 | 50 | 64 | 58 |
| Belgium | 20 | 17 | 13 | 9 | 22 | 15 | 18 | 13 | 23 | 5 | 20 | 10 | 14 | 11 | 8 | 12 | 20 | 19 | 15 | 12 | 15 | 14 | 24 | 12 | 29 | 9 | 39 | 13 | 34 | 12 | 63 | 14 | 68 | 14 | 41 | 17 | 57 | 14 | 55 | 30 | 62 | 43 |
| Denmark | 29 | 6 | 41 | 14 | 35 | 9 | 33 | 9 | 36 | 12 | 56 | 24 | 35 | 23 | 28 | 10 | 33 | 10 | 23 | 21 | 27 | 12 | 35 | 11 | 53 | 7 | 63 | 19 | 77 | 33 | 94 | 26 | 124 | 26 | 6 | 90 | 36 | 87 | 37 | 118 | 24 | 134 |
| Finland | 25 | 31 | 19 | 29 | 26 | 31 | 28 | 32 | 27 | 34 | 35 | 40 | 32 | 35 | 25 | 36 | 28 | 24 | 23 | 24 | 21 | 34 | 20 | 37 | 42 | 40 | 34 | 32 | 35 | 29 | 51 | 36 | 54 | 46 | 42 | 47 | 53 | 36 | 51 | 37 | 59 | 49 |
| France | 159 | 549 | 150 | 501 | 165 | 409 | 176 | 380 | 159 | 336 | 171 | 323 | 131 | 430 | 106 | 415 | 106 | 444 | 106 | 367 | 115 | 405 | 114 | 355 | 190 | 357 | 184 | 352 | 247 | 548 | 247 | 431 | 310 | 395 | 282 | 377 | 263 | 324 | 308 | 274 | 304 | 263 |
| Germany | 359 | 482 | 355 | 541 | 396 | 513 | 432 | 500 | 471 | 504 | 449 | 582 | 404 | 565 | 281 | 641 | 331 | 628 | 382 | 617 | 335 | 523 | 435 | 489 | 712 | 496 | 637 | 422 | 849 | 568 | 1,029 | 580 | 998 | 576 | 950 | 575 | 971 | 681 | 969 | 618 | 943 | 600 |
| Hungary | 5 | 8 | 2 | 4 | 1 | 13 | 4 | 17 | 2 | 9 | 3 | 12 | 0 | 11 | 3 | 13 | 3 | 7 | 2 | 12 | 4 | 5 | 0 | 5 | 5 | 13 | 1 | 8 | 6 | 9 | 8 | 9 | 8 | 9 | 5 | 13 | 7 | 6 | 13 | 7 | 10 | 7 |
| Ireland | 9 | 15 | 11 | 7 | 19 | 10 | 10 | 6 | 8 | 3 | 22 | 8 | 19 | 6 | 28 | 13 | 22 | 7 | 22 | 10 | 9 | 5 | 25 | 11 | 47 | 12 | 56 | 12 | 51 | 11 | 59 | 24 | 76 | 18 | 61 | 31 | 96 | 27 | 84 | 20 | 104 | 19 |
| Italy | 67 | 248 | 56 | 358 | 71 | 396 | 79 | 167 | 84 | 182 | 94 | 165 | 79 | 350 | 56 | 182 | 59 | 31 | 64 | 29 | 56 | 26 | 60 | 37 | 90 | 91 | 86 | 158 | 104 | 120 | 141 | 32 | 153 | 28 | 137 | 42 | 136 | 48 | 129 | 40 | 154 | 269 |
| Netherlands | 81 | 146 | 81 | 73 | 107 | 83 | 94 | 76 | 90 | 64 | 94 | 59 | 76 | 39 | 89 | 47 | 91 | 48 | 89 | 42 | 85 | 50 | 97 | 82 | 93 | 80 | 85 | 114 | 86 | 136 | 94 | 75 | 89 | 139 | 55 | 148 | 95 | 208 | 140 | 194 | 65 |
| Spain | 12 | 67 | 13 | 71 | 15 | 80 | 7 | 80 | 14 | 48 | 16 | 60 | 10 | 73 | 8 | 100 | 10 | 72 | 17 | 103 | 9 | 68 | 4 | 105 | 11 | 109 | 14 | 117 | 25 | 108 | 33 | 157 | 38 | 141 | 35 | 140 | 31 | 121 | 40 | 139 | 39 | 120 |
| Sweden | 138 | 149 | 108 | 146 | 140 | 137 | 168 | 136 | 136 | 175 | 159 | 132 | 118 | 160 | 110 | 102 | 118 | 80 | 82 | 64 | 78 | 71 | 60 | 107 | 101 | 108 | 136 | 89 | 174 | 81 | 180 | 64 | 200 | 67 | 178 | 52 | 167 | 64 | 179 | 68 | 187 | 57 |
| United Kingdom | 159 | 88 | 159 | 93 | 172 | 87 | 158 | 88 | 151 | 105 | 178 | 112 | 151 | 117 | 127 | 120 | 132 | 93 | 123 | 61 | 103 | 86 | 108 | 83 | 213 | 101 | 196 | 113 | 283 | 128 | 381 | 121 | 430 | 89 | 452 | 122 | 506 | 144 | 466 | 149 | 415 | 112 |
| All others | 10 | 103 | 18 | 114 | 8 | 93 | 10 | 96 | 11 | 80 | 13 | 105 | 15 | 107 | 9 | 91 | 9 | 91 | 10 | 136 | 9 | 110 | 5 | 142 | 23 | 134 | 19 | 148 | 28 | 169 | 28 | 175 | 26 | 174 | 36 | 193 | 31 | 237 | 41 | 205 | 51 | 206 |
| Other Europe | 105 | 1,736 | 104 | 1,723 | 133 | 1,718 | 135 | 1,165 | 136 | 1,799 | 135 | 2,724 | 125 | 3,149 | 102 | 1,986 | 110 | 2,184 | 106 | 2,051 | 117 | 2,225 | 129 | 2,597 | 12 | 1,690 | 18 | 1,428 | 25 | 1,729 | 26 | 1,296 | 26 | 1,305 | 25 | 1,570 | 23 | 1,130 | 14 | 1,766 | 19 | 1,694 |
| Former Soviet Union | 1 | 77 | 0 | 80 | 2 | 65 | 0 | 62 | 1 | 106 | 3 | 366 | 2 | 17 | 7 | 187 | 1 | 126 | 3 | 158 | 2 | 147 | 2 | 203 | 3 | 158 | 2 | 135 | 4 | 135 | 0 | 139 | 1 | 152 | 2 | 216 | 5 | 166 | 4 | 128 | 3 | 119 |
| Norway | 5 | 15 | 4 | 14 | 12 | 13 | 18 | 20 | 16 | 30 | 18 | 17 | 16 | 17 | 7 | 16 | 13 | 18 | 12 | 8 | 7 | 9 | 8 | 14 | 25 | 16 | 21 | 11 | 25 | 6 | 25 | 13 | 25 | 9 | 20 | 17 | 13 | 9 | 18 | 15 | 20 | 12 |
| Russia | 10 | 1,587 | 13 | 1,569 | 22 | 1,574 | 15 | 1,022 | 14 | 1,588 | 14 | 2,262 | 10 | 1,837 | 13 | 1,705 | 9 | 1,946 | 12 | 1,796 | 13 | 1,958 | 15 | 2,259 | 12 | 1,690 | 18 | 1,428 | 25 | 1,729 | 26 | 1,296 | 26 | 1,305 | 25 | 1,570 | 23 | 1,130 | 14 | 1,766 | 19 | 1,694 |
| Switzerland | 83 | 53 | 83 | 55 | 91 | 61 | 96 | 58 | 98 | 64 | 94 | 73 | 94 | 76 | 73 | 76 | 78 | 89 | 68 | 78 | 82 | 92 | 93 | 90 | 145 | 88 | 176 | 71 | 218 | 80 | 256 | 77 | 295 | 71 | 326 | 88 | 273 | 77 | 286 | 97 | 289 | 72 |
| All others | 5 | 3 | 4 | 5 | 7 | 4 | 5 | 3 | 6 | 11 | 6 | 6 | 3 | 3 | 8 | 3 | 8 | 5 | 11 | 12 | 12 | 19 | 11 | 6 | 16 | 13 | 19 | 4 | 13 | 7 | 19 | 6 | 24 | 4 | 36 | 6 | 42 | 10 | 57 | 7 | 45 | 7 |
| Asia | 613 | 2,297 | 579 | 2,319 | 567 | 2,213 | 620 | 2,109 | 757 | 2,120 | 850 | 2,672 | 696 | 3,183 | 592 | 3,738 | 759 | 4,406 | 701 | 4,841 | 738 | 5,145 | 712 | 5,653 | 1,077 | 7,054 | 1,173 | 8,397 | 1,562 | 9,584 | 1,758 | 10,617 | 1,850 | 11,563 | 1,920 | 11,003 | 1,919 | 13,424 | 2,099 | 14,486 | 2,325 | 14,822 |

**TABLE S8-17**

## USPTO patents and patent families granted in medical technology, by region, country, or economy: 1998–2018

(Number)

| | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Region, country, or economy | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| China | 11 | 93 | 10 | 65 | 9 | 179 | 5 | 187 | 15 | 144 | 19 | 297 | 15 | 433 | 19 | 377 | 21 | 500 | 21 | 544 | 25 | 843 | 41 | 1,294 | 76 | 1,390 | 73 | 1,769 | 103 | 2,586 | 112 | 2,866 | 103 | 3,242 | 122 | 4,819 | 183 | 5,576 | 222 | 6,516 | 272 | 7,285 |
| India | 4 | 2 | 4 | 3 | 3 | 2 | 4 | 5 | 1 | 1 | 5 | 3 | 7 | 7 | 4 | 3 | 12 | 7 | 7 | 5 | 11 | 6 | 11 | 6 | 10 | 4 | 14 | 6 | 22 | 11 | 39 | 9 | 50 | 11 | 52 | 8 | 60 | 11 | 71 | 19 | 77 | 18 |
| Japan | 508 | 2,011 | 474 | 1,933 | 445 | 1,810 | 504 | 1,666 | 584 | 1,577 | 669 | 1,784 | 532 | 2,095 | 430 | 2,229 | 559 | 2,197 | 547 | 2,540 | 569 | 2,941 | 547 | 3,248 | 826 | 4,252 | 889 | 4,526 | 1,137 | 4,444 | 1,272 | 4,938 | 1,305 | 5,195 | 1,305 | 3,333 | 1,200 | 4,144 | 1,262 | 4,129 | 1,320 | 3,968 |
| Malaysia | 0 | 0 | 0 | 0 | 2 | 1 | 1 | 1 | 5 | 5 | 4 | 4 | 3 | 3 | 2 | 3 | 2 | 3 | 0 | 4 | 2 | 3 | 1 | 5 | 3 | 7 | 2 | 17 | 3 | 25 | 4 | 16 | 5 | 23 | 7 | 26 | 6 | 11 | 9 | 12 | 4 | 25 |
| Singapore | 3 | 2 | 2 | 2 | 2 | 1 | 4 | 1 | 4 | 3 | 6 | 5 | 5 | 1 | 3 | 2 | 6 | 2 | 3 | 1 | 9 | 4 | 9 | 3 | 11 | 2 | 11 | 4 | 22 | 4 | 20 | 2 | 33 | 8 | 31 | 8 | 26 | 4 | 29 | 5 | 31 | 9 |
| South Korea | 22 | 107 | 25 | 212 | 29 | 120 | 34 | 145 | 43 | 242 | 69 | 428 | 37 | 467 | 38 | 906 | 45 | 1,420 | 39 | 1,468 | 49 | 1,202 | 45 | 940 | 72 | 1,221 | 85 | 1,880 | 114 | 2,223 | 151 | 2,391 | 201 | 2,632 | 223 | 2,366 | 262 | 2,996 | 318 | 3,017 | 400 | 3,029 |
| Taiwan | 63 | 79 | 61 | 99 | 76 | 97 | 67 | 98 | 101 | 139 | 77 | 141 | 97 | 170 | 93 | 211 | 113 | 269 | 81 | 262 | 73 | 138 | 55 | 148 | 78 | 174 | 97 | 192 | 156 | 279 | 155 | 387 | 147 | 435 | 170 | 435 | 174 | 673 | 179 | 722 | 214 | 475 |
| All others | 3 | 5 | 3 | 5 | 1 | 2 | 1 | 7 | 5 | 9 | 1 | 10 | 0 | 7 | 2 | 7 | 1 | 7 | 2 | 16 | 1 | 7 | 2 | 9 | 2 | 6 | 2 | 4 | 6 | 12 | 4 | 7 | 7 | 16 | 8 | 9 | 8 | 10 | 8 | 17 | 6 | 12 |
| Middle East | 101 | 49 | 88 | 45 | 96 | 64 | 146 | 61 | 163 | 68 | 167 | 81 | 135 | 46 | 99 | 42 | 142 | 48 | 113 | 31 | 115 | 33 | 166 | 42 | 233 | 48 | 264 | 63 | 294 | 66 | 407 | 88 | 457 | 72 | 411 | 80 | 452 | 119 | 524 | 105 | 506 | 95 |
| Israel | 100 | 43 | 85 | 39 | 94 | 35 | 142 | 43 | 162 | 55 | 165 | 62 | 133 | 37 | 99 | 30 | 140 | 37 | 112 | 27 | 111 | 23 | 164 | 36 | 231 | 43 | 254 | 51 | 285 | 54 | 373 | 59 | 430 | 51 | 379 | 54 | 418 | 86 | 485 | 73 | 456 | 61 |
| All others | 1 | 5 | 3 | 6 | 1 | 30 | 4 | 18 | 1 | 13 | 3 | 19 | 2 | 8 | 0 | 12 | 2 | 11 | 1 | 3 | 5 | 10 | 2 | 6 | 2 | 5 | 9 | 12 | 10 | 12 | 34 | 28 | 27 | 21 | 31 | 25 | 34 | 33 | 39 | 32 | 50 | 33 |
| Africa | 9 | 27 | 7 | 27 | 11 | 28 | 4 | 26 | 7 | 45 | 10 | 53 | 5 | 42 | 7 | 20 | 12 | 27 | 5 | 56 | 3 | 50 | 6 | 38 | 9 | 17 | 11 | 11 | 17 | 16 | 10 | 20 | 17 | 13 | 14 | 6 | 16 | 5 | 17 | 4 | 19 | 4 |
| South Africa | 8 | 19 | 6 | 21 | 11 | 8 | 3 | 11 | 4 | 24 | 6 | 26 | 4 | 24 | 5 | 17 | 9 | 21 | 4 | 38 | 2 | 36 | 5 | 31 | 7 | 13 | 8 | 2 | 13 | 5 | 9 | 3 | 12 | 3 | 11 | 1 | 13 | 1 | 13 | 1 | 14 | 1 |
| All others | 0 | 9 | 0 | 6 | 0 | 20 | 1 | 15 | 3 | 21 | 4 | 26 | 1 | 18 | 2 | 4 | 3 | 5 | 0 | 18 | 1 | 14 | 1 | 7 | 2 | 4 | 3 | 9 | 4 | 10 | 2 | 17 | 5 | 10 | 3 | 5 | 3 | 4 | 4 | 2 | 5 | 3 |
| Australia and Oceania | 54 | 46 | 59 | 50 | 68 | 58 | 58 | 87 | 82 | 119 | 90 | 52 | 73 | 63 | 71 | 64 | 99 | 67 | 71 | 76 | 64 | 74 | 78 | 69 | 110 | 80 | 161 | 96 | 141 | 116 | 204 | 178 | 216 | 168 | 221 | 285 | 178 | 231 | 220 | 81 | 239 | 75 |
| Australia | 50 | 45 | 54 | 42 | 60 | 57 | 53 | 86 | 67 | 119 | 77 | 51 | 56 | 63 | 58 | 63 | 84 | 65 | 65 | 75 | 60 | 74 | 70 | 69 | 95 | 80 | 148 | 95 | 115 | 114 | 184 | 176 | 195 | 166 | 187 | 283 | 149 | 230 | 174 | 80 | 180 | 74 |
| New Zealand | 4 | 1 | 6 | 4 | 8 | 1 | 5 | 0 | 15 | 1 | 13 | 1 | 17 | 1 | 12 | 1 | 15 | 2 | 7 | 1 | 4 | 0 | 7 | 0 | 14 | 0 | 13 | 0 | 26 | 2 | 20 | 2 | 21 | 2 | 34 | 2 | 29 | 1 | 46 | 1 | 59 | 1 |
| All others | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Unclassified | 0 | 69 | 1 | 25 | 2 | 14 | 0 | 2 | 0 | 9 | 0 | 2 | 0 | 1 | 0 | 23 | 0 | 9 | 0 | 0 | 0 | 1 | 0 | 5 | 0 | 0 | 1 | 3 | 0 | 0 | 0 | 1 | 1 | 2 | 2 | 2 | 3 | 0 | 5 | 0 | 2 | 0 |

EU = European Union; USPTO = U.S. Patent and Trademark Office.

**Note(s)**

USPTO patents are allocated according to patent inventorship information. USPTO patents are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named inventors. Patents are classified under the World Intellectual Property Organization (WIPO) classification of patents, which classifies International Patent Classification (IPC) codes under 35 technical fields. IPC reformed codes take into account changes that were made to the WIPO classification in 2006 under the eighth version of the classification and were used to prepare these data. However, because PatentsView only provides the original IPC codes as they appeared on patents and not the IPC reformed codes, current Cooperative Patent Classification codes on patents were converted back to the most recent IPC classification to prepare these statistics. Fractional counts of patents were assigned to each technological field on patents to assign the proper weight of a patent to the corresponding technological fields under the classification. International Patent Documentation (INPADOC) patent families across all patent offices covered in the Worldwide Patent Statistical Database (PATSTAT) are counted according to the year of the first granted patent in the patent family. Patent families are allocated according to patent inventorship information found on the priority patent of the INPADOC patent families. To account for missing ownership information in PATSTAT for some offices, a method designed by de Rassenfosse et al. (2012) is used to fill in missing information on priority patents using information in successive filings within the patent families (see technical documentation for details). Patent families are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named inventors. Because of data coverage issues for some patent offices in PATSTAT, statistics for some countries may be underestimated partially for some years or across the whole trend. Countries with identified issues include India (missing data) and South Africa (no data for 2018). For Italy, because of data gaps regarding information on granted patents, patent applications are used instead, which slightly overestimates Italy's output and creates a small shift in the year for which its output is accounted. The EU includes 28 member countries. China includes Hong Kong.

**Source(s)**

Science-Metrix; PATSTAT, accessed April 2019; PatentsView, USPTO, accessed June 2019.

TABLE SB-18

## USPTO patents and patent families granted in organic fine chemistry, by region, country, or economy: 1998–2018

(Number)

| Region, country, or economy | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| World | 5,653 | 4,760 | 5,694 | 4,892 | 5,411 | 4,003 | 5,717 | 3,458 | 6,210 | 3,299 | 5,239 | 3,609 | 4,330 | 4,594 | 3,750 | 4,518 | 4,655 | 6,046 |
| North America | 2,740 | 1,249 | 2,826 | 1,147 | 2,618 | 904 | 2,677 | 828 | 2,973 | 772 | 2,557 | 602 | 2,077 | 478 | 1,875 | 369 | 2,329 | 479 |
| Canada | 72 | 35 | 87 | 38 | 75 | 30 | 75 | 21 | 89 | 22 | 76 | 22 | 71 | 15 | 49 | 11 | 81 | 13 |
| Mexico | 3 | 3 | 2 | 2 | 1 | 0 | 1 | 0 | 4 | 2 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Puerto Rico | 0 | 0 | 3 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 0 |
| United States | 2,665 | 1,210 | 2,734 | 1,106 | 2,542 | 874 | 2,600 | 806 | 2,881 | 748 | 2,478 | 578 | 2,005 | 462 | 1,826 | 358 | 2,246 | 466 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Central and South America | 6 | 2 | 6 | 5 | 9 | 4 | 6 | 3 | 11 | 4 | 8 | 1 | 5 | 3 | 4 | 3 | 11 | 1 |
| Argentina | 1 | 0 | 1 | 0 | 3 | 0 | 0 | 1 | 3 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 3 | 0 |
| Brazil | 2 | 0 | 1 | 1 | 4 | 3 | 2 | 1 | 6 | 3 | 4 | 0 | 4 | 1 | 2 | 2 | 4 | 1 |
| All others | 3 | 2 | 4 | 3 | 2 | 1 | 4 | 1 | 2 | 1 | 3 | 0 | 1 | 0 | 2 | 0 | 4 | 0 |
| Europe | 1,943 | 1,379 | 1,906 | 1,332 | 1,864 | 1,246 | 1,985 | 1,040 | 2,090 | 1,093 | 1,735 | 1,180 | 1,429 | 1,350 | 1,185 | 1,147 | 1,479 | 1,303 |
| EU | 1,824 | 997 | 1,751 | 953 | 1,732 | 910 | 1,843 | 800 | 1,945 | 761 | 1,620 | 786 | 1,305 | 908 | 1,103 | 798 | 1,261 | 945 |
| Austria | 13 | 13 | 18 | 9 | 15 | 6 | 17 | 13 | 13 | 19 | 11 | 12 | 12 | 20 | 10 | 10 | 7 | 7 |
| Belgium | 40 | 8 | 26 | 13 | 34 | 7 | 44 | 9 | 48 | 6 | 12 | 2 | 7 | 2 | 8 | 43 | 14 | 37 |
| Denmark | 44 | 3 | 52 | 2 | 40 | 4 | 50 | 5 | 47 | 3 | 51 | 4 | 37 | 1 | 32 | 1 | 31 | 2 |
| Finland | 7 | 10 | 12 | 15 | 9 | 11 | 12 | 14 | 20 | 6 | 10 | 14 | 13 | 3 | 11 | 7 | 7 | 5 |
| France | 405 | 344 | 414 | 302 | 387 | 307 | 430 | 332 | 469 | 337 | 367 | 336 | 247 | 360 | 222 | 338 | 259 | 502 |
| Germany | 731 | 223 | 651 | 180 | 681 | 183 | 710 | 151 | 770 | 141 | 622 | 142 | 543 | 156 | 405 | 150 | 536 | 168 |
| Hungary | 11 | 10 | 7 | 13 | 11 | 11 | 16 | 4 | 11 | 5 | 18 | 14 | 10 | 10 | 11 | 8 | 12 | 9 |
| Ireland | 2 | 4 | 3 | 2 | 1 | 1 | 5 | 0 | 5 | 0 | 5 | 1 | 3 | 2 | 2 | 0 | 2 | 0 |
| Italy | 139 | 108 | 119 | 167 | 112 | 169 | 102 | 61 | 113 | 105 | 85 | 63 | 77 | 131 | 79 | 52 | 80 | 7 |
| Netherlands | 49 | 33 | 53 | 26 | 51 | 23 | 58 | 38 | 51 | 19 | 47 | 20 | 51 | 12 | 42 | 8 | 45 | 12 |
| Spain | 31 | 43 | 30 | 39 | 18 | 34 | 19 | 28 | 33 | 23 | 36 | 37 | 19 | 46 | 22 | 57 | 36 | 48 |
| Sweden | 20 | 7 | 32 | 10 | 27 | 5 | 40 | 9 | 43 | 6 | 41 | 12 | 24 | 9 | 24 | 4 | 41 | 6 |
| United Kingdom | 317 | 32 | 315 | 19 | 331 | 40 | 323 | 18 | 294 | 17 | 273 | 13 | 211 | 24 | 191 | 18 | 235 | 22 |
| All others | 15 | 159 | 19 | 158 | 14 | 109 | 18 | 117 | 20 | 83 | 20 | 110 | 17 | 135 | 14 | 142 | 27 | 139 |
| Other Europe | 119 | 382 | 154 | 379 | 132 | 336 | 142 | 241 | 145 | 332 | 115 | 294 | 125 | 443 | 82 | 349 | 118 | 358 |
| Former Soviet Union | 1 | 14 | 0 | 15 | 0 | 10 | 3 | 14 | 2 | 13 | 1 | 42 | 2 | 74 | 1 | 32 | 1 | 38 |
| Norway | 5 | 3 | 6 | 2 | 8 | 3 | 5 | 5 | 8 | 4 | 6 | 4 | 8 | 4 | 4 | 4 | 5 | 3 |
| Russia | 14 | 342 | 9 | 338 | 12 | 299 | 10 | 204 | 9 | 297 | 7 | 335 | 7 | 342 | 7 | 302 | 9 | 301 |
| Switzerland | 99 | 19 | 133 | 22 | 109 | 22 | 120 | 15 | 122 | 16 | 98 | 12 | 104 | 11 | 68 | 8 | 99 | 12 |
| All others | 1 | 4 | 6 | 3 | 2 | 2 | 5 | 3 | 4 | 2 | 3 | 2 | 4 | 11 | 3 | 4 | 4 | 4 |
| Asia | 927 | 2,082 | 923 | 2,235 | 875 | 1,748 | 994 | 1,540 | 1,066 | 1,368 | 868 | 1,785 | 760 | 2,727 | 635 | 2,964 | 761 | 4,202 |

| Region, country, or economy | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| World | 4,488 | 6,103 | 4,343 | 5,794 | 4,680 | 5,344 | 5,734 | 5,811 | 5,613 | 7,316 | 6,460 | 9,445 | 7,092 | 9,784 | 7,055 | 10,304 | 6,791 | 11,831 | 5,951 | 12,218 | 5,928 | 10,886 | 5,488 | 10,956 |
| North America | 2,142 | 375 | 2,096 | 397 | 2,244 | 353 | 2,735 | 408 | 2,569 | 360 | 3,000 | 328 | 3,306 | 373 | 3,300 | 411 | 3,145 | 355 | 2,860 | 302 | 2,917 | 234 | 2,649 | 191 |
| Canada | 76 | 25 | 84 | 25 | 100 | 30 | 105 | 28 | 109 | 24 | 102 | 14 | 109 | 14 | 112 | 15 | 101 | 18 | 95 | 20 | 78 | 12 | 74 | 8 |
| Mexico | 4 | 2 | 1 | 1 | 2 | 0 | 2 | 0 | 2 | 0 | 1 | 0 | 3 | 1 | 6 | 0 | 7 | 1 | 5 | 12 | 7 | 13 | 6 | 10 |
| Puerto Rico | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 0 |
| United States | 2,061 | 348 | 2,010 | 371 | 2,142 | 323 | 2,627 | 380 | 2,456 | 336 | 2,895 | 314 | 3,193 | 359 | 3,182 | 395 | 3,057 | 336 | 2,759 | 269 | 2,831 | 209 | 2,567 | 173 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Central and South America | 3 | 3 | 9 | 6 | 10 | 11 | 8 | 12 | 12 | 9 | 16 | 14 | 20 | 16 | 25 | 12 | 22 | 21 | 17 | 30 | 13 | 31 | 16 | 42 |
| Argentina | 1 | 1 | 2 | 1 | 2 | 0 | 1 | 1 | 2 | 0 | 2 | 0 | 3 | 1 | 3 | 0 | 2 | 0 | 2 | 0 | 1 | 0 | 0 | 0 |
| Brazil | 1 | 1 | 4 | 4 | 7 | 1 | 7 | 10 | 9 | 9 | 9 | 11 | 14 | 13 | 16 | 10 | 16 | 19 | 11 | 29 | 8 | 29 | 12 | 40 |
| All others | 1 | 1 | 2 | 2 | 2 | 1 | 0 | 1 | 2 | 0 | 4 | 2 | 3 | 2 | 7 | 1 | 4 | 1 | 4 | 1 | 4 | 2 | 3 | 2 |
| Europe | 1,512 | 1,237 | 1,466 | 1,307 | 1,488 | 1,176 | 1,864 | 1,163 | 1,789 | 1,251 | 1,997 | 1,662 | 2,222 | 1,417 | 2,131 | 1,276 | 1,934 | 1,269 | 1,608 | 1,086 | 1,480 | 1,178 | 1,412 | 1,171 |
| EU | 1,417 | 873 | 1,344 | 878 | 1,355 | 756 | 1,689 | 768 | 1,606 | 834 | 1,815 | 1,164 | 1,996 | 1,031 | 1,951 | 861 | 1,765 | 803 | 1,426 | 781 | 1,297 | 718 | 1,264 | 747 |
| Austria | 15 | 7 | 13 | 7 | 12 | 5 | 23 | 4 | 10 | 4 | 22 | 5 | 24 | 6 | 29 | 5 | 27 | 3 | 20 | 4 | 13 | 1 | 12 | 3 |
| Belgium | 37 | 8 | 37 | 8 | 54 | 9 | 49 | 5 | 69 | 4 | 62 | 7 | 89 | 6 | 91 | 4 | 87 | 4 | 68 | 3 | 59 | 11 | 53 | 11 |
| Denmark | 30 | 3 | 25 | 8 | 33 | 3 | 57 | 3 | 55 | 3 | 52 | 0 | 50 | 3 | 30 | 0 | 36 | 1 | 31 | 1 | 25 | 1 | 32 | 0 |
| Finland | 8 | 7 | 7 | 5 | 9 | 7 | 11 | 6 | 10 | 3 | 9 | 4 | 11 | 5 | 13 | 5 | 13 | 7 | 8 | 8 | 7 | 8 | 13 | 7 |
| France | 297 | 378 | 277 | 395 | 253 | 362 | 310 | 378 | 344 | 413 | 328 | 652 | 410 | 521 | 361 | 420 | 342 | 456 | 282 | 383 | 245 | 271 | 242 | 288 |
| Germany | 483 | 68 | 595 | 62 | 490 | 71 | 414 | 95 | 648 | 67 | 745 | 84 | 779 | 52 | 647 | 65 | 487 | 55 | 440 | 70 | 414 | 95 | 414 | 95 |
| Hungary | 12 | 12 | 20 | 11 | 8 | 10 | 19 | 32 | 16 | 20 | 14 | 3 | 8 | 13 | 14 | 2 | 19 | 8 | 12 | 9 | 15 | 9 | 7 | 9 |
| Ireland | 2 | 0 | 1 | 1 | 3 | 2 | 5 | 2 | 4 | 1 | 4 | 1 | 8 | 1 | 6 | 0 | 4 | 0 | 7 | 1 | 9 | 1 | 6 | 0 |
| Italy | 86 | 10 | 105 | 8 | 88 | 15 | 134 | 24 | 115 | 26 | 132 | 15 | 142 | 8 | 141 | 7 | 131 | 8 | 108 | 9 | 99 | 92 | 85 | 45 |
| Netherlands | 54 | 8 | 56 | 9 | 55 | 6 | 57 | 6 | 61 | 13 | 47 | 4 | 58 | 8 | 70 | 12 | 79 | 4 | 56 | 5 | 48 | 12 | 66 | 4 |
| Spain | 32 | 3 | 43 | 8 | 47 | 52 | 55 | 67 | 53 | 63 | 78 | 60 | 64 | 61 | 56 | 51 | 48 | 45 | 50 | 40 | 45 | 47 | 42 | 33 |
| Sweden | 16 | 4 | 40 | 51 | 47 | 3 | 47 | 3 | 47 | 4 | 54 | 5 | 43 | 1 | 42 | 2 | 34 | 5 | 27 | 3 | 24 | 3 | 27 | 4 |
| United Kingdom | 266 | 13 | 234 | 17 | 229 | 23 | 289 | 21 | 275 | 16 | 326 | 17 | 285 | 12 | 281 | 13 | 255 | 14 | 224 | 13 | 228 | 17 | 234 | 15 |
| All others | 36 | 242 | 17 | 258 | 37 | 191 | 28 | 155 | 56 | 195 | 40 | 310 | 54 | 308 | 38 | 287 | 44 | 184 | 46 | 248 | 41 | 175 | 31 | 232 |
| Other Europe | 358 | 95 | 365 | 122 | 430 | 133 | 420 | 175 | 395 | 184 | 417 | 181 | 498 | 227 | 386 | 181 | 414 | 170 | 466 | 182 | 305 | 184 | 460 | 424 |
| Former Soviet Union | 2 | 50 | 2 | 52 | 1 | 67 | 0 | 54 | 1 | 43 | 4 | 42 | 2 | 46 | 3 | 65 | 2 | 51 | 2 | 40 | 3 | 37 | 1 | 28 |
| Norway | 1 | 4 | 1 | 7 | 2 | 7 | 7 | 1 | 10 | 2 | 10 | 3 | 3 | 1 | 13 | 1 | 14 | 0 | 17 | 1 | 9 | 1 | 13 | 2 |
| Russia | 8 | 295 | 6 | 361 | 9 | 340 | 11 | 322 | 15 | 361 | 7 | 440 | 21 | 326 | 17 | 340 | 16 | 408 | 13 | 252 | 15 | 410 | 18 | 382 |
| Switzerland | 83 | 15 | 106 | 7 | 114 | 8 | 153 | 12 | 151 | 7 | 157 | 7 | 185 | 9 | 144 | 6 | 134 | 4 | 148 | 9 | 149 | 12 | 114 | 8 |
| All others | 2 | 3 | 4 | 8 | 1 | 3 | 4 | 5 | 6 | 4 | 3 | 5 | 4 | 3 | 4 | 3 | 4 | 3 | 3 | 3 | 7 | 1 | 4 | 4 |
| Asia | 765 | 4,435 | 696 | 4,039 | 849 | 3,767 | 1,035 | 4,181 | 1,159 | 5,664 | 1,362 | 7,381 | 1,418 | 7,911 | 1,484 | 8,532 | 1,554 | 10,096 | 1,367 | 10,678 | 1,410 | 9,402 | 1,293 | 9,511 |

**TABLE SB-18**

## USPTO patents and patent families granted in organic fine chemistry, by region, country, or economy: 1998–2018

(Number)

| Region, country, or economy | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| China | 11 | 112 | 9 | 162 | 11 | 309 | 11 | 266 | 13 | 236 | 13 | 466 | 21 | 895 | 17 | 828 | 19 | 1,279 | 23 | 1,267 | 27 | 1,412 | 47 | 1,695 | 76 | 2,019 | 77 | 3,034 | 124 | 4,401 | 174 | 5,070 | 230 | 5,656 | 247 | 7,692 | 278 | 8,178 | 297 | 6,836 | 296 | 7,160 |
| India | 24 | 12 | 39 | 13 | 45 | 14 | 50 | 19 | 84 | 48 | 91 | 61 | 78 | 50 | 75 | 36 | 95 | 43 | 89 | 30 | 95 | 22 | 99 | 21 | 122 | 15 | 131 | 11 | 153 | 12 | 195 | 12 | 189 | 12 | 241 | 13 | 207 | 15 | 231 | 16 | 162 | 2 |
| Japan | 826 | 1,559 | 798 | 1,543 | 728 | 1,188 | 837 | 1,058 | 858 | 799 | 659 | 866 | 561 | 1,259 | 467 | 940 | 554 | 1,181 | 541 | 1,539 | 467 | 1,614 | 575 | 1,464 | 682 | 1,589 | 766 | 1,743 | 860 | 1,891 | 785 | 1,721 | 768 | 1,703 | 766 | 1,336 | 617 | 1,304 | 591 | 1,034 | 538 | 924 |
| Malaysia | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 1 | 3 | 0 | 1 | 4 | 0 | 1 | 2 | 3 | 0 | 7 | 2 | 12 | 4 | 5 | 3 | 7 | 3 | 8 | 3 | 5 | 1 | 10 | 0 | 11 | 1 | 1 |
| Singapore | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 3 | 0 | 2 | 0 | 3 | 2 | 3 | 3 | 2 | 2 | 6 | 4 | 4 | 0 | 8 | 1 | 16 | 1 | 11 | 3 | 20 | 2 | 20 | 1 | 15 | 0 | 16 | 2 | 16 | 0 |
| South Korea | 44 | 369 | 51 | 489 | 68 | 206 | 64 | 143 | 82 | 244 | 77 | 366 | 66 | 472 | 52 | 1,121 | 57 | 1,661 | 82 | 1,548 | 73 | 945 | 82 | 484 | 102 | 503 | 122 | 790 | 142 | 987 | 164 | 949 | 186 | 1,022 | 183 | 913 | 188 | 1,031 | 202 | 1,387 | 210 | 1,354 |
| Taiwan | 20 | 30 | 23 | 26 | 19 | 29 | 30 | 54 | 27 | 40 | 23 | 26 | 28 | 51 | 21 | 36 | 30 | 36 | 24 | 42 | 26 | 38 | 37 | 95 | 47 | 47 | 52 | 67 | 59 | 80 | 83 | 147 | 87 | 125 | 87 | 134 | 58 | 134 | 67 | 110 | 64 | 66 |
| All others | 1 | 1 | 2 | 2 | 3 | 1 | 3 | 0 | 2 | 1 | 1 | 1 | 3 | 0 | 1 | 2 | 2 | 1 | 1 | 2 | 4 | 3 | 1 | 2 | 1 | 1 | 1 | 6 | 4 | 4 | 3 | 3 | 2 | 5 | 7 | 3 | 3 | 5 | 6 | 6 | 6 | 5 |
| Middle East | 18 | 5 | 17 | 8 | 24 | 12 | 32 | 8 | 44 | 10 | 46 | 10 | 35 | 7 | 32 | 2 | 51 | 8 | 47 | 7 | 59 | 10 | 61 | 4 | 60 | 8 | 42 | 3 | 45 | 6 | 64 | 14 | 74 | 12 | 64 | 8 | 56 | 14 | 68 | 18 | 82 | 26 |
| Israel | 17 | 4 | 16 | 6 | 19 | 6 | 28 | 6 | 40 | 5 | 42 | 8 | 35 | 4 | 31 | 0 | 47 | 3 | 42 | 3 | 56 | 6 | 60 | 1 | 57 | 3 | 38 | 2 | 40 | 0 | 52 | 3 | 55 | 1 | 42 | 1 | 34 | 0 | 33 | 2 | 32 | 1 |
| All others | 1 | 1 | 0 | 2 | 5 | 6 | 3 | 2 | 4 | 5 | 3 | 2 | 1 | 4 | 1 | 1 | 4 | 4 | 5 | 4 | 3 | 4 | 1 | 3 | 3 | 5 | 5 | 1 | 5 | 6 | 12 | 11 | 19 | 11 | 23 | 7 | 22 | 14 | 35 | 16 | 50 | 25 |
| Africa | 2 | 20 | 3 | 36 | 4 | 16 | 3 | 11 | 5 | 17 | 5 | 16 | 5 | 16 | 3 | 10 | 2 | 11 | 2 | 13 | 4 | 8 | 6 | 9 | 4 | 11 | 8 | 4 | 3 | 5 | 11 | 7 | 3 | 3 | 7 | 5 | 9 | 4 | 6 | 2 | 3 | 2 |
| South Africa | 2 | 17 | 3 | 35 | 3 | 13 | 3 | 5 | 5 | 11 | 5 | 8 | 5 | 12 | 3 | 6 | 1 | 11 | 2 | 9 | 2 | 5 | 5 | 7 | 3 | 7 | 6 | 1 | 2 | 0 | 8 | 1 | 1 | 0 | 5 | 0 | 7 | 0 | 5 | 0 | 1 | 0 |
| All others | 0 | 2 | 0 | 1 | 1 | 3 | 0 | 5 | 0 | 6 | 0 | 8 | 0 | 5 | 0 | 4 | 1 | 0 | 1 | 5 | 2 | 3 | 1 | 1 | 1 | 4 | 2 | 3 | 0 | 5 | 2 | 6 | 1 | 5 | 2 | 5 | 2 | 4 | 1 | 2 | 2 | 2 |
| Australia and Oceania | 15 | 12 | 11 | 11 | 14 | 17 | 20 | 20 | 19 | 31 | 20 | 14 | 19 | 11 | 15 | 14 | 23 | 13 | 17 | 29 | 14 | 26 | 23 | 19 | 27 | 25 | 33 | 24 | 38 | 48 | 48 | 45 | 35 | 58 | 43 | 77 | 34 | 94 | 33 | 21 | 32 | 11 |
| Australia | 13 | 12 | 8 | 11 | 8 | 17 | 14 | 20 | 17 | 31 | 17 | 14 | 15 | 11 | 14 | 14 | 16 | 13 | 13 | 29 | 12 | 26 | 18 | 18 | 20 | 25 | 26 | 24 | 32 | 48 | 43 | 45 | 30 | 57 | 36 | 77 | 29 | 94 | 28 | 20 | 25 | 11 |
| New Zealand | 2 | 0 | 3 | 0 | 6 | 0 | 4 | 0 | 2 | 0 | 3 | 0 | 4 | 0 | 1 | 0 | 7 | 0 | 4 | 0 | 2 | 0 | 5 | 0 | 8 | 0 | 7 | 0 | 5 | 0 | 5 | 0 | 5 | 0 | 7 | 0 | 5 | 0 | 5 | 0 | 6 | 0 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Unclassified | 2 | 11 | 2 | 117 | 2 | 56 | 1 | 8 | 2 | 4 | 0 | 1 | 0 | 2 | 0 | 10 | 0 | 29 | 0 | 3 | 0 | 1 | 0 | 5 | 0 | 2 | 0 | 1 | 1 | 1 | 2 | 0 | 1 | 2 | 0 | 0 | 1 | 10 | 1 | 0 | 1 | 1 |

EU = European Union; USPTO = U.S. Patent and Trademark Office.

**Note(s)**

USPTO patents are allocated according to patent inventorship information. USPTO patents are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named inventors. Patents are classified under the World Intellectual Property Organization (WIPO) classification of patents, which classifies International Patent Classification (IPC) codes under 35 technical fields. IPC reformed codes take into account changes that were made to the WIPO classification in 2006 under the eighth version of the classification and were used to prepare these data. However, because PatentsView only provides the original IPC codes as they appeared on patents and not the IPC reformed codes, current Cooperative Patent Classification codes on patents were converted back to the most recent IPC classification to prepare these statistics. Fractional counts of patents were assigned to each technological field on patents to assign the proper weight of a patent to the corresponding technological fields under the classification. International Patent Documentation (INPADOC) patent families across all patent offices covered in the Worldwide Patent Statistical Database (PATSTAT) are counted according to the year of the first granted patent in the patent family. Patent families are allocated according to patent inventorship information found on the priority patent of the INPADOC patent families. To account for missing ownership information in PATSTAT for some offices, a method designed by de Rassenfosse et al. (2012) is used to fill in missing information on priority patents using information in successive filings within the patent families (see technical documentation for details). Patent families are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named inventors. Because of data coverage issues for some patent offices in PATSTAT, statistics for some countries may be underestimated partially for some years or across the whole trend. Countries with identified issues include India (missing data) and South Africa (no data for 2018). For Italy, because of data gaps regarding information on granted patents, patent applications are used instead, which slightly overestimates Italy's output and creates a small shift in the year for which its output is accounted. The EU includes 28 member countries. China includes Hong Kong.

**Source(s)**

Science-Metrix; PATSTAT, accessed April 2019; PatentsView, USPTO, accessed June 2019.

TABLE S8-19

## USPTO patents and patent families granted in biotechnology, by region, country, or economy: 1998–2018

(Number)

| Region, country, or economy | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| World | 4,260 | 3,060 | 4,315 | 2,987 | 3,713 | 2,660 | 4,216 | 2,021 | 3,830 | 1,796 | 3,472 | 2,754 | 3,039 | 3,245 | 2,654 | 3,519 | 3,686 | 4,011 | 3,697 | 3,674 | 3,377 | 3,591 | 3,526 | 3,359 | 4,526 | 4,434 | 4,654 | 5,702 | 4,791 | 7,784 | 5,043 | 9,118 | 5,589 | 8,800 | 5,593 | 8,355 | 5,732 | 8,153 | 5,941 | 7,440 | 5,950 | 8,497 |
| North America | 2,862 | 1,365 | 2,911 | 1,193 | 2,522 | 869 | 2,791 | 735 | 2,614 | 615 | 2,304 | 429 | 1,985 | 333 | 1,709 | 261 | 2,346 | 363 | 2,378 | 335 | 2,108 | 325 | 2,247 | 336 | 2,785 | 350 | 2,769 | 352 | 2,874 | 409 | 2,982 | 418 | 3,224 | 392 | 3,226 | 439 | 3,288 | 392 | 3,526 | 443 | 3,484 | 378 |
| Canada | 105 | 57 | 131 | 65 | 130 | 46 | 142 | 38 | 139 | 31 | 102 | 16 | 98 | 14 | 69 | 11 | 119 | 16 | 126 | 18 | 101 | 20 | 111 | 16 | 124 | 18 | 131 | 19 | 145 | 20 | 136 | 30 | 115 | 21 | 132 | 35 | 121 | 28 | 136 | 32 | 134 | 33 |
| Mexico | 3 | 2 | 2 | 1 | 3 | 0 | 4 | 1 | 2 | 0 | 2 | 0 | 2 | 1 | 1 | 2 | 1 | 0 | 0 | 0 | 1 | 0 | 3 | 1 | 4 | 0 | 2 | 0 | 5 | 0 | 5 | 0 | 4 | 0 | 2 | 2 | 4 | 19 | 4 | 25 | 4 | 15 |
| Puerto Rico | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 2 | 0 | 1 | 0 |
| United States | 2,753 | 1,306 | 2,779 | 1,127 | 2,389 | 823 | 2,645 | 696 | 2,473 | 583 | 2,199 | 412 | 1,885 | 318 | 1,638 | 249 | 2,226 | 347 | 2,251 | 316 | 2,007 | 305 | 2,133 | 319 | 2,656 | 332 | 2,635 | 333 | 2,724 | 388 | 2,841 | 388 | 3,105 | 370 | 3,091 | 401 | 3,161 | 345 | 3,385 | 386 | 3,346 | 330 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Central and South America | 7 | 4 | 3 | 5 | 4 | 4 | 7 | 2 | 2 | 7 | 2 | 8 | 2 | 8 | 6 | 4 | 2 | 15 | 2 | 12 | 6 | 9 | 3 | 13 | 9 | 16 | 7 | 14 | 7 | 18 | 3 | 19 | 17 | 20 | 22 | 31 | 17 | 23 | 21 | 22 | 22 | 27 | 30 |
| Argentina | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 3 | 1 | 0 | 0 | 5 | 0 | 2 | 3 | 1 | 2 | 4 | 2 | 5 | 1 | 3 | 1 | 1 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 4 | 1 | 3 | 2 | 8 | 1 |
| Brazil | 1 | 1 | 1 | 1 | 2 | 2 | 4 | 1 | 3 | 0 | 4 | 1 | 4 | 3 | 2 | 1 | 7 | 0 | 6 | 2 | 3 | 1 | 4 | 5 | 6 | 5 | 5 | 5 | 9 | 1 | 9 | 5 | 11 | 7 | 18 | 18 | 12 | 11 | 19 | 10 | 18 | 11 |
| All others | 5 | 3 | 1 | 2 | 2 | 2 | 2 | 1 | 1 | 4 | 1 | 3 | 1 | 2 | 2 | 1 | 3 | 1 | 4 | 1 | 4 | 0 | 5 | 2 | 6 | 2 | 6 | 2 | 7 | 1 | 9 | 5 | 11 | 3 | 10 | 4 | 9 | 1 | 9 | 2 | 9 | 1 |
| Europe | 807 | 662 | 868 | 612 | 747 | 588 | 877 | 470 | 736 | 559 | 717 | 1,280 | 623 | 1,194 | 536 | 1,321 | 675 | 1,190 | 713 | 643 | 671 | 642 | 686 | 655 | 914 | 778 | 970 | 824 | 1,011 | 808 | 1,068 | 763 | 1,262 | 764 | 1,286 | 933 | 1,324 | 757 | 1,264 | 819 | 1,296 | 807 |
| EU | 747 | 404 | 817 | 429 | 687 | 395 | 815 | 325 | 678 | 379 | 668 | 398 | 581 | 464 | 493 | 391 | 625 | 409 | 653 | 396 | 613 | 281 | 628 | 337 | 831 | 389 | 884 | 444 | 932 | 466 | 985 | 442 | 1,145 | 395 | 1,188 | 511 | 1,211 | 470 | 1,152 | 458 | 1,191 | 423 |
| Austria | 22 | 13 | 16 | 12 | 18 | 12 | 17 | 17 | 16 | 12 | 14 | 22 | 10 | 11 | 13 | 10 | 9 | 11 | 16 | 16 | 11 | 16 | 18 | 12 | 21 | 14 | 27 | 11 | 22 | 7 | 35 | 10 | 46 | 7 | 38 | 5 | 41 | 6 | 35 | 7 | 42 | 8 |
| Belgium | 40 | 8 | 48 | 8 | 42 | 5 | 39 | 5 | 41 | 3 | 32 | 6 | 35 | 7 | 23 | 4 | 29 | 6 | 42 | 7 | 32 | 4 | 37 | 3 | 45 | 3 | 46 | 5 | 34 | 4 | 50 | 4 | 50 | 1 | 50 | 1 | 58 | 3 | 71 | 7 | 64 | 11 |
| Denmark | 57 | 5 | 62 | 9 | 59 | 7 | 68 | 4 | 47 | 3 | 58 | 4 | 30 | 0 | 30 | 3 | 44 | 1 | 38 | 0 | 38 | 3 | 38 | 2 | 63 | 1 | 82 | 1 | 77 | 2 | 98 | 3 | 112 | 8 | 95 | 5 | 108 | 1 | 79 | 2 | 91 | 2 |
| Finland | 20 | 8 | 22 | 12 | 10 | 10 | 14 | 10 | 10 | 8 | 9 | 7 | 11 | 9 | 10 | 9 | 12 | 7 | 10 | 5 | 16 | 4 | 13 | 6 | 21 | 9 | 16 | 7 | 14 | 4 | 12 | 5 | 17 | 6 | 18 | 5 | 27 | 8 | 20 | 10 | 20 | 8 |
| France | 130 | 95 | 131 | 92 | 116 | 74 | 141 | 101 | 107 | 110 | 127 | 138 | 85 | 175 | 87 | 85 | 106 | 93 | 104 | 105 | 95 | 56 | 92 | 51 | 114 | 65 | 130 | 80 | 146 | 115 | 156 | 95 | 174 | 73 | 186 | 90 | 201 | 104 | 188 | 76 | 179 | 77 |
| Germany | 179 | 94 | 187 | 105 | 158 | 88 | 212 | 61 | 174 | 96 | 195 | 83 | 188 | 79 | 142 | 115 | 193 | 165 | 187 | 122 | 190 | 88 | 177 | 85 | 251 | 81 | 243 | 91 | 266 | 101 | 260 | 100 | 313 | 88 | 332 | 147 | 293 | 104 | 300 | 96 | 316 | 88 |
| Hungary | 4 | 6 | 2 | 2 | 1 | 0 | 5 | 3 | 4 | 6 | 5 | 3 | 7 | 1 | 3 | 1 | 3 | 1 | 3 | 1 | 1 | 1 | 1 | 4 | 3 | 5 | 2 | 7 | 4 | 1 | 1 | 2 | 3 | 2 | 5 | 3 | 8 | 4 | 6 | 3 | 2 | 1 |
| Ireland | 1 | 2 | 4 | 1 | 2 | 2 | 4 | 1 | 2 | 0 | 3 | 2 | 4 | 0 | 2 | 1 | 4 | 0 | 3 | 1 | 2 | 0 | 5 | 0 | 7 | 0 | 8 | 0 | 5 | 0 | 8 | 1 | 6 | 1 | 9 | 1 | 10 | 0 | 9 | 1 | 9 | 0 |
| Italy | 32 | 50 | 42 | 68 | 22 | 67 | 21 | 24 | 26 | 40 | 20 | 23 | 13 | 68 | 17 | 21 | 27 | 6 | 22 | 12 | 25 | 9 | 24 | 15 | 45 | 22 | 41 | 25 | 45 | 14 | 52 | 6 | 48 | 4 | 57 | 15 | 58 | 5 | 62 | 44 | 62 | 49 |
| Netherlands | 60 | 22 | 61 | 20 | 66 | 20 | 56 | 12 | 52 | 7 | 39 | 13 | 40 | 11 | 43 | 10 | 43 | 9 | 47 | 5 | 46 | 7 | 54 | 9 | 58 | 14 | 70 | 11 | 67 | 12 | 79 | 20 | 109 | 18 | 101 | 29 | 115 | 25 | 119 | 18 | 116 | 15 |
| Spain | 8 | 27 | 10 | 30 | 9 | 36 | 10 | 37 | 8 | 26 | 7 | 38 | 8 | 42 | 8 | 77 | 10 | 51 | 12 | 46 | 14 | 30 | 15 | 71 | 15 | 105 | 19 | 109 | 28 | 96 | 22 | 85 | 38 | 79 | 35 | 91 | 27 | 62 | 31 | 46 | 46 | 43 |
| Sweden | 36 | 9 | 38 | 10 | 27 | 10 | 40 | 6 | 40 | 9 | 37 | 14 | 36 | 8 | 24 | 6 | 28 | 5 | 35 | 5 | 34 | 2 | 25 | 3 | 31 | 3 | 38 | 3 | 44 | 6 | 38 | 2 | 53 | 4 | 48 | 7 | 43 | 2 | 53 | 5 | 49 | 6 |
| United Kingdom | 150 | 22 | 185 | 23 | 149 | 19 | 179 | 12 | 145 | 15 | 120 | 19 | 109 | 13 | 86 | 15 | 109 | 11 | 125 | 12 | 102 | 15 | 119 | 9 | 138 | 10 | 147 | 14 | 162 | 8 | 154 | 14 | 157 | 9 | 193 | 16 | 183 | 15 | 175 | 13 | 182 | 10 |
| All others | 7 | 41 | 9 | 35 | 8 | 44 | 10 | 34 | 6 | 43 | 2 | 26 | 5 | 40 | 5 | 33 | 8 | 42 | 9 | 59 | 7 | 47 | 11 | 67 | 18 | 57 | 14 | 79 | 11 | 96 | 21 | 94 | 18 | 91 | 21 | 104 | 39 | 133 | 21 | 110 | 25 | 108 |
| Other Europe | 59 | 258 | 51 | 183 | 60 | 193 | 63 | 144 | 57 | 180 | 48 | 882 | 41 | 730 | 43 | 930 | 51 | 781 | 60 | 247 | 58 | 361 | 58 | 319 | 83 | 399 | 86 | 380 | 79 | 342 | 83 | 321 | 116 | 370 | 99 | 422 | 113 | 287 | 111 | 361 | 105 | 384 |
| Former Soviet Union | 0 | 18 | 0 | 7 | 0 | 7 | 1 | 11 | 1 | 13 | 1 | 34 | 2 | 8 | 1 | 96 | 0 | 27 | 1 | 19 | 2 | 26 | 1 | 34 | 0 | 35 | 1 | 40 | 1 | 40 | 1 | 23 | 2 | 36 | 1 | 28 | 1 | 42 | 2 | 39 | 1 | 29 | 1 |
| Norway | 5 | 1 | 9 | 1 | 8 | 2 | 6 | 2 | 3 | 2 | 7 | 7 | 8 | 1 | 5 | 1 | 4 | 2 | 7 | 0 | 6 | 2 | 10 | 1 | 9 | 1 | 11 | 4 | 11 | 1 | 13 | 2 | 6 | 0 | 17 | 1 | 18 | 2 | 19 | 1 | 14 | 2 |
| Russia | 11 | 230 | 5 | 163 | 9 | 174 | 7 | 114 | 12 | 154 | 6 | 829 | 7 | 626 | 10 | 895 | 9 | 753 | 17 | 213 | 16 | 318 | 15 | 277 | 20 | 341 | 25 | 332 | 14 | 313 | 15 | 280 | 17 | 335 | 12 | 371 | 18 | 238 | 12 | 325 | 12 | 344 |
| Switzerland | 43 | 9 | 36 | 11 | 42 | 9 | 47 | 15 | 38 | 10 | 31 | 11 | 23 | 7 | 26 | 5 | 35 | 7 | 31 | 7 | 29 | 7 | 29 | 4 | 50 | 4 | 49 | 3 | 51 | 4 | 50 | 2 | 74 | 7 | 66 | 7 | 73 | 8 | 75 | 5 | 77 | 8 |
| All others | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 3 | 1 | 3 | 1 | 1 | 0 | 2 | 2 | 2 | 0 | 3 | 1 | 5 | 0 | 4 | 1 | 4 | 2 | 1 | 0 | 3 | 1 | 3 | 2 | 8 | 1 | 3 | 1 | 2 | 0 | 3 | 0 | 1 | 2 |
| Asia | 492 | 981 | 426 | 1,118 | 362 | 1,138 | 438 | 765 | 376 | 548 | 369 | 998 | 360 | 1,664 | 354 | 1,887 | 547 | 2,415 | 511 | 2,638 | 506 | 2,540 | 472 | 2,303 | 683 | 3,248 | 749 | 4,458 | 731 | 6,479 | 787 | 7,839 | 900 | 7,500 | 868 | 6,817 | 909 | 6,791 | 938 | 6,116 | 957 | 7,250 |

**TABLE SB-19**

## USPTO patents and patent families granted in biotechnology, by region, country, or economy: 1998–2018

(Number)

| Region, country, or economy | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| China | 7 | 33 | 3 | 32 | 6 | 121 | 8 | 148 | 13 | 79 | 12 | 275 | 13 | 549 | 17 | 603 | 26 | 881 | 37 | 945 | 28 | 1,001 | 27 | 1,108 | 46 | 1,773 | 45 | 2,728 | 59 | 4,489 | 81 | 5,582 | 99 | 5,144 | 98 | 4,803 | 131 | 4,784 | 150 | 3,994 | 174 | 5,271 |
| India | 6 | 3 | 4 | 4 | 8 | 4 | 12 | 6 | 19 | 16 | 29 | 20 | 22 | 15 | 19 | 7 | 27 | 15 | 27 | 14 | 23 | 14 | 21 | 5 | 33 | 5 | 24 | 4 | 30 | 6 | 21 | 9 | 37 | 7 | 37 | 5 | 45 | 4 | 50 | 2 | 52 | 3 |
| Japan | 440 | 678 | 367 | 657 | 308 | 741 | 341 | 450 | 283 | 248 | 271 | 351 | 275 | 423 | 261 | 408 | 368 | 506 | 347 | 528 | 361 | 610 | 308 | 709 | 425 | 791 | 511 | 836 | 433 | 754 | 457 | 784 | 488 | 710 | 472 | 715 | 450 | 641 | 391 | 501 | 376 | 539 |
| Malaysia | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 3 | 9 | 2 | 1 | 2 | 5 | 5 | 15 | 3 | 12 | 4 | 14 | 4 | 8 | 7 | 20 | 3 | 15 | 3 | 18 | 2 | 23 | 4 | 12 |
| Singapore | 4 | 3 | 3 | 0 | 3 | 0 | 3 | 1 | 1 | 0 | 4 | 0 | 4 | 3 | 4 | 0 | 9 | 1 | 7 | 1 | 7 | 1 | 8 | 3 | 8 | 3 | 9 | 2 | 19 | 1 | 20 | 1 | 28 | 4 | 28 | 1 | 35 | 1 | 32 | 0 | 43 | 2 |
| South Korea | 18 | 250 | 33 | 405 | 24 | 255 | 43 | 129 | 34 | 179 | 36 | 324 | 27 | 632 | 35 | 822 | 74 | 957 | 61 | 1,068 | 47 | 857 | 62 | 411 | 102 | 579 | 104 | 795 | 110 | 1,093 | 132 | 1,269 | 160 | 1,458 | 156 | 1,133 | 176 | 1,176 | 229 | 1,445 | 228 | 1,326 |
| Taiwan | 16 | 14 | 14 | 18 | 11 | 16 | 29 | 29 | 25 | 25 | 16 | 27 | 18 | 40 | 17 | 47 | 40 | 53 | 30 | 69 | 35 | 53 | 42 | 61 | 60 | 79 | 51 | 78 | 75 | 115 | 69 | 180 | 80 | 150 | 70 | 138 | 65 | 162 | 74 | 145 | 69 | 91 |
| All others | 0 | 1 | 2 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 2 | 1 | 0 | 3 | 2 | 1 | 3 | 3 | 2 | 1 | 1 | 4 | 3 | 3 | 3 | 2 | 6 | 3 | 6 | 1 | 9 | 3 | 7 | 4 | 4 | 10 | 5 | 11 | 6 |
| Middle East | 35 | 11 | 43 | 10 | 30 | 8 | 35 | 14 | 34 | 11 | 39 | 9 | 26 | 5 | 16 | 3 | 38 | 3 | 37 | 6 | 32 | 4 | 46 | 4 | 53 | 3 | 66 | 8 | 72 | 5 | 86 | 5 | 89 | 6 | 96 | 4 | 96 | 6 | 111 | 7 | 103 | 6 |
| Israel | 35 | 9 | 42 | 10 | 30 | 6 | 34 | 12 | 34 | 10 | 39 | 9 | 26 | 4 | 16 | 1 | 38 | 2 | 36 | 6 | 32 | 3 | 46 | 3 | 53 | 2 | 65 | 3 | 68 | 1 | 83 | 2 | 81 | 2 | 90 | 3 | 89 | 2 | 102 | 2 | 89 | 2 |
| All others | 0 | 2 | 1 | 1 | 0 | 2 | 1 | 2 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 5 | 4 | 4 | 2 | 3 | 8 | 4 | 6 | 2 | 7 | 4 | 9 | 4 | 14 | 4 |
| Africa | 1 | 6 | 3 | 8 | 3 | 4 | 4 | 2 | 3 | 4 | 2 | 8 | 1 | 6 | 0 | 8 | 2 | 6 | 2 | 3 | 2 | 21 | 3 | 23 | 3 | 12 | 5 | 4 | 4 | 4 | 2 | 5 | 4 | 8 | 11 | 6 | 10 | 6 | 5 | 4 | 5 | 7 |
| South Africa | 1 | 5 | 1 | 7 | 1 | 3 | 2 | 2 | 2 | 1 | 1 | 5 | 1 | 3 | 0 | 4 | 1 | 5 | 1 | 2 | 1 | 14 | 2 | 12 | 2 | 7 | 3 | 1 | 4 | 0 | 4 | 0 | 3 | 0 | 8 | 2 | 8 | 0 | 4 | 0 | 2 | 0 |
| All others | 0 | 1 | 1 | 2 | 1 | 1 | 2 | 0 | 1 | 3 | 1 | 3 | 0 | 3 | 0 | 4 | 1 | 1 | 1 | 0 | 1 | 7 | 1 | 10 | 1 | 4 | 1 | 4 | 1 | 2 | 5 | 1 | 7 | 2 | 4 | 1 | 6 | 1 | 4 | 3 | 7 |
| Australia and Oceania | 55 | 24 | 60 | 21 | 44 | 23 | 64 | 32 | 58 | 58 | 34 | 26 | 36 | 36 | 35 | 36 | 62 | 32 | 44 | 44 | 49 | 54 | 60 | 28 | 70 | 36 | 82 | 49 | 81 | 75 | 95 | 70 | 90 | 106 | 74 | 137 | 79 | 180 | 74 | 29 | 76 | 19 |
| Australia | 51 | 22 | 53 | 18 | 39 | 22 | 60 | 31 | 46 | 55 | 28 | 26 | 27 | 35 | 32 | 36 | 50 | 31 | 37 | 44 | 42 | 54 | 48 | 28 | 57 | 36 | 66 | 48 | 66 | 74 | 79 | 70 | 69 | 105 | 59 | 135 | 63 | 179 | 61 | 28 | 64 | 19 |
| New Zealand | 3 | 1 | 7 | 2 | 6 | 1 | 4 | 1 | 11 | 3 | 5 | 0 | 8 | 0 | 3 | 1 | 12 | 1 | 7 | 0 | 7 | 0 | 11 | 0 | 13 | 0 | 16 | 1 | 14 | 1 | 16 | 0 | 21 | 1 | 15 | 2 | 16 | 1 | 13 | 0 | 12 | 0 |
| All others | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Unclassified | 1 | 7 | 2 | 21 | 0 | 26 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 2 | 1 | 2 | 2 | 0 | 1 | 0 | 2 | 0 |

EU = European Union; USPTO = U.S. Patent and Trademark Office.

**Note(s)**

USPTO patents are allocated according to patent inventorship information. USPTO patents are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named inventors. Patents are classified under the World Intellectual Property Organization (WIPO) classification of patents, which classifies International Patent Classification (IPC) codes under 35 technical fields. IPC reformed codes take into account changes that were made to the WIPO classification in 2006 under the eighth version of the classification and were used to prepare these data. However, because PatentsView only provides the original IPC codes as they appeared on patents and not the IPC reformed codes, current Cooperative Patent Classification codes on patents were converted back to the most recent IPC classification to prepare these statistics. Fractional counts of patents were assigned to each technological field on patents to assign the proper weight of a patent to the corresponding technological fields under the classification. International Patent Documentation (INPADOC) patent families across all patent offices covered in the Worldwide Patent Statistical Database (PATSTAT) are counted according to the year of the first granted patent in the patent family. Patent families are allocated according to patent inventorship information found on the priority patent of the INPADOC patent families. To account for missing ownership information in PATSTAT for some offices, a method designed by de Rassenfosse et al. (2012) is used to fill in missing information on priority patents using information in successive filings within the patent families (see technical documentation for details). Patent families are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named inventors. Because of data coverage issues for some patent offices in PATSTAT, statistics for some countries may be underestimated partially for some years or across the whole trend. Countries with identified issues include India (missing data) and South Africa (no data for 2018). For Italy, because of data gaps regarding information on granted patents, patent applications are used instead, which slightly overestimates Italy's output and creates a small shift in the year for which its output is accounted. The EU includes 28 member countries. China includes Hong Kong.

**Source(s)**

Science-Metrix; PATSTAT, accessed April 2019; PatentsView, USPTO, accessed June 2019.

TABLE S8-20

## USPTO patents and patent families granted in pharmaceuticals, by region, country, or economy: 1998–2018

(Number)

| Region, country, or economy | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| World | 3,979 | 3,623 | 4,247 | 3,682 | 3,931 | 4,297 | 4,238 | 3,859 | 4,289 | 3,574 | 3,957 | 4,102 | 2,925 | 5,297 | 2,581 | 5,045 |
| North America | 2,735 | 1,350 | 2,886 | 1,207 | 2,645 | 953 | 2,804 | 901 | 2,880 | 719 | 2,590 | 586 | 1,910 | 418 | 1,665 | 293 |
| Canada | 137 | 64 | 143 | 50 | 134 | 50 | 133 | 43 | 148 | 31 | 136 | 26 | 109 | 20 | 84 | 12 |
| Mexico | 1 | 1 | 2 | 1 | 4 | 2 | 2 | 1 | 0 | 0 | 5 | 0 | 2 | 1 | 2 | 0 |
| Puerto Rico | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| United States | 2,597 | 1,286 | 2,741 | 1,156 | 2,507 | 902 | 2,668 | 858 | 2,731 | 688 | 2,449 | 560 | 1,799 | 397 | 1,579 | 280 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Central and South America | 12 | 6 | 10 | 9 | 10 | 4 | 11 | 8 | 19 | 8 | 16 | 8 | 8 | 12 | 6 | 6 |
| Argentina | 6 | 3 | 5 | 3 | 4 | 2 | 7 | 3 | 7 | 3 | 9 | 2 | 4 | 2 | 1 | 2 |
| Brazil | 0 | 1 | 2 | 3 | 3 | 2 | 1 | 5 | 2 | 3 | 5 | 4 | 1 | 6 | 2 | 2 |
| All others | 5 | 2 | 3 | 3 | 3 | 1 | 3 | 1 | 10 | 2 | 2 | 2 | 3 | 3 | 2 | 2 |
| Europe | 825 | 1,380 | 882 | 1,403 | 876 | 1,418 | 914 | 1,080 | 873 | 1,531 | 870 | 1,686 | 638 | 2,207 | 552 | 1,427 |
| EU | 751 | 603 | 813 | 618 | 807 | 654 | 839 | 540 | 806 | 592 | 805 | 601 | 589 | 723 | 504 | 595 |
| Austria | 21 | 10 | 23 | 16 | 13 | 9 | 13 | 17 | 15 | 21 | 11 | 18 | 8 | 8 | 11 | 16 |
| Belgium | 30 | 6 | 35 | 8 | 36 | 7 | 29 | 6 | 42 | 6 | 31 | 5 | 33 | 6 | 22 | 5 |
| Denmark | 30 | 7 | 34 | 5 | 22 | 5 | 34 | 1 | 24 | 4 | 33 | 2 | 25 | 1 | 21 | 4 |
| Finland | 16 | 8 | 18 | 8 | 15 | 14 | 16 | 10 | 15 | 10 | 14 | 9 | 12 | 8 | 10 | 7 |
| France | 136 | 191 | 125 | 162 | 134 | 166 | 143 | 197 | 124 | 183 | 150 | 216 | 87 | 268 | 84 | 181 |
| Germany | 172 | 210 | 118 | 212 | 116 | 222 | 71 | 206 | 93 | 219 | 72 | 80 | 162 | 82 | 132 | 81 |
| Hungary | 5 | 7 | 4 | 6 | 4 | 7 | 4 | 3 | 8 | 6 | 7 | 9 | 5 | 2 | 4 | 5 |
| Ireland | 3 | 5 | 3 | 1 | 9 | 2 | 4 | 1 | 6 | 1 | 6 | 1 | 7 | 1 | 7 | 1 |
| Italy | 61 | 77 | 69 | 124 | 65 | 136 | 79 | 77 | 67 | 106 | 60 | 70 | 49 | 156 | 42 | 68 |
| Netherlands | 29 | 14 | 36 | 16 | 30 | 12 | 32 | 15 | 33 | 18 | 31 | 25 | 28 | 12 | 28 | 11 |
| Spain | 15 | 35 | 8 | 29 | 8 | 45 | 8 | 35 | 17 | 25 | 14 | 47 | 10 | 43 | 7 | 75 |
| Sweden | 60 | 17 | 59 | 22 | 62 | 20 | 55 | 15 | 66 | 20 | 62 | 14 | 37 | 21 | 35 | 10 |
| United Kingdom | 167 | 26 | 176 | 23 | 191 | 38 | 186 | 26 | 176 | 25 | 151 | 19 | 115 | 23 | 95 | 24 |
| All others | 6 | 72 | 15 | 79 | 8 | 78 | 15 | 66 | 8 | 73 | 16 | 87 | 10 | 93 | 6 | 108 |
| Other Europe | 74 | 776 | 69 | 785 | 69 | 765 | 74 | 540 | 68 | 939 | 65 | 1,085 | 49 | 1,484 | 48 | 831 |
| Former Soviet Union | 1 | 42 | 0 | 53 | 0 | 38 | 1 | 42 | 2 | 73 | 1 | 170 | 0 | 608 | 0 | 115 |
| Norway | 10 | 5 | 10 | 2 | 16 | 4 | 15 | 9 | 7 | 5 | 9 | 3 | 7 | 2 | 8 | 4 |
| Russia | 12 | 708 | 14 | 703 | 8 | 703 | 9 | 469 | 11 | 836 | 8 | 895 | 5 | 858 | 7 | 699 |
| Switzerland | 47 | 18 | 39 | 24 | 40 | 17 | 47 | 17 | 44 | 22 | 40 | 14 | 36 | 12 | 31 | 10 |
| All others | 2 | 4 | 5 | 3 | 5 | 2 | 3 | 3 | 4 | 3 | 7 | 3 | 2 | 4 | 2 | 3 |
| Asia | 308 | 816 | 345 | 985 | 304 | 1,831 | 400 | 1,767 | 388 | 1,174 | 363 | 1,736 | 285 | 2,560 | 281 | 3,239 |

| Region, country, or economy | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| World | 3,243 | 6,722 | 2,696 | 6,724 | 2,690 | 6,404 | 2,730 | 6,583 | 3,979 | 7,617 | 4,012 | 11,216 | 4,739 | 11,888 | 5,758 | 11,996 |
| North America | 2,088 | 323 | 1,719 | 272 | 1,675 | 239 | 1,697 | 221 | 2,480 | 291 | 2,447 | 245 | 2,892 | 278 | 3,433 | 264 |
| Canada | 104 | 19 | 91 | 16 | 97 | 21 | 96 | 18 | 127 | 24 | 133 | 21 | 112 | 15 | 146 | 14 |
| Mexico | 2 | 0 | 1 | 0 | 1 | 0 | 3 | 2 | 4 | 1 | 4 | 3 | 6 | 0 | 9 | 4 |
| Puerto Rico | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 2 | 0 | 0 | 2 | 0 | 0 |
| United States | 1,982 | 305 | 1,627 | 255 | 1,574 | 215 | 1,597 | 202 | 2,346 | 264 | 2,307 | 223 | 2,769 | 258 | 3,272 | 249 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Central and South America | 16 | 6 | 10 | 6 | 12 | 9 | 11 | 17 | 22 | 14 | 21 | 14 | 26 | 13 | 34 | 18 |
| Argentina | 6 | 2 | 4 | 1 | 3 | 0 | 4 | 3 | 1 | 2 | 6 | 2 | 5 | 3 | 9 | 3 |
| Brazil | 7 | 4 | 2 | 2 | 2 | 6 | 4 | 0 | 9 | 9 | 6 | 10 | 9 | 7 | 13 | 6 |
| All others | 3 | 1 | 4 | 4 | 8 | 3 | 3 | 5 | 12 | 3 | 10 | 3 | 11 | 4 | 13 | 9 |
| Europe | 669 | 1,593 | 566 | 1,476 | 596 | 1,667 | 582 | 1,679 | 888 | 1,504 | 882 | 1,636 | 1,028 | 1,678 | 1,260 | 1,408 |
| EU | 616 | 654 | 523 | 610 | 550 | 626 | 531 | 591 | 813 | 619 | 788 | 642 | 925 | 699 | 1,123 | 563 |
| Austria | 9 | 16 | 12 | 11 | 10 | 17 | 13 | 11 | 24 | 10 | 25 | 12 | 20 | 12 | 32 | 6 |
| Belgium | 32 | 7 | 27 | 6 | 27 | 8 | 26 | 3 | 43 | 3 | 28 | 6 | 34 | 4 | 47 | 4 |
| Denmark | 24 | 4 | 22 | 5 | 25 | 3 | 19 | 4 | 36 | 1 | 33 | 1 | 43 | 2 | 59 | 5 |
| Finland | 11 | 5 | 8 | 3 | 8 | 4 | 8 | 2 | 14 | 6 | 11 | 5 | 14 | 5 | 9 | 3 |
| France | 99 | 249 | 79 | 245 | 94 | 233 | 90 | 184 | 138 | 199 | 128 | 173 | 171 | 282 | 202 | 214 |
| Germany | 156 | 120 | 144 | 98 | 141 | 80 | 131 | 72 | 208 | 59 | 201 | 59 | 301 | 239 | 57 | 281 |
| Hungary | 4 | 5 | 4 | 11 | 3 | 6 | 5 | 9 | 5 | 10 | 7 | 17 | 4 | 17 | 6 | 13 |
| Ireland | 5 | 1 | 4 | 2 | 6 | 0 | 8 | 1 | 8 | 2 | 10 | 3 | 9 | 1 | 10 | 2 |
| Italy | 51 | 20 | 43 | 23 | 45 | 19 | 50 | 27 | 74 | 52 | 84 | 76 | 99 | 52 | 112 | 21 |
| Netherlands | 27 | 10 | 28 | 8 | 28 | 15 | 36 | 8 | 42 | 9 | 53 | 16 | 46 | 12 | 55 | 8 |
| Spain | 13 | 76 | 11 | 69 | 12 | 77 | 15 | 73 | 21 | 107 | 19 | 117 | 24 | 91 | 41 | 97 |
| Sweden | 37 | 14 | 28 | 7 | 34 | 10 | 27 | 9 | 42 | 10 | 41 | 5 | 46 | 7 | 46 | 3 |
| United Kingdom | 134 | 26 | 108 | 19 | 111 | 19 | 90 | 22 | 140 | 21 | 135 | 25 | 158 | 22 | 200 | 13 |
| All others | 15 | 96 | 8 | 109 | 6 | 131 | 17 | 165 | 14 | 123 | 15 | 126 | 16 | 139 | 24 | 136 |
| Other Europe | 53 | 938 | 42 | 867 | 46 | 1,041 | 50 | 1,088 | 75 | 885 | 94 | 994 | 103 | 979 | 138 | 845 |
| Former Soviet Union | 0 | 105 | 0 | 112 | 0 | 119 | 0 | 119 | 0 | 108 | 1 | 140 | 0 | 118 | 0 | 84 |
| Norway | 6 | 6 | 11 | 2 | 7 | 1 | 9 | 1 | 13 | 4 | 15 | 2 | 17 | 2 | 20 | 5 |
| Russia | 5 | 811 | 6 | 730 | 6 | 903 | 8 | 950 | 12 | 753 | 10 | 830 | 11 | 852 | 21 | 738 |
| Switzerland | 38 | 11 | 24 | 15 | 32 | 12 | 29 | 13 | 47 | 15 | 62 | 16 | 70 | 17 | 85 | 9 |
| All others | 3 | 5 | 2 | 8 | 1 | 7 | 4 | 5 | 2 | 6 | 6 | 6 | 5 | 10 | 10 | 9 |
| Asia | 386 | 4,684 | 318 | 4,865 | 309 | 4,358 | 332 | 4,572 | 467 | 5,724 | 501 | 9,237 | 615 | 9,805 | 805 | 10,152 |

| Region, country, or economy | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| World | 6,590 | 13,284 | 6,722 | 12,225 | 6,565 | 11,052 | 7,225 | 9,405 | 6,904 | 10,030 |
| North America | 3,893 | 306 | 3,928 | 247 | 3,886 | 231 | 4,310 | 226 | 4,039 | 206 |
| Canada | 159 | 16 | 164 | 15 | 138 | 10 | 152 | 10 | 167 | 14 |
| Mexico | 11 | 1 | 7 | 2 | 10 | 34 | 9 | 50 | 8 | 35 |
| Puerto Rico | 2 | 0 | 2 | 0 | 4 | 0 | 1 | 0 | 2 | 0 |
| United States | 3,721 | 289 | 3,755 | 230 | 3,734 | 186 | 4,148 | 167 | 3,863 | 157 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Central and South America | 51 | 13 | 38 | 27 | 42 | 16 | 36 | 23 | 29 | 49 |
| Argentina | 5 | 3 | 5 | 0 | 10 | 1 | 9 | 2 | 7 | 2 |
| Brazil | 17 | 7 | 10 | 19 | 17 | 12 | 11 | 17 | 12 | 45 |
| All others | 9 | 3 | 23 | 8 | 15 | 3 | 16 | 4 | 10 | 2 |
| Europe | 1,479 | 1,469 | 1,534 | 1,560 | 1,450 | 1,248 | 1,574 | 1,570 | 1,474 | 1,471 |
| EU | 1,312 | 529 | 1,385 | 476 | 1,282 | 455 | 1,391 | 624 | 1,312 | 567 |
| Austria | 43 | 8 | 25 | 2 | 33 | 5 | 37 | 6 | 30 | 11 |
| Belgium | 52 | 4 | 66 | 7 | 66 | 4 | 62 | 11 | 64 | 7 |
| Denmark | 79 | 2 | 61 | 1 | 60 | 3 | 61 | 3 | 63 | 0 |
| Finland | 17 | 4 | 12 | 7 | 14 | 6 | 12 | 5 | 21 | 4 |
| France | 233 | 143 | 248 | 141 | 226 | 116 | 232 | 102 | 219 | 98 |
| Germany | 328 | 47 | 344 | 44 | 310 | 45 | 341 | 48 | 301 | 39 |
| Hungary | 9 | 5 | 7 | 9 | 10 | 12 | 8 | 6 | 8 | 6 |
| Ireland | 13 | 1 | 15 | 2 | 13 | 1 | 16 | 2 | 17 | 0 |
| Italy | 139 | 19 | 136 | 12 | 131 | 11 | 117 | 186 | 114 | 136 |
| Netherlands | 59 | 13 | 66 | 8 | 64 | 15 | 73 | 11 | 60 | 7 |
| Spain | 48 | 89 | 75 | 101 | 46 | 64 | 64 | 55 | 55 | 70 |
| Sweden | 63 | 6 | 64 | 5 | 57 | 5 | 75 | 5 | 70 | 4 |
| United Kingdom | 199 | 13 | 233 | 14 | 225 | 21 | 251 | 6 | 254 | 12 |
| All others | 136 | 35 | 177 | 29 | 134 | 31 | 148 | 38 | 173 | 33 |
| Other Europe | 845 | 168 | 940 | 150 | 1,084 | 168 | 982 | 146 | 162 | 904 |
| Former Soviet Union | 2 | 84 | 2 | 113 | 1 | 113 | 2 | 116 | 4 | 90 |
| Norway | 2 | 20 | 5 | 23 | 1 | 22 | 2 | 24 | 2 | 23 |
| Russia | 20 | 814 | 22 | 959 | 23 | 658 | 30 | 835 | 19 | 785 |
| Switzerland | 7 | 85 | 9 | 104 | 6 | 94 | 6 | 115 | 12 | 110 |
| All others | 7 | 10 | 5 | 10 | 5 | 5 | 13 | 6 | 13 | 10 |
| Asia | 908 | 11,272 | 964 | 10,174 | 955 | 9,155 | 1,048 | 7,499 | 1,088 | 8,230 |

TABLE S8-20

## USPTO patents and patent families granted in pharmaceuticals, by region, country, or economy: 1998–2018

(Number)

| Region, country, or economy | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| China | 5 | 80 | 10 | 164 | 9 | 1,191 | 15 | 1,185 | 16 | 698 | 18 | 1,048 | 22 | 1,825 | 23 | 2,077 | 31 | 3,202 | 37 | 3,264 | 37 | 3,098 | 31 | 3,621 | 38 | 4,634 | 43 | 7,618 | 71 | 7,820 | 102 | 8,007 | 125 | 8,847 | 148 | 8,337 | 171 | 6,937 | 204 | 5,103 | 242 | 6,271 |
| India | 10 | 5 | 11 | 7 | 15 | 8 | 28 | 11 | 30 | 20 | 46 | 31 | 25 | 21 | 31 | 17 | 39 | 24 | 30 | 24 | 29 | 20 | 22 | 9 | 34 | 12 | 41 | 7 | 64 | 8 | 86 | 7 | 97 | 8 | 121 | 9 | 136 | 9 | 146 | 13 | 125 | 4 |
| Japan | 267 | 582 | 287 | 557 | 239 | 490 | 312 | 457 | 287 | 291 | 244 | 334 | 180 | 423 | 176 | 343 | 250 | 351 | 187 | 425 | 171 | 435 | 205 | 532 | 279 | 614 | 287 | 731 | 306 | 774 | 398 | 699 | 431 | 714 | 422 | 510 | 342 | 630 | 351 | 537 | 359 | 513 |
| Malaysia | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 2 | 3 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 3 | 2 | 2 | 0 | 1 | 3 | 4 | 2 | 8 | 4 | 14 | 2 | 15 | 9 | 12 | 4 | 11 | 5 | 18 | 4 | 22 | 7 | 12 |
| Singapore | 1 | 0 | 1 | 1 | 4 | 0 | 1 | 0 | 1 | 0 | 3 | 1 | 2 | 1 | 2 | 0 | 4 | 0 | 4 | 1 | 7 | 1 | 4 | 0 | 5 | 1 | 9 | 0 | 11 | 0 | 14 | 2 | 15 | 2 | 18 | 1 | 20 | 1 | 21 | 1 | 24 | 3 |
| South Korea | 16 | 133 | 24 | 235 | 23 | 110 | 28 | 79 | 30 | 132 | 32 | 287 | 33 | 254 | 25 | 745 | 32 | 1,047 | 35 | 1,081 | 28 | 743 | 32 | 355 | 58 | 394 | 58 | 775 | 80 | 1,031 | 99 | 1,194 | 128 | 1,466 | 139 | 1,084 | 172 | 1,327 | 197 | 1,593 | 205 | 1,256 |
| Taiwan | 8 | 9 | 11 | 14 | 11 | 25 | 13 | 32 | 21 | 24 | 17 | 28 | 20 | 28 | 22 | 46 | 27 | 58 | 22 | 57 | 33 | 53 | 35 | 48 | 49 | 62 | 58 | 91 | 75 | 145 | 99 | 219 | 99 | 213 | 103 | 215 | 102 | 221 | 120 | 222 | 123 | 164 |
| All others | 0 | 6 | 1 | 8 | 2 | 6 | 2 | 2 | 2 | 6 | 1 | 4 | 2 | 7 | 1 | 10 | 4 | 2 | 2 | 8 | 2 | 7 | 2 | 6 | 2 | 3 | 3 | 7 | 4 | 13 | 5 | 9 | 4 | 10 | 9 | 8 | 6 | 12 | 5 | 9 | 4 | 6 |
| Middle East | 43 | 19 | 61 | 19 | 48 | 29 | 42 | 35 | 61 | 41 | 62 | 24 | 42 | 21 | 40 | 11 | 42 | 22 | 43 | 19 | 51 | 34 | 57 | 9 | 68 | 11 | 84 | 13 | 97 | 14 | 128 | 24 | 150 | 14 | 148 | 19 | 136 | 27 | 149 | 25 | 170 | 35 |
| Israel | 41 | 15 | 59 | 17 | 45 | 13 | 40 | 14 | 59 | 16 | 61 | 11 | 41 | 9 | 37 | 4 | 41 | 4 | 42 | 7 | 51 | 7 | 55 | 8 | 67 | 3 | 80 | 5 | 91 | 3 | 125 | 5 | 134 | 3 | 132 | 3 | 116 | 5 | 127 | 4 | 127 | 1 |
| All others | 1 | 4 | 2 | 2 | 2 | 16 | 1 | 20 | 2 | 25 | 1 | 13 | 1 | 12 | 4 | 7 | 1 | 18 | 1 | 11 | 0 | 27 | 2 | 1 | 2 | 8 | 3 | 8 | 6 | 10 | 13 | 19 | 16 | 12 | 16 | 17 | 20 | 22 | 21 | 21 | 43 | 33 |
| Africa | 5 | 10 | 4 | 6 | 6 | 8 | 7 | 10 | 6 | 17 | 7 | 12 | 3 | 22 | 3 | 18 | 3 | 20 | 5 | 16 | 2 | 20 | 5 | 16 | 10 | 12 | 7 | 8 | 9 | 6 | 15 | 9 | 9 | 18 | 10 | 2 | 8 | 12 | 9 | 11 | 11 | 5 |
| South Africa | 3 | 2 | 3 | 1 | 1 | 0 | 4 | 0 | 4 | 4 | 5 | 3 | 2 | 9 | 1 | 5 | 2 | 10 | 2 | 7 | 1 | 12 | 2 | 11 | 3 | 6 | 3 | 0 | 5 | 1 | 9 | 1 | 3 | 1 | 7 | 0 | 6 | 1 | 5 | 0 | 8 | 1 |
| All others | 2 | 8 | 1 | 5 | 5 | 8 | 3 | 10 | 3 | 14 | 2 | 9 | 1 | 14 | 2 | 13 | 2 | 9 | 4 | 8 | 1 | 8 | 3 | 5 | 7 | 6 | 4 | 8 | 4 | 5 | 6 | 14 | 6 | 18 | 3 | 2 | 3 | 11 | 5 | 11 | 3 | 5 |
| Australia and Oceania | 51 | 26 | 59 | 27 | 42 | 34 | 59 | 52 | 58 | 81 | 48 | 48 | 40 | 56 | 34 | 50 | 38 | 55 | 36 | 68 | 44 | 77 | 47 | 66 | 44 | 58 | 70 | 63 | 71 | 93 | 81 | 116 | 99 | 189 | 97 | 195 | 86 | 359 | 99 | 50 | 92 | 33 |
| Australia | 46 | 25 | 50 | 23 | 34 | 34 | 54 | 51 | 44 | 80 | 37 | 47 | 30 | 55 | 27 | 49 | 34 | 53 | 29 | 67 | 37 | 77 | 37 | 65 | 36 | 58 | 53 | 61 | 58 | 93 | 67 | 116 | 89 | 189 | 90 | 193 | 76 | 359 | 87 | 50 | 81 | 32 |
| New Zealand | 5 | 1 | 9 | 2 | 7 | 1 | 6 | 1 | 14 | 2 | 11 | 1 | 9 | 1 | 7 | 1 | 5 | 2 | 7 | 1 | 7 | 0 | 10 | 0 | 8 | 0 | 16 | 2 | 13 | 0 | 14 | 0 | 10 | 0 | 8 | 2 | 10 | 1 | 12 | 0 | 12 | 0 |
| All others | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Unclassified | 1 | 16 | 1 | 27 | 1 | 18 | 1 | 7 | 3 | 2 | 0 | 2 | 0 | 1 | 0 | 1 | 0 | 19 | 0 | 3 | 0 | 1 | 0 | 3 | 0 | 3 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 2 | 2 | 1 | 2 | 4 | 1 | 1 | 1 | 0 |

EU = European Union; USPTO = U.S. Patent and Trademark Office.

**Note(s)**

USPTO patents are allocated according to patent inventorship information. USPTO patents are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named inventors. Patents are classified under the World Intellectual Property Organization (WIPO) classification of patents, which classifies International Patent Classification (IPC) codes under 35 technical fields. IPC reformed codes take into account changes that were made to the WIPO classification in 2006 under the eighth version of the classification and were used to prepare these data. However, because PatentsView only provides the original IPC codes as they appeared on patents and not the IPC reformed codes, current Cooperative Patent Classification codes on patents were converted back to the most recent IPC classification to prepare these statistics. Fractional counts of patents were assigned to each technological field on patents to assign the proper weight of a patent to the corresponding technological fields under the classification. International Patent Documentation (INPADOC) patent families across all patent offices covered in the Worldwide Patent Statistical Database (PATSTAT) are counted according to the year of the first granted patent in the patent family. Patent families are allocated according to patent inventorship information found on the priority patent of the INPADOC patent families. To account for missing ownership information in PATSTAT for some offices, a method designed by de Rassenfosse et al. (2012) is used to fill in missing information on priority patents using information in successive filings within the patent families (see technical documentation for details). Patent families are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named inventors. Because of data coverage issues for some patent offices in PATSTAT, statistics for some countries may be underestimated partially for some years or across the whole trend. Countries with identified issues include India (missing data) and South Africa (no data for 2018). For Italy, because of data gaps regarding information on granted patents, patent applications are used instead, which slightly overestimates Italy's output and creates a small shift in the year for which its output is accounted. The EU includes 28 member countries. China includes Hong Kong.

**Source(s)**

Science-Metrix; PATSTAT, accessed April 2019; PatentsView, USPTO, accessed June 2019.

TABLE S8-21

## USPTO patents and patent families granted in macromolecular chemistry, polymers, by region, country, or economy: 1998–2018

(Number)

| Region, country, or economy | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| World | 2,908 | 4,301 | 2,937 | 4,819 | 2,938 | 4,174 | 3,199 | 3,935 | 3,266 | 4,202 | 3,113 | 4,700 | 2,796 | 4,521 | 2,027 | 4,841 | 2,189 | 5,389 | 1,855 | 5,412 | 1,561 | 4,700 | 1,739 | 4,632 | 2,676 | 5,370 | 2,637 | 7,013 | 2,765 | 8,406 | 3,192 | 8,972 | 3,431 | 8,727 | 3,367 | 8,652 | 3,375 | 10,882 | 3,378 | 9,867 | 3,114 | 9,966 |
| North America | 1,374 | 816 | 1,414 | 779 | 1,408 | 726 | 1,499 | 691 | 1,553 | 693 | 1,414 | 581 | 1,199 | 475 | 946 | 344 | 992 | 351 | 861 | 321 | 738 | 266 | 800 | 288 | 1,177 | 384 | 1,148 | 317 | 1,152 | 284 | 1,294 | 297 | 1,374 | 309 | 1,328 | 270 | 1,322 | 243 | 1,308 | 204 | 1,192 | 164 |
| Canada | 34 | 19 | 33 | 22 | 38 | 17 | 50 | 13 | 62 | 26 | 39 | 19 | 43 | 9 | 29 | 14 | 31 | 17 | 33 | 15 | 29 | 15 | 27 | 20 | 47 | 27 | 31 | 17 | 37 | 20 | 43 | 21 | 50 | 22 | 61 | 26 | 55 | 29 | 76 | 23 | 56 | 19 |
| Mexico | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 3 | 2 | 1 | 1 | 4 | 1 | 2 | 1 | 6 | 1 | 3 | 1 | 3 | 1 | 3 | 1 | 3 | 7 | 6 | 9 | 7 | 8 |
| Puerto Rico | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| United States | 1,340 | 797 | 1,379 | 756 | 1,369 | 708 | 1,449 | 678 | 1,490 | 667 | 1,373 | 562 | 1,154 | 456 | 916 | 330 | 960 | 334 | 829 | 306 | 707 | 251 | 770 | 267 | 1,129 | 356 | 1,114 | 299 | 1,113 | 263 | 1,245 | 275 | 1,321 | 286 | 1,264 | 242 | 1,264 | 207 | 1,226 | 173 | 1,129 | 137 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Central and South America | 3 | 1 | 3 | 2 | 4 | 2 | 2 | 2 | 2 | 1 | 2 | 1 | 3 | 0 | 2 | 3 | 3 | 4 | 1 | 2 | 2 | 3 | 3 | 6 | 4 | 5 | 5 | 16 | 4 | 10 | 3 | 11 | 12 | 6 | 8 | 3 | 9 | 5 | 8 | 6 | 10 | 14 |
| Argentina | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| Brazil | 1 | 0 | 1 | 0 | 3 | 1 | 1 | 2 | 2 | 0 | 1 | 0 | 2 | 0 | 1 | 1 | 1 | 3 | 0 | 1 | 1 | 3 | 3 | 6 | 3 | 5 | 2 | 15 | 3 | 8 | 5 | 10 | 9 | 5 | 5 | 1 | 8 | 4 | 8 | 6 | 7 | 13 |
| All others | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 3 | 1 | 2 | 1 | 1 | 0 | 0 | 0 | 3 | 1 |
| Europe | 795 | 684 | 747 | 663 | 744 | 640 | 822 | 556 | 814 | 582 | 852 | 589 | 772 | 596 | 504 | 639 | 564 | 617 | 465 | 509 | 362 | 478 | 381 | 455 | 653 | 466 | 603 | 532 | 685 | 662 | 820 | 576 | 866 | 554 | 816 | 600 | 786 | 571 | 775 | 722 | 726 | 629 |
| EU | 740 | 456 | 687 | 445 | 700 | 482 | 772 | 400 | 768 | 403 | 802 | 363 | 735 | 361 | 475 | 375 | 540 | 413 | 431 | 310 | 337 | 259 | 353 | 251 | 609 | 258 | 554 | 318 | 620 | 415 | 750 | 340 | 812 | 335 | 765 | 339 | 718 | 408 | 700 | 468 | 664 | 392 |
| Austria | 6 | 12 | 12 | 11 | 12 | 11 | 13 | 11 | 13 | 14 | 9 | 12 | 7 | 10 | 5 | 15 | 8 | 10 | 5 | 3 | 5 | 8 | 7 | 7 | 12 | 14 | 7 | 13 | 18 | 18 | 18 | 11 | 29 | 18 | 21 | 15 | 30 | 21 | 25 | 21 | 27 | 20 |
| Belgium | 45 | 18 | 48 | 14 | 52 | 15 | 73 | 10 | 63 | 9 | 54 | 15 | 39 | 6 | 33 | 5 | 35 | 13 | 29 | 9 | 23 | 13 | 23 | 7 | 57 | 9 | 39 | 9 | 49 | 7 | 70 | 8 | 61 | 11 | 58 | 4 | 48 | 8 | 43 | 11 | 39 | 10 |
| Denmark | 2 | 1 | 2 | 0 | 3 | 3 | 2 | 0 | 5 | 0 | 2 | 1 | 4 | 1 | 3 | 0 | 2 | 0 | 2 | 0 | 2 | 0 | 2 | 1 | 3 | 0 | 5 | 0 | 3 | 0 | 5 | 0 | 10 | 0 | 8 | 3 | 9 | 1 | 7 | 2 | 5 | 1 |
| Finland | 10 | 12 | 11 | 7 | 12 | 15 | 18 | 10 | 17 | 3 | 17 | 9 | 12 | 7 | 9 | 7 | 5 | 5 | 7 | 6 | 9 | 6 | 7 | 9 | 13 | 7 | 8 | 13 | 9 | 12 | 19 | 15 | 16 | 13 | 18 | 14 | 17 | 26 | 17 | 20 | 19 | 20 |
| France | 91 | 108 | 75 | 97 | 84 | 91 | 93 | 96 | 88 | 104 | 94 | 108 | 89 | 92 | 66 | 110 | 69 | 137 | 62 | 95 | 43 | 65 | 48 | 49 | 74 | 58 | 76 | 88 | 87 | 146 | 113 | 87 | 119 | 89 | 107 | 110 | 106 | 102 | 101 | 119 | 111 | 94 |
| Germany | 397 | 109 | 363 | 101 | 352 | 103 | 385 | 100 | 371 | 104 | 419 | 84 | 402 | 89 | 246 | 103 | 288 | 134 | 203 | 85 | 169 | 64 | 154 | 43 | 270 | 46 | 272 | 40 | 293 | 45 | 328 | 55 | 380 | 53 | 332 | 54 | 288 | 55 | 287 | 73 | 238 | 68 |
| Hungary | 0 | 1 | 0 | 1 | 1 | 1 | 4 | 1 | 4 | 0 | 2 | 1 | 2 | 0 | 0 | 3 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 2 | 1 | 2 | 1 | 5 | 0 | 1 | 1 | 2 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 2 | 1 | 2 |
| Ireland | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 2 | 0 | 1 | 1 | 4 | 1 | 1 | 0 | 1 | 0 | 3 | 1 | 1 | 0 | 4 | 3 | 4 | 2 | 6 | 1 | 4 | 2 | 6 | 1 | 2 | 1 | 2 | 1 | 3 | 3 | 3 | 1 |
| Italy | 58 | 49 | 54 | 73 | 59 | 91 | 68 | 42 | 71 | 44 | 59 | 22 | 60 | 71 | 32 | 28 | 55 | 10 | 39 | 9 | 34 | 10 | 48 | 8 | 54 | 11 | 45 | 17 | 53 | 19 | 56 | 3 | 55 | 2 | 56 | 5 | 63 | 8 | 66 | 45 | 62 | 34 |
| Netherlands | 54 | 43 | 49 | 39 | 45 | 40 | 53 | 36 | 63 | 31 | 68 | 32 | 54 | 22 | 23 | 12 | 27 | 10 | 36 | 13 | 16 | 7 | 26 | 11 | 50 | 19 | 37 | 12 | 43 | 8 | 48 | 16 | 56 | 18 | 63 | 8 | 56 | 10 | 67 | 18 | 63 | 11 |
| Spain | 4 | 6 | 5 | 9 | 5 | 18 | 3 | 12 | 4 | 7 | 5 | 12 | 4 | 9 | 4 | 13 | 4 | 10 | 3 | 12 | 1 | 12 | 3 | 16 | 5 | 17 | 6 | 20 | 5 | 25 | 6 | 20 | 8 | 20 | 14 | 19 | 7 | 23 | 6 | 10 | 10 | 16 |
| Sweden | 8 | 7 | 9 | 9 | 7 | 8 | 9 | 5 | 9 | 6 | 11 | 8 | 4 | 9 | 6 | 6 | 8 | 6 | 6 | 4 | 6 | 9 | 5 | 11 | 10 | 9 | 5 | 9 | 13 | 4 | 23 | 4 | 17 | 7 | 19 | 4 | 22 | 4 | 16 | 8 | 15 | 8 |
| United Kingdom | 61 | 12 | 54 | 14 | 59 | 11 | 50 | 8 | 56 | 11 | 47 | 9 | 55 | 10 | 38 | 7 | 34 | 7 | 33 | 5 | 19 | 6 | 23 | 6 | 47 | 10 | 43 | 7 | 42 | 8 | 51 | 9 | 45 | 7 | 55 | 8 | 58 | 8 | 53 | 9 | 61 | 4 |
| All others | 4 | 78 | 3 | 70 | 8 | 71 | 4 | 66 | 8 | 68 | 15 | 46 | 5 | 33 | 6 | 63 | 5 | 70 | 6 | 67 | 7 | 76 | 4 | 81 | 8 | 53 | 7 | 83 | 8 | 121 | 8 | 105 | 9 | 96 | 11 | 95 | 10 | 139 | 8 | 124 | 11 | 105 |
| Other Europe | 56 | 228 | 60 | 218 | 44 | 158 | 50 | 156 | 46 | 180 | 50 | 226 | 36 | 235 | 29 | 264 | 24 | 204 | 34 | 199 | 25 | 199 | 28 | 203 | 43 | 209 | 49 | 214 | 56 | 247 | 70 | 236 | 54 | 218 | 51 | 261 | 68 | 163 | 75 | 254 | 62 | 236 |
| Former Soviet Union | 1 | 8 | 0 | 4 | 0 | 6 | 0 | 8 | 0 | 9 | 0 | 27 | 0 | 17 | 0 | 23 | 0 | 26 | 0 | 35 | 0 | 39 | 1 | 29 | 1 | 19 | 0 | 21 | 0 | 12 | 1 | 7 | 1 | 0 | 1 | 14 | 2 | 12 | 0 | 13 | 0 | 12 |
| Norway | 1 | 2 | 3 | 3 | 2 | 2 | 4 | 6 | 4 | 1 | 10 | 1 | 6 | 1 | 5 | 2 | 5 | 4 | 2 | 5 | 2 | 4 | 4 | 3 | 3 | 6 | 6 | 2 | 1 | 1 | 7 | 1 | 4 | 1 | 3 | 2 | 5 | 2 | 5 | 1 | 3 | 1 |
| Russia | 6 | 206 | 7 | 193 | 6 | 140 | 6 | 127 | 2 | 162 | 3 | 190 | 2 | 156 | 1 | 231 | 1 | 164 | 5 | 147 | 3 | 149 | 4 | 165 | 5 | 172 | 2 | 181 | 3 | 225 | 4 | 215 | 5 | 186 | 4 | 231 | 6 | 136 | 9 | 228 | 8 | 208 |
| Switzerland | 47 | 11 | 47 | 18 | 33 | 9 | 39 | 14 | 38 | 7 | 35 | 8 | 27 | 10 | 23 | 6 | 15 | 10 | 23 | 12 | 16 | 5 | 17 | 6 | 32 | 11 | 37 | 10 | 45 | 9 | 57 | 9 | 42 | 13 | 43 | 14 | 53 | 12 | 58 | 11 | 45 | 15 |
| All others | 1 | 1 | 3 | 0 | 3 | 1 | 1 | 1 | 2 | 0 | 2 | 0 | 1 | 1 | 0 | 1 | 3 | 0 | 4 | 0 | 4 | 2 | 2 | 0 | 3 | 0 | 3 | 0 | 4 | 0 | 1 | 1 | 3 | 2 | 1 | 1 | 3 | 1 | 3 | 1 | 5 | 1 |
| Asia | 723 | 2,779 | 756 | 3,338 | 767 | 2,765 | 850 | 2,662 | 869 | 2,906 | 818 | 3,512 | 801 | 3,429 | 560 | 3,843 | 612 | 4,409 | 517 | 4,568 | 450 | 3,939 | 535 | 3,870 | 825 | 4,497 | 862 | 6,137 | 897 | 7,437 | 1,045 | 8,071 | 1,131 | 7,828 | 1,166 | 7,751 | 1,216 | 10,023 | 1,234 | 8,911 | 1,128 | 9,137 |

TABLE S8-21

## USPTO patents and patent families granted in macromolecular chemistry, polymers, by region, country, or economy: 1998–2018

(Number)

| | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Region, country, or economy | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| China | 2 | 45 | 4 | 57 | 8 | 141 | 5 | 171 | 10 | 147 | 13 | 416 | 10 | 684 | 3 | 623 | 8 | 872 | 14 | 751 | 13 | 804 | 15 | 1,152 | 22 | 1,513 | 24 | 2,769 | 40 | 3,604 | 57 | 3,708 | 63 | 3,749 | 81 | 5,160 | 93 | 7,248 | 109 | 6,010 | 102 | 6,564 |
| India | 6 | 5 | 6 | 3 | 7 | 3 | 9 | 5 | 9 | 6 | 8 | 9 | 12 | 14 | 10 | 6 | 11 | 12 | 14 | 10 | 10 | 10 | 14 | 11 | 21 | 11 | 14 | 5 | 16 | 6 | 15 | 5 | 32 | 11 | 24 | 7 | 24 | 6 | 37 | 4 | 40 | 2 |
| Japan | 675 | 2,438 | 685 | 2,451 | 680 | 2,341 | 770 | 2,296 | 772 | 2,384 | 704 | 2,583 | 673 | 2,158 | 469 | 1,999 | 512 | 1,706 | 422 | 2,459 | 359 | 2,317 | 432 | 2,231 | 644 | 2,488 | 665 | 2,841 | 667 | 2,984 | 765 | 3,344 | 802 | 3,056 | 761 | 1,775 | 797 | 1,866 | 784 | 1,736 | 709 | 1,582 |
| Malaysia | 1 | 1 | 2 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 1 | 1 | 0 | 0 | 1 | 0 | 4 | 0 | 2 | 1 | 3 | 1 | 4 | 3 | 10 | 2 | 5 | 3 | 7 | 6 | 9 | 1 | 5 | 3 | 9 | 4 | 12 | 2 | 6 |
| Singapore | 1 | 0 | 2 | 2 | 1 | 2 | 1 | 0 | 3 | 1 | 1 | 0 | 2 | 0 | 3 | 1 | 4 | 1 | 4 | 2 | 1 | 1 | 1 | 1 | 4 | 2 | 3 | 0 | 5 | 1 | 8 | 1 | 9 | 2 | 13 | 3 | 10 | 1 | 10 | 2 | 9 | 2 |
| South Korea | 24 | 254 | 34 | 787 | 49 | 236 | 43 | 123 | 53 | 312 | 67 | 443 | 77 | 489 | 56 | 1,167 | 61 | 1,738 | 48 | 1,278 | 54 | 752 | 55 | 363 | 97 | 421 | 109 | 434 | 122 | 755 | 145 | 830 | 163 | 822 | 214 | 607 | 231 | 732 | 236 | 1,026 | 215 | 889 |
| Taiwan | 14 | 36 | 23 | 34 | 22 | 41 | 22 | 65 | 22 | 55 | 23 | 60 | 23 | 82 | 18 | 46 | 16 | 77 | 15 | 63 | 12 | 54 | 15 | 108 | 33 | 55 | 43 | 75 | 44 | 78 | 50 | 175 | 54 | 177 | 64 | 190 | 56 | 156 | 49 | 120 | 48 | 89 |
| All others | 0 | 1 | 2 | 3 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 2 | 2 | 1 | 3 | 1 | 4 | 2 | 2 | 3 | 3 | 7 | 3 | 1 | 4 | 5 | 2 | 2 | 3 |
| Middle East | 4 | 1 | 7 | 5 | 7 | 5 | 8 | 6 | 10 | 3 | 14 | 7 | 8 | 8 | 8 | 5 | 10 | 1 | 5 | 3 | 2 | 1 | 12 | 2 | 6 | 4 | 11 | 6 | 14 | 8 | 18 | 7 | 35 | 14 | 33 | 14 | 31 | 20 | 35 | 15 | 40 | 11 |
| Israel | 4 | 1 | 6 | 2 | 6 | 2 | 7 | 4 | 5 | 1 | 10 | 3 | 4 | 1 | 6 | 2 | 4 | 1 | 4 | 0 | 2 | 1 | 10 | 1 | 4 | 2 | 9 | 2 | 8 | 1 | 10 | 1 | 17 | 1 | 16 | 2 | 14 | 0 | 12 | 0 | 14 | 1 |
| All others | 1 | 0 | 0 | 3 | 2 | 3 | 1 | 2 | 5 | 2 | 4 | 4 | 4 | 7 | 2 | 2 | 5 | 1 | 1 | 3 | 0 | 0 | 1 | 1 | 2 | 2 | 3 | 3 | 6 | 6 | 8 | 2 | 18 | 13 | 17 | 12 | 16 | 20 | 23 | 15 | 26 | 10 |
| Africa | 1 | 9 | 1 | 5 | 1 | 8 | 3 | 5 | 5 | 3 | 2 | 7 | 1 | 4 | 1 | 3 | 0 | 1 | 2 | 4 | 1 | 7 | 2 | 7 | 1 | 5 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 3 | 1 | 1 | 1 | 3 | 3 | 4 | 2 | 2 |
| South Africa | 1 | 9 | 1 | 5 | 1 | 5 | 3 | 1 | 5 | 1 | 1 | 2 | 1 | 3 | 0 | 0 | 0 | 0 | 2 | 2 | 0 | 6 | 2 | 7 | 1 | 3 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 |
| All others | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 4 | 0 | 2 | 0 | 5 | 0 | 1 | 1 | 3 | 0 | 1 | 0 | 2 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 2 | 0 | 3 | 1 | 1 | 1 | 3 | 2 | 4 | 1 | 2 |
| Australia and Oceania | 7 | 3 | 10 | 7 | 6 | 4 | 14 | 12 | 11 | 14 | 12 | 3 | 12 | 8 | 5 | 5 | 9 | 4 | 4 | 4 | 6 | 5 | 6 | 3 | 11 | 9 | 6 | 4 | 11 | 4 | 10 | 9 | 12 | 14 | 17 | 14 | 11 | 15 | 15 | 4 | 14 | 9 |
| Australia | 7 | 3 | 10 | 7 | 6 | 4 | 12 | 12 | 11 | 14 | 11 | 3 | 12 | 8 | 5 | 5 | 8 | 4 | 3 | 4 | 4 | 4 | 6 | 3 | 10 | 9 | 5 | 3 | 7 | 4 | 10 | 8 | 11 | 14 | 15 | 14 | 8 | 15 | 15 | 4 | 13 | 9 |
| New Zealand | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 2 | 0 | 3 | 0 | 0 | 0 | 1 | 0 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Unclassified | 0 | 6 | 0 | 20 | 0 | 24 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 |

EU = European Union; USPTO = U.S. Patent and Trademark Office.

**Note(s)**

USPTO patents are allocated according to patent inventorship information. USPTO patents are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named inventors. Patents are classified under the World Intellectual Property Organization (WIPO) classification of patents, which classifies International Patent Classification (IPC) codes under 35 technical fields. IPC reformed codes take into account changes that were made to the WIPO classification in 2006 under the eighth version of the classification and were used to prepare these data. However, because PatentsView only provides the original IPC codes as they appeared on patents and not the IPC reformed codes, current Cooperative Patent Classification codes on patents were converted back to the most recent IPC classification to prepare these statistics. Fractional counts of patents were assigned to each technological field on patents to assign the proper weight of a patent to the corresponding technological fields under the classification. International Patent Documentation (INPADOC) patent families across all patent offices covered in the Worldwide Patent Statistical Database (PATSTAT) are counted according to the year of the first granted patent in the patent family. Patent families are allocated according to patent inventorship information found on the priority patent of the INPADOC patent families. To account for missing ownership information in PATSTAT for some offices, a method designed by de Rassenfosse et al. (2012) is used to fill in missing information on priority patents using information in successive filings within the patent families (see technical documentation for details). Patent families are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named inventors. Because of data coverage issues for some patent offices in PATSTAT, statistics for some countries may be underestimated partially for some years or across the whole trend. Countries with identified issues include India (missing data) and South Africa (no data for 2018). For Italy, because of data gaps regarding information on granted patents, patent applications are used instead, which slightly overestimates Italy's output and creates a small shift in the year for which its output is accounted. The EU includes 28 member countries. China includes Hong Kong.

**Source(s)**

Science-Metrix; PATSTAT, accessed April 2019; PatentsView, USPTO, accessed June 2019.

TABLE S8-22

## USPTO patents and patent families granted in food chemistry, by region, country, or economy: 1998–2018

(Number)

| Region, country, or economy | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| World | 952 | 3,489 | 1,247 | 4,148 | 1,238 | 3,911 | 1,184 | 3,644 | 1,066 | 3,320 | 961 | 5,014 | 945 | 5,133 | 707 | 6,116 | 831 | 5,991 | 859 | 6,244 | 767 | 6,683 | 895 | 8,971 | 1,153 | 8,379 | 1,231 | 10,194 | 1,597 | 13,610 | 1,857 | 15,529 | 1,857 | 15,100 | 1,767 | 12,925 | 1,755 | 14,687 | 1,795 | 8,818 | 1,722 | 9,310 |
| North America | 650 | 508 | 814 | 606 | 828 | 586 | 787 | 488 | 662 | 372 | 600 | 335 | 603 | 351 | 482 | 281 | 594 | 265 | 638 | 259 | 579 | 245 | 703 | 269 | 810 | 255 | 873 | 319 | 1,161 | 419 | 1,338 | 448 | 1,271 | 390 | 1,215 | 471 | 1,196 | 358 | 1,218 | 412 | 1,194 | 473 |
| Canada | 21 | 19 | 27 | 17 | 25 | 18 | 31 | 13 | 24 | 19 | 34 | 18 | 22 | 14 | 23 | 15 | 22 | 7 | 26 | 9 | 29 | 17 | 34 | 16 | 55 | 16 | 63 | 17 | 60 | 24 | 49 | 29 | 91 | 25 | 94 | 45 | 63 | 29 | 76 | 35 | 96 | 40 |
| Mexico | 1 | 1 | 3 | 2 | 1 | 0 | 4 | 2 | 3 | 1 | 0 | 1 | 1 | 1 | 3 | 2 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 1 | 3 | 2 | 2 | 1 | 4 | 3 | 5 | 0 | 4 | 1 | 8 | 1 | 6 | 15 | 9 | 10 | 5 | 14 |
| Puerto Rico | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| United States | 627 | 486 | 784 | 588 | 801 | 567 | 752 | 473 | 634 | 352 | 565 | 316 | 580 | 336 | 455 | 264 | 571 | 257 | 612 | 249 | 548 | 228 | 667 | 252 | 752 | 237 | 809 | 301 | 1,097 | 392 | 1,234 | 420 | 1,176 | 364 | 1,113 | 425 | 1,126 | 314 | 1,133 | 367 | 1,092 | 418 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Central and South America | 6 | 3 | 5 | 1 | 9 | 8 | 3 | 5 | 5 | 6 | 4 | 5 | 4 | 5 | 6 | 5 | 4 | 5 | 10 | 6 | 8 | 5 | 7 | 6 | 16 | 10 | 7 | 4 | 5 | 6 | 13 | 12 | 31 | 24 | 10 | 16 | 12 | 17 | 13 | 22 | 6 | 24 |
| Argentina | 3 | 1 | 1 | 1 | 3 | 3 | 0 | 0 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 5 | 3 | 5 | 3 | 6 | 2 | 1 | 1 | 2 | 1 | 1 | 3 | 3 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 6 | 2 | 2 | 0 |
| Brazil | 0 | 0 | 1 | 0 | 5 | 4 | 1 | 2 | 2 | 5 | 0 | 2 | 3 | 4 | 3 | 3 | 2 | 2 | 3 | 1 | 2 | 2 | 1 | 4 | 12 | 7 | 2 | 3 | 1 | 3 | 3 | 10 | 22 | 22 | 2 | 14 | 6 | 17 | 3 | 9 | 2 | 23 |
| All others | 3 | 2 | 3 | 0 | 1 | 2 | 2 | 3 | 1 | 0 | 3 | 2 | 0 | 0 | 1 | 1 | 0 | 2 | 1 | 2 | 1 | 1 | 1 | 0 | 3 | 2 | 2 | 0 | 2 | 2 | 7 | 2 | 8 | 2 | 6 | 2 | 4 | 0 | 4 | 2 | 2 | 1 |
| Europe | 181 | 1,361 | 270 | 1,539 | 233 | 1,400 | 241 | 1,420 | 236 | 1,304 | 212 | 2,154 | 192 | 2,038 | 141 | 2,306 | 117 | 2,094 | 123 | 2,294 | 103 | 3,015 | 104 | 5,373 | 191 | 4,373 | 200 | 4,432 | 256 | 3,199 | 314 | 3,719 | 357 | 5,342 | 358 | 2,784 | 348 | 5,236 | 352 | 1,744 | 318 | 1,374 |
| EU | 158 | 586 | 233 | 556 | 200 | 506 | 206 | 429 | 204 | 448 | 185 | 492 | 169 | 527 | 126 | 530 | 102 | 424 | 112 | 394 | 96 | 434 | 168 | 409 | 186 | 431 | 232 | 472 | 285 | 458 | 318 | 443 | 316 | 411 | 308 | 419 | 310 | 514 | 280 | 459 | | |
| Austria | 3 | 8 | 4 | 9 | 4 | 8 | 5 | 9 | 1 | 8 | 2 | 9 | 8 | 7 | 2 | 10 | 3 | 8 | 5 | 6 | 3 | 6 | 5 | 8 | 5 | 5 | 8 | 10 | 4 | 9 | 9 | 7 | 9 | 10 | 5 | 10 | 5 | 3 | 5 | 2 | 5 | 5 |
| Belgium | 3 | 6 | 7 | 4 | 8 | 4 | 6 | 3 | 3 | 4 | 6 | 13 | 5 | 6 | 2 | 4 | 8 | 4 | 6 | 3 | 6 | 4 | 3 | 4 | 6 | 3 | 7 | 5 | 12 | 7 | 14 | 2 | 14 | 4 | 11 | 2 | 11 | 3 | 8 | 16 | 11 | 45 |
| Denmark | 13 | 5 | 24 | 10 | 28 | 8 | 8 | 5 | 5 | 21 | 7 | 19 | 11 | 8 | 8 | 8 | 15 | 3 | 13 | 3 | 13 | 12 | 11 | 9 | 11 | 24 | 5 | 19 | 4 | 27 | 6 | 23 | 9 | 22 | 3 | 21 | 7 | 24 | 6 | 25 | 6 | 18 | 4 |
| Finland | 6 | 8 | 9 | 9 | 8 | 12 | 7 | 8 | 8 | 8 | 8 | 6 | 6 | 11 | 8 | 5 | 15 | 6 | 4 | 1 | 6 | 1 | 2 | 6 | 5 | 11 | 2 | 11 | 6 | 13 | 8 | 6 | 3 | 6 | 8 | 4 | 3 | 9 | 4 | 8 | 9 | 6 |
| France | 25 | 100 | 37 | 101 | 20 | 96 | 27 | 115 | 32 | 85 | 36 | 104 | 22 | 103 | 22 | 126 | 16 | 125 | 14 | 97 | 14 | 78 | 10 | 87 | 27 | 62 | 22 | 84 | 31 | 113 | 45 | 75 | 51 | 91 | 48 | 91 | 42 | 70 | 44 | 73 | 34 | 55 |
| Germany | 34 | 75 | 46 | 62 | 35 | 49 | 49 | 49 | 52 | 43 | 70 | 29 | 50 | 69 | 45 | 55 | 28 | 42 | 16 | 73 | 20 | 59 | 17 | 50 | 22 | 50 | 25 | 41 | 30 | 60 | 41 | 32 | 49 | 35 | 48 | 36 | 50 | 43 | 52 | 43 | 44 | 42 |
| Hungary | 1 | 13 | 0 | 16 | 0 | 19 | 2 | 21 | 1 | 30 | 0 | 37 | 0 | 12 | 1 | 2 | 0 | 7 | 0 | 16 | 0 | 18 | 1 | 5 | 0 | 5 | 1 | 6 | 0 | 5 | 2 | 3 | 1 | 2 | 4 | 2 | 7 | 3 | 4 | 5 | 1 | 2 |
| Ireland | 1 | 27 | 0 | 12 | 0 | 3 | 2 | 0 | 1 | 1 | 3 | 3 | 1 | 1 | 1 | 2 | 0 | 6 | 1 | 7 | 1 | 3 | 1 | 1 | 0 | 4 | 1 | 1 | 0 | 5 | 2 | 3 | 4 | 1 | 6 | 1 | 2 | 0 | 2 | 1 | 2 | 0 |
| Italy | 11 | 84 | 17 | 118 | 16 | 117 | 23 | 45 | 8 | 57 | 11 | 45 | 12 | 127 | 9 | 62 | 6 | 16 | 10 | 19 | 11 | 23 | 10 | 19 | 12 | 34 | 8 | 27 | 19 | 33 | 18 | 23 | 23 | 20 | 21 | 8 | 19 | 30 | 10 | 26 | 95 | 30 | 87 |
| Netherlands | 24 | 46 | 37 | 30 | 34 | 30 | 25 | 41 | 31 | 42 | 22 | 41 | 22 | 35 | 17 | 45 | 14 | 26 | 17 | 34 | 11 | 27 | 16 | 25 | 31 | 31 | 58 | 50 | 44 | 34 | 74 | 41 | 88 | 30 | 89 | 33 | 85 | 34 | 91 | 40 | 83 | 22 |
| Spain | 3 | 45 | 8 | 48 | 3 | 78 | 6 | 29 | 8 | 38 | 3 | 67 | 2 | 68 | 5 | 110 | 3 | 67 | 3 | 59 | 4 | 50 | 5 | 106 | 8 | 98 | 3 | 75 | 4 | 94 | 10 | 83 | 10 | 81 | 12 | 64 | 12 | 79 | 14 | 62 | 12 | 67 |
| Sweden | 9 | 11 | 9 | 9 | 12 | 11 | 11 | 12 | 11 | 7 | 9 | 9 | 5 | 15 | 4 | 6 | 3 | 7 | 3 | 5 | 3 | 6 | 2 | 7 | 5 | 5 | 2 | 7 | 3 | 5 | 7 | 2 | 8 | 3 | 7 | 2 | 5 | 2 | 5 | 5 | 4 | 3 |
| United Kingdom | 24 | 12 | 35 | 8 | 30 | 9 | 27 | 17 | 35 | 18 | 36 | 12 | 28 | 10 | 15 | 20 | 14 | 6 | 17 | 9 | 11 | 9 | 10 | 10 | 20 | 14 | 23 | 11 | 29 | 16 | 18 | 11 | 17 | 15 | 27 | 10 | 24 | 20 | 33 | 19 | 25 | 15 |
| All others | 1 | 147 | 1 | 121 | 1 | 93 | 0 | 72 | 1 | 74 | 0 | 67 | 0 | 71 | 0 | 78 | 1 | 59 | 2 | 61 | 1 | 99 | 1 | 95 | 0 | 92 | 2 | 80 | 12 | 102 | 7 | 156 | 10 | 139 | 7 | 134 | 6 | 135 | 6 | 138 | 5 | 99 |
| Other Europe | 23 | 775 | 37 | 983 | 33 | 862 | 35 | 991 | 32 | 856 | 27 | 1,661 | 23 | 1,511 | 15 | 1,776 | 16 | 1,670 | 12 | 1,900 | 7 | 2,631 | 7 | 4,939 | 23 | 3,964 | 15 | 4,001 | 24 | 2,727 | 29 | 3,260 | 39 | 4,899 | 42 | 2,327 | 41 | 4,817 | 42 | 1,230 | 39 | 915 |
| Former Soviet Union | 0 | 29 | 0 | 26 | 0 | 40 | 1 | 76 | 1 | 73 | 0 | 157 | 0 | 484 | 0 | 121 | 0 | 65 | 0 | 94 | 0 | 101 | 0 | 90 | 0 | 77 | 0 | 91 | 0 | 68 | 0 | 95 | 0 | 130 | 0 | 142 | 0 | 100 | 0 | 98 | 0 | 100 |
| Norway | 1 | 6 | 4 | 9 | 2 | 7 | 2 | 14 | 8 | 9 | 4 | 5 | 5 | 8 | 3 | 8 | 3 | 8 | 0 | 12 | 1 | 3 | 1 | 1 | 8 | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 8 | 1 | 6 | 2 | 5 | 4 | 5 | 3 | 6 | 6 |
| Russia | 0 | 719 | 1 | 930 | 0 | 793 | 0 | 875 | 3 | 748 | 0 | 1,477 | 2 | 995 | 2 | 1,627 | 1 | 1,583 | 0 | 1,775 | 1 | 2,513 | 1 | 4,829 | 3 | 3,875 | 2 | 3,895 | 4 | 2,638 | 1 | 3,147 | 2 | 4,755 | 3 | 2,217 | 1 | 4,704 | 2 | 1,112 | 2 | 795 |
| Switzerland | 21 | 19 | 32 | 16 | 31 | 20 | 30 | 26 | 17 | 25 | 21 | 20 | 15 | 24 | 10 | 18 | 10 | 12 | 11 | 14 | 5 | 12 | 5 | 13 | 11 | 8 | 11 | 11 | 17 | 13 | 24 | 10 | 29 | 10 | 31 | 8 | 35 | 6 | 32 | 11 | 29 | 12 |
| All others | 0 | 1 | 0 | 1 | 0 | 2 | 2 | 1 | 2 | 1 | 2 | 2 | 1 | 0 | 1 | 2 | 2 | 3 | 0 | 5 | 0 | 2 | 1 | 5 | 0 | 4 | 1 | 2 | 0 | 5 | 1 | 4 | 0 | 3 | 2 | 3 | 0 | 3 | 3 | 6 | 2 | 2 |
| Asia | 100 | 1,591 | 139 | 1,956 | 139 | 1,868 | 124 | 1,693 | 136 | 1,577 | 122 | 2,468 | 128 | 2,688 | 68 | 3,469 | 91 | 3,575 | 75 | 3,633 | 74 | 3,367 | 61 | 3,296 | 109 | 3,717 | 125 | 5,378 | 155 | 9,937 | 165 | 11,298 | 168 | 9,291 | 155 | 9,591 | 160 | 9,028 | 167 | 6,615 | 160 | 7,397 |

TABLE S8-22

## USPTO patents and patent families granted in food chemistry, by region, country, or economy: 1998–2018

(Number)

| Region, country, or economy | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| China | 3 | 164 | 1 | 199 | 4 | 460 | 4 | 631 | 5 | 472 | 3 | 635 | 4 | 788 | 2 | 1,001 | 2 | 1,167 | 5 | 1,123 | 3 | 1,051 | 1 | 1,154 | 3 | 1,640 | 6 | 2,596 | 10 | 6,760 | 10 | 8,025 | 15 | 6,150 | 21 | 7,318 | 23 | 6,386 | 28 | 3,441 | 26 | 4,017 |
| India | 1 | 1 | 2 | 1 | 2 | 1 | 5 | 2 | 9 | 6 | 11 | 9 | 10 | 7 | 7 | 9 | 9 | 7 | 8 | 13 | 10 | 7 | 6 | 2 | 2 | 2 | 9 | 3 | 5 | 2 | 4 | 2 | 8 | 2 | 5 | 1 | 9 | 1 | 7 | 1 | 7 | 2 |
| Japan | 81 | 1,165 | 118 | 1,304 | 116 | 1,174 | 99 | 877 | 104 | 758 | 93 | 1,104 | 96 | 1,046 | 48 | 1,037 | 65 | 929 | 49 | 900 | 49 | 1,064 | 43 | 1,194 | 84 | 1,271 | 85 | 1,452 | 95 | 1,217 | 102 | 1,065 | 102 | 946 | 100 | 932 | 87 | 1,154 | 89 | 972 | 76 | 987 |
| Malaysia | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 2 | 1 | 4 | 0 | 0 | 1 | 9 | 3 | 4 | 1 | 4 | 16 | 4 | 13 | 8 | 3 | 2 | 1 | 11 | 1 | 6 | 3 | 10 | 1 | 9 |
| Singapore | 3 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 1 | 0 | 3 | 0 | 1 | 0 | 5 | 0 | 1 | 0 | 1 | 0 | 2 | 1 | 1 | 0 |
| South Korea | 7 | 250 | 11 | 442 | 6 | 213 | 10 | 163 | 11 | 328 | 11 | 697 | 11 | 822 | 8 | 1,292 | 9 | 1,432 | 4 | 1,555 | 7 | 1,206 | 9 | 910 | 15 | 772 | 18 | 1,281 | 20 | 1,910 | 24 | 2,149 | 25 | 2,134 | 19 | 1,270 | 29 | 1,420 | 29 | 2,119 | 37 | 2,329 |
| Taiwan | 5 | 8 | 2 | 6 | 8 | 15 | 4 | 15 | 2 | 11 | 4 | 19 | 4 | 19 | 3 | 28 | 3 | 34 | 5 | 27 | 3 | 36 | 1 | 26 | 2 | 25 | 5 | 39 | 5 | 41 | 10 | 46 | 8 | 51 | 7 | 55 | 6 | 55 | 9 | 70 | 7 | 50 |
| All others | 0 | 3 | 1 | 2 | 2 | 4 | 1 | 3 | 3 | 2 | 0 | 3 | 2 | 5 | 0 | 2 | 1 | 3 | 1 | 10 | 1 | 2 | 0 | 1 | 0 | 3 | 1 | 3 | 1 | 2 | 0 | 2 | 2 | 6 | 1 | 4 | 4 | 5 | 1 | 2 | 4 | 4 |
| Middle East | 5 | 3 | 4 | 6 | 10 | 29 | 7 | 20 | 8 | 13 | 8 | 13 | 5 | 15 | 3 | 22 | 5 | 9 | 4 | 11 | 1 | 23 | 2 | 3 | 7 | 5 | 7 | 20 | 4 | 11 | 12 | 13 | 2 | 2 | 14 | 9 | 19 | 12 | 21 | 4 | 23 | 10 |
| Israel | 5 | 2 | 4 | 2 | 10 | 3 | 6 | 1 | 8 | 3 | 8 | 0 | 5 | 4 | 3 | 1 | 5 | 3 | 4 | 1 | 1 | 1 | 2 | 1 | 7 | 1 | 5 | 2 | 4 | 1 | 9 | 3 | 11 | 2 | 13 | 1 | 16 | 3 | 15 | 1 | 17 | 3 |
| All others | 0 | 1 | 1 | 4 | 0 | 25 | 1 | 18 | 0 | 10 | 0 | 12 | 0 | 12 | 0 | 22 | 0 | 5 | 0 | 9 | 0 | 22 | 0 | 1 | 0 | 4 | 2 | 18 | 1 | 10 | 3 | 9 | 3 | 0 | 2 | 8 | 3 | 9 | 6 | 3 | 6 | 7 |
| Africa | 0 | 12 | 3 | 22 | 5 | 9 | 3 | 8 | 3 | 27 | 3 | 23 | 3 | 18 | 0 | 16 | 1 | 20 | 1 | 10 | 1 | 11 | 1 | 9 | 2 | 5 | 2 | 11 | 3 | 7 | 2 | 8 | 1 | 11 | 1 | 4 | 3 | 1 | 2 | 3 | 3 | 3 |
| South Africa | 0 | 7 | 3 | 11 | 4 | 0 | 2 | 5 | 3 | 7 | 2 | 7 | 3 | 9 | 0 | 11 | 1 | 6 | 1 | 7 | 1 | 7 | 1 | 4 | 2 | 2 | 1 | 0 | 3 | 0 | 2 | 1 | 1 | 1 | 1 | 1 | 3 | 0 | 2 | 0 | 2 | 1 |
| All others | 0 | 5 | 0 | 11 | 1 | 8 | 1 | 3 | 0 | 20 | 1 | 16 | 0 | 9 | 0 | 5 | 0 | 14 | 0 | 3 | 0 | 3 | 0 | 5 | 0 | 2 | 1 | 11 | 0 | 7 | 0 | 8 | 0 | 8 | 0 | 10 | 0 | 3 | 0 | 1 | 0 | 3 | 1 | 2 |
| Australia and Oceania | 10 | 7 | 12 | 9 | 14 | 11 | 19 | 9 | 16 | 13 | 13 | 11 | 9 | 17 | 7 | 16 | 19 | 20 | 8 | 31 | 2 | 14 | 17 | 16 | 19 | 13 | 17 | 31 | 13 | 31 | 11 | 32 | 16 | 38 | 15 | 46 | 17 | 33 | 22 | 18 | 19 | 30 |
| Australia | 8 | 6 | 11 | 8 | 8 | 10 | 14 | 8 | 11 | 13 | 7 | 10 | 7 | 17 | 4 | 16 | 14 | 20 | 5 | 30 | 1 | 14 | 10 | 16 | 14 | 13 | 14 | 30 | 10 | 28 | 8 | 32 | 14 | 37 | 6 | 13 | 46 | 11 | 33 | 18 | 17 | 16 |
| New Zealand | 2 | 1 | 1 | 1 | 6 | 0 | 5 | 1 | 5 | 0 | 5 | 1 | 2 | 0 | 2 | 0 | 4 | 0 | 2 | 1 | 1 | 0 | 7 | 0 | 5 | 0 | 3 | 1 | 3 | 3 | 3 | 0 | 2 | 1 | 2 | 1 | 6 | 0 | 4 | 1 | 3 | 0 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Unclassified | 0 | 5 | 1 | 9 | 0 | 1 | 0 | 1 | 0 | 8 | 0 | 7 | 0 | 1 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 1 | 0 | 0 | 0 | 0 |

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**Source(s)**

Science-Metrix; PATSTAT, accessed April 2019; PatentsView, USPTO, accessed June 2019.

TABLE S8-23

## USPTO patents and patent families granted in basic materials chemistry, by region, country, or economy: 1998–2018

(Number)

| Region, country, or economy | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| World | 3,419 | 5,537 | 3,664 | 6,161 | 3,418 | 4,785 | 3,567 | 4,548 | 3,422 | 4,525 | 3,367 | 5,579 | 2,939 | 6,039 | 2,163 | 6,250 | 2,410 | 7,053 | 2,236 | 7,355 | 2,140 | 6,626 | 2,347 | 6,783 | 3,342 | 7,639 | 3,471 | 9,053 | 3,884 | 12,112 | 4,391 | 16,526 | 4,802 | 16,257 | 4,546 | 15,672 | 4,490 | 16,910 | 4,599 | 14,648 | 4,465 | 14,869 |
| North America | 1,859 | 1,284 | 2,023 | 1,273 | 1,867 | 1,089 | 1,833 | 981 | 1,743 | 891 | 1,700 | 832 | 1,456 | 693 | 1,086 | 470 | 1,229 | 519 | 1,104 | 435 | 1,060 | 362 | 1,188 | 370 | 1,694 | 501 | 1,785 | 482 | 1,998 | 498 | 2,237 | 515 | 2,464 | 637 | 2,197 | 560 | 2,132 | 499 | 2,167 | 438 | 2,086 | 359 |
| Canada | 67 | 55 | 77 | 74 | 71 | 60 | 71 | 48 | 71 | 43 | 61 | 45 | 57 | 37 | 38 | 23 | 43 | 22 | 39 | 26 | 43 | 25 | 74 | 39 | 81 | 35 | 98 | 46 | 99 | 43 | 120 | 49 | 140 | 78 | 123 | 56 | 107 | 57 | 112 | 42 | 91 | 24 |
| Mexico | 3 | 1 | 5 | 2 | 4 | 1 | 2 | 0 | 4 | 2 | 3 | 1 | 2 | 2 | 1 | 0 | 0 | 0 | 4 | 2 | 1 | 1 | 2 | 0 | 4 | 1 | 5 | 0 | 5 | 1 | 7 | 1 | 13 | 0 | 10 | 2 | 9 | 21 | 17 | 23 | 18 | 19 |
| Puerto Rico | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 2 | 0 | 1 | 0 | 0 | 0 |
| United States | 1,789 | 1,227 | 1,939 | 1,197 | 1,792 | 1,029 | 1,760 | 932 | 1,668 | 845 | 1,635 | 786 | 1,396 | 654 | 1,046 | 447 | 1,186 | 497 | 1,061 | 407 | 1,016 | 336 | 1,111 | 331 | 1,609 | 466 | 1,680 | 436 | 1,894 | 454 | 2,110 | 465 | 2,311 | 559 | 2,062 | 502 | 2,015 | 421 | 2,037 | 373 | 1,978 | 316 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Central and South America | 11 | 5 | 21 | 11 | 16 | 7 | 11 | 5 | 15 | 7 | 16 | 5 | 13 | 10 | 9 | 11 | 16 | 8 | 11 | 10 | 9 | 6 | 13 | 17 | 28 | 14 | 25 | 26 | 32 | 21 | 21 | 22 | 24 | 29 | 27 | 40 | 28 | 46 | 25 | 35 | 23 | 63 |
| Argentina | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 2 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 2 | 0 | 1 | 1 | 3 | 3 | 1 | 1 |
| Brazil | 3 | 1 | 6 | 3 | 7 | 3 | 4 | 1 | 4 | 2 | 7 | 2 | 5 | 3 | 7 | 10 | 10 | 5 | 4 | 5 | 6 | 5 | 6 | 16 | 15 | 13 | 14 | 23 | 9 | 9 | 14 | 12 | 20 | 14 | 15 | 10 | 34 | 20 | 43 | 13 | 29 | 11 |
| All others | 7 | 4 | 15 | 9 | 8 | 3 | 6 | 3 | 10 | 4 | 7 | 3 | 8 | 6 | 0 | 0 | 5 | 2 | 7 | 4 | 3 | 1 | 5 | 1 | 12 | 1 | 10 | 3 | 22 | 6 | 8 | 1 | 9 | 3 | 15 | 6 | 6 | 2 | 9 | 2 | 12 | 5 |
| Europe | 918 | 1,695 | 976 | 1,588 | 905 | 1,301 | 1,017 | 1,166 | 968 | 1,369 | 937 | 1,633 | 767 | 1,621 | 578 | 1,462 | 617 | 1,372 | 539 | 1,227 | 473 | 1,323 | 499 | 1,265 | 752 | 1,279 | 723 | 1,285 | 823 | 1,481 | 931 | 1,773 | 1,065 | 1,485 | 1,016 | 1,372 | 950 | 1,256 | 968 | 1,492 | 924 | 1,440 |
| Austria | 849 | 869 | 909 | 922 | 843 | 722 | 942 | 654 | 894 | 704 | 878 | 677 | 709 | 654 | 537 | 665 | 571 | 668 | 499 | 592 | 439 | 618 | 451 | 531 | 690 | 607 | 670 | 622 | 760 | 766 | 852 | 647 | 978 | 588 | 929 | 608 | 850 | 691 | 869 | 701 | 831 | 771 |
| Belgium | 5 | 13 | 5 | 18 | 4 | 13 | 7 | 8 | 8 | 18 | 6 | 15 | 5 | 12 | 5 | 15 | 6 | 8 | 4 | 8 | 3 | 13 | 2 | 12 | 5 | 20 | 6 | 11 | 9 | 22 | 4 | 11 | 13 | 9 | 13 | 16 | 11 | 21 | 11 | 13 | 16 | 16 |
| Denmark | 79 | 40 | 88 | 32 | 70 | 24 | 65 | 18 | 85 | 33 | 72 | 26 | 45 | 23 | 39 | 13 | 38 | 17 | 28 | 12 | 20 | 8 | 33 | 18 | 39 | 13 | 35 | 18 | 43 | 13 | 54 | 27 | 63 | 19 | 42 | 11 | 39 | 13 | 41 | 33 | 42 | 42 |
| Finland | 14 | 5 | 24 | 5 | 11 | 4 | 21 | 2 | 13 | 1 | 19 | 5 | 9 | 1 | 7 | 1 | 8 | 1 | 13 | 2 | 6 | 2 | 8 | 2 | 12 | 3 | 3 | 19 | 1 | 16 | 3 | 19 | 4 | 14 | 4 | 17 | 2 | 25 | 2 | 22 | 7 | 26 |
| France | 8 | 16 | 13 | 13 | 7 | 18 | 11 | 22 | 9 | 10 | 8 | 16 | 6 | 20 | 4 | 12 | 3 | 11 | 8 | 9 | 5 | 11 | 7 | 15 | 4 | 16 | 11 | 10 | 15 | 14 | 10 | 24 | 10 | 24 | 20 | 17 | 18 | 13 | 23 | 14 | 24 | 25 |
| Germany | 99 | 173 | 115 | 170 | 109 | 122 | 101 | 133 | 108 | 133 | 101 | 145 | 74 | 137 | 59 | 142 | 57 | 175 | 71 | 147 | 63 | 113 | 58 | 96 | 98 | 118 | 96 | 144 | 105 | 212 | 124 | 160 | 139 | 140 | 126 | 177 | 148 | 160 | 142 | 143 | 144 | 134 |
| Hungary | 377 | 169 | 386 | 172 | 380 | 144 | 449 | 133 | 424 | 168 | 402 | 160 | 337 | 131 | 249 | 156 | 278 | 177 | 219 | 158 | 205 | 156 | 204 | 115 | 296 | 120 | 280 | 100 | 346 | 129 | 377 | 107 | 455 | 91 | 417 | 119 | 346 | 130 | 362 | 107 | 114 | 122 |
| Ireland | 1 | 12 | 1 | 5 | 1 | 8 | 3 | 10 | 1 | 5 | 1 | 8 | 1 | 3 | 2 | 3 | 1 | 4 | 0 | 7 | 1 | 2 | 0 | 3 | 1 | 6 | 1 | 6 | 1 | 4 | 1 | 6 | 3 | 3 | 2 | 3 | 1 | 5 | 3 | 3 | 1 | 3 |
| Italy | 1 | 3 | 0 | 4 | 1 | 2 | 2 | 0 | 1 | 2 | 3 | 1 | 4 | 1 | 3 | 0 | 2 | 0 | 3 | 1 | 2 | 0 | 2 | 0 | 2 | 0 | 3 | 1 | 4 | 1 | 5 | 3 | 3 | 2 | 5 | 2 | 2 | 2 | 4 | 3 | 4 | 1 |
| Netherlands | 25 | 52 | 35 | 109 | 37 | 90 | 27 | 52 | 40 | 58 | 44 | 42 | 20 | 79 | 16 | 44 | 20 | 15 | 14 | 10 | 19 | 12 | 14 | 8 | 23 | 19 | 28 | 28 | 23 | 25 | 29 | 7 | 24 | 8 | 30 | 6 | 31 | 12 | 35 | 82 | 29 | 77 |
| Spain | 36 | 31 | 48 | 34 | 56 | 27 | 52 | 34 | 48 | 21 | 51 | 30 | 43 | 25 | 32 | 19 | 41 | 18 | 32 | 22 | 15 | 24 | 31 | 15 | 49 | 18 | 39 | 22 | 41 | 16 | 59 | 28 | 65 | 17 | 67 | 18 | 66 | 22 | 63 | 27 | 57 | 18 |
| Sweden | 9 | 34 | 7 | 62 | 6 | 52 | 10 | 34 | 6 | 32 | 7 | 32 | 7 | 37 | 7 | 63 | 3 | 37 | 3 | 44 | 5 | 44 | 4 | 49 | 7 | 55 | 9 | 65 | 11 | 50 | 11 | 65 | 12 | 58 | 16 | 62 | 15 | 52 | 20 | 42 | 12 | 41 |
| United Kingdom | 9 | 25 | 16 | 28 | 9 | 20 | 14 | 24 | 10 | 9 | 12 | 15 | 12 | 22 | 6 | 12 | 8 | 12 | 11 | 13 | 7 | 8 | 6 | 10 | 6 | 7 | 10 | 12 | 11 | 13 | 15 | 12 | 6 | 14 | 5 | 13 | 8 | 16 | 6 | 15 | 6 | 11 |
| All others | 184 | 58 | 167 | 45 | 148 | 49 | 179 | 30 | 139 | 34 | 152 | 49 | 142 | 38 | 105 | 24 | 105 | 23 | 90 | 19 | 83 | 26 | 79 | 22 | 144 | 34 | 128 | 25 | 126 | 39 | 134 | 35 | 150 | 31 | 153 | 34 | 125 | 32 | 128 | 36 | 135 | 40 |
| Other Europe | 3 | 238 | 4 | 223 | 3 | 148 | 1 | 154 | 4 | 179 | 1 | 133 | 4 | 124 | 2 | 160 | 2 | 171 | 2 | 140 | 3 | 198 | 3 | 166 | 4 | 175 | 3 | 182 | 7 | 221 | 11 | 173 | 11 | 181 | 13 | 131 | 11 | 211 | 11 | 171 | 13 | 247 |
| Former Soviet Union | 69 | 826 | 67 | 666 | 63 | 579 | 75 | 512 | 74 | 665 | 59 | 956 | 58 | 967 | 41 | 797 | 46 | 703 | 40 | 636 | 35 | 705 | 48 | 733 | 62 | 672 | 53 | 663 | 63 | 715 | 79 | 1,126 | 87 | 897 | 87 | 763 | 100 | 565 | 100 | 791 | 45 | 669 |
| Norway | 2 | 35 | 0 | 22 | 0 | 14 | 2 | 34 | 1 | 58 | 0 | 97 | 1 | 240 | 0 | 90 | 0 | 84 | 1 | 113 | 1 | 89 | 0 | 95 | 0 | 87 | 1 | 81 | 1 | 56 | 2 | 70 | 2 | 64 | 1 | 51 | 3 | 55 | 1 | 45 | 1 | 52 |
| Russia | 3 | 8 | 4 | 10 | 5 | 9 | 6 | 10 | 4 | 9 | 3 | 6 | 7 | 4 | 3 | 5 | 3 | 6 | 3 | 9 | 5 | 6 | 3 | 2 | 7 | 4 | 3 | 9 | 7 | 9 | 10 | 4 | 10 | 6 | 9 | 2 | 10 | 8 | 11 | 8 | 13 | 5 |
| Switzerland | 6 | 762 | 5 | 605 | 6 | 539 | 5 | 452 | 7 | 577 | 6 | 834 | 6 | 709 | 4 | 685 | 6 | 600 | 8 | 503 | 4 | 592 | 6 | 618 | 11 | 564 | 5 | 550 | 5 | 633 | 10 | 1,033 | 11 | 811 | 11 | 696 | 10 | 486 | 10 | 722 | 9 | 590 |
| All others | 58 | 20 | 56 | 29 | 52 | 15 | 63 | 15 | 62 | 20 | 50 | 19 | 42 | 14 | 33 | 15 | 36 | 13 | 28 | 10 | 24 | 13 | 37 | 14 | 43 | 12 | 42 | 21 | 49 | 22 | 57 | 15 | 64 | 13 | 65 | 11 | 74 | 14 | 73 | 12 | 64 | 17 |
| Asia | 0 | 0 | 1 | 0 | 0 | 2 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 6 | 2 | 4 | 0 | 4 | 2 | 2 | 2 | 2 | 1 | 3 | 1 | 3 | 1 | 4 | 3 | 2 | 5 | 3 | 6 | 5 |
| | 591 | 2,489 | 606 | 3,187 | 593 | 2,315 | 678 | 2,349 | 660 | 2,208 | 676 | 3,062 | 669 | 3,683 | 451 | 4,261 | 522 | 5,116 | 554 | 5,634 | 562 | 4,884 | 614 | 5,077 | 810 | 5,794 | 871 | 7,209 | 967 | 10,055 | 1,112 | 14,143 | 1,154 | 14,021 | 1,186 | 13,588 | 1,263 | 15,005 | 1,301 | 12,635 | 1,272 | 12,943 |

TABLE S8-23

## USPTO patents and patent families granted in basic materials chemistry, by region, country, or economy: 1998–2018

(Number)

| | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Region, country, or economy | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| China | 8 | 200 | 5 | 239 | 5 | 455 | 5 | 607 | 14 | 438 | 9 | 932 | 16 | 1,251 | 10 | 1,458 | 14 | 1,700 | 8 | 1,626 | 15 | 1,661 | 17 | 2,222 | 27 | 2,299 | 33 | 3,277 | 43 | 5,618 | 66 | 9,307 | 80 | 8,914 | 116 | 10,121 | 152 | 11,528 | 147 | 8,998 | 178 | 9,554 |
| India | 6 | 3 | 10 | 5 | 10 | 5 | 13 | 7 | 20 | 12 | 17 | 13 | 18 | 9 | 16 | 13 | 16 | 7 | 9 | 7 | 10 | 8 | 15 | 4 | 21 | 4 | 11 | 4 | 23 | 4 | 34 | 6 | 45 | 12 | 55 | 17 | 68 | 24 | 77 | 15 | 79 | 10 |
| Japan | 551 | 2,050 | 548 | 2,499 | 543 | 1,596 | 600 | 1,447 | 570 | 1,438 | 584 | 1,520 | 563 | 1,759 | 374 | 1,375 | 439 | 1,634 | 471 | 2,253 | 462 | 2,172 | 479 | 2,120 | 631 | 2,476 | 684 | 2,795 | 723 | 2,924 | 829 | 3,056 | 843 | 3,375 | 802 | 2,078 | 801 | 2,068 | 814 | 1,832 | 718 | 1,626 |
| Malaysia | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 3 | 3 | 1 | 6 | 2 | 10 | 3 | 4 | 7 | 9 | 5 | 16 | 7 | 19 | 4 | 14 | 7 | 15 | 7 | 19 | 7 | 7 | 8 | 22 | 6 | 38 | 4 | 20 |
| Singapore | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 1 | 3 | 1 | 3 | 3 | 2 | 0 | 1 | 0 | 2 | 1 | 4 | 3 | 2 | 0 | 3 | 3 | 2 | 2 | 3 | 2 | 5 | 3 | 6 | 1 | 5 | 1 | 14 | 2 | 7 | 2 | 14 | 2 | 14 | 1 |
| South Korea | 14 | 207 | 26 | 416 | 16 | 224 | 35 | 229 | 32 | 268 | 42 | 534 | 44 | 574 | 32 | 1,343 | 35 | 1,681 | 43 | 1,651 | 45 | 960 | 64 | 658 | 82 | 895 | 97 | 1,036 | 120 | 1,371 | 112 | 1,585 | 113 | 1,492 | 139 | 1,162 | 169 | 1,172 | 193 | 1,592 | 223 | 1,629 |
| Taiwan | 9 | 23 | 11 | 24 | 13 | 31 | 20 | 54 | 18 | 50 | 18 | 57 | 25 | 87 | 16 | 68 | 14 | 84 | 16 | 84 | 25 | 75 | 28 | 62 | 41 | 100 | 34 | 72 | 44 | 115 | 52 | 167 | 56 | 204 | 50 | 194 | 53 | 177 | 44 | 152 | 55 | 101 |
| All others | 2 | 5 | 3 | 2 | 1 | 2 | 2 | 4 | 1 | 2 | 2 | 3 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 3 | 1 | 1 | 1 | 2 | 1 | 3 | 4 | 6 | 5 | 7 | 5 | 4 | 4 | 5 | 5 | 8 | 6 | 7 | 3 | 2 |
| Middle East | 11 | 6 | 7 | 4 | 5 | 6 | 9 | 4 | 10 | 5 | 9 | 8 | 9 | 5 | 9 | 8 | 8 | 7 | 9 | 13 | 9 | 8 | 12 | 10 | 20 | 6 | 23 | 12 | 28 | 7 | 46 | 15 | 44 | 13 | 63 | 24 | 79 | 20 | 94 | 25 | 109 | 34 |
| Israel | 9 | 4 | 7 | 3 | 5 | 1 | 8 | 3 | 9 | 2 | 5 | 4 | 8 | 3 | 8 | 3 | 6 | 2 | 6 | 4 | 6 | 2 | 6 | 5 | 11 | 2 | 16 | 3 | 15 | 2 | 26 | 3 | 18 | 2 | 22 | 4 | 25 | 2 | 30 | 0 | 23 | 4 |
| All others | 2 | 2 | 1 | 1 | 0 | 5 | 1 | 1 | 1 | 3 | 4 | 4 | 1 | 2 | 1 | 6 | 2 | 5 | 3 | 9 | 2 | 6 | 6 | 5 | 9 | 4 | 7 | 10 | 13 | 5 | 20 | 12 | 26 | 11 | 41 | 20 | 54 | 18 | 64 | 24 | 86 | 30 |
| Africa | 4 | 20 | 9 | 22 | 4 | 19 | 4 | 20 | 6 | 20 | 8 | 23 | 4 | 11 | 7 | 13 | 1 | 12 | 6 | 12 | 7 | 23 | 5 | 14 | 7 | 22 | 9 | 9 | 12 | 17 | 12 | 11 | 12 | 9 | 9 | 4 | 5 | 5 | 9 | 4 | 8 | 4 |
| South Africa | 4 | 19 | 7 | 14 | 3 | 12 | 3 | 3 | 5 | 3 | 5 | 5 | 3 | 2 | 7 | 7 | 1 | 7 | 6 | 8 | 7 | 16 | 4 | 8 | 7 | 17 | 8 | 0 | 12 | 3 | 11 | 2 | 12 | 0 | 8 | 1 | 3 | 0 | 8 | 0 | 6 | 1 |
| All others | 0 | 2 | 2 | 8 | 1 | 7 | 1 | 16 | 2 | 18 | 4 | 18 | 1 | 9 | 0 | 6 | 0 | 4 | 0 | 4 | 0 | 7 | 1 | 6 | 0 | 5 | 0 | 9 | 0 | 14 | 1 | 9 | 2 | 9 | 1 | 4 | 2 | 5 | 1 | 4 | 2 | 3 |
| Australia and Oceania | 22 | 16 | 21 | 17 | 27 | 16 | 14 | 21 | 20 | 24 | 21 | 15 | 21 | 15 | 22 | 18 | 17 | 17 | 13 | 22 | 20 | 20 | 16 | 17 | 30 | 22 | 35 | 28 | 24 | 33 | 32 | 47 | 37 | 62 | 46 | 83 | 32 | 76 | 34 | 19 | 41 | 26 |
| Australia | 19 | 17 | 15 | 23 | 16 | 12 | 21 | 17 | 17 | 24 | 20 | 15 | 19 | 15 | 22 | 18 | 17 | 17 | 11 | 22 | 17 | 19 | 15 | 15 | 27 | 20 | 31 | 27 | 20 | 33 | 24 | 45 | 31 | 59 | 41 | 83 | 23 | 76 | 30 | 17 | 34 | 26 |
| New Zealand | 3 | 1 | 4 | 1 | 3 | 0 | 1 | 0 | 3 | 0 | 2 | 0 | 2 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 2 | 1 | 1 | 2 | 3 | 2 | 4 | 1 | 4 | 0 | 8 | 2 | 5 | 2 | 6 | 1 | 9 | 0 | 5 | 2 | 7 | 0 |
| All others | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Unclassified | 3 | 22 | 1 | 59 | 1 | 32 | 0 | 3 | 0 | 2 | 0 | 1 | 0 | 1 | 0 | 7 | 0 | 4 | 0 | 0 | 0 | 1 | 0 | 13 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 2 | 1 | 0 | 1 | 2 | 1 | 0 | 2 | 0 |

EU = European Union; USPTO = U.S. Patent and Trademark Office.

**Note(s)**

USPTO patents are allocated according to patent inventorship information. USPTO patents are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named inventors. Patents are classified under the World Intellectual Property Organization (WIPO) classification of patents, which classifies International Patent Classification (IPC) codes under 35 technical fields. IPC reformed codes take into account changes that were made to the WIPO classification in 2006 under the eighth version of the classification and were used to prepare these data. However, because PatentsView only provides the original IPC codes as they appeared on patents and not the IPC reformed codes, current Cooperative Patent Classification codes on patents were converted back to the most recent IPC classification to prepare these statistics. Fractional counts of patents were assigned to each technological field on patents to assign the proper weight of a patent to the corresponding technological fields under the classification. International Patent Documentation (INPADOC) patent families across all patent offices covered in the Worldwide Patent Statistical Database (PATSTAT) are counted according to the year of the first granted patent in the patent family. Patent families are allocated according to patent inventorship information found on the priority patent of the INPADOC patent families. To account for missing ownership information in PATSTAT for some offices, a method designed by de Rassenfosse et al. (2012) is used to fill in missing information on priority patents using information in successive filings within the patent families (see technical documentation for details). Patent families are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named inventors. Because of data coverage issues for some patent offices in PATSTAT, statistics for some countries may be underestimated partially for some years or across the whole trend. Countries with identified issues include India (missing data) and South Africa (no data for 2018). For Italy, because of data gaps regarding information on granted patents, patent applications are used instead, which slightly overestimates Italy's output and creates a small shift in the year for which its output is accounted. The EU includes 28 member countries. China includes Hong Kong.

**Source(s)**

Science-Metrix; PATSTAT, accessed April 2019; PatentsView, USPTO, accessed June 2019.

TABLE S8-24

## USPTO patents and patent families granted in materials, metallurgy, by region, country, or economy: 1998–2018

(Number)

| Region, country, or economy | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| World | 2,150 | 7,353 | 2,313 | 7,569 | 2,092 | 6,707 | 2,372 | 6,148 | 2,402 | 6,324 | 2,315 | 7,095 | 2,040 | 7,789 | 1,585 | 7,571 | 1,607 | 8,626 | 1,459 | 9,557 | 1,360 | 10,739 | 1,684 | 11,149 | 2,342 | 11,628 | 2,331 | 14,079 | 2,530 | 16,996 | 2,659 | 18,408 | 2,781 | 18,842 | 2,812 | 20,803 | 2,763 | 23,541 | 3,033 | 22,309 | 2,981 | 20,746 |
| North America | 1,013 | 708 | 1,053 | 678 | 937 | 580 | 1,028 | 569 | 1,018 | 552 | 1,008 | 503 | 884 | 450 | 697 | 339 | 733 | 343 | 662 | 292 | 606 | 256 | 744 | 278 | 1,009 | 348 | 965 | 306 | 1,002 | 310 | 1,084 | 276 | 1,107 | 296 | 1,046 | 302 | 1,015 | 276 | 1,151 | 271 | 1,123 | 258 |
| Canada | 58 | 40 | 73 | 64 | 52 | 37 | 57 | 36 | 70 | 43 | 62 | 34 | 50 | 27 | 39 | 23 | 44 | 21 | 33 | 22 | 33 | 24 | 39 | 15 | 52 | 13 | 49 | 15 | 52 | 21 | 54 | 14 | 58 | 18 | 48 | 13 | 52 | 16 | 51 | 13 | 51 | 10 |
| Mexico | 5 | 5 | 8 | 6 | 10 | 4 | 2 | 1 | 6 | 5 | 4 | 3 | 2 | 2 | 0 | 1 | 4 | 2 | 3 | 0 | 2 | 2 | 5 | 2 | 6 | 2 | 7 | 2 | 6 | 2 | 8 | 2 | 8 | 1 | 4 | 2 | 5 | 14 | 5 | 15 | 4 | 12 |
| Puerto Rico | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| United States | 949 | 662 | 972 | 607 | 876 | 539 | 969 | 531 | 942 | 504 | 941 | 465 | 831 | 421 | 657 | 315 | 685 | 321 | 626 | 270 | 572 | 230 | 699 | 261 | 950 | 333 | 909 | 289 | 944 | 286 | 1,022 | 260 | 1,041 | 277 | 995 | 287 | 957 | 245 | 1,094 | 243 | 1,067 | 236 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Central and South America | 6 | 4 | 6 | 6 | 9 | 8 | 10 | 4 | 9 | 7 | 10 | 7 | 6 | 10 | 2 | 3 | 6 | 3 | 7 | 1 | 6 | 4 | 9 | 28 | 9 | 16 | 15 | 32 | 13 | 25 | 10 | 22 | 20 | 31 | 18 | 25 | 16 | 43 | 15 | 26 | 10 | 37 |
| Argentina | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 1 | 1 | 1 | 2 | 0 | 0 | 0 | 2 | 1 | 2 | 1 | 1 | 0 | 1 | 1 | 0 | 0 |
| Brazil | 1 | 1 | 1 | 2 | 2 | 2 | 3 | 1 | 2 | 2 | 4 | 5 | 2 | 6 | 0 | 1 | 3 | 2 | 3 | 0 | 3 | 0 | 2 | 0 | 0 | 0 | 8 | 29 | 5 | 21 | 6 | 21 | 11 | 26 | 13 | 22 | 11 | 39 | 11 | 21 | 4 | 33 |
| All others | 4 | 3 | 4 | 4 | 7 | 6 | 5 | 1 | 7 | 4 | 4 | 2 | 4 | 4 | 2 | 2 | 3 | 1 | 4 | 1 | 4 | 1 | 4 | 1 | 5 | 2 | 3 | 2 | 5 | 4 | 3 | 0 | 6 | 4 | 4 | 3 | 4 | 4 | 3 | 4 | 6 | 4 |
| Europe | 514 | 2,248 | 551 | 1,839 | 552 | 1,936 | 626 | 1,657 | 618 | 1,766 | 546 | 2,065 | 488 | 2,430 | 383 | 1,887 | 360 | 1,739 | 323 | 2,204 | 300 | 3,060 | 349 | 2,784 | 500 | 2,209 | 490 | 2,356 | 549 | 2,308 | 570 | 2,366 | 606 | 2,100 | 628 | 2,132 | 610 | 1,673 | 612 | 2,208 | 617 | 1,788 |
| EU | 461 | 919 | 496 | 966 | 506 | 958 | 583 | 847 | 566 | 821 | 497 | 766 | 445 | 782 | 358 | 788 | 333 | 737 | 300 | 688 | 277 | 662 | 324 | 626 | 467 | 635 | 453 | 795 | 501 | 736 | 528 | 703 | 561 | 721 | 579 | 687 | 551 | 725 | 560 | 767 | 563 | 748 |
| Austria | 17 | 55 | 29 | 70 | 19 | 58 | 34 | 83 | 30 | 60 | 29 | 54 | 19 | 47 | 17 | 43 | 16 | 29 | 17 | 26 | 8 | 35 | 14 | 21 | 21 | 40 | 20 | 49 | 23 | 37 | 22 | 39 | 26 | 31 | 25 | 24 | 29 | 31 | 33 | 44 | 34 | 34 |
| Belgium | 13 | 5 | 14 | 7 | 15 | 5 | 17 | 6 | 23 | 8 | 12 | 8 | 9 | 20 | 8 | 12 | 8 | 14 | 6 | 7 | 6 | 10 | 6 | 15 | 4 | 23 | 3 | 15 | 6 | 16 | 5 | 18 | 7 | 28 | 3 | 26 | 6 | 26 | 2 | 23 | 12 | 19 | 16 |
| Denmark | 9 | 3 | 13 | 4 | 11 | 7 | 12 | 7 | 14 | 8 | 8 | 5 | 12 | 2 | 10 | 3 | 11 | 1 | 4 | 3 | 4 | 5 | 7 | 2 | 8 | 3 | 7 | 3 | 7 | 1 | 7 | 2 | 9 | 1 | 8 | 1 | 5 | 1 | 6 | 4 | 10 | 2 |
| Finland | 8 | 11 | 5 | 12 | 5 | 9 | 11 | 13 | 8 | 21 | 9 | 14 | 15 | 13 | 9 | 27 | 6 | 22 | 5 | 16 | 4 | 14 | 14 | 10 | 14 | 16 | 16 | 6 | 20 | 8 | 21 | 12 | 9 | 17 | 16 | 28 | 14 | 18 | 21 | 20 | 12 | 15 |
| France | 103 | 195 | 110 | 177 | 110 | 163 | 120 | 152 | 97 | 145 | 85 | 132 | 66 | 141 | 65 | 126 | 52 | 168 | 56 | 152 | 54 | 135 | 63 | 116 | 90 | 127 | 87 | 206 | 127 | 166 | 110 | 145 | 115 | 193 | 126 | 172 | 111 | 150 | 108 | 133 | 110 | 112 |
| Germany | 184 | 286 | 165 | 286 | 226 | 277 | 235 | 283 | 228 | 274 | 208 | 276 | 199 | 240 | 156 | 268 | 137 | 270 | 123 | 267 | 101 | 237 | 133 | 217 | 182 | 198 | 189 | 199 | 203 | 194 | 223 | 229 | 224 | 214 | 206 | 170 | 204 | 199 | 203 | 221 | 218 | 228 |
| Hungary | 2 | 4 | 2 | 4 | 1 | 3 | 1 | 3 | 1 | 2 | 1 | 3 | 1 | 4 | 0 | 1 | 0 | 4 | 1 | 4 | 1 | 2 | 0 | 2 | 1 | 5 | 2 | 1 | 0 | 6 | 2 | 4 | 1 | 2 | 1 | 2 | 1 | 3 | 1 | 4 | 1 | 1 |
| Ireland | 1 | 3 | 1 | 1 | 0 | 2 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 2 | 1 | 1 | 2 | 0 | 1 | 2 | 2 | 1 | 1 | 0 | 3 | 1 | 1 | 1 | 3 | 2 | 1 | 0 | 2 | 0 | 4 | 1 |
| Italy | 19 | 75 | 26 | 109 | 29 | 117 | 30 | 58 | 35 | 65 | 28 | 44 | 20 | 106 | 19 | 49 | 21 | 10 | 14 | 7 | 16 | 7 | 11 | 7 | 26 | 20 | 24 | 36 | 20 | 31 | 23 | 6 | 29 | 7 | 33 | 9 | 34 | 8 | 27 | 85 | 28 | 50 |
| Netherlands | 17 | 27 | 20 | 26 | 15 | 29 | 15 | 20 | 16 | 17 | 16 | 19 | 19 | 15 | 15 | 14 | 11 | 12 | 10 | 8 | 17 | 11 | 18 | 11 | 17 | 12 | 23 | 11 | 15 | 13 | 22 | 22 | 24 | 11 | 17 | 6 | 17 | 10 | 18 | 9 | 20 | 6 |
| Spain | 1 | 17 | 7 | 39 | 6 | 51 | 4 | 34 | 8 | 21 | 9 | 45 | 4 | 57 | 4 | 60 | 6 | 44 | 2 | 38 | 4 | 39 | 4 | 47 | 4 | 54 | 7 | 66 | 7 | 63 | 7 | 56 | 10 | 65 | 7 | 61 | 10 | 44 | 10 | 44 | 6 | 39 |
| Sweden | 20 | 32 | 34 | 30 | 24 | 34 | 45 | 37 | 48 | 36 | 33 | 50 | 26 | 35 | 19 | 34 | 20 | 35 | 29 | 24 | 26 | 18 | 22 | 18 | 30 | 19 | 25 | 28 | 23 | 13 | 26 | 6 | 25 | 11 | 35 | 22 | 26 | 13 | 30 | 16 | 21 | 17 |
| United Kingdom | 58 | 16 | 65 | 21 | 42 | 18 | 47 | 21 | 45 | 16 | 53 | 12 | 39 | 23 | 25 | 17 | 34 | 16 | 27 | 14 | 24 | 11 | 22 | 11 | 36 | 13 | 41 | 18 | 40 | 18 | 43 | 17 | 46 | 10 | 60 | 26 | 58 | 18 | 48 | 16 | 66 | 17 |
| All others | 8 | 189 | 3 | 180 | 4 | 175 | 11 | 130 | 12 | 137 | 6 | 104 | 3 | 92 | 7 | 137 | 3 | 119 | 6 | 121 | 6 | 142 | 3 | 145 | 10 | 122 | 7 | 152 | 10 | 167 | 12 | 151 | 13 | 154 | 16 | 158 | 16 | 227 | 10 | 158 | 13 | 209 |
| Other Europe | 53 | 1,328 | 56 | 872 | 46 | 978 | 44 | 809 | 52 | 945 | 48 | 1,299 | 43 | 1,648 | 25 | 1,099 | 27 | 1,002 | 22 | 1,516 | 24 | 2,398 | 26 | 2,158 | 33 | 1,574 | 37 | 1,560 | 49 | 1,572 | 42 | 1,663 | 46 | 1,379 | 49 | 1,445 | 58 | 948 | 52 | 1,441 | 54 | 1,040 |
| Former Soviet Union | 1 | 55 | 2 | 21 | 1 | 28 | 2 | 27 | 3 | 70 | 4 | 156 | 0 | 489 | 3 | 161 | 1 | 146 | 0 | 253 | 0 | 255 | 1 | 239 | 1 | 230 | 2 | 174 | 1 | 122 | 0 | 138 | 2 | 114 | 2 | 126 | 2 | 88 | 1 | 104 | 1 | 62 |
| Norway | 8 | 12 | 5 | 11 | 8 | 4 | 5 | 12 | 6 | 12 | 6 | 9 | 10 | 6 | 5 | 14 | 4 | 5 | 4 | 10 | 7 | 5 | 2 | 7 | 7 | 13 | 5 | 9 | 4 | 5 | 8 | 5 | 10 | 9 | 10 | 9 | 3 | 9 | 5 | 8 | 4 | 6 |
| Russia | 12 | 1,233 | 9 | 803 | 6 | 922 | 9 | 741 | 11 | 841 | 9 | 1,113 | 12 | 1,131 | 7 | 910 | 7 | 838 | 5 | 1,235 | 4 | 2,112 | 8 | 1,891 | 9 | 1,317 | 6 | 1,362 | 3 | 1,433 | 8 | 1,500 | 8 | 1,226 | 8 | 1,300 | 10 | 839 | 7 | 1,319 | 9 | 950 |
| Switzerland | 33 | 26 | 39 | 34 | 29 | 23 | 27 | 28 | 31 | 23 | 26 | 20 | 20 | 20 | 10 | 13 | 14 | 13 | 12 | 16 | 10 | 24 | 14 | 17 | 14 | 11 | 21 | 3 | 33 | 12 | 23 | 12 | 27 | 15 | 27 | 12 | 30 | 14 | 32 | 13 | 35 | 21 |
| All others | 0 | 2 | 1 | 3 | 1 | 1 | 1 | 1 | 1 | 0 | 3 | 1 | 0 | 1 | 0 | 1 | 2 | 0 | 1 | 3 | 3 | 2 | 1 | 5 | 1 | 4 | 3 | 3 | 3 | 0 | 2 | 2 | 1 | 3 | 3 | 4 | 6 | 2 | 4 | 2 | 4 | 1 |
| Asia | 595 | 4,339 | 659 | 4,776 | 558 | 3,998 | 665 | 3,846 | 720 | 3,950 | 712 | 4,479 | 624 | 4,846 | 477 | 5,245 | 468 | 6,498 | 439 | 7,036 | 419 | 7,373 | 541 | 8,030 | 765 | 9,017 | 804 | 11,338 | 911 | 14,263 | 934 | 15,669 | 979 | 16,375 | 1,047 | 18,295 | 1,058 | 21,495 | 1,176 | 19,763 | 1,161 | 18,630 |

TABLE S8-24

## USPTO patents and patent families granted in materials, metallurgy, by region, country, or economy: 1998–2018

(Number)

| | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Region, country, or economy | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| China | 4 | 249 | 5 | 277 | 5 | 504 | 4 | 493 | 6 | 411 | 2 | 667 | 8 | 1,161 | 3 | 1,408 | 6 | 1,749 | 11 | 2,123 | 9 | 2,612 | 20 | 3,410 | 32 | 4,270 | 32 | 6,019 | 56 | 8,012 | 62 | 8,858 | 87 | 9,214 | 91 | 13,245 | 98 | 16,216 | 151 | 15,197 | 154 | 14,408 |
| India | 3 | 2 | 5 | 7 | 5 | 4 | 4 | 4 | 8 | 5 | 8 | 7 | 15 | 12 | 9 | 7 | 11 | 10 | 11 | 6 | 10 | 14 | 6 | 4 | 10 | 6 | 8 | 6 | 16 | 5 | 17 | 8 | 18 | 10 | 22 | 8 | 19 | 8 | 18 | 8 | 25 | 4 |
| Japan | 531 | 3,666 | 584 | 3,710 | 499 | 2,838 | 581 | 2,903 | 639 | 2,850 | 634 | 2,749 | 534 | 2,598 | 416 | 2,195 | 395 | 2,697 | 363 | 2,993 | 356 | 3,044 | 435 | 3,537 | 615 | 3,451 | 631 | 3,724 | 685 | 3,922 | 682 | 3,872 | 698 | 4,217 | 720 | 2,931 | 715 | 2,876 | 769 | 2,401 | 753 | 2,347 |
| Malaysia | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 3 | 0 | 1 | 0 | 2 | 1 | 1 | 7 | 1 | 3 | 0 | 4 | 1 | 7 | 1 | 5 | 1 | 5 | 1 | 7 | 2 | 7 | 0 | 9 | 0 | 7 | 2 | 9 | 1 | 8 |
| Singapore | 1 | 2 | 0 | 0 | 1 | 1 | 1 | 0 | 3 | 1 | 4 | 1 | 4 | 1 | 2 | 1 | 2 | 3 | 1 | 1 | 1 | 1 | 3 | 1 | 2 | 1 | 2 | 0 | 2 | 0 | 3 | 1 | 3 | 0 | 6 | 1 | 11 | 0 | 8 | 0 | 9 | 2 |
| South Korea | 36 | 367 | 46 | 747 | 34 | 604 | 56 | 346 | 41 | 607 | 44 | 956 | 37 | 966 | 33 | 1,536 | 33 | 1,923 | 32 | 1,813 | 26 | 1,628 | 52 | 988 | 72 | 1,195 | 99 | 1,492 | 102 | 2,184 | 120 | 2,671 | 127 | 2,665 | 158 | 1,861 | 173 | 2,131 | 193 | 1,939 | 177 | 1,716 |
| Taiwan | 20 | 42 | 19 | 31 | 14 | 43 | 17 | 93 | 22 | 73 | 19 | 92 | 22 | 101 | 12 | 91 | 18 | 112 | 21 | 85 | 17 | 68 | 26 | 73 | 32 | 82 | 30 | 89 | 46 | 128 | 46 | 245 | 40 | 253 | 46 | 228 | 40 | 248 | 32 | 199 | 40 | 142 |
| All others | 1 | 11 | 0 | 3 | 0 | 4 | 2 | 5 | 0 | 3 | 1 | 7 | 1 | 6 | 1 | 5 | 0 | 3 | 1 | 7 | 1 | 5 | 0 | 13 | 1 | 5 | 2 | 3 | 3 | 6 | 4 | 8 | 3 | 8 | 4 | 11 | 3 | 9 | 3 | 10 | 2 | 5 |
| Middle East | 5 | 4 | 8 | 4 | 9 | 25 | 7 | 14 | 6 | 10 | 6 | 11 | 6 | 16 | 5 | 9 | 9 | 5 | 6 | 6 | 8 | 12 | 9 | 2 | 11 | 4 | 14 | 11 | 21 | 12 | 22 | 16 | 29 | 7 | 29 | 16 | 36 | 24 | 46 | 25 | 42 | 20 |
| Israel | 5 | 2 | 7 | 3 | 8 | 6 | 6 | 5 | 4 | 3 | 5 | 3 | 6 | 4 | 5 | 1 | 8 | 2 | 5 | 2 | 7 | 3 | 6 | 0 | 7 | 0 | 8 | 1 | 8 | 2 | 7 | 1 | 12 | 1 | 6 | 1 | 11 | 2 | 9 | 2 | 9 | 0 |
| All others | 1 | 2 | 1 | 1 | 1 | 20 | 2 | 9 | 1 | 7 | 1 | 7 | 0 | 12 | 0 | 7 | 1 | 2 | 1 | 3 | 1 | 9 | 3 | 2 | 4 | 4 | 6 | 10 | 13 | 10 | 15 | 15 | 17 | 6 | 23 | 15 | 26 | 22 | 37 | 23 | 33 | 20 |
| Africa | 2 | 15 | 6 | 16 | 4 | 14 | 10 | 18 | 6 | 22 | 6 | 18 | 8 | 14 | 6 | 11 | 11 | 10 | 3 | 8 | 3 | 13 | 6 | 13 | 9 | 10 | 9 | 4 | 7 | 12 | 12 | 5 | 8 | 9 | 11 | 4 | 5 | 8 | 9 | 5 | 3 | 4 |
| South Africa | 2 | 15 | 5 | 12 | 3 | 9 | 10 | 9 | 6 | 10 | 6 | 9 | 7 | 6 | 6 | 7 | 10 | 8 | 3 | 7 | 3 | 10 | 6 | 10 | 9 | 6 | 8 | 0 | 7 | 1 | 12 | 1 | 8 | 0 | 10 | 0 | 5 | 1 | 7 | 0 | 3 | 2 |
| All others | 0 | 1 | 1 | 4 | 0 | 5 | 0 | 9 | 0 | 12 | 0 | 9 | 1 | 7 | 0 | 4 | 1 | 2 | 0 | 1 | 0 | 3 | 0 | 2 | 0 | 3 | 0 | 4 | 0 | 0 | 1 | 4 | 0 | 8 | 1 | 4 | 0 | 7 | 2 | 5 | 0 | 2 |
| Australia and Oceania | 15 | 13 | 30 | 10 | 22 | 12 | 25 | 24 | 26 | 9 | 27 | 13 | 24 | 9 | 15 | 9 | 21 | 9 | 19 | 10 | 16 | 16 | 25 | 9 | 39 | 13 | 35 | 28 | 27 | 41 | 26 | 19 | 31 | 19 | 32 | 21 | 22 | 16 | 23 | 10 | 25 | 9 |
| Australia | 13 | 12 | 30 | 10 | 20 | 12 | 23 | 23 | 26 | 9 | 26 | 13 | 23 | 9 | 15 | 9 | 20 | 9 | 18 | 10 | 16 | 16 | 24 | 9 | 38 | 12 | 33 | 28 | 24 | 41 | 24 | 19 | 30 | 19 | 30 | 21 | 20 | 16 | 22 | 10 | 23 | 8 |
| New Zealand | 2 | 1 | 0 | 0 | 2 | 0 | 2 | 1 | 0 | 0 | 2 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 2 | 0 | 3 | 0 | 1 | 0 | 1 | 0 | 2 | 0 | 2 | 0 | 1 | 0 | 1 | 1 |
| All others | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Unclassified | 1 | 22 | 0 | 242 | 1 | 133 | 0 | 18 | 0 | 7 | 0 | 0 | 0 | 14 | 0 | 67 | 0 | 18 | 0 | 0 | 0 | 4 | 0 | 6 | 0 | 13 | 0 | 4 | 0 | 26 | 0 | 34 | 1 | 4 | 0 | 6 | 1 | 7 | 1 | 1 | 0 | 0 |

EU = European Union; USPTO = U.S. Patent and Trademark Office.

**Note(s)**

USPTO patents are allocated according to patent inventorship information. USPTO patents are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named inventors. Patents are classified under the World Intellectual Property Organization (WIPO) classification of patents, which classifies International Patent Classification (IPC) codes under 35 technical fields. IPC reformed codes take into account changes that were made to the WIPO classification in 2006 and the eighth version of the classification and were used to prepare these data. However, because PatentsView only provides the original IPC codes as they appeared on patents and not the IPC reformed codes, current Cooperative Patent Classification codes on patents were converted back to the most recent IPC classification to prepare these statistics. Fractional counts of patents were assigned to each technological field on patents to assign the proper weight of a patent to the corresponding technological fields under the classification. International Patent Documentation (INPADOC) patent families across all patent offices covered in the Worldwide Patent Statistical Database (PATSTAT) are counted according to the year of the first granted patent in the patent family. Patent families are allocated according to patent inventorship information found on the priority patent of the INPADOC patent families. To account for missing ownership information in PATSTAT for some offices, a method designed by de Rassenfosse et al. (2012) is used to fill in missing information on priority patents using information in successive filings within the patent families (see technical documentation for details). Patent families are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named inventors. Because of data coverage issues for some patent offices in PATSTAT, statistics for some countries may be underestimated partially for some years or across the whole trend. Countries with identified issues include India (missing data) and South Africa (no data for 2018). For Italy, because of data gaps regarding information on granted patents, patent applications are used instead, which slightly overestimates Italy's output and creates a small shift in the year for which its output is accounted. The EU includes 28 member countries. China includes Hong Kong.

**Source(s)**

Science-Metrix; PATSTAT, accessed April 2019; PatentsView, USPTO, accessed June 2019.

TABLE 5B-25

## USPTO patents and patent families granted in surface technology, coating, by region, country, or economy: 1998–2018

(Number)

| Region, country, or economy | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| World | 2,133 | 4,983 | 2,356 | 5,419 | 2,502 | 4,911 | 2,654 | 4,735 | 2,678 | 4,332 | 2,619 | 4,691 | 2,474 | 4,621 | 1,915 | 4,742 | 1,760 | 5,440 | 1,665 | 6,226 | 1,575 | 5,964 | 1,565 | 6,283 | 2,232 | 7,615 | 2,305 | 8,836 | 2,607 | 9,783 | 2,763 | 9,651 | 2,929 | 10,161 | 3,036 | 10,373 | 3,184 | 11,783 | 3,577 | 11,090 | 3,519 | 11,263 |
| North America | 1,150 | 834 | 1,265 | 857 | 1,325 | 842 | 1,420 | 865 | 1,393 | 825 | 1,406 | 791 | 1,270 | 712 | 1,040 | 605 | 905 | 618 | 867 | 624 | 798 | 607 | 812 | 619 | 1,071 | 857 | 1,076 | 787 | 1,222 | 818 | 1,270 | 819 | 1,272 | 713 | 1,331 | 594 | 1,369 | 530 | 1,541 | 474 | 1,451 | 418 |
| Canada | 28 | 30 | 28 | 23 | 35 | 26 | 41 | 36 | 42 | 27 | 39 | 24 | 34 | 21 | 29 | 26 | 29 | 23 | 29 | 23 | 20 | 20 | 18 | 16 | 21 | 25 | 36 | 26 | 52 | 46 | 39 | 37 | 40 | 36 | 40 | 22 | 52 | 24 | 55 | 17 | 52 | 16 |
| Mexico | 0 | 1 | 2 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 3 | 2 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 2 | 0 | 0 | 1 | 0 | 2 | 2 | 1 | 1 | 2 | 2 | 3 | 6 | 4 | 9 | 6 | 7 |
| Puerto Rico | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| United States | 1,120 | 803 | 1,236 | 833 | 1,289 | 815 | 1,377 | 829 | 1,351 | 797 | 1,365 | 767 | 1,233 | 689 | 1,010 | 578 | 875 | 595 | 836 | 601 | 777 | 587 | 794 | 602 | 1,049 | 830 | 1,040 | 761 | 1,169 | 772 | 1,226 | 781 | 1,230 | 675 | 1,289 | 570 | 1,314 | 500 | 1,482 | 449 | 1,394 | 395 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Central and South America | 3 | 2 | 4 | 1 | 3 | 1 | 3 | 3 | 3 | 7 | 0 | 7 | 3 | 8 | 5 | 1 | 3 | 2 | 3 | 4 | 3 | 3 | 2 | 2 | 3 | 3 | 9 | 4 | 11 | 5 | 12 | 11 | 9 | 4 | 16 | 8 | 13 | 5 | 10 | 6 | 5 | 8 | 13 |
| Argentina | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 2 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| Brazil | 1 | 1 | 2 | 0 | 0 | 0 | 1 | 3 | 3 | 0 | 1 | 0 | 0 | 3 | 0 | 0 | 1 | 2 | 2 | 2 | 2 | 2 | 0 | 3 | 1 | 8 | 1 | 1 | 1 | 9 | 4 | 7 | 2 | 16 | 5 | 7 | 11 | 3 | 9 | 4 | 4 | 3 | 12 |
| All others | 2 | 1 | 2 | 1 | 3 | 0 | 2 | 0 | 0 | 7 | 0 | 6 | 2 | 5 | 1 | 1 | 2 | 1 | 2 | 1 | 1 | 0 | 2 | 0 | 2 | 1 | 3 | 0 | 3 | 2 | 6 | 1 | 2 | 0 | 3 | 2 | 2 | 0 | 1 | 1 | 4 | 0 |
| Europe | 368 | 950 | 389 | 833 | 390 | 759 | 482 | 774 | 463 | 824 | 444 | 963 | 403 | 1,015 | 306 | 896 | 310 | 912 | 256 | 923 | 254 | 853 | 219 | 965 | 396 | 904 | 417 | 974 | 448 | 978 | 471 | 945 | 500 | 1,226 | 576 | 1,029 | 594 | 878 | 661 | 1,040 | 656 | 911 |
| Austria | 7 | 19 | 10 | 22 | 10 | 12 | 14 | 25 | 25 | 14 | 21 | 10 | 17 | 8 | 11 | 6 | 19 | 6 | 20 | 6 | 12 | 6 | 20 | 5 | 18 | 10 | 10 | 12 | 15 | 12 | 21 | 12 | 23 | 14 | 19 | 12 | 25 | 20 | 22 | 24 | 27 | 23 |
| Belgium | 17 | 6 | 9 | 5 | 11 | 7 | 17 | 8 | 17 | 8 | 13 | 9 | 8 | 5 | 12 | 8 | 8 | 8 | 10 | 8 | 8 | 6 | 12 | 5 | 17 | 7 | 20 | 8 | 17 | 9 | 16 | 8 | 8 | 2 | 4 | 2 | 5 | 3 | 26 | 15 | 25 | 21 |
| Denmark | 1 | 2 | 2 | 4 | 3 | 1 | 4 | 5 | 3 | 4 | 4 | 4 | 2 | 2 | 2 | 1 | 1 | 4 | 1 | 0 | 3 | 3 | 3 | 1 | 3 | 1 | 5 | 2 | 4 | 1 | 4 | 2 | 8 | 2 | 4 | 2 | 7 | 2 | 7 | 5 | 9 | 3 |
| Finland | 8 | 8 | 7 | 5 | 5 | 11 | 13 | 13 | 11 | 13 | 14 | 18 | 19 | 13 | 11 | 23 | 17 | 9 | 9 | 15 | 10 | 14 | 15 | 20 | 12 | 20 | 10 | 17 | 7 | 17 | 15 | 19 | 11 | 18 | 16 | 23 | 20 | 23 | 31 | 16 | 26 | 17 |
| France | 52 | 104 | 49 | 106 | 53 | 89 | 60 | 77 | 51 | 82 | 57 | 111 | 50 | 106 | 30 | 84 | 35 | 128 | 33 | 125 | 26 | 100 | 36 | 81 | 53 | 98 | 43 | 125 | 57 | 128 | 63 | 112 | 73 | 143 | 78 | 138 | 79 | 122 | 98 | 133 | 107 | 99 |
| Germany | 154 | 175 | 181 | 192 | 169 | 162 | 210 | 209 | 202 | 223 | 204 | 214 | 183 | 204 | 141 | 245 | 131 | 243 | 97 | 241 | 96 | 202 | 80 | 226 | 157 | 203 | 158 | 194 | 165 | 222 | 184 | 234 | 213 | 193 | 235 | 204 | 225 | 175 | 244 | 168 | 248 | 217 |
| Hungary | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 2 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 2 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 2 | 3 | 1 | 0 | 0 | 3 |
| Ireland | 0 | 10 | 0 | 3 | 0 | 2 | 0 | 1 | 2 | 1 | 2 | 1 | 2 | 2 | 0 | 2 | 2 | 0 | 0 | 1 | 4 | 4 | 2 | 1 | 2 | 6 | 3 | 2 | 6 | 2 | 2 | 2 | 5 | 1 | 4 | 2 | 5 | 2 | 4 | 2 | 3 | 1 |
| Italy | 26 | 58 | 19 | 74 | 28 | 88 | 27 | 52 | 22 | 58 | 24 | 40 | 20 | 97 | 13 | 36 | 16 | 8 | 16 | 10 | 10 | 7 | 13 | 6 | 20 | 22 | 19 | 30 | 26 | 26 | 20 | 7 | 17 | 5 | 26 | 7 | 26 | 9 | 82 | 21 | 82 | 32 |
| Netherlands | 11 | 24 | 10 | 21 | 15 | 28 | 11 | 27 | 17 | 17 | 15 | 24 | 15 | 22 | 14 | 21 | 10 | 16 | 14 | 34 | 14 | 17 | 9 | 8 | 16 | 18 | 18 | 19 | 19 | 20 | 18 | 20 | 23 | 21 | 19 | 24 | 17 | 31 | 21 | 38 | 37 | 27 |
| Spain | 2 | 15 | 1 | 18 | 2 | 25 | 0 | 20 | 4 | 15 | 1 | 17 | 3 | 22 | 3 | 34 | 2 | 21 | 2 | 32 | 0 | 23 | 1 | 24 | 4 | 28 | 4 | 35 | 7 | 28 | 3 | 31 | 5 | 23 | 8 | 25 | 11 | 20 | 10 | 22 | 5 | 19 |
| Sweden | 22 | 21 | 24 | 32 | 23 | 30 | 31 | 25 | 26 | 18 | 21 | 24 | 24 | 24 | 21 | 34 | 25 | 28 | 15 | 31 | 21 | 17 | 12 | 16 | 22 | 12 | 37 | 11 | 37 | 7 | 28 | 8 | 23 | 6 | 22 | 3 | 22 | 6 | 5 | 21 | 12 | 20 |
| United Kingdom | 38 | 23 | 44 | 21 | 37 | 10 | 51 | 17 | 51 | 18 | 36 | 26 | 27 | 19 | 26 | 24 | 25 | 22 | 27 | 19 | 22 | 12 | 16 | 14 | 40 | 23 | 47 | 32 | 50 | 25 | 54 | 28 | 49 | 24 | 69 | 20 | 53 | 25 | 67 | 32 | 66 | 22 |
| All others | 1 | 51 | 2 | 63 | 2 | 44 | 4 | 38 | 4 | 55 | 5 | 36 | 2 | 44 | 4 | 42 | 3 | 41 | 4 | 39 | 7 | 51 | 3 | 63 | 7 | 59 | 4 | 58 | 4 | 67 | 7 | 53 | 4 | 82 | 8 | 80 | 12 | 100 | 11 | 79 | 13 | 85 |
| Other Europe | 28 | 421 | 31 | 268 | 32 | 248 | 44 | 255 | 38 | 290 | 38 | 422 | 41 | 444 | 24 | 323 | 31 | 364 | 23 | 357 | 26 | 376 | 13 | 480 | 30 | 395 | 35 | 421 | 37 | 407 | 43 | 393 | 36 | 684 | 44 | 470 | 57 | 346 | 58 | 410 | 50 | 321 |
| Former Soviet Union | 2 | 13 | 2 | 3 | 1 | 6 | 1 | 14 | 1 | 14 | 1 | 14 | 1 | 38 | 1 | 104 | 3 | 33 | 0 | 40 | 1 | 61 | 2 | 52 | 0 | 68 | 0 | 54 | 0 | 51 | 1 | 40 | 1 | 48 | 2 | 49 | 3 | 60 | 2 | 45 | 0 | 36 |
| Norway | 2 | 7 | 2 | 1 | 2 | 1 | 1 | 4 | 2 | 3 | 1 | 9 | 3 | 5 | 3 | 7 | 4 | 5 | 2 | 2 | 7 | 1 | 2 | 8 | 1 | 6 | 4 | 8 | 3 | 2 | 6 | 4 | 3 | 2 | 3 | 4 | 5 | 7 | 3 | 5 | 4 | 1 |
| Russia | 7 | 387 | 5 | 242 | 7 | 228 | 12 | 212 | 7 | 260 | 8 | 361 | 6 | 317 | 3 | 263 | 4 | 300 | 4 | 278 | 2 | 304 | 3 | 385 | 3 | 320 | 4 | 352 | 5 | 344 | 1 | 326 | 1 | 616 | 3 | 388 | 5 | 286 | 4 | 359 | 4 | 269 |
| Switzerland | 17 | 12 | 22 | 21 | 19 | 13 | 29 | 24 | 27 | 13 | 25 | 12 | 29 | 16 | 15 | 19 | 21 | 18 | 14 | 15 | 14 | 16 | 7 | 17 | 24 | 15 | 24 | 13 | 26 | 16 | 36 | 14 | 29 | 13 | 32 | 13 | 41 | 11 | 44 | 8 | 44 | 18 |
| All others | 1 | 2 | 0 | 0 | 2 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 0 | 1 | 2 | 1 | 2 | 0 | 1 | 2 | 1 | 1 | 2 | 1 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 3 | 2 | 3 | 2 | 2 | 5 | 3 | 1 | 1 |
| Asia | 599 | 3,171 | 675 | 3,620 | 768 | 3,225 | 728 | 3,058 | 792 | 2,655 | 743 | 2,912 | 770 | 2,869 | 556 | 3,196 | 532 | 3,890 | 520 | 4,657 | 506 | 4,482 | 517 | 4,666 | 741 | 5,791 | 785 | 7,028 | 910 | 7,932 | 988 | 7,810 | 1,125 | 8,178 | 1,094 | 8,712 | 1,179 | 10,326 | 1,329 | 9,554 | 1,360 | 9,905 |

TABLE S8-25

## USPTO patents and patent families granted in surface technology, coating, by region, country, or economy: 1998–2018

(Number)

| | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Region, country, or economy | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| China | 2 | 56 | 3 | 57 | 2 | 94 | 4 | 90 | 4 | 92 | 3 | 186 | 4 | 339 | 6 | 404 | 6 | 539 | 6 | 613 | 4 | 820 | 7 | 1,265 | 25 | 1,698 | 20 | 2,126 | 34 | 2,652 | 50 | 2,275 | 63 | 2,751 | 60 | 4,784 | 92 | 6,066 | 120 | 5,681 | 134 | 6,158 |
| India | 0 | 1 | 2 | 2 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 2 | 1 | 1 | 2 | 1 | 2 | 5 | 1 | 2 | 3 | 2 | 1 | 1 | 3 | 7 | 4 | 4 | 6 | 6 | 7 | 4 | 7 | 4 | 9 | 3 | 13 | 3 | 13 | 3 | 13 | 3 |
| Japan | 540 | 2,861 | 588 | 3,035 | 652 | 2,747 | 619 | 2,545 | 656 | 2,208 | 616 | 2,159 | 624 | 1,864 | 451 | 1,804 | 417 | 2,081 | 424 | 2,696 | 392 | 2,757 | 414 | 2,814 | 561 | 3,220 | 605 | 3,823 | 673 | 3,782 | 669 | 3,573 | 767 | 3,511 | 748 | 2,412 | 756 | 2,650 | 835 | 2,290 | 873 | 2,283 |
| Malaysia | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 2 | 1 | 1 | 1 | 2 | 0 | 1 | 0 | 1 | 0 | 3 | 0 | 1 | 0 | 4 | 1 | 9 | 4 | 8 | 3 | 10 | 2 | 8 | 2 | 7 | 1 | 8 | 3 | 3 |
| Singapore | 0 | 0 | 1 | 1 | 4 | 2 | 7 | 4 | 8 | 6 | 8 | 4 | 7 | 4 | 6 | 4 | 5 | 4 | 4 | 4 | 3 | 2 | 3 | 1 | 5 | 2 | 4 | 4 | 4 | 3 | 4 | 3 | 6 | 4 | 6 | 3 | 12 | 4 | 10 | 2 | 11 | 2 |
| South Korea | 28 | 193 | 37 | 453 | 54 | 278 | 39 | 268 | 68 | 229 | 59 | 398 | 76 | 469 | 54 | 828 | 65 | 1,088 | 44 | 1,170 | 68 | 788 | 68 | 476 | 93 | 681 | 92 | 874 | 103 | 1,278 | 113 | 1,528 | 149 | 1,492 | 179 | 1,103 | 203 | 1,207 | 248 | 1,255 | 213 | 1,257 |
| Taiwan | 28 | 57 | 43 | 71 | 54 | 104 | 59 | 149 | 54 | 121 | 54 | 160 | 57 | 188 | 38 | 152 | 37 | 174 | 41 | 169 | 35 | 111 | 24 | 106 | 52 | 182 | 59 | 193 | 87 | 200 | 139 | 417 | 128 | 402 | 87 | 395 | 98 | 384 | 100 | 311 | 109 | 197 |
| All others | 0 | 2 | 2 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 2 | 2 | 1 | 1 | 0 | 2 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 1 | 2 | 1 | 4 | 3 | 3 | 3 | 4 | 3 | 3 | 4 | 2 |
| Middle East | 6 | 3 | 8 | 5 | 3 | 12 | 6 | 7 | 11 | 8 | 9 | 2 | 6 | 4 | 4 | 5 | 5 | 2 | 7 | 6 | 3 | 4 | 6 | 4 | 7 | 7 | 12 | 6 | 10 | 8 | 13 | 12 | 14 | 6 | 13 | 8 | 21 | 9 | 21 | 8 | 26 | 8 |
| Israel | 5 | 1 | 8 | 5 | 3 | 4 | 5 | 2 | 11 | 4 | 9 | 2 | 6 | 4 | 4 | 1 | 5 | 1 | 6 | 2 | 3 | 2 | 6 | 4 | 7 | 5 | 11 | 3 | 12 | 5 | 7 | 3 | 12 | 3 | 10 | 4 | 14 | 2 | 12 | 1 | 12 | 2 |
| All others | 1 | 1 | 0 | 0 | 0 | 8 | 0 | 5 | 1 | 4 | 1 | 1 | 0 | 0 | 0 | 4 | 1 | 1 | 1 | 3 | 0 | 3 | 0 | 0 | 0 | 1 | 1 | 3 | 3 | 3 | 2 | 6 | 2 | 3 | 3 | 4 | 7 | 6 | 9 | 7 | 13 | 6 |
| Africa | 1 | 10 | 2 | 6 | 4 | 5 | 3 | 4 | 1 | 7 | 0 | 11 | 1 | 2 | 0 | 4 | 0 | 3 | 0 | 3 | 0 | 5 | 0 | 15 | 3 | 7 | 0 | 2 | 4 | 7 | 1 | 3 | 1 | 6 | 2 | 3 | 3 | 4 | 2 | 1 | 1 | 2 |
| South Africa | 1 | 8 | 2 | 4 | 3 | 3 | 3 | 1 | 1 | 0 | 0 | 4 | 1 | 1 | 0 | 2 | 0 | 3 | 0 | 2 | 0 | 5 | 0 | 15 | 2 | 3 | 0 | 0 | 3 | 1 | 1 | 3 | 1 | 6 | 2 | 0 | 2 | 0 | 2 | 0 | 1 | 0 |
| All others | 0 | 2 | 0 | 1 | 1 | 3 | 0 | 3 | 0 | 7 | 0 | 8 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 4 | 0 | 2 | 9 | 19 | 7 | 0 | 4 | 1 | 6 | 0 | 3 | 0 | 4 | 0 | 1 | 0 |
| Australia and Oceania | 6 | 6 | 11 | 7 | 10 | 8 | 12 | 11 | 10 | 12 | 9 | 8 | 16 | 9 | 8 | 11 | 5 | 6 | 11 | 7 | 10 | 8 | 9 | 11 | 11 | 16 | 11 | 22 | 9 | 19 | 9 | 16 | 13 | 16 | 13 | 14 | 12 | 15 | 15 | 7 | 16 | 5 |
| Australia | 5 | 6 | 9 | 6 | 9 | 8 | 11 | 11 | 9 | 12 | 9 | 8 | 14 | 9 | 7 | 11 | 5 | 6 | 10 | 7 | 9 | 8 | 7 | 11 | 10 | 16 | 10 | 22 | 9 | 18 | 9 | 15 | 11 | 16 | 11 | 14 | 11 | 15 | 11 | 7 | 13 | 5 |
| New Zealand | 1 | 0 | 2 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 1 | 2 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 1 | 0 | 4 | 0 | 2 | 0 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Unclassified | 0 | 7 | 3 | 90 | 0 | 59 | 0 | 13 | 0 | 2 | 0 | 0 | 0 | 5 | 0 | 22 | 1 | 3 | 0 | 3 | 0 | 2 | 0 | 0 | 0 | 25 | 0 | 5 | 0 | 10 | 0 | 34 | 0 | 1 | 0 | 0 | 0 | 12 | 1 | 0 | 1 | 0 |

EU = European Union; USPTO = U.S. Patent and Trademark Office.

**Note(s)**

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**Source(s)**

Science-Metrix; PATSTAT, accessed April 2019; PatentsView, USPTO, accessed June 2019.

TABLE S8-26

## USPTO patents and patent families granted in microstructural and nanotechnology, by region, country, or economy: 1998–2018

(Number)

| | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Region, country, or economy | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| World | 411 | 51 | 440 | 84 | 473 | 95 | 578 | 122 | 683 | 161 | 888 | 233 | 1,013 | 293 | 953 | 339 | 1,117 | 439 | 1,021 | 566 | 1,042 | 574 | 1,126 | 614 | 1,475 | 870 | 1,442 | 1,302 | 1,394 | 1,425 | 1,541 | 1,558 | 1,655 | 1,790 | 1,464 | 1,872 | 1,263 | 1,993 | 1,118 | 1,958 | 876 | 1,644 |
| North America | 201 | 17 | 214 | 25 | 239 | 39 | 310 | 51 | 371 | 61 | 505 | 101 | 570 | 100 | 552 | 76 | 612 | 39 | 561 | 20 | 573 | 22 | 572 | 19 | 701 | 30 | 672 | 44 | 655 | 54 | 733 | 84 | 787 | 133 | 697 | 140 | 599 | 123 | 535 | 96 | 397 | 58 |
| Canada | 3 | 1 | 5 | 1 | 5 | 1 | 5 | 1 | 2 | 0 | 15 | 5 | 15 | 2 | 14 | 2 | 16 | 1 | 12 | 0 | 17 | 0 | 10 | 0 | 22 | 1 | 22 | 2 | 22 | 2 | 20 | 2 | 24 | 6 | 22 | 5 | 20 | 4 | 14 | 2 | 8 | 2 |
| Mexico | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 2 | 1 | 2 | 0 | 3 |
| Puerto Rico | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| United States | 198 | 17 | 209 | 24 | 234 | 38 | 305 | 51 | 369 | 61 | 490 | 96 | 555 | 98 | 538 | 74 | 596 | 38 | 548 | 20 | 555 | 22 | 561 | 19 | 678 | 29 | 650 | 42 | 633 | 52 | 712 | 81 | 761 | 127 | 674 | 135 | 579 | 117 | 520 | 92 | 388 | 52 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Central and South America | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 2 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 0 | 3 | 2 | 0 | 2 | 6 |
| Argentina | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Brazil | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 2 | 0 | 1 | 0 | 0 | 3 | 1 | 0 | 1 | 5 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 |
| Europe | 66 | 4 | 52 | 8 | 51 | 8 | 59 | 17 | 74 | 19 | 86 | 29 | 101 | 39 | 101 | 66 | 117 | 71 | 114 | 109 | 109 | 120 | 125 | 180 | 203 | 229 | 207 | 282 | 207 | 278 | 238 | 304 | 246 | 319 | 243 | 374 | 213 | 323 | 203 | 369 | 181 | 331 |
| EU | 60 | 4 | 48 | 8 | 45 | 7 | 52 | 15 | 68 | 18 | 76 | 22 | 89 | 29 | 93 | 59 | 104 | 58 | 106 | 87 | 96 | 68 | 116 | 68 | 184 | 74 | 186 | 91 | 193 | 112 | 221 | 109 | 225 | 120 | 224 | 136 | 193 | 154 | 188 | 138 | 168 | 137 |
| Austria | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 2 | 1 | 2 | 1 | 3 | 1 | 2 | 1 | 5 | 1 | 5 | 3 | 6 | 3 | 5 | 2 | 2 | 1 | 6 | 3 | 3 | 1 | 5 | 3 | 7 | 5 |
| Belgium | 2 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 3 | 0 | 1 | 0 | 3 | 0 | 2 | 0 | 3 | 0 | 5 | 0 | 8 | 0 | 10 | 0 | 10 | 1 | 12 | 0 | 8 | 1 | 9 | 3 | 7 | 1 | 8 | 0 | 8 | 5 |
| Denmark | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 2 | 0 | 1 | 0 | 2 | 0 | 1 | 0 | 2 | 0 | 3 | 0 | 2 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 2 | 0 | 2 | 0 | 3 | 1 | 3 | 2 | 1 | 1 | 3 | 1 |
| Finland | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 2 | 2 | 2 | 2 | 4 | 2 | 5 | 0 | 3 | 1 | 2 | 4 | 4 | 2 | 5 | 3 | 9 | 7 | 3 | 2 |
| France | 17 | 1 | 13 | 2 | 10 | 1 | 9 | 1 | 12 | 4 | 12 | 7 | 14 | 7 | 15 | 18 | 13 | 24 | 14 | 31 | 13 | 25 | 18 | 26 | 46 | 26 | 42 | 24 | 40 | 30 | 38 | 27 | 45 | 32 | 44 | 37 | 35 | 29 | 28 | 35 | 28 | 26 |
| Germany | 19 | 2 | 17 | 4 | 17 | 5 | 21 | 10 | 27 | 11 | 37 | 9 | 36 | 10 | 41 | 29 | 47 | 27 | 49 | 45 | 41 | 25 | 45 | 18 | 64 | 28 | 62 | 34 | 71 | 31 | 82 | 28 | 86 | 37 | 85 | 38 | 69 | 51 | 72 | 46 | 71 | 59 |
| Hungary | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 |
| Ireland | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 2 | 0 | 1 | 0 | 2 | 0 | 4 | 1 | 3 | 0 | 1 | 0 | 1 | 1 | 2 | 1 | 2 | 1 |
| Italy | 2 | 0 | 1 | 1 | 1 | 0 | 3 | 2 | 4 | 0 | 2 | 1 | 5 | 4 | 3 | 1 | 7 | 2 | 8 | 5 | 8 | 5 | 5 | 0 | 10 | 1 | 14 | 2 | 7 | 2 | 13 | 2 | 13 | 1 | 16 | 2 | 14 | 1 | 15 | 2 | 12 | 1 |
| Netherlands | 4 | 0 | 3 | 0 | 1 | 0 | 6 | 0 | 5 | 0 | 5 | 1 | 5 | 2 | 6 | 2 | 9 | 0 | 11 | 0 | 10 | 1 | 14 | 2 | 20 | 1 | 15 | 1 | 22 | 1 | 26 | 3 | 24 | 2 | 16 | 1 | 20 | 3 | 18 | 2 | 13 | 1 |
| Spain | 0 | 0 | 1 | 0 | 1 | 0 | 2 | 0 | 1 | 0 | 3 | 1 | 5 | 3 | 4 | 4 | 3 | 0 | 4 | 2 | 1 | 2 | 1 | 2 | 2 | 3 | 2 | 5 | 1 | 15 | 4 | 3 | 5 | 12 | 5 | 13 | 4 | 12 | 3 | 9 | 2 | 8 |
| Sweden | 2 | 0 | 1 | 0 | 5 | 1 | 3 | 2 | 3 | 0 | 3 | 1 | 5 | 3 | 4 | 4 | 3 | 0 | 4 | 0 | 4 | 0 | 3 | 1 | 6 | 2 | 8 | 3 | 10 | 3 | 6 | 1 | 7 | 1 | 9 | 5 | 6 | 2 | 4 | 0 | 3 | 2 |
| United Kingdom | 9 | 0 | 9 | 0 | 8 | 0 | 6 | 0 | 10 | 0 | 10 | 0 | 14 | 0 | 16 | 2 | 15 | 1 | 12 | 0 | 10 | 2 | 15 | 2 | 17 | 1 | 15 | 3 | 14 | 5 | 21 | 4 | 25 | 3 | 22 | 6 | 19 | 6 | 20 | 4 | 14 | 4 |
| All others | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 1 | 5 | 1 | 12 | 2 | 9 | 5 | 12 | 2 | 19 | 5 | 26 | 3 | 26 | 4 | 25 | 7 | 41 | 2 | 27 | 0 | 31 |
| Other Europe | 6 | 0 | 5 | 1 | 6 | 1 | 6 | 1 | 6 | 1 | 10 | 7 | 11 | 10 | 8 | 7 | 12 | 12 | 7 | 22 | 13 | 52 | 9 | 112 | 18 | 155 | 21 | 190 | 14 | 166 | 16 | 195 | 20 | 200 | 18 | 220 | 20 | 169 | 23 | 131 | 13 | 194 |
| Former Soviet Union | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 3 | 1 | 3 | 0 | 5 | 0 | 4 | 0 | 8 | 1 | 6 | 1 | 6 | 1 | 8 | 1 | 7 | 1 | 11 | 0 | 10 | 0 | 8 | 0 |
| Norway | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 2 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 0 |
| Russia | 1 | 0 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 0 | 2 | 6 | 2 | 6 | 2 | 3 | 2 | 8 | 1 | 16 | 3 | 46 | 2 | 108 | 2 | 147 | 2 | 181 | 2 | 159 | 4 | 183 | 4 | 188 | 3 | 223 | 4 | 157 | 3 | 216 | 1 | 177 |
| Switzerland | 5 | 0 | 3 | 0 | 3 | 0 | 4 | 0 | 3 | 0 | 6 | 1 | 7 | 2 | 6 | 1 | 7 | 1 | 4 | 2 | 8 | 1 | 5 | 0 | 14 | 0 | 15 | 3 | 10 | 2 | 10 | 3 | 14 | 4 | 13 | 3 | 14 | 2 | 10 | 5 | 10 | 7 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 2 | 0 | 1 | 0 | 1 | 0 |
| Asia | 141 | 29 | 169 | 50 | 177 | 48 | 191 | 53 | 229 | 77 | 286 | 103 | 330 | 153 | 285 | 193 | 368 | 327 | 328 | 436 | 347 | 430 | 410 | 413 | 553 | 609 | 540 | 973 | 513 | 1,089 | 544 | 1,164 | 594 | 1,331 | 498 | 1,351 | 428 | 1,539 | 359 | 1,487 | 278 | 1,241 |

TABLE S8-26

## USPTO patents and patent families granted in microstructural and nanotechnology, by region, country, or economy: 1998–2018

(Number)

| | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Region, country, or economy | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| China | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 3 | 12 | 3 | 21 | 8 | 53 | 7 | 53 |
| India | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 2 | 0 | 1 | 0 | 2 | 0 | 2 | 1 |
| Japan | 130 | 28 | 155 | 47 | 160 | 42 | 172 | 48 | 193 | 56 | 245 | 54 | 264 | 55 | 229 | 57 | 277 | 75 | 237 | 99 |
| Malaysia | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 0 |
| Singapore | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 2 | 1 | 4 | 1 | 3 | 1 | 3 | 0 | 3 | 1 | 4 | 1 |
| South Korea | 9 | 1 | 11 | 2 | 6 | 1 | 13 | 3 | 20 | 3 | 26 | 24 | 38 | 57 | 33 | 93 | 51 | 171 | 42 | 243 |
| Taiwan | 1 | 0 | 3 | 1 | 10 | 5 | 5 | 3 | 12 | 17 | 9 | 23 | 19 | 28 | 15 | 22 | 27 | 26 | 35 | 37 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| Middle East | 2 | 0 | 3 | 0 | 3 | 0 | 4 | 0 | 2 | 0 | 5 | 0 | 5 | 0 | 3 | 0 | 3 | 1 | 5 | 1 |
| Israel | 2 | 0 | 3 | 1 | 3 | 0 | 4 | 0 | 2 | 0 | 5 | 0 | 5 | 0 | 3 | 0 | 3 | 1 | 4 | 0 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 |
| Africa | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| South Africa | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| Australia and Oceania | 1 | 0 | 1 | 0 | 2 | 0 | 13 | 0 | 7 | 4 | 6 | 0 | 7 | 1 | 10 | 2 | 16 | 1 | 13 | 0 |
| Australia | 1 | 0 | 1 | 0 | 2 | 0 | 13 | 0 | 7 | 4 | 6 | 0 | 7 | 1 | 10 | 2 | 16 | 1 | 12 | 0 |
| New Zealand | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Unclassified | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Region, country, or economy | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| China | 96 | 167 | 17 | 167 | 23 | 176 | 22 | 285 | 29 | 429 | 47 | 522 | 65 | 703 | 60 | 935 | 59 | 1,173 | 59 | 1,179 | 41 | 988 |
| India | 2 | 0 | 2 | 0 | 1 | 1 | 2 | 4 | 4 | 2 | 6 | 2 | 8 | 5 | 9 | 2 | 6 | 2 | 6 | 2 | 7 | 1 |
| Japan | 96 | 131 | 274 | 131 | 360 | 190 | 353 | 201 | 310 | 240 | 300 | 216 | 300 | 172 | 214 | 113 | 172 | 133 | 114 | 112 | 87 | 99 |
| Malaysia | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 2 | 0 | 3 | 1 | 1 | 1 | 2 | 1 | 4 | 1 | 2 | 1 | 2 | 1 | 4 |
| Singapore | 0 | 0 | 4 | 0 | 6 | 0 | 4 | 0 | 8 | 0 | 6 | 1 | 13 | 2 | 11 | 3 | 14 | 2 | 13 | 3 | 8 | 1 |
| South Korea | 213 | 100 | 82 | 100 | 113 | 222 | 113 | 454 | 91 | 378 | 104 | 361 | 114 | 367 | 110 | 198 | 86 | 145 | 73 | 117 | 56 | 94 |
| Taiwan | 21 | 14 | 30 | 14 | 49 | 19 | 46 | 26 | 70 | 36 | 79 | 60 | 93 | 77 | 93 | 94 | 89 | 81 | 91 | 71 | 77 | 53 |
| All others | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 2 | 1 | 1 | 0 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 |
| Middle East | 0 | 0 | 7 | 0 | 7 | 0 | 9 | 1 | 11 | 1 | 17 | 4 | 16 | 4 | 16 | 3 | 15 | 3 | 15 | 3 | 14 | 5 |
| Israel | 0 | 0 | 6 | 0 | 7 | 0 | 7 | 0 | 7 | 0 | 12 | 0 | 11 | 1 | 8 | 1 | 11 | 1 | 11 | 1 | 8 | 1 |
| All others | 1 | 1 | 1 | 0 | 0 | 0 | 2 | 1 | 4 | 1 | 5 | 4 | 5 | 3 | 8 | 2 | 4 | 2 | 4 | 2 | 6 | 4 |
| Africa | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 3 | 0 | 2 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 |
| South Africa | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 |
| Australia and Oceania | 7 | 1 | 12 | 1 | 10 | 1 | 12 | 1 | 4 | 1 | 5 | 1 | 9 | 2 | 8 | 2 | 6 | 2 | 3 | 2 | 5 | 2 |
| Australia | 7 | 1 | 11 | 1 | 10 | 1 | 12 | 1 | 4 | 1 | 4 | 1 | 9 | 2 | 7 | 2 | 5 | 2 | 3 | 2 | 5 | 2 |
| New Zealand | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Unclassified | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

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**Source(s)**

Science-Metrix; PATSTAT, accessed April 2019; PatentsView, USPTO, accessed June 2019.

TABLE S8-27

## USPTO patents and patent families granted in chemical engineering, by region, country, or economy: 1998–2018

(Number)

| Region, country, or economy | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| World | 3,443 | 6,653 | 3,692 | 7,254 | 3,444 | 5,982 | 3,470 | 5,937 | 3,328 | 6,099 | 3,313 | 6,463 | 2,982 | 6,952 | 2,575 | 7,009 | 2,716 | 7,484 | 2,450 | 8,104 | 2,456 | 7,946 | 2,456 | 8,144 | 3,392 | 8,848 | 3,454 | 10,498 | 3,650 | 12,624 | 3,966 | 12,602 | 4,306 | 13,252 | 4,541 | 15,532 | 4,705 | 17,233 | 4,917 | 18,097 | 4,844 | 18,558 |
| North America | 1,999 | 1,503 | 2,231 | 1,520 | 2,030 | 1,294 | 1,956 | 1,166 | 1,844 | 1,067 | 1,890 | 1,003 | 1,738 | 904 | 1,489 | 721 | 1,566 | 801 | 1,400 | 705 | 1,356 | 674 | 1,373 | 684 | 1,800 | 838 | 1,856 | 846 | 1,951 | 803 | 2,047 | 770 | 1,81 | 769 | 2,295 | 724 | 2,328 | 694 | 2,528 | 703 | 2,369 | 597 |
| Canada | 91 | 89 | 90 | 85 | 94 | 69 | 102 | 61 | 88 | 66 | 80 | 51 | 74 | 56 | 59 | 34 | 74 | 56 | 55 | 34 | 52 | 39 | 58 | 55 | 68 | 36 | 80 | 53 | 95 | 40 | 82 | 40 | 109 | 50 | 114 | 47 | 122 | 44 | 124 | 50 | 123 | 37 |
| Mexico | 1 | 0 | 0 | 0 | 2 | 0 | 2 | 2 | 4 | 4 | 3 | 1 | 3 | 2 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 2 | 0 | 3 | 1 | 3 | 1 | 5 | 1 | 3 | 0 | 5 | 4 | 4 | 12 | 6 | 14 | 9 | 15 |
| Puerto Rico | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 2 | 0 | 2 | 0 | 3 | 0 |
| United States | 1,907 | 1,414 | 2,138 | 1,434 | 1,933 | 1,225 | 1,852 | 1,104 | 1,752 | 997 | 1,807 | 951 | 1,661 | 847 | 1,429 | 687 | 1,491 | 745 | 1,342 | 670 | 1,304 | 635 | 1,313 | 628 | 1,729 | 802 | 1,773 | 791 | 1,852 | 763 | 1,960 | 729 | 2,068 | 719 | 2,176 | 674 | 2,199 | 638 | 2,396 | 639 | 2,234 | 545 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Central and South America | 11 | 5 | 23 | 13 | 13 | 11 | 13 | 8 | 8 | 7 | 6 | 7 | 11 | 8 | 7 | 11 | 7 | 8 | 7 | 8 | 11 | 10 | 7 | 18 | 6 | 27 | 12 | 35 | 14 | 24 | 14 | 40 | 24 | 32 | 17 | 37 | 17 | 26 | 22 | 38 | 18 | 65 |
| Argentina | 0 | 0 | 3 | 2 | 3 | 3 | 1 | 1 | 1 | 0 | 2 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 2 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 4 | 2 | 1 | 0 |
| Brazil | 3 | 1 | 7 | 3 | 6 | 5 | 5 | 3 | 4 | 4 | 3 | 5 | 7 | 5 | 3 | 5 | 3 | 4 | 4 | 5 | 4 | 7 | 4 | 5 | 6 | 26 | 7 | 32 | 9 | 22 | 6 | 36 | 13 | 28 | 9 | 35 | 11 | 26 | 13 | 35 | 13 | 61 |
| All others | 8 | 4 | 14 | 8 | 5 | 4 | 7 | 5 | 3 | 3 | 1 | 1 | 3 | 3 | 4 | 5 | 3 | 4 | 3 | 2 | 6 | 2 | 2 | 1 | 1 | 1 | 5 | 2 | 4 | 2 | 6 | 3 | 10 | 4 | 7 | 5 | 5 | 0 | 5 | 1 | 4 | 3 |
| Europe | 858 | 2,466 | 893 | 2,293 | 860 | 2,062 | 901 | 1,954 | 888 | 2,109 | 839 | 2,196 | 712 | 2,476 | 616 | 2,056 | 682 | 1,875 | 567 | 1,949 | 590 | 2,044 | 555 | 2,007 | 828 | 1,774 | 847 | 1,848 | 894 | 1,925 | 1,010 | 1,821 | 1,121 | 1,885 | 1,127 | 2,024 | 1,188 | 1,810 | 1,142 | 2,213 | 1,151 | 2,121 |
| EU | 785 | 1,443 | 813 | 1,463 | 786 | 1,312 | 827 | 1,195 | 808 | 1,267 | 775 | 1,171 | 656 | 1,322 | 577 | 1,165 | 633 | 1,059 | 523 | 1,046 | 544 | 941 | 503 | 872 | 872 | 773 | 1,016 | 808 | 997 | 916 | 985 | 1,013 | 1,011 | 1,030 | 1,019 | 1,088 | 1,066 | 1,053 | 1,711 | 1,084 | 1,843 |
| Austria | 18 | 31 | 18 | 42 | 11 | 31 | 15 | 33 | 14 | 41 | 11 | 34 | 8 | 30 | 9 | 37 | 10 | 32 | 11 | 23 | 7 | 37 | 8 | 28 | 11 | 32 | 10 | 38 | 12 | 27 | 14 | 26 | 22 | 33 | 22 | 35 | 24 | 35 | 23 | 35 | 25 | 32 |
| Belgium | 17 | 8 | 13 | 7 | 17 | 4 | 24 | 4 | 16 | 7 | 16 | 8 | 16 | 8 | 15 | 7 | 15 | 13 | 11 | 10 | 15 | 8 | 15 | 9 | 23 | 9 | 28 | 12 | 30 | 10 | 34 | 5 | 32 | 10 | 34 | 7 | 34 | 9 | 33 | 15 | 24 | 23 |
| Denmark | 23 | 9 | 23 | 17 | 24 | 8 | 14 | 11 | 15 | 8 | 11 | 8 | 7 | 9 | 10 | 6 | 13 | 2 | 11 | 9 | 9 | 7 | 12 | 10 | 15 | 5 | 18 | 12 | 26 | 11 | 18 | 5 | 16 | 12 | 20 | 10 | 23 | 11 | 23 | 10 | 22 | 12 |
| Finland | 20 | 42 | 20 | 39 | 27 | 42 | 31 | 36 | 26 | 49 | 35 | 47 | 25 | 34 | 34 | 17 | 35 | 21 | 31 | 10 | 28 | 16 | 34 | 12 | 27 | 20 | 35 | 26 | 30 | 16 | 33 | 23 | 34 | 28 | 42 | 33 | 44 | 32 | 39 | 31 | 34 | 34 |
| France | 125 | 279 | 137 | 275 | 138 | 283 | 165 | 273 | 165 | 278 | 148 | 252 | 112 | 263 | 99 | 201 | 94 | 262 | 95 | 269 | 79 | 193 | 81 | 189 | 120 | 186 | 118 | 245 | 115 | 262 | 139 | 216 | 161 | 254 | 155 | 274 | 172 | 244 | 166 | 206 | 157 | 190 |
| Germany | 329 | 519 | 332 | 455 | 327 | 390 | 332 | 416 | 340 | 475 | 333 | 427 | 270 | 398 | 244 | 423 | 275 | 432 | 207 | 387 | 227 | 333 | 219 | 287 | 314 | 259 | 330 | 235 | 326 | 243 | 392 | 287 | 411 | 265 | 416 | 280 | 429 | 302 | 397 | 304 | 409 | 303 |
| Hungary | 1 | 4 | 1 | 5 | 2 | 3 | 0 | 6 | 2 | 4 | 1 | 4 | 1 | 4 | 1 | 0 | 1 | 3 | 1 | 3 | 1 | 3 | 0 | 1 | 2 | 4 | 1 | 5 | 3 | 3 | 2 | 1 | 3 | 5 | 3 | 7 | 2 | 5 | 4 | 5 | 2 | 2 |
| Ireland | 3 | 9 | 3 | 4 | 3 | 2 | 1 | 1 | 1 | 1 | 3 | 6 | 4 | 2 | 4 | 2 | 3 | 1 | 1 | 1 | 5 | 2 | 2 | 4 | 3 | 1 | 5 | 3 | 3 | 2 | 9 | 1 | 6 | 1 | 8 | 3 | 9 | 3 | 7 | 1 | 7 | 1 |
| Italy | 54 | 128 | 51 | 190 | 50 | 200 | 20 | 47 | 108 | 48 | 110 | 33 | 96 | 44 | 226 | 40 | 103 | 43 | 15 | 33 | 15 | 27 | 13 | 30 | 11 | 62 | 35 | 54 | 77 | 49 | 48 | 54 | 19 | 63 | 11 | 51 | 15 | 77 | 21 | 66 | 168 | 84 | 132 |
| Netherlands | 44 | 91 | 32 | 91 | 37 | 70 | 30 | 58 | 59 | 45 | 67 | 44 | 53 | 42 | 63 | 36 | 55 | 34 | 42 | 27 | 46 | 38 | 42 | 36 | 50 | 42 | 44 | 40 | 57 | 57 | 45 | 60 | 64 | 58 | 74 | 43 | 69 | 45 | 74 | 66 | 83 | 35 |
| Spain | 6 | 51 | 15 | 52 | 11 | 51 | 10 | 47 | 11 | 31 | 10 | 44 | 6 | 54 | 5 | 77 | 9 | 56 | 5 | 58 | 10 | 54 | 5 | 55 | 10 | 62 | 9 | 72 | 16 | 66 | 7 | 79 | 14 | 79 | 18 | 59 | 13 | 58 | 15 | 58 | 17 | 45 |
| Sweden | 51 | 79 | 50 | 82 | 38 | 71 | 52 | 53 | 40 | 57 | 42 | 55 | 29 | 80 | 27 | 47 | 37 | 50 | 25 | 46 | 35 | 38 | 22 | 44 | 44 | 58 | 43 | 37 | 47 | 43 | 53 | 31 | 59 | 30 | 52 | 49 | 60 | 50 | 53 | 41 | 50 | 45 |
| United Kingdom | 90 | 48 | 112 | 51 | 93 | 50 | 97 | 48 | 84 | 47 | 85 | 57 | 87 | 50 | 68 | 51 | 72 | 45 | 82 | 37 | 73 | 38 | 58 | 39 | 101 | 41 | 84 | 66 | 104 | 66 | 111 | 45 | 128 | 64 | 132 | 51 | 128 | 59 | 145 | 55 | 131 | 65 |
| All others | 3 | 144 | 4 | 153 | 9 | 106 | 3 | 99 | 3 | 92 | 3 | 81 | 6 | 100 | 4 | 120 | 4 | 75 | 3 | 114 | 5 | 137 | 2 | 118 | 6 | 101 | 7 | 123 | 8 | 139 | 7 | 174 | 12 | 155 | 17 | 143 | 14 | 181 | 16 | 169 | 13 | 185 |
| Other Europe | 73 | 1,022 | 80 | 830 | 74 | 750 | 74 | 760 | 80 | 842 | 65 | 1,025 | 55 | 1,155 | 39 | 891 | 49 | 817 | 44 | 903 | 45 | 1,103 | 52 | 1,135 | 56 | 903 | 74 | 833 | 86 | 928 | 94 | 836 | 109 | 874 | 98 | 1,005 | 100 | 743 | 88 | 1,042 | 83 | 1,018 |
| Former Soviet Union | 1 | 36 | 4 | 26 | 2 | 22 | 3 | 40 | 2 | 75 | 1 | 134 | 1 | 353 | 1 | 115 | 2 | 65 | 0 | 143 | 2 | 145 | 1 | 154 | 1 | 126 | 0 | 121 | 3 | 96 | 2 | 113 | 1 | 102 | 2 | 105 | 1 | 90 | 0 | 69 | 1 | 76 |
| Norway | 6 | 23 | 17 | 16 | 10 | 18 | 14 | 24 | 18 | 24 | 10 | 23 | 13 | 13 | 9 | 21 | 7 | 17 | 12 | 17 | 9 | 15 | 12 | 14 | 11 | 23 | 14 | 26 | 18 | 19 | 17 | 14 | 19 | 12 | 20 | 14 | 19 | 17 | 17 | 13 | 14 | 17 |
| Russia | 15 | 922 | 11 | 749 | 11 | 682 | 9 | 667 | 15 | 710 | 12 | 833 | 8 | 763 | 5 | 735 | 10 | 702 | 7 | 704 | 6 | 923 | 7 | 943 | 10 | 716 | 9 | 659 | 14 | 788 | 18 | 683 | 21 | 716 | 13 | 866 | 14 | 615 | 14 | 939 | 12 | 895 |
| Switzerland | 51 | 39 | 47 | 36 | 49 | 28 | 46 | 28 | 43 | 31 | 41 | 33 | 33 | 26 | 24 | 20 | 29 | 32 | 23 | 35 | 28 | 18 | 29 | 22 | 32 | 36 | 49 | 24 | 49 | 20 | 54 | 22 | 64 | 32 | 60 | 16 | 61 | 20 | 51 | 19 | 52 | 26 |
| All others | 1 | 1 | 1 | 3 | 3 | 1 | 1 | 1 | 2 | 2 | 1 | 3 | 1 | 1 | 0 | 0 | 1 | 0 | 2 | 4 | 1 | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 3 | 6 | 3 | 4 | 3 | 2 | 2 | 3 | 5 | 2 | 5 | 3 | 4 | 4 |
| Asia | 513 | 2,613 | 485 | 3,186 | 480 | 2,472 | 550 | 2,727 | 527 | 2,862 | 525 | 3,207 | 472 | 3,501 | 412 | 4,158 | 416 | 4,752 | 433 | 5,395 | 462 | 5,167 | 490 | 5,399 | 700 | 6,151 | 677 | 7,711 | 706 | 9,796 | 792 | 9,904 | 865 | 10,484 | 979 | 12,676 | 1,052 | 14,621 | 1,082 | 15,081 | 1,146 | 15,704 |

TABLE S8-27

## USPTO patents and patent families granted in chemical engineering, by region, country, or economy: 1998–2018

(Number)

| | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Region, country, or economy | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| China | 10 | 81 | 9 | 112 | 14 | 204 | 14 | 205 | 16 | 260 | 11 | 579 | 18 | 668 | 13 | 655 | 24 | 738 | 18 | 921 | 20 | 1,340 | 29 | 1,831 | 46 | 2,072 | 61 | 3,005 | 73 | 4,431 | 81 | 4,654 | 93 | 5,334 | 124 | 8,750 | 146 | 10,286 | 170 | 10,463 | 207 | 11,334 |
| India | 7 | 4 | 9 | 5 | 10 | 5 | 9 | 4 | 7 | 5 | 9 | 10 | 12 | 8 | 11 | 4 | 14 | 7 | 15 | 9 | 9 | 7 | 8 | 3 | 10 | 8 | 11 | 5 | 7 | 8 | 13 | 9 | 28 | 12 | 32 | 8 | 45 | 11 | 39 | 9 | 52 | 7 |
| Japan | 400 | 2,205 | 374 | 2,479 | 362 | 1,952 | 396 | 2,206 | 392 | 2,209 | 372 | 2,050 | 345 | 2,142 | 290 | 2,206 | 279 | 2,331 | 293 | 2,560 | 303 | 2,409 | 315 | 2,482 | 459 | 2,726 | 436 | 2,926 | 447 | 3,032 | 477 | 2,522 | 486 | 2,439 | 544 | 1,754 | 569 | 1,915 | 559 | 1,787 | 556 | 1,561 |
| Malaysia | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 1 | 2 | 1 | 3 | 0 | 7 | 2 | 18 | 1 | 2 | 0 | 2 | 0 | 13 | 2 | 12 | 3 | 22 | 3 | 11 | 2 | 12 | 1 | 14 | 2 | 11 | 3 | 18 | 6 | 14 |
| Singapore | 1 | 2 | 1 | 1 | 1 | 1 | 4 | 3 | 5 | 2 | 6 | 1 | 3 | 3 | 5 | 3 | 2 | 2 | 3 | 2 | 4 | 2 | 4 | 2 | 6 | 2 | 8 | 2 | 10 | 2 | 10 | 1 | 13 | 1 | 11 | 2 | 16 | 2 | 16 | 2 | 22 | 3 |
| South Korea | 29 | 234 | 31 | 504 | 24 | 210 | 34 | 155 | 28 | 264 | 33 | 425 | 28 | 561 | 36 | 1,153 | 38 | 1,495 | 37 | 1,714 | 62 | 1,250 | 72 | 942 | 96 | 1,164 | 96 | 1,563 | 99 | 2,115 | 122 | 2,435 | 140 | 2,417 | 179 | 1,886 | 185 | 2,090 | 205 | 2,501 | 212 | 2,574 |
| Taiwan | 62 | 77 | 60 | 78 | 67 | 97 | 91 | 149 | 76 | 119 | 90 | 133 | 65 | 117 | 53 | 132 | 60 | 169 | 64 | 170 | 63 | 155 | 62 | 133 | 81 | 165 | 63 | 195 | 66 | 182 | 83 | 267 | 99 | 262 | 82 | 252 | 85 | 300 | 86 | 293 | 85 | 203 |
| All others | 3 | 9 | 1 | 7 | 2 | 3 | 2 | 4 | 3 | 3 | 3 | 7 | 0 | 1 | 3 | 2 | 1 | 4 | 0 | 1 | 1 | 1 | 0 | 3 | 0 | 1 | 1 | 3 | 1 | 3 | 3 | 4 | 3 | 6 | 4 | 9 | 3 | 5 | 4 | 8 | 5 | 8 |
| Middle East | 17 | 7 | 21 | 13 | 23 | 13 | 20 | 14 | 21 | 15 | 18 | 12 | 14 | 11 | 13 | 11 | 9 | 7 | 9 | 8 | 8 | 8 | 10 | 6 | 20 | 16 | 17 | 9 | 34 | 20 | 44 | 22 | 56 | 27 | 61 | 27 | 67 | 32 | 90 | 41 | 106 | 32 |
| Israel | 17 | 5 | 20 | 11 | 16 | 5 | 18 | 5 | 18 | 6 | 15 | 7 | 12 | 4 | 11 | 6 | 7 | 1 | 8 | 3 | 6 | 1 | 8 | 3 | 14 | 7 | 13 | 3 | 16 | 2 | 24 | 3 | 25 | 5 | 29 | 4 | 30 | 7 | 27 | 8 | 34 | 4 |
| All others | 0 | 2 | 1 | 2 | 7 | 7 | 2 | 9 | 3 | 9 | 3 | 5 | 2 | 7 | 2 | 5 | 2 | 5 | 1 | 5 | 1 | 7 | 2 | 3 | 6 | 9 | 4 | 6 | 18 | 17 | 20 | 18 | 31 | 22 | 32 | 22 | 36 | 25 | 63 | 33 | 72 | 28 |
| Africa | 6 | 14 | 8 | 18 | 8 | 27 | 6 | 15 | 9 | 14 | 10 | 14 | 9 | 15 | 5 | 14 | 7 | 11 | 8 | 11 | 5 | 13 | 8 | 12 | 5 | 12 | 7 | 14 | 8 | 10 | 11 | 9 | 4 | 6 | 9 | 9 | 5 | 8 | 5 | 4 | 4 | 7 | 4 |
| South Africa | 6 | 10 | 7 | 10 | 7 | 15 | 5 | 11 | 9 | 6 | 10 | 4 | 8 | 9 | 5 | 10 | 4 | 10 | 7 | 7 | 5 | 12 | 7 | 6 | 4 | 8 | 6 | 3 | 7 | 1 | 9 | 1 | 6 | 2 | 8 | 2 | 7 | 0 | 3 | 0 | 5 | 1 |
| All others | 0 | 4 | 1 | 8 | 1 | 11 | 1 | 5 | 0 | 8 | 0 | 10 | 1 | 5 | 0 | 4 | 2 | 1 | 1 | 4 | 0 | 1 | 1 | 5 | 0 | 4 | 0 | 11 | 1 | 9 | 2 | 1 | 7 | 1 | 3 | 2 | 5 | 1 | 4 | 2 | 3 |
| Australia and Oceania | 37 | 16 | 31 | 24 | 31 | 26 | 24 | 28 | 30 | 21 | 24 | 23 | 26 | 26 | 32 | 23 | 28 | 20 | 27 | 25 | 25 | 28 | 13 | 19 | 34 | 27 | 39 | 34 | 43 | 45 | 48 | 41 | 52 | 46 | 52 | 40 | 46 | 42 | 49 | 16 | 46 | 35 |
| Australia | 32 | 15 | 28 | 23 | 29 | 26 | 20 | 27 | 23 | 21 | 21 | 22 | 19 | 26 | 27 | 22 | 24 | 19 | 24 | 21 | 27 | 12 | 19 | 32 | 25 | 34 | 32 | 41 | 44 | 44 | 43 | 39 | 48 | 46 | 47 | 38 | 39 | 41 | 42 | 15 | 41 | 34 |
| New Zealand | 5 | 1 | 3 | 1 | 1 | 0 | 3 | 1 | 7 | 0 | 3 | 0 | 6 | 0 | 5 | 1 | 3 | 1 | 3 | 0 | 4 | 1 | 1 | 0 | 2 | 1 | 5 | 3 | 2 | 1 | 5 | 1 | 5 | 0 | 5 | 2 | 6 | 1 | 7 | 1 | 5 | 0 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Unclassified | 0 | 29 | 0 | 185 | 0 | 77 | 0 | 24 | 0 | 4 | 0 | 1 | 0 | 9 | 0 | 15 | 0 | 10 | 0 | 4 | 0 | 2 | 0 | 0 | 0 | 3 | 0 | 1 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 3 | 1 | 1 | 1 | 0 |

EU = European Union; USPTO = U.S. Patent and Trademark Office.

**Note(s)**

USPTO patents are allocated according to patent inventorship information. USPTO patents are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named inventors. Patents are classified under the World Intellectual Property Organization (WIPO) classification of patents, which classifies International Patent Classification (IPC) codes under 35 technical fields. IPC reformed codes take into account changes that were made to the WIPO classification in 2006 under the eighth version of the classification and were used to prepare these data. However, because PatentsView only provides the original IPC codes as they appeared on patents and not the IPC reformed codes, current Cooperative Patent Classification codes on patents were converted back to the most recent IPC classification to prepare these statistics. Fractional counts of patents were assigned to each technological field on patents to assign the proper weight of a patent to the corresponding technological fields under the classification. International Patent Documentation (INPADOC) patent families across all patent offices covered in the Worldwide Patent Statistical Database (PATSTAT) are counted according to the year of the first granted patent in the patent family. Patent families are allocated according to patent inventorship information found on the priority patent of the INPADOC patent families. To account for missing ownership information in PATSTAT for some offices, a method designed by de Rassenfosse et al. (2012) is used to fill in missing information on priority patents using information in successive filings within the patent families (see technical documentation for details). Patent families are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named inventors. Because of data coverage issues for some patent offices in PATSTAT, statistics for some countries may be underestimated partially for some years or across the whole trend. Countries with identified issues include India (missing data) and South Africa (no data for 2018). For Italy, because of data gaps regarding information on granted patents, patent applications are used instead, which slightly overestimates Italy's output and creates a small shift in the year for which its output is accounted. The EU includes 28 member countries. China includes Hong Kong.

**Source(s)**

Science-Metrix; PATSTAT, accessed April 2019; PatentsView, USPTO, accessed June 2019.

TABLE S8-28

## USPTO patents and patent families granted in environmental technology, by region, country, or economy: 1998–2018

(Number)

| Region, country, or economy | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| World | 1,751 | 4,167 | 1,752 | 4,793 | 1,739 | 4,209 | 1,769 | 3,967 | 1,686 | 4,440 | 1,647 | 4,920 | 1,524 | 5,485 | 1,344 | 6,026 | 1,455 | 6,646 | 1,438 | 7,155 | 1,510 | 6,609 | 1,550 | 6,782 | 2,057 | 7,364 | 2,009 | 9,067 | 2,260 | 10,318 | 2,633 | 10,851 | 2,744 | 10,994 | 2,684 | 11,518 | 2,549 | 13,297 | 2,866 | 12,826 | 2,687 | 12,843 |
| North America | 1,089 | 814 | 1,082 | 741 | 1,086 | 689 | 1,033 | 642 | 996 | 608 | 950 | 536 | 864 | 495 | 760 | 398 | 883 | 433 | 849 | 401 | 906 | 430 | 896 | 433 | 1,168 | 502 | 1,142 | 454 | 1,269 | 466 | 1,405 | 497 | 1,483 | 509 | 1,376 | 496 | 1,341 | 481 | 1,442 | 456 | 1,315 | 403 |
| Canada | 42 | 38 | 58 | 47 | 77 | 46 | 75 | 51 | 70 | 34 | 60 | 32 | 56 | 33 | 51 | 23 | 58 | 30 | 46 | 20 | 54 | 38 | 51 | 34 | 64 | 24 | 55 | 27 | 70 | 29 | 72 | 29 | 69 | 23 | 76 | 23 | 63 | 30 | 69 | 25 | 80 | 22 |
| Mexico | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 1 | 1 | 3 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 0 | 0 | 3 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 3 | 2 | 4 | 1 | 2 | 0 | 5 | 3 | 3 | 3 | 16 | 5 | 13 | 3 | 5 |
| Puerto Rico | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 2 | 0 |
| United States | 1,048 | 776 | 1,024 | 693 | 1,008 | 643 | 956 | 589 | 925 | 572 | 887 | 504 | 807 | 461 | 708 | 374 | 823 | 401 | 803 | 381 | 849 | 391 | 845 | 399 | 1,104 | 478 | 1,087 | 426 | 1,196 | 434 | 1,330 | 466 | 1,412 | 485 | 1,295 | 471 | 1,274 | 434 | 1,367 | 418 | 1,230 | 376 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Central and South America | 3 | 2 | 1 | 1 | 1 | 2 | 1 | 3 | 4 | 4 | 3 | 2 | 3 | 7 | 2 | 3 | 1 | 3 | 3 | 4 | 5 | 1 | 6 | 17 | 3 | 7 | 10 | 16 | 4 | 20 | 8 | 22 | 6 | 18 | 9 | 20 | 7 | 26 | 7 | 11 | 8 | 22 |
| Argentina | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Brazil | 1 | 1 | 1 | 1 | 0 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 1 | 5 | 1 | 3 | 1 | 3 | 2 | 2 | 1 | 0 | 1 | 14 | 2 | 2 | 4 | 13 | 0 | 16 | 2 | 18 | 2 | 16 | 1 | 16 | 2 | 18 | 2 | 10 | 3 | 20 |
| All others | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 2 | 4 | 1 | 4 | 2 | 2 | 0 | 6 | 1 | 4 | 3 | 5 | 4 | 4 | 2 | 7 | 2 | 4 | 1 | 3 | 1 | 4 | 2 |
| Europe | 311 | 1,488 | 332 | 1,354 | 314 | 1,225 | 391 | 1,088 | 328 | 1,245 | 315 | 1,272 | 274 | 1,446 | 244 | 1,213 | 244 | 1,229 | 259 | 1,279 | 262 | 1,353 | 281 | 1,237 | 382 | 1,287 | 382 | 1,315 | 424 | 1,370 | 554 | 1,389 | 558 | 1,384 | 591 | 1,399 | 523 | 1,350 | 626 | 1,502 | 549 | 1,513 |
| EU | 287 | 930 | 309 | 919 | 293 | 824 | 357 | 750 | 314 | 784 | 298 | 715 | 259 | 856 | 227 | 776 | 231 | 751 | 247 | 778 | 249 | 803 | 264 | 690 | 361 | 763 | 363 | 779 | 406 | 835 | 524 | 853 | 528 | 864 | 557 | 851 | 496 | 915 | 594 | 891 | 591 | 823 |
| Austria | 6 | 35 | 5 | 22 | 3 | 30 | 9 | 26 | 6 | 37 | 4 | 27 | 4 | 21 | 2 | 25 | 3 | 30 | 8 | 23 | 5 | 33 | 5 | 27 | 6 | 34 | 5 | 20 | 6 | 26 | 10 | 25 | 8 | 18 | 14 | 21 | 13 | 32 | 9 | 24 | 10 | 26 |
| Belgium | 7 | 7 | 10 | 6 | 8 | 5 | 9 | 6 | 13 | 5 | 7 | 6 | 4 | 7 | 6 | 8 | 4 | 6 | 7 | 7 | 3 | 5 | 5 | 12 | 8 | 9 | 14 | 7 | 9 | 7 | 4 | 23 | 4 | 4 | 5 | 16 | 8 | 16 | 5 | 23 | 18 | 13 | 22 |
| Denmark | 3 | 6 | 12 | 10 | 7 | 7 | 15 | 4 | 7 | 3 | 7 | 4 | 2 | 5 | 6 | 8 | 4 | 4 | 6 | 5 | 7 | 9 | 8 | 2 | 4 | 5 | 6 | 3 | 7 | 6 | 8 | 7 | 11 | 6 | 7 | 4 | 9 | 8 | 9 | 8 | 11 | 5 |
| Finland | 16 | 22 | 14 | 17 | 10 | 12 | 14 | 16 | 8 | 14 | 11 | 21 | 8 | 24 | 9 | 16 | 7 | 27 | 7 | 15 | 5 | 16 | 5 | 12 | 9 | 18 | 8 | 17 | 6 | 20 | 9 | 26 | 13 | 34 | 11 | 27 | 11 | 29 | 12 | 26 | 10 | 16 |
| France | 50 | 180 | 51 | 177 | 51 | 164 | 78 | 169 | 48 | 167 | 40 | 152 | 32 | 158 | 30 | 132 | 30 | 225 | 45 | 220 | 38 | 201 | 35 | 172 | 54 | 175 | 52 | 235 | 47 | 220 | 76 | 231 | 49 | 242 | 55 | 275 | 70 | 188 | 77 | 189 | 73 | 162 |
| Germany | 118 | 299 | 126 | 270 | 140 | 248 | 145 | 224 | 134 | 233 | 141 | 209 | 120 | 221 | 116 | 230 | 106 | 211 | 114 | 260 | 119 | 246 | 131 | 186 | 175 | 174 | 173 | 142 | 216 | 224 | 258 | 231 | 249 | 223 | 281 | 213 | 229 | 242 | 273 | 200 | 216 | 185 |
| Hungary | 1 | 7 | 0 | 11 | 0 | 1 | 0 | 5 | 0 | 9 | 0 | 7 | 1 | 3 | 0 | 7 | 0 | 3 | 0 | 5 | 1 | 6 | 0 | 5 | 2 | 5 | 2 | 7 | 2 | 5 | 1 | 5 | 2 | 5 | 0 | 11 | 2 | 7 | 0 | 5 | 4 | 3 |
| Ireland | 0 | 6 | 2 | 3 | 2 | 2 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 2 | 1 | 0 | 1 | 1 | 1 | 1 | 3 | 2 | 0 | 1 | 2 | 4 | 3 | 4 | 4 | 1 | 2 | 5 | 4 | 2 | 2 | 3 |
| Italy | 13 | 86 | 8 | 117 | 11 | 118 | 12 | 67 | 18 | 65 | 11 | 45 | 13 | 157 | 4 | 92 | 8 | 7 | 9 | 7 | 6 | 6 | 8 | 11 | 10 | 10 | 29 | 16 | 39 | 16 | 27 | 21 | 7 | 24 | 4 | 26 | 11 | 20 | 16 | 25 | 87 | 96 |
| Netherlands | 7 | 66 | 18 | 61 | 11 | 50 | 18 | 42 | 21 | 48 | 16 | 49 | 12 | 40 | 7 | 30 | 7 | 50 | 8 | 41 | 11 | 42 | 14 | 39 | 19 | 46 | 17 | 47 | 13 | 57 | 25 | 65 | 23 | 35 | 22 | 30 | 17 | 39 | 33 | 47 | 24 | 20 |
| Spain | 1 | 35 | 1 | 40 | 2 | 34 | 4 | 41 | 3 | 26 | 1 | 37 | 4 | 46 | 3 | 52 | 1 | 45 | 4 | 50 | 2 | 57 | 3 | 65 | 3 | 74 | 3 | 72 | 4 | 56 | 4 | 64 | 6 | 71 | 5 | 49 | 3 | 72 | 8 | 51 | 6 | 42 |
| Sweden | 23 | 49 | 20 | 43 | 19 | 37 | 21 | 37 | 19 | 52 | 20 | 40 | 19 | 62 | 13 | 37 | 17 | 33 | 13 | 23 | 14 | 26 | 12 | 21 | 17 | 39 | 23 | 32 | 15 | 53 | 21 | 37 | 25 | 29 | 35 | 35 | 29 | 45 | 36 | 49 | 35 | 62 |
| United Kingdom | 39 | 34 | 40 | 29 | 27 | 26 | 29 | 23 | 36 | 36 | 40 | 32 | 36 | 36 | 29 | 40 | 41 | 31 | 26 | 27 | 34 | 23 | 32 | 29 | 45 | 31 | 43 | 49 | 58 | 36 | 63 | 41 | 82 | 42 | 73 | 45 | 68 | 40 | 69 | 59 | 61 | 43 |
| All others | 4 | 95 | 3 | 113 | 1 | 91 | 3 | 90 | 1 | 90 | 0 | 86 | 3 | 76 | 3 | 100 | 0 | 78 | 3 | 93 | 1 | 126 | 1 | 110 | 3 | 115 | 5 | 107 | 7 | 100 | 4 | 121 | 9 | 145 | 7 | 122 | 7 | 186 | 12 | 125 | 12 | 138 |
| Other Europe | 24 | 559 | 23 | 435 | 21 | 401 | 35 | 337 | 15 | 461 | 17 | 557 | 15 | 590 | 17 | 438 | 14 | 477 | 12 | 502 | 13 | 551 | 17 | 547 | 21 | 524 | 19 | 536 | 18 | 534 | 30 | 536 | 30 | 520 | 34 | 532 | 32 | 612 | 30 | 690 |
| Former Soviet Union | 0 | 28 | 1 | 11 | 0 | 9 | 0 | 1 | 23 | 0 | 31 | 0 | 0 | 79 | 0 | 0 | 1 | 64 | 0 | 86 | 3 | 89 | 1 | 92 | 1 | 72 | 1 | 99 | 1 | 51 | 1 | 71 | 0 | 40 | 0 | 38 | 0 | 38 | 0 | 36 | 0 | 33 |
| Norway | 6 | 13 | 4 | 15 | 3 | 9 | 7 | 8 | 3 | 13 | 6 | 14 | 6 | 7 | 7 | 11 | 2 | 11 | 7 | 6 | 4 | 3 | 8 | 3 | 8 | 10 | 6 | 12 | 4 | 11 | 9 | 18 | 9 | 12 | 13 | 12 | 12 | 10 | 11 | 11 | 9 | 10 |
| Russia | 6 | 499 | 8 | 394 | 6 | 375 | 13 | 294 | 3 | 405 | 4 | 449 | 3 | 405 | 5 | 360 | 3 | 388 | 2 | 398 | 4 | 448 | 3 | 438 | 3 | 421 | 3 | 409 | 3 | 457 | 8 | 429 | 5 | 451 | 3 | 481 | 4 | 370 | 2 | 547 | 6 | 633 |
| Switzerland | 9 | 19 | 9 | 15 | 12 | 5 | 13 | 11 | 8 | 12 | 6 | 16 | 7 | 14 | 5 | 15 | 6 | 13 | 3 | 10 | 2 | 11 | 5 | 13 | 8 | 18 | 8 | 13 | 10 | 11 | 10 | 16 | 16 | 15 | 17 | 14 | 10 | 13 | 18 | 16 | 14 | 14 |
| All others | 2 | 0 | 0 | 1 | 0 | 2 | 1 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 2 | 0 | 3 | 1 | 5 | 2 | 2 | 0 | 2 | 1 | 3 | 0 | 3 | 2 | 2 | 2 | 0 |
| Asia | 327 | 1,838 | 310 | 2,630 | 313 | 2,248 | 312 | 2,192 | 336 | 2,549 | 354 | 3,080 | 357 | 3,494 | 308 | 4,378 | 303 | 4,950 | 300 | 5,428 | 314 | 4,788 | 333 | 5,063 | 463 | 5,521 | 440 | 7,243 | 518 | 8,405 | 591 | 8,883 | 633 | 8,624 | 633 | 9,566 | 614 | 11,387 | 720 | 10,812 | 724 | 10,857 |

**TABLE 5B-28**

## USPTO patents and patent families granted in environmental technology, by region, country, or economy: 1998–2018

(Number)

| Region, country, or economy | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| China | 3 | 27 | 2 | 31 | 4 | 102 | 5 | 106 | 3 | 148 | 6 | 303 | 7 | 484 | 2 | 555 | 5 | 702 | 5 | 770 | 5 | 936 | 12 | 1,452 | 25 | 1,495 | 24 | 2,802 | 32 | 3,774 | 28 | 4,180 | 52 | 4,345 | 45 | 6,265 | 63 | 7,660 | 92 | 6,928 | 101 | 7,265 |
| India | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 2 | 2 | 6 | 6 | 3 | 2 | 6 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 2 | 6 | 3 | 9 | 4 | 11 | 8 | 16 | 9 | 12 | 4 | 16 | 10 | 22 | 9 | 21 | 11 |
| Japan | 281 | 1,500 | 259 | 1,808 | 261 | 1,693 | 252 | 1,625 | 265 | 1,849 | 282 | 1,928 | 285 | 1,956 | 250 | 2,076 | 253 | 2,403 | 242 | 2,608 | 252 | 2,344 | 252 | 2,430 | 361 | 2,629 | 343 | 2,808 | 380 | 2,660 | 428 | 2,354 | 444 | 2,163 | 452 | 1,704 | 416 | 1,899 | 441 | 1,817 | 424 | 1,581 |
| Malaysia | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 2 | 0 | 5 | 0 | 2 | 0 | 0 | 1 | 6 | 1 | 2 | 0 | 8 | 0 | 9 | 1 | 6 | 1 | 4 | 2 | 6 | 1 | 9 | 1 | 14 | 1 | 5 |
| Singapore | 0 | 1 | 1 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 3 | 2 | 2 | 1 | 3 | 3 | 0 | 0 | 0 | 1 | 2 | 0 | 2 | 1 | 3 | 2 | 2 | 0 | 2 | 0 | 4 | 2 | 3 | 0 | 3 | 2 | 3 | 1 | 5 | 1 | 5 | 1 |
| South Korea | 20 | 270 | 19 | 746 | 20 | 402 | 21 | 398 | 31 | 460 | 28 | 758 | 26 | 982 | 18 | 1,629 | 21 | 1,725 | 23 | 1,952 | 23 | 1,422 | 36 | 1,106 | 45 | 1,316 | 38 | 1,539 | 51 | 1,852 | 78 | 2,186 | 88 | 1,960 | 94 | 1,438 | 87 | 1,618 | 116 | 1,857 | 144 | 1,877 |
| Taiwan | 21 | 37 | 29 | 45 | 25 | 46 | 29 | 60 | 34 | 86 | 27 | 80 | 31 | 68 | 26 | 107 | 20 | 109 | 26 | 91 | 28 | 79 | 28 | 63 | 23 | 74 | 24 | 82 | 43 | 103 | 39 | 145 | 27 | 141 | 24 | 146 | 26 | 184 | 40 | 180 | 26 | 110 |
| All others | 1 | 3 | 0 | 0 | 1 | 3 | 3 | 1 | 1 | 3 | 2 | 1 | 2 | 1 | 3 | 4 | 0 | 3 | 0 | 2 | 0 | 2 | 0 | 4 | 0 | 1 | 2 | 1 | 0 | 2 | 1 | 1 | 3 | 2 | 1 | 2 | 3 | 5 | 3 | 7 | 3 | 6 |
| Middle East | 7 | 4 | 12 | 6 | 9 | 4 | 14 | 9 | 12 | 6 | 13 | 8 | 9 | 5 | 11 | 4 | 11 | 2 | 17 | 12 | 12 | 5 | 21 | 11 | 21 | 8 | 19 | 10 | 28 | 15 | 46 | 23 | 34 | 15 | 48 | 19 | 48 | 20 | 52 | 21 | 68 | 25 |
| Israel | 5 | 4 | 12 | 5 | 7 | 2 | 13 | 6 | 10 | 1 | 12 | 3 | 9 | 2 | 10 | 3 | 11 | 1 | 14 | 4 | 10 | 3 | 19 | 9 | 18 | 2 | 15 | 4 | 15 | 4 | 24 | 5 | 22 | 7 | 26 | 6 | 25 | 6 | 27 | 4 | 31 | 8 |
| All others | 2 | 0 | 1 | 0 | 2 | 2 | 1 | 4 | 2 | 5 | 1 | 4 | 1 | 2 | 0 | 1 | 1 | 1 | 3 | 8 | 2 | 2 | 2 | 1 | 3 | 5 | 5 | 6 | 13 | 10 | 21 | 17 | 13 | 8 | 22 | 13 | 23 | 14 | 25 | 17 | 37 | 17 |
| Africa | 2 | 4 | 3 | 9 | 5 | 10 | 8 | 10 | 3 | 13 | 4 | 13 | 3 | 9 | 5 | 8 | 8 | 4 | 3 | 5 | 2 | 13 | 1 | 3 | 1 | 19 | 2 | 7 | 2 | 12 | 5 | 16 | 2 | 11 | 3 | 1 | 2 | 5 | 2 | 6 | 3 | 4 |
| South Africa | 2 | 2 | 3 | 4 | 4 | 6 | 8 | 6 | 3 | 2 | 4 | 2 | 2 | 5 | 3 | 3 | 6 | 3 | 2 | 1 | 1 | 9 | 1 | 2 | 1 | 11 | 2 | 0 | 2 | 1 | 4 | 3 | 2 | 1 | 1 | 1 | 1 | 0 | 2 | 1 | 2 | 0 |
| All others | 0 | 2 | 1 | 5 | 1 | 4 | 0 | 5 | 0 | 11 | 0 | 10 | 1 | 3 | 0 | 2 | 2 | 1 | 1 | 4 | 1 | 4 | 0 | 1 | 0 | 8 | 0 | 7 | 1 | 10 | 1 | 13 | 0 | 10 | 1 | 1 | 1 | 5 | 0 | 5 | 1 | 4 |
| Australia and Oceania | 11 | 10 | 10 | 8 | 10 | 7 | 10 | 17 | 7 | 14 | 8 | 8 | 15 | 27 | 17 | 15 | 4 | 17 | 7 | 21 | 10 | 19 | 12 | 16 | 19 | 21 | 12 | 23 | 16 | 31 | 24 | 21 | 27 | 33 | 24 | 16 | 13 | 28 | 17 | 16 | 19 | 18 |
| Australia | 10 | 10 | 10 | 8 | 8 | 6 | 9 | 17 | 7 | 14 | 7 | 8 | 14 | 27 | 17 | 15 | 3 | 17 | 6 | 21 | 8 | 19 | 11 | 16 | 15 | 21 | 12 | 23 | 15 | 30 | 22 | 21 | 24 | 32 | 22 | 16 | 12 | 27 | 16 | 16 | 16 | 18 |
| New Zealand | 1 | 0 | 1 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 4 | 0 | 1 | 0 | 1 | 1 | 2 | 0 | 3 | 1 | 2 | 0 | 1 | 1 | 1 | 0 | 3 | 0 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Unclassified | 1 | 7 | 1 | 44 | 0 | 23 | 1 | 6 | 0 | 1 | 0 | 1 | 0 | 2 | 0 | 10 | 1 | 8 | 0 | 4 | 0 | 1 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 |

EU = European Union; USPTO = U.S. Patent and Trademark Office.

**Note(s)**

USPTO patents are allocated according to patent inventorship information. USPTO patents are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named inventors. Patents are classified under the World Intellectual Property Organization (WIPO) classification of patents, which classifies International Patent Classification (IPC) codes under 35 technical fields. IPC reformed codes take into account changes that were made to the WIPO classification in 2006 under the eighth version of the classification and were used to prepare these data. However, because PatentsView only provides the original IPC codes as they appeared on patents and not the IPC reformed codes, current Cooperative Patent Classification codes on patents were converted back to the most recent IPC classification to prepare these statistics. Fractional counts of patents were assigned to each technological field on patents to assign the proper weight of a patent to the corresponding technological fields under the classification. International Patent Documentation (INPADOC) patent families across all patent offices covered in the Worldwide Patent Statistical Database (PATSTAT) are counted according to the year of the first granted patent in the patent family. Patent families are allocated according to patent inventorship information found on the priority patent of the INPADOC patent families. To account for missing ownership information in PATSTAT for some offices, a method designed by de Rassenfosse et al. (2012) is used to fill in missing information on priority patents using information in successive filings within the patent families (see technical documentation for details). Patent families are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named inventors. Because of data coverage issues for some patent offices in PATSTAT, statistics for some countries may be underestimated partially for some years or across the whole trend. Countries with identified issues include India (missing data) and South Africa (no data for 2018). For Italy, because of data gaps regarding information on granted patents, patent applications are used instead, which slightly overestimates Italy's output and creates a small shift in the year for which its output is accounted. The EU includes 28 member countries. China includes Hong Kong.

**Source(s)**

Science-Metrix; PATSTAT, accessed April 2019; PatentsView, USPTO, accessed June 2019.

TABLE S8-29

## USPTO patents and patent families granted in handling, by region, country, or economy: 1998–2018

(Number)

| Region, country, or economy | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| World | 4,090 | 9,855 | 4,267 | 10,404 | 4,173 | 8,107 | 4,134 | 7,747 | 3,980 | 8,025 | 3,822 | 8,349 | 3,235 | 8,718 | 2,836 | 8,801 | 3,030 | 9,711 | 2,596 | 10,667 | 2,676 | 10,356 | 2,725 | 10,934 | 3,576 | 11,653 | 3,660 | 12,947 | 3,763 | 14,533 | 4,480 | 14,652 | 4,824 | 15,590 | 4,896 | 16,422 | 4,943 | 20,693 | 5,349 | 22,236 | 5,305 | 22,127 |
| North America | 2,448 | 2,021 | 2,626 | 2,062 | 2,503 | 1,872 | 2,410 | 1,705 | 2,279 | 1,500 | 2,121 | 1,379 | 1,775 | 1,110 | 1,636 | 1,040 | 1,692 | 1,136 | 1,426 | 989 | 1,326 | 885 | 1,355 | 931 | 1,754 | 1,085 | 1,860 | 1,082 | 1,815 | 1,003 | 2,170 | 1,154 | 2,292 | 1,080 | 2,345 | 934 | 2,482 | 921 | 2,588 | 860 | 2,582 | 891 |
| Canada | 124 | 107 | 123 | 93 | 131 | 108 | 138 | 115 | 95 | 81 | 115 | 87 | 94 | 71 | 68 | 70 | 80 | 69 | 64 | 60 | 64 | 60 | 57 | 51 | 87 | 66 | 92 | 65 | 97 | 62 | 105 | 85 | 117 | 84 | 112 | 59 | 129 | 66 | 140 | 66 | 147 | 65 |
| Mexico | 2 | 3 | 5 | 2 | 6 | 5 | 10 | 8 | 13 | 12 | 8 | 5 | 4 | 6 | 4 | 4 | 2 | 1 | 1 | 1 | 1 | 2 | 3 | 2 | 2 | 1 | 4 | 1 | 4 | 0 | 4 | 1 | 6 | 1 | 5 | 1 | 3 | 21 | 5 | 13 | 5 | 14 |
| Puerto Rico | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 2 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 |
| United States | 2,320 | 1,909 | 2,498 | 1,967 | 2,367 | 1,760 | 2,262 | 1,583 | 2,170 | 1,408 | 1,997 | 1,287 | 1,676 | 1,033 | 1,562 | 966 | 1,609 | 1,066 | 1,360 | 928 | 1,259 | 822 | 1,294 | 878 | 1,665 | 1,018 | 1,764 | 1,016 | 1,713 | 940 | 2,061 | 1,068 | 2,169 | 995 | 2,228 | 873 | 2,349 | 834 | 2,443 | 780 | 2,430 | 812 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Central and South America | 9 | 2 | 14 | 9 | 10 | 12 | 13 | 6 | 4 | 6 | 9 | 10 | 8 | 14 | 4 | 10 | 4 | 8 | 9 | 11 | 5 | 14 | 12 | 35 | 7 | 26 | 14 | 33 | 10 | 42 | 16 | 29 | 15 | 17 | 11 | 23 | 18 | 27 | 16 | 27 | 19 | 78 |
| Argentina | 1 | 0 | 3 | 2 | 5 | 2 | 4 | 1 | 3 | 0 | 1 | 1 | 2 | 1 | 0 | 0 | 1 | 0 | 2 | 3 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 2 | 0 | 2 | 1 | 0 | 0 | 2 | 1 | 4 | 0 | 1 | 1 | 3 | 1 |
| Brazil | 5 | 1 | 7 | 4 | 5 | 9 | 8 | 3 | 0 | 6 | 4 | 6 | 6 | 6 | 12 | 3 | 7 | 2 | 6 | 4 | 7 | 2 | 6 | 3 | 4 | 4 | 25 | 12 | 31 | 4 | 38 | 8 | 27 | 12 | 7 | 2 | 22 | 10 | 25 | 12 | 25 | 11 |
| All others | 3 | 1 | 4 | 3 | 1 | 1 | 1 | 2 | 2 | 0 | 4 | 2 | 0 | 1 | 1 | 3 | 1 | 2 | 3 | 1 | 2 | 2 | 7 | 3 | 2 | 1 | 3 | 2 | 5 | 4 | 6 | 2 | 3 | 1 | 2 | 0 | 4 | 2 | 4 | 1 | 5 | 5 |
| Europe | 1,061 | 2,786 | 1,001 | 2,926 | 1,065 | 2,548 | 1,057 | 2,386 | 1,026 | 2,365 | 1,020 | 2,466 | 856 | 2,976 | 722 | 2,590 | 756 | 2,406 | 655 | 2,315 | 735 | 2,233 | 670 | 2,035 | 906 | 2,176 | 882 | 1,967 | 942 | 2,039 | 1,137 | 1,905 | 1,272 | 1,940 | 1,222 | 1,845 | 1,182 | 1,968 | 1,415 | 2,476 | 1,356 | 2,179 |
| EU | 962 | 2,410 | 915 | 2,583 | 971 | 2,255 | 949 | 2,104 | 932 | 2,026 | 921 | 2,030 | 767 | 2,488 | 652 | 2,138 | 677 | 1,912 | 589 | 1,886 | 651 | 1,780 | 596 | 1,568 | 814 | 1,778 | 785 | 1,672 | 847 | 1,735 | 1,006 | 1,552 | 1,129 | 1,620 | 1,066 | 1,555 | 1,056 | 1,741 | 1,265 | 2,172 | 1,231 | 1,886 |
| Austria | 17 | 52 | 15 | 54 | 23 | 46 | 18 | 33 | 8 | 42 | 26 | 61 | 16 | 35 | 18 | 42 | 7 | 61 | 19 | 45 | 11 | 61 | 15 | 52 | 24 | 60 | 15 | 58 | 23 | 55 | 33 | 58 | 41 | 36 | 28 | 58 | 37 | 53 | 48 | 50 | 45 | 58 |
| Belgium | 25 | 26 | 19 | 15 | 15 | 16 | 14 | 15 | 12 | 21 | 6 | 8 | 13 | 12 | 9 | 11 | 9 | 17 | 11 | 10 | 9 | 17 | 6 | 15 | 10 | 19 | 15 | 12 | 8 | 13 | 11 | 12 | 17 | 11 | 16 | 8 | 17 | 10 | 29 | 25 | 31 | 49 |
| Denmark | 14 | 9 | 12 | 13 | 12 | 11 | 15 | 15 | 17 | 17 | 17 | 18 | 15 | 15 | 8 | 8 | 8 | 9 | 9 | 10 | 16 | 14 | 7 | 12 | 12 | 12 | 22 | 11 | 16 | 22 | 21 | 21 | 21 | 23 | 22 | 19 | 29 | 29 | 32 | 28 | 28 | 20 |
| Finland | 45 | 73 | 34 | 51 | 31 | 74 | 22 | 60 | 36 | 60 | 44 | 92 | 20 | 55 | 24 | 71 | 26 | 64 | 17 | 75 | 33 | 73 | 41 | 68 | 35 | 92 | 29 | 61 | 36 | 68 | 47 | 65 | 39 | 72 | 38 | 97 | 44 | 87 | 100 | 74 | 91 | 55 |
| France | 105 | 509 | 108 | 503 | 108 | 477 | 116 | 470 | 124 | 433 | 112 | 464 | 101 | 425 | 76 | 337 | 89 | 450 | 63 | 409 | 65 | 363 | 61 | 369 | 97 | 425 | 109 | 357 | 108 | 426 | 138 | 384 | 130 | 430 | 126 | 432 | 125 | 394 | 138 | 306 | 130 | 232 |
| Germany | 382 | 576 | 369 | 557 | 396 | 454 | 397 | 516 | 374 | 574 | 376 | 596 | 289 | 602 | 244 | 690 | 280 | 676 | 252 | 631 | 253 | 623 | 247 | 433 | 317 | 493 | 285 | 393 | 331 | 380 | 376 | 454 | 463 | 442 | 440 | 426 | 413 | 499 | 472 | 551 | 437 | 539 |
| Hungary | 0 | 6 | 0 | 2 | 1 | 5 | 0 | 2 | 0 | 2 | 0 | 9 | 1 | 8 | 1 | 5 | 0 | 3 | 0 | 4 | 0 | 4 | 0 | 1 | 1 | 5 | 3 | 5 | 3 | 3 | 2 | 8 | 0 | 2 | 2 | 3 | 1 | 3 | 1 | 4 | 1 | 1 |
| Ireland | 4 | 15 | 3 | 9 | 6 | 4 | 3 | 4 | 2 | 1 | 5 | 1 | 4 | 3 | 5 | 4 | 4 | 4 | 2 | 6 | 2 | 2 | 6 | 1 | 4 | 1 | 7 | 3 | 3 | 3 | 2 | 8 | 0 | 6 | 2 | 10 | 7 | 5 | 6 | 6 | 3 | 6 |
| Italy | 137 | 445 | 121 | 708 | 126 | 628 | 118 | 382 | 121 | 323 | 145 | 243 | 136 | 686 | 112 | 360 | 100 | 54 | 91 | 65 | 117 | 75 | 91 | 66 | 124 | 155 | 115 | 230 | 112 | 181 | 140 | 38 | 127 | 36 | 135 | 29 | 129 | 60 | 514 | 147 | 514 | 159 |
| Netherlands | 39 | 182 | 55 | 194 | 46 | 160 | 55 | 189 | 57 | 163 | 35 | 171 | 35 | 170 | 27 | 183 | 38 | 192 | 19 | 159 | 38 | 175 | 29 | 157 | 46 | 152 | 33 | 133 | 34 | 146 | 56 | 132 | 70 | 141 | 66 | 100 | 81 | 141 | 85 | 155 | 78 | 78 |
| Spain | 21 | 104 | 13 | 110 | 21 | 102 | 19 | 110 | 18 | 72 | 15 | 93 | 16 | 114 | 13 | 141 | 16 | 135 | 11 | 180 | 14 | 115 | 11 | 125 | 18 | 122 | 18 | 128 | 21 | 123 | 23 | 100 | 14 | 127 | 19 | 127 | 31 | 125 | 44 | 114 | 35 | 117 |
| Sweden | 54 | 175 | 53 | 146 | 71 | 103 | 58 | 101 | 62 | 118 | 38 | 108 | 42 | 159 | 31 | 84 | 35 | 69 | 30 | 72 | 24 | 73 | 21 | 51 | 41 | 64 | 42 | 70 | 46 | 70 | 45 | 45 | 61 | 26 | 45 | 25 | 43 | 42 | 54 | 50 | 51 | 45 |
| United Kingdom | 116 | 114 | 106 | 103 | 112 | 87 | 111 | 90 | 94 | 108 | 99 | 97 | 78 | 123 | 82 | 104 | 62 | 102 | 64 | 91 | 65 | 83 | 59 | 72 | 80 | 74 | 86 | 106 | 99 | 129 | 104 | 97 | 112 | 87 | 109 | 88 | 85 | 97 | 94 | 102 | 125 | 94 |
| All others | 3 | 123 | 7 | 117 | 3 | 88 | 2 | 116 | 5 | 90 | 4 | 69 | 2 | 80 | 2 | 97 | 4 | 75 | 1 | 130 | 3 | 102 | 2 | 144 | 4 | 107 | 5 | 106 | 8 | 118 | 10 | 133 | 6 | 160 | 11 | 124 | 13 | 197 | 14 | 194 | 16 | 158 |
| Other Europe | 99 | 377 | 86 | 343 | 94 | 292 | 108 | 282 | 94 | 339 | 99 | 436 | 89 | 488 | 71 | 453 | 80 | 494 | 65 | 429 | 84 | 453 | 73 | 468 | 92 | 398 | 97 | 296 | 95 | 304 | 131 | 354 | 143 | 320 | 156 | 262 | 151 | 304 | 125 | 293 | 151 | 304 |
| Former Soviet Union | 1 | 17 | 1 | 10 | 1 | 11 | 2 | 11 | 0 | 25 | 0 | 73 | 1 | 129 | 1 | 45 | 0 | 84 | 0 | 68 | 0 | 48 | 0 | 66 | 0 | 48 | 0 | 38 | 1 | 49 | 0 | 51 | 0 | 40 | 0 | 28 | 0 | 30 | 1 | 37 | 1 | 37 |
| Norway | 12 | 28 | 11 | 28 | 12 | 27 | 16 | 18 | 6 | 20 | 7 | 22 | 6 | 20 | 2 | 19 | 4 | 29 | 5 | 18 | 7 | 13 | 6 | 23 | 10 | 20 | 5 | 20 | 8 | 13 | 3 | 19 | 6 | 20 | 12 | 16 | 14 | 27 | 16 | 36 | 12 | 20 |
| Russia | 1 | 280 | 1 | 236 | 0 | 178 | 1 | 182 | 1 | 225 | 1 | 271 | 1 | 271 | 0 | 321 | 3 | 296 | 4 | 274 | 0 | 333 | 0 | 312 | 1 | 259 | 2 | 181 | 0 | 185 | 0 | 228 | 6 | 200 | 5 | 199 | 4 | 135 | 2 | 187 | 3 | 181 |
| Switzerland | 85 | 47 | 73 | 63 | 81 | 70 | 87 | 70 | 85 | 64 | 90 | 62 | 81 | 67 | 65 | 66 | 73 | 82 | 55 | 64 | 76 | 58 | 67 | 63 | 81 | 65 | 89 | 50 | 83 | 8 | 124 | 52 | 126 | 57 | 133 | 38 | 103 | 31 | 125 | 38 | 103 | 50 |
| All others | 1 | 5 | 1 | 5 | 1 | 6 | 1 | 1 | 1 | 4 | 1 | 9 | 0 | 2 | 3 | 2 | 0 | 3 | 1 | 4 | 1 | 2 | 0 | 4 | 1 | 6 | 0 | 7 | 3 | 8 | 3 | 3 | 5 | 4 | 6 | 9 | 4 | 5 | 6 | 5 | 5 | 5 |
| Asia | 526 | 4,952 | 574 | 5,321 | 546 | 3,579 | 601 | 3,537 | 623 | 4,062 | 617 | 4,423 | 547 | 4,499 | 427 | 5,053 | 535 | 6,078 | 465 | 7,260 | 572 | 7,134 | 641 | 7,838 | 844 | 8,266 | 858 | 9,760 | 929 | 11,337 | 1,091 | 11,461 | 1,163 | 12,465 | 1,236 | 13,512 | 1,176 | 17,663 | 1,246 | 18,813 | 1,257 | 18,900 |

TABLE S8-29

## USPTO patents and patent families granted in handling, by region, country, or economy: 1998–2018

(Number)

| | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Region, country, or economy | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| China | 6 | 18 | 7 | 26 | 3 | 48 | 6 | 60 | 7 | 77 | 14 | 136 | 10 | 177 | 15 | 200 | 16 | 276 | 13 | 355 | 15 | 482 | 21 | 853 | 33 | 1,080 | 29 | 1,741 | 56 | 2,562 | 84 | 2,541 | 102 | 3,201 | 118 | 6,998 | 113 | 9,586 | 118 | 11,206 | 159 | 11,483 |
| India | 2 | 0 | 1 | 0 | 2 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 3 | 2 | 3 | 0 | 0 | 1 | 2 | 2 | 0 | 1 | 0 | 1 | 1 | 2 | 2 | 2 | 9 | 4 | 4 | 2 | 5 | 3 | 13 | 7 | 13 | 4 | 13 | 2 | 12 | 2 |
| Japan | 396 | 4,536 | 421 | 4,597 | 397 | 3,106 | 452 | 3,128 | 474 | 3,502 | 453 | 3,686 | 408 | 3,632 | 312 | 3,842 | 403 | 4,127 | 353 | 5,180 | 442 | 5,269 | 467 | 5,929 | 647 | 5,921 | 678 | 6,271 | 673 | 6,570 | 795 | 6,174 | 839 | 6,571 | 890 | 4,413 | 857 | 5,490 | 880 | 4,838 | 875 | 4,657 |
| Malaysia | 4 | 4 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 3 | 3 | 4 | 3 | 1 | 1 | 7 | 1 | 20 | 3 | 4 | 4 | 2 | 2 | 12 | 1 | 9 | 3 | 8 | 1 | 11 | 4 | 5 | 3 | 8 | 3 | 6 | 1 | 11 | 5 | 14 |
| Singapore | 3 | 3 | 0 | 1 | 4 | 4 | 4 | 4 | 4 | 4 | 7 | 7 | 3 | 4 | 4 | 4 | 6 | 4 | 8 | 6 | 2 | 2 | 4 | 6 | 5 | 4 | 6 | 2 | 2 | 6 | 3 | 6 | 3 | 9 | 4 | 6 | 4 | 9 | 4 | 7 | 3 |
| South Korea | 43 | 292 | 53 | 581 | 43 | 304 | 55 | 223 | 34 | 327 | 38 | 444 | 30 | 534 | 26 | 866 | 43 | 1,437 | 33 | 1,375 | 42 | 1,194 | 56 | 821 | 55 | 986 | 51 | 1,440 | 66 | 1,898 | 86 | 2,406 | 95 | 2,369 | 87 | 1,841 | 83 | 2,135 | 116 | 2,347 | 98 | 2,460 |
| Taiwan | 71 | 97 | 92 | 115 | 94 | 114 | 82 | 117 | 102 | 147 | 103 | 147 | 88 | 144 | 63 | 138 | 65 | 225 | 55 | 321 | 66 | 180 | 88 | 224 | 99 | 256 | 89 | 292 | 114 | 287 | 111 | 315 | 108 | 303 | 110 | 238 | 93 | 431 | 102 | 400 | 96 | 279 |
| All others | 2 | 3 | 0 | 0 | 0 | 1 | 2 | 4 | 2 | 4 | 2 | 1 | 1 | 1 | 1 | 0 | 0 | 2 | 0 | 1 | 1 | 1 | 1 | 2 | 3 | 6 | 2 | 3 | 2 | 5 | 2 | 4 | 4 | 9 | 7 | 3 | 7 | 6 | 8 | 7 | 6 | 2 |
| Middle East | 10 | 5 | 8 | 4 | 14 | 10 | 6 | 3 | 10 | 9 | 12 | 12 | 8 | 7 | 10 | 7 | 7 | 8 | 9 | 4 | 6 | 4 | 9 | 5 | 14 | 6 | 12 | 11 | 20 | 21 | 20 | 13 | 30 | 14 | 26 | 14 | 32 | 12 | 29 | 16 | 32 | 14 |
| Israel | 8 | 4 | 6 | 3 | 12 | 8 | 5 | 3 | 9 | 4 | 12 | 8 | 8 | 6 | 10 | 5 | 6 | 5 | 9 | 3 | 6 | 4 | 8 | 4 | 13 | 5 | 9 | 5 | 16 | 12 | 17 | 8 | 24 | 11 | 24 | 9 | 25 | 8 | 22 | 10 | 26 | 8 |
| All others | 1 | 1 | 2 | 1 | 1 | 2 | 0 | 1 | 1 | 5 | 0 | 4 | 1 | 1 | 0 | 2 | 1 | 4 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 3 | 6 | 5 | 9 | 3 | 5 | 6 | 3 | 2 | 6 | 7 | 4 | 7 | 6 | 6 | 6 |
| Africa | 7 | 36 | 9 | 34 | 7 | 19 | 6 | 34 | 7 | 18 | 7 | 26 | 7 | 26 | 10 | 23 | 4 | 10 | 4 | 16 | 5 | 26 | 6 | 22 | 8 | 15 | 4 | 10 | 9 | 16 | 4 | 10 | 4 | 4 | 9 | 5 | 6 | 6 | 6 | 2 | 8 | 4 |
| South Africa | 7 | 33 | 7 | 25 | 7 | 9 | 6 | 23 | 7 | 14 | 5 | 16 | 4 | 20 | 4 | 13 | 2 | 8 | 3 | 14 | 4 | 23 | 3 | 20 | 8 | 15 | 4 | 2 | 9 | 9 | 4 | 6 | 3 | 2 | 6 | 3 | 4 | 1 | 6 | 1 | 5 | 1 |
| All others | 0 | 3 | 2 | 9 | 0 | 10 | 0 | 11 | 0 | 5 | 2 | 11 | 3 | 6 | 7 | 10 | 3 | 1 | 1 | 2 | 1 | 3 | 3 | 2 | 0 | 0 | 0 | 8 | 0 | 7 | 0 | 4 | 1 | 3 | 3 | 2 | 2 | 5 | 0 | 2 | 3 | 3 |
| Australia and Oceania | 28 | 44 | 33 | 35 | 27 | 44 | 41 | 73 | 31 | 61 | 37 | 33 | 34 | 82 | 26 | 62 | 32 | 61 | 28 | 73 | 28 | 61 | 33 | 67 | 43 | 78 | 30 | 82 | 36 | 75 | 41 | 80 | 47 | 69 | 47 | 88 | 46 | 96 | 47 | 43 | 50 | 58 |
| Australia | 19 | 43 | 25 | 33 | 24 | 43 | 34 | 73 | 27 | 60 | 34 | 31 | 27 | 81 | 22 | 60 | 26 | 59 | 25 | 73 | 26 | 60 | 32 | 67 | 36 | 76 | 26 | 81 | 28 | 73 | 33 | 77 | 39 | 69 | 37 | 87 | 41 | 94 | 38 | 41 | 43 | 58 |
| New Zealand | 9 | 0 | 7 | 2 | 3 | 1 | 7 | 0 | 3 | 1 | 3 | 2 | 6 | 1 | 5 | 1 | 6 | 2 | 4 | 1 | 2 | 1 | 1 | 0 | 7 | 2 | 4 | 1 | 8 | 2 | 8 | 2 | 8 | 1 | 10 | 1 | 6 | 1 | 8 | 2 | 6 | 0 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Unclassified | 0 | 9 | 2 | 13 | 2 | 23 | 1 | 2 | 0 | 2 | 0 | 0 | 0 | 3 | 0 | 17 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 2 |

EU = European Union; USPTO = U.S. Patent and Trademark Office.

**Note(s)**

USPTO patents are allocated according to patent inventorship information. USPTO patents are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named inventors. Patents are classified under the World Intellectual Property Organization (WIPO) classification of patents, which classifies International Patent Classification (IPC) codes under 35 technical fields. IPC reformed codes take into account changes that were made to the WIPO classification in 2006 under the eighth version of the classification and were used to prepare these data. However, because PatentsView only provides the original IPC codes as they appeared on patents and not the IPC reformed codes, current Cooperative Patent Classification codes on patents were converted back to the most recent IPC classification to prepare these statistics. Fractional counts of patents were assigned to each technological field on patents to assign the proper weight of a patent to the corresponding technological fields under the classification. International Patent Documentation (INPADOC) patent families across all patent offices covered in the Worldwide Patent Statistical Database (PATSTAT) are counted according to the year of the first granted patent in the patent family. Patent families are allocated according to patent inventorship information found on the priority patent of the INPADOC patent families. To account for missing ownership information in PATSTAT for some offices, a method designed by de Rassenfosse et al. (2012) is used to fill in missing information on priority patents using information in successive filings within the patent families (see technical documentation for details). Patent families are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named inventors. Because of data coverage issues for some patent offices in PATSTAT, statistics for some countries may be underestimated partially for some years or across the whole trend. Countries with identified issues include India (missing data) and South Africa (no data for 2018). For Italy, because of data gaps regarding information on granted patents, patent applications are used instead, which slightly overestimates Italy's output and creates a small shift in the year for which its output is accounted. The EU includes 28 member countries. China includes Hong Kong.

**Source(s)**

Science-Metrix; PATSTAT, accessed April 2019; PatentsView, USPTO, accessed June 2019.

TABLE SB-30

## USPTO patents and patent families granted in machine tools, by region, country, or economy: 1998–2018

(Number)

| Region, country, or economy | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| World | 3,781 | 10,087 | 4,259 | 10,483 | 4,449 | 8,803 | 4,561 | 8,272 | 4,106 | 8,285 | 4,301 | 8,830 | 3,991 | 9,425 | 3,489 | 9,826 | 4,077 | 11,117 | 3,270 | 10,494 | 2,689 | 10,386 | 2,487 | 11,394 | 3,162 | 12,010 | 3,321 | 14,199 | 3,655 | 16,807 | 4,087 | 17,268 | 4,175 | 18,664 | 4,329 | 23,289 | 4,259 | 27,393 | 4,640 | 28,594 | 4,400 | 27,007 |
| North America | 2,095 | 1,686 | 2,351 | 1,797 | 2,355 | 1,698 | 2,386 | 1,598 | 2,114 | 1,287 | 2,157 | 1,351 | 1,997 | 1,229 | 1,782 | 1,054 | 2,069 | 1,230 | 1,619 | 997 | 1,241 | 723 | 1,189 | 750 | 1,498 | 995 | 1,575 | 1,053 | 1,633 | 1,161 | 1,849 | 1,237 | 1,929 | 1,283 | 1,912 | 1,094 | 1,904 | 881 | 2,075 | 811 | 1,907 | 669 |
| Canada | 90 | 78 | 114 | 98 | 122 | 93 | 100 | 79 | 101 | 68 | 99 | 86 | 80 | 68 | 78 | 63 | 98 | 68 | 78 | 53 | 63 | 57 | 58 | 49 | 77 | 54 | 71 | 66 | 87 | 80 | 67 | 90 | 67 | 78 | 57 | 86 | 52 | 82 | 40 | 78 | 36 | |
| Mexico | 2 | 1 | 4 | 3 | 1 | 0 | 5 | 4 | 2 | 0 | 1 | 0 | 2 | 0 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 2 | 2 | 2 | 4 | 2 | 2 | 1 | 6 | 4 | 2 | 4 | 3 | 7 | 4 | 6 | 4 | 10 |
| Puerto Rico | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 |
| United States | 2,003 | 1,606 | 2,234 | 1,695 | 2,230 | 1,605 | 2,281 | 1,514 | 2,008 | 1,219 | 2,057 | 1,265 | 1,905 | 1,160 | 1,701 | 991 | 1,969 | 1,161 | 1,540 | 943 | 1,177 | 666 | 1,131 | 699 | 1,420 | 939 | 1,502 | 986 | 1,541 | 1,098 | 1,766 | 1,169 | 1,832 | 1,212 | 1,832 | 1,033 | 1,815 | 822 | 1,989 | 765 | 1,824 | 623 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Central and South America | 1 | 3 | 7 | 4 | 7 | 7 | 3 | 4 | 4 | 4 | 3 | 4 | 5 | 8 | 5 | 4 | 4 | 5 | 5 | 7 | 4 | 9 | 4 | 20 | 6 | 15 | 4 | 20 | 4 | 17 | 8 | 21 | 3 | 16 | 7 | 18 | 6 | 9 | 10 | 17 | 9 | 23 |
| Argentina | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 2 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 2 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 1 |
| Brazil | 0 | 0 | 6 | 3 | 2 | 5 | 2 | 2 | 4 | 3 | 2 | 3 | 5 | 5 | 2 | 2 | 4 | 4 | 3 | 5 | 2 | 5 | 2 | 16 | 5 | 14 | 2 | 17 | 3 | 16 | 3 | 19 | 2 | 15 | 4 | 17 | 3 | 8 | 7 | 16 | 7 | 22 |
| All others | 1 | 2 | 1 | 2 | 4 | 2 | 1 | 2 | 0 | 0 | 2 | 2 | 2 | 1 | 2 | 0 | 2 | 1 | 2 | 1 | 2 | 4 | 2 | 3 | 2 | 1 | 1 | 2 | 1 | 0 | 3 | 2 | 1 | 1 | 2 | 1 | 3 | 1 | 3 | 1 | 1 | 0 |
| Europe | 820 | 2,921 | 894 | 2,700 | 962 | 2,606 | 965 | 2,397 | 867 | 2,467 | 944 | 2,847 | 839 | 3,177 | 688 | 2,836 | 795 | 2,732 | 672 | 2,450 | 607 | 2,541 | 538 | 2,770 | 699 | 2,276 | 722 | 2,129 | 864 | 2,374 | 967 | 2,219 | 944 | 2,389 | 1,021 | 2,461 | 991 | 2,175 | 1,099 | 2,446 | 1,032 | 1,951 |
| EU | 752 | 1,808 | 828 | 2,010 | 883 | 1,854 | 892 | 1,710 | 798 | 1,666 | 854 | 1,648 | 756 | 1,879 | 630 | 1,831 | 716 | 1,707 | 625 | 1,516 | 542 | 1,538 | 497 | 1,463 | 653 | 1,344 | 678 | 1,329 | 796 | 1,424 | 908 | 1,367 | 875 | 1,570 | 957 | 1,587 | 928 | 1,612 | 1,033 | 1,655 | 947 | 1,372 |
| Austria | 18 | 54 | 22 | 39 | 28 | 77 | 41 | 63 | 27 | 65 | 26 | 74 | 27 | 53 | 25 | 48 | 29 | 100 | 21 | 62 | 23 | 67 | 20 | 74 | 19 | 61 | 28 | 75 | 37 | 26 | 93 | 31 | 80 | 44 | 74 | 42 | 97 | 44 | 88 | 58 | 62 | 37 | 65 |
| Belgium | 11 | 5 | 8 | 5 | 5 | 6 | 5 | 6 | 7 | 8 | 10 | 5 | 7 | 4 | 7 | 5 | 2 | 5 | 4 | 5 | 5 | 5 | 4 | 6 | 15 | 3 | 7 | 6 | 7 | 4 | 12 | 3 | 1 | 11 | 6 | 11 | 10 | 13 | 8 | 10 | 17 | 13 | 19 |
| Denmark | 4 | 6 | 3 | 3 | 5 | 6 | 10 | 11 | 6 | 8 | 11 | 5 | 14 | 7 | 6 | 6 | 5 | 5 | 5 | 9 | 6 | 5 | 5 | 9 | 3 | 8 | 7 | 3 | 3 | 10 | 6 | 9 | 7 | 3 | 8 | 13 | 9 | 10 | 12 | 9 | 7 | 4 |
| Finland | 18 | 67 | 19 | 34 | 20 | 34 | 28 | 31 | 19 | 45 | 17 | 44 | 14 | 34 | 13 | 45 | 15 | 27 | 10 | 17 | 8 | 26 | 8 | 24 | 13 | 23 | 7 | 29 | 12 | 23 | 4 | 24 | 11 | 16 | 18 | 47 | 9 | 24 | 14 | 27 | 9 | 22 |
| France | 62 | 257 | 71 | 280 | 73 | 226 | 80 | 254 | 78 | 228 | 76 | 243 | 61 | 216 | 54 | 191 | 70 | 257 | 54 | 232 | 53 | 261 | 44 | 307 | 56 | 222 | 57 | 178 | 69 | 288 | 78 | 231 | 93 | 355 | 85 | 309 | 83 | 259 | 96 | 285 | 85 | 195 |
| Germany | 379 | 656 | 422 | 659 | 463 | 658 | 436 | 660 | 406 | 686 | 479 | 730 | 404 | 721 | 356 | 918 | 390 | 907 | 363 | 801 | 309 | 791 | 261 | 645 | 370 | 578 | 377 | 539 | 452 | 548 | 514 | 618 | 475 | 700 | 519 | 685 | 517 | 678 | 560 | 610 | 509 | 580 |
| Hungary | 1 | 2 | 1 | 1 | 0 | 3 | 0 | 2 | 1 | 2 | 2 | 3 | 2 | 3 | 0 | 4 | 1 | 2 | 2 | 3 | 1 | 2 | 1 | 0 | 1 | 3 | 1 | 5 | 2 | 1 | 2 | 1 | 1 | 2 | 3 | 5 | 3 | 1 | 5 | 5 | 1 | 2 |
| Ireland | 1 | 8 | 2 | 7 | 3 | 0 | 2 | 1 | 2 | 2 | 6 | 4 | 2 | 3 | 2 | 4 | 1 | 2 | 0 | 1 | 1 | 2 | 1 | 2 | 3 | 2 | 3 | 2 | 3 | 6 | 1 | 4 | 2 | 2 | 4 | 1 | 9 | 2 | 6 | 3 | 2 | 2 |
| Italy | 74 | 273 | 98 | 466 | 97 | 429 | 78 | 240 | 77 | 219 | 72 | 155 | 64 | 423 | 38 | 168 | 58 | 21 | 43 | 24 | 37 | 30 | 41 | 34 | 32 | 89 | 49 | 121 | 57 | 95 | 54 | 15 | 57 | 18 | 61 | 25 | 65 | 25 | 77 | 242 | 72 | 185 |
| Netherlands | 30 | 54 | 22 | 51 | 25 | 55 | 25 | 64 | 23 | 47 | 21 | 45 | 21 | 55 | 16 | 43 | 13 | 48 | 15 | 44 | 10 | 44 | 11 | 34 | 16 | 33 | 15 | 47 | 27 | 42 | 22 | 44 | 18 | 31 | 27 | 27 | 29 | 32 | 29 | 38 | 34 | 13 |
| Spain | 5 | 51 | 6 | 50 | 12 | 48 | 7 | 56 | 7 | 47 | 2 | 34 | 5 | 57 | 1 | 75 | 4 | 61 | 1 | 70 | 2 | 57 | 5 | 66 | 7 | 56 | 6 | 63 | 10 | 59 | 18 | 56 | 6 | 71 | 8 | 46 | 8 | 50 | 17 | 38 | 10 | 40 |
| Sweden | 61 | 138 | 89 | 198 | 75 | 105 | 87 | 101 | 70 | 131 | 68 | 132 | 65 | 120 | 59 | 130 | 51 | 102 | 51 | 111 | 54 | 105 | 53 | 84 | 54 | 82 | 55 | 64 | 46 | 60 | 68 | 49 | 64 | 35 | 74 | 36 | 61 | 53 | 59 | 60 | 65 | 55 |
| United Kingdom | 85 | 63 | 62 | 56 | 75 | 38 | 87 | 50 | 72 | 50 | 57 | 67 | 65 | 67 | 47 | 76 | 71 | 60 | 51 | 32 | 46 | 49 | 39 | 49 | 57 | 42 | 57 | 61 | 79 | 61 | 88 | 46 | 72 | 55 | 83 | 62 | 62 | 48 | 72 | 44 | 78 | 46 |
| All others | 4 | 174 | 2 | 139 | 4 | 167 | 6 | 170 | 5 | 126 | 8 | 108 | 5 | 116 | 6 | 115 | 3 | 113 | 2 | 107 | 5 | 95 | 6 | 131 | 6 | 142 | 11 | 136 | 4 | 135 | 10 | 186 | 14 | 201 | 14 | 225 | 17 | 335 | 17 | 215 | 25 | 144 |
| Other Europe | 68 | 1,113 | 66 | 691 | 79 | 753 | 74 | 687 | 69 | 801 | 90 | 1,200 | 83 | 1,298 | 58 | 1,005 | 79 | 1,025 | 47 | 934 | 45 | 1,003 | 41 | 1,307 | 47 | 992 | 44 | 800 | 68 | 951 | 59 | 852 | 69 | 819 | 64 | 874 | 63 | 563 | 66 | 791 | 85 | 579 |
| Former Soviet Union | 2 | 37 | 1 | 20 | 1 | 21 | 2 | 29 | 1 | 34 | 1 | 14 | 0 | 384 | 0 | 118 | 0 | 72 | 0 | 123 | 1 | 124 | 0 | 147 | 2 | 125 | 0 | 102 | 0 | 78 | 2 | 103 | 2 | 81 | 1 | 59 | 2 | 51 | 0 | 60 | 1 | 80 |
| Norway | 5 | 9 | 2 | 8 | 3 | 6 | 3 | 7 | 4 | 7 | 3 | 6 | 0 | 4 | 2 | 9 | 4 | 6 | 1 | 13 | 1 | 7 | 0 | 8 | 3 | 11 | 2 | 7 | 3 | 9 | 5 | 5 | 5 | 8 | 6 | 10 | 4 | 9 | 7 | 7 | 4 | 8 |
| Russia | 4 | 1,024 | 2 | 608 | 4 | 672 | 9 | 587 | 3 | 674 | 6 | 986 | 4 | 852 | 7 | 813 | 6 | 874 | 1 | 733 | 3 | 797 | 3 | 1,090 | 2 | 734 | 2 | 648 | 1 | 804 | 2 | 691 | 4 | 672 | 1 | 770 | 2 | 457 | 2 | 678 | 4 | 442 |
| Switzerland | 56 | 39 | 59 | 51 | 68 | 49 | 58 | 60 | 59 | 80 | 77 | 82 | 72 | 54 | 47 | 62 | 63 | 69 | 43 | 60 | 38 | 72 | 35 | 61 | 36 | 59 | 35 | 40 | 62 | 56 | 47 | 48 | 56 | 53 | 52 | 32 | 52 | 43 | 55 | 42 | 71 | 44 |
| All others | 1 | 3 | 2 | 4 | 3 | 4 | 1 | 4 | 2 | 6 | 3 | 2 | 6 | 4 | 1 | 3 | 5 | 3 | 1 | 6 | 2 | 3 | 3 | 1 | 3 | 2 | 4 | 3 | 2 | 3 | 2 | 4 | 3 | 6 | 4 | 2 | 3 | 3 | 3 | 5 | 5 | 5 |
| Asia | 806 | 5,407 | 958 | 5,803 | 1,082 | 4,339 | 1,144 | 4,192 | 1,074 | 4,471 | 1,136 | 4,596 | 1,087 | 4,922 | 976 | 5,690 | 1,148 | 7,047 | 932 | 6,983 | 800 | 7,045 | 723 | 7,802 | 909 | 8,654 | 977 | 10,925 | 1,088 | 13,148 | 1,174 | 13,674 | 1,207 | 14,858 | 1,314 | 19,636 | 1,292 | 24,226 | 1,382 | 25,217 | 1,379 | 24,302 |

TABLE S8-30

## USPTO patents and patent families granted in machine tools, by region, country, or economy: 1998–2018

(Number)

| | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Region, country, or economy | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| China | 5 | 48 | 6 | 88 | 8 | 144 | 15 | 207 | 17 | 160 | 27 | 250 | 22 | 355 | 29 | 428 | 34 | 550 | 25 | 754 | 22 | 1,476 | 39 | 2,102 | 47 | 2,603 | 57 | 3,853 | 77 | 5,271 | 74 | 5,200 | 103 | 6,211 | 116 | 13,329 | 139 | 17,400 | 174 | 19,155 | 157 | 18,379 |
| India | 1 | 1 | 2 | 2 | 0 | 0 | 1 | 2 | 4 | 2 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 2 | 4 | 2 | 2 | 2 | 0 | 2 | 2 | 4 | 7 | 5 | 7 | 7 | 12 | 3 | 8 | 12 | 8 | 13 | 5 | 20 | 4 | 18 | 4 |
| Japan | 622 | 4,758 | 678 | 4,305 | 738 | 3,314 | 757 | 3,158 | 692 | 3,397 | 744 | 3,156 | 677 | 3,086 | 576 | 3,235 | 669 | 3,559 | 528 | 3,444 | 486 | 3,429 | 437 | 3,958 | 600 | 4,136 | 633 | 4,540 | 681 | 4,751 | 722 | 4,810 | 759 | 4,859 | 780 | 2,965 | 782 | 3,895 | 830 | 2,972 | 863 | 2,984 |
| Malaysia | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 3 | 1 | 0 | 1 | 2 | 2 | 2 | 4 | 2 | 8 | 5 | 13 | 2 | 0 | 1 | 4 | 2 | 1 | 3 | 13 | 4 | 8 | 7 | 7 | 4 | 9 | 3 | 4 | 5 | 10 | 4 | 11 | 2 | 11 |
| Singapore | 1 | 2 | 3 | 2 | 7 | 5 | 15 | 15 | 8 | 9 | 10 | 5 | 9 | 5 | 7 | 5 | 7 | 10 | 16 | 9 | 5 | 4 | 8 | 11 | 6 | 3 | 5 | 4 | 6 | 5 | 8 | 5 | 5 | 5 | 7 | 3 | 11 | 5 | 4 | 1 | 4 | 2 |
| South Korea | 28 | 384 | 35 | 1,130 | 39 | 499 | 40 | 333 | 40 | 521 | 50 | 786 | 43 | 1,035 | 40 | 1,482 | 54 | 2,293 | 40 | 2,065 | 45 | 1,668 | 47 | 1,242 | 50 | 1,389 | 43 | 1,921 | 57 | 2,446 | 64 | 2,949 | 98 | 3,085 | 98 | 2,585 | 98 | 2,145 | 110 | 2,176 | 102 | 2,308 |
| Taiwan | 148 | 211 | 230 | 272 | 288 | 375 | 314 | 473 | 306 | 375 | 304 | 396 | 331 | 436 | 320 | 533 | 379 | 624 | 315 | 691 | 235 | 463 | 187 | 484 | 204 | 517 | 229 | 587 | 254 | 659 | 289 | 686 | 231 | 677 | 295 | 740 | 237 | 758 | 237 | 890 | 232 | 613 |
| All others | 0 | 4 | 1 | 4 | 1 | 2 | 2 | 4 | 3 | 4 | 2 | 1 | 2 | 2 | 2 | 2 | 3 | 2 | 0 | 4 | 1 | 2 | 1 | 1 | 0 | 3 | 3 | 2 | 3 | 3 | 4 | 4 | 2 | 6 | 4 | 3 | 5 | 8 | 3 | 9 | 2 | 2 |
| Middle East | 30 | 11 | 20 | 4 | 24 | 10 | 30 | 11 | 21 | 12 | 31 | 4 | 24 | 10 | 12 | 6 | 31 | 5 | 26 | 5 | 17 | 7 | 20 | 5 | 16 | 4 | 24 | 6 | 32 | 16 | 59 | 12 | 65 | 21 | 48 | 33 | 39 | 23 | 38 | 27 | 45 | 28 |
| Israel | 29 | 10 | 20 | 4 | 22 | 5 | 28 | 8 | 19 | 5 | 30 | 4 | 23 | 6 | 12 | 3 | 30 | 3 | 25 | 2 | 16 | 2 | 18 | 3 | 15 | 2 | 23 | 4 | 28 | 5 | 52 | 7 | 60 | 18 | 44 | 29 | 37 | 20 | 32 | 20 | 39 | 22 |
| All others | 1 | 1 | 0 | 0 | 2 | 5 | 1 | 3 | 3 | 7 | 1 | 0 | 1 | 4 | 0 | 3 | 1 | 2 | 1 | 3 | 1 | 5 | 2 | 3 | 2 | 2 | 1 | 2 | 4 | 11 | 6 | 5 | 5 | 3 | 4 | 4 | 2 | 3 | 6 | 7 | 6 | 6 |
| Africa | 3 | 11 | 4 | 15 | 4 | 7 | 4 | 15 | 5 | 10 | 2 | 9 | 2 | 14 | 2 | 16 | 3 | 11 | 2 | 9 | 3 | 17 | 0 | 13 | 3 | 7 | 1 | 5 | 5 | 7 | 3 | 6 | 2 | 4 | 3 | 2 | 4 | 0 | 3 | 0 | 2 | 1 |
| South Africa | 3 | 8 | 4 | 12 | 4 | 4 | 4 | 8 | 5 | 1 | 2 | 4 | 2 | 7 | 2 | 13 | 3 | 7 | 2 | 6 | 3 | 16 | 0 | 8 | 3 | 5 | 1 | 0 | 5 | 3 | 3 | 1 | 2 | 3 | 3 | 1 | 4 | 0 | 2 | 0 | 2 | 0 |
| All others | 0 | 3 | 0 | 3 | 0 | 2 | 0 | 8 | 0 | 10 | 0 | 6 | 0 | 7 | 0 | 3 | 0 | 4 | 0 | 3 | 0 | 1 | 0 | 5 | 0 | 2 | 0 | 5 | 0 | 4 | 0 | 5 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| Australia and Oceania | 25 | 22 | 24 | 25 | 16 | 27 | 29 | 36 | 21 | 25 | 27 | 18 | 33 | 43 | 26 | 39 | 26 | 36 | 14 | 40 | 17 | 36 | 13 | 32 | 30 | 47 | 18 | 61 | 29 | 80 | 27 | 60 | 26 | 66 | 24 | 45 | 21 | 59 | 32 | 75 | 24 | 33 |
| Australia | 21 | 22 | 19 | 23 | 16 | 27 | 26 | 36 | 16 | 25 | 24 | 16 | 27 | 40 | 24 | 37 | 23 | 36 | 12 | 39 | 16 | 36 | 9 | 32 | 28 | 46 | 14 | 60 | 24 | 79 | 23 | 60 | 22 | 64 | 20 | 45 | 15 | 57 | 26 | 75 | 17 | 33 |
| New Zealand | 5 | 0 | 5 | 1 | 0 | 0 | 3 | 0 | 5 | 0 | 3 | 2 | 6 | 2 | 2 | 2 | 2 | 1 | 3 | 1 | 1 | 0 | 4 | 0 | 2 | 1 | 4 | 1 | 5 | 1 | 4 | 1 | 5 | 1 | 4 | 0 | 6 | 2 | 6 | 0 | 7 | 0 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Unclassified | 0 | 26 | 0 | 136 | 1 | 108 | 0 | 19 | 0 | 9 | 0 | 1 | 0 | 25 | 0 | 182 | 0 | 50 | 0 | 4 | 0 | 9 | 0 | 2 | 0 | 12 | 0 | 0 | 0 | 2 | 0 | 39 | 0 | 26 | 1 | 0 | 2 | 19 | 0 | 0 | 2 | 0 |

EU = European Union; USPTO = U.S. Patent and Trademark Office.

**Note(s)**

USPTO patents are allocated according to patent inventorship information. USPTO patents are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named inventors. Patents are classified under the World Intellectual Property Organization (WIPO) classification of patents, which classifies International Patent Classification (IPC) codes under 35 technical fields. IPC reformed codes take into account changes that were made to the WIPO classification in 2006 under the eighth version of the classification and were used to prepare these data. However, because PatentsView only provides the original IPC codes as they appeared on patents and not the IPC reformed codes, current Cooperative Patent Classification codes on patents were converted back to the most recent IPC classification to prepare these statistics. Fractional counts of patents were assigned to each technological field on patents to assign the proper weight of a patent to the corresponding technological fields under the classification. International Patent Documentation (INPADOC) patent families across all patent offices covered in the Worldwide Patent Statistical Database (PATSTAT) are counted according to the year of the first granted patent in the patent family. Patent families are allocated according to patent inventorship information found on the priority patent of the INPADOC patent families. To account for missing ownership information in PATSTAT for some offices, a method designed by de Rassenfosse et al. (2012) is used to fill in missing information on priority patents using information in successive filings within the patent families (see technical documentation for details). Patent families are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named inventors. Because of data coverage issues for some patent offices in PATSTAT, statistics for some countries may be underestimated partially for some years or across the whole trend. Countries with identified issues include India (missing data) and South Africa (no data for 2018). For Italy, because of data gaps regarding information on granted patents, patent applications are used instead, which slightly overestimates Italy's output and creates a small shift in the year for which its output is accounted. The EU includes 28 member countries. China includes Hong Kong.

**Source(s)**

Science-Metrix; PATSTAT, accessed April 2019; PatentsView, USPTO, accessed June 2019.

TABLE S8-31

## USPTO patents and patent families granted in engines, pumps, turbines, by region, country, or economy: 1998–2018

(Number)

| Region, country, or economy | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| World | 3,496 | 8,340 | 3,424 | 9,710 | 4,148 | 7,824 | 4,852 | 7,662 | 4,897 | 7,444 | 4,918 | 8,243 | 4,654 | 8,537 | 4,206 | 8,745 | 4,607 | 10,272 |
| North America | 1,551 | 1,284 | 1,479 | 1,160 | 1,866 | 1,406 | 2,191 | 1,567 | 2,334 | 1,660 | 2,172 | 1,485 | 1,996 | 1,357 | 1,862 | 1,220 | 2,029 | 1,240 |
| Canada | 58 | 49 | 67 | 63 | 91 | 66 | 110 | 74 | 96 | 62 | 103 | 65 | 89 | 54 | 108 | 73 | 120 | 54 |
| Mexico | 3 | 2 | 2 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 2 | 2 | 2 | 2 | 2 | 0 | 0 |
| Puerto Rico | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 0 |
| United States | 1,490 | 1,233 | 1,410 | 1,096 | 1,772 | 1,339 | 2,082 | 1,493 | 2,237 | 1,598 | 2,067 | 1,418 | 1,902 | 1,296 | 1,751 | 1,148 | 1,908 | 1,185 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Central and South America | 6 | 9 | 10 | 8 | 7 | 7 | 13 | 10 | 9 | 7 | 17 | 9 | 7 | 11 | 3 | 5 | 19 | 9 |
| Argentina | 0 | 5 | 1 | 2 | 1 | 1 | 3 | 2 | 4 | 2 | 4 | 2 | 4 | 2 | 1 | 1 | 2 | 1 |
| Brazil | 4 | 2 | 6 | 4 | 5 | 5 | 5 | 7 | 5 | 2 | 8 | 5 | 5 | 7 | 2 | 4 | 14 | 7 |
| All others | 2 | 3 | 3 | 3 | 1 | 1 | 4 | 2 | 2 | 4 | 4 | 2 | 2 | 3 | 0 | 0 | 3 | 2 |
| Europe | 828 | 2,610 | 822 | 2,470 | 1,016 | 2,193 | 1,207 | 2,164 | 1,147 | 2,333 | 1,202 | 2,770 | 1,188 | 2,762 | 1,036 | 2,685 | 1,079 | 2,785 |
| EU | 774 | 1,486 | 778 | 1,514 | 954 | 1,403 | 1,119 | 1,332 | 1,081 | 1,391 | 1,146 | 1,526 | 1,134 | 1,566 | 1,000 | 1,599 | 1,013 | 1,796 |
| Austria | 11 | 40 | 13 | 25 | 31 | 15 | 41 | 58 | 58 | 28 | 23 | 36 | 45 | 39 | 27 | 30 | 40 | 29 |
| Belgium | 7 | 4 | 7 | 2 | 12 | 7 | 6 | 9 | 10 | 11 | 12 | 10 | 11 | 5 | 7 | 6 | 9 | 12 |
| Denmark | 20 | 18 | 9 | 21 | 8 | 16 | 11 | 22 | 10 | 39 | 17 | 17 | 16 | 22 | 14 | 29 | 7 | 28 |
| Finland | 8 | 29 | 4 | 14 | 7 | 10 | 19 | 10 | 9 | 9 | 8 | 20 | 2 | 18 | 11 | 10 | 10 | 12 |
| France | 126 | 248 | 100 | 276 | 112 | 263 | 101 | 256 | 92 | 281 | 98 | 304 | 107 | 286 | 85 | 282 | 129 | 480 |
| Germany | 404 | 619 | 441 | 614 | 568 | 638 | 646 | 561 | 662 | 596 | 715 | 670 | 704 | 638 | 625 | 782 | 580 | 816 |
| Hungary | 1 | 7 | 0 | 8 | 3 | 2 | 0 | 1 | 2 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 2 | 1 |
| Ireland | 2 | 1 | 1 | 2 | 2 | 1 | 3 | 1 | 2 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 1 |
| Italy | 33 | 130 | 39 | 192 | 43 | 179 | 44 | 124 | 124 | 51 | 116 | 65 | 76 | 72 | 203 | 55 | 127 | 59 |
| Netherlands | 9 | 35 | 10 | 28 | 11 | 39 | 21 | 23 | 37 | 22 | 39 | 13 | 34 | 11 | 26 | 12 | 33 | 6 |
| Spain | 4 | 58 | 1 | 41 | 8 | 29 | 7 | 41 | 5 | 46 | 8 | 43 | 10 | 36 | 7 | 48 | 2 | 41 |
| Sweden | 42 | 84 | 48 | 111 | 53 | 49 | 68 | 58 | 58 | 69 | 60 | 61 | 130 | 53 | 123 | 39 | 65 | 46 |
| United Kingdom | 101 | 67 | 99 | 64 | 102 | 57 | 151 | 45 | 116 | 64 | 105 | 61 | 101 | 89 | 107 | 80 | 128 | 91 |
| All others | 6 | 148 | 4 | 116 | 6 | 110 | 5 | 99 | 4 | 102 | 7 | 108 | 6 | 91 | 6 | 90 | 7 | 89 |
| Other Europe | 54 | 1,124 | 44 | 956 | 50 | 790 | 88 | 832 | 66 | 942 | 56 | 1,244 | 53 | 1,196 | 36 | 1,085 | 66 | 989 |
| Former Soviet Union | 0 | 35 | 2 | 28 | 0 | 16 | 0 | 37 | 0 | 53 | 2 | 133 | 3 | 310 | 2 | 142 | 8 | 72 |
| Norway | 1 | 7 | 3 | 11 | 3 | 4 | 7 | 8 | 2 | 9 | 3 | 10 | 3 | 6 | 3 | 18 | 6 | 22 |
| Russia | 10 | 1,060 | 7 | 896 | 11 | 753 | 22 | 762 | 21 | 851 | 11 | 1,039 | 5 | 851 | 6 | 892 | 6 | 864 |
| Switzerland | 43 | 22 | 31 | 19 | 36 | 15 | 55 | 23 | 40 | 26 | 38 | 59 | 39 | 27 | 23 | 31 | 46 | 29 |
| All others | 0 | 0 | 0 | 2 | 4 | 1 | 1 | 3 | 1 | 3 | 3 | 2 | 3 | 1 | 2 | 1 | 1 | 1 |
| Asia | 1,060 | 4,389 | 1,077 | 5,907 | 1,218 | 4,139 | 1,397 | 3,824 | 1,363 | 3,383 | 1,477 | 3,934 | 1,427 | 4,304 | 1,258 | 4,696 | 1,448 | 6,142 |

| Region, country, or economy | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| World | 3,949 | 10,605 | 3,737 | 10,506 | 3,641 | 10,645 | 4,514 | 11,500 | 4,810 | 12,423 | 6,086 | 14,082 | 6,248 | 14,182 | 6,777 | 14,059 | 6,693 | 14,863 |
| North America | 1,715 | 1,023 | 1,589 | 921 | 1,707 | 972 | 2,043 | 1,156 | 2,300 | 1,230 | 2,841 | 1,492 | 2,927 | 1,413 | 3,068 | 1,416 | 3,090 | 1,696 |
| Canada | 108 | 72 | 80 | 53 | 110 | 70 | 122 | 64 | 105 | 67 | 138 | 85 | 133 | 81 | 128 | 70 | 139 | 93 |
| Mexico | 1 | 1 | 0 | 0 | 0 | 1 | 3 | 1 | 2 | 2 | 2 | 4 | 3 | 3 | 3 | 1 | 3 | 2 |
| Puerto Rico | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 4 | 0 | 2 | 0 | 3 | 0 | 1 | 0 |
| United States | 1,606 | 951 | 1,508 | 868 | 1,597 | 901 | 1,918 | 1,091 | 2,192 | 1,160 | 2,695 | 1,405 | 2,789 | 1,330 | 2,933 | 1,345 | 2,946 | 1,601 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Central and South America | 9 | 5 | 10 | 13 | 5 | 17 | 8 | 18 | 18 | 27 | 17 | 30 | 16 | 16 | 22 | 19 | 29 | 15 |
| Argentina | 2 | 1 | 1 | 0 | 0 | 0 | 3 | 1 | 3 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 |
| Brazil | 2 | 1 | 4 | 6 | 10 | 2 | 15 | 4 | 16 | 13 | 26 | 12 | 26 | 10 | 14 | 15 | 15 | 19 |
| All others | 1 | 0 | 3 | 3 | 5 | 1 | 1 | 2 | 2 | 2 | 1 | 4 | 5 | 6 | 2 | 3 | 8 | 4 |
| Europe | 963 | 2,627 | 941 | 2,701 | 884 | 2,844 | 1,167 | 2,781 | 1,224 | 2,661 | 1,605 | 3,014 | 1,633 | 3,050 | 1,863 | 3,367 | 1,771 | 3,466 |
| EU | 914 | 1,600 | 887 | 1,525 | 828 | 1,588 | 1,104 | 1,645 | 1,156 | 1,745 | 1,531 | 2,002 | 1,531 | 2,000 | 1,771 | 2,257 | 1,676 | 2,325 |
| Austria | 19 | 24 | 21 | 45 | 12 | 56 | 23 | 48 | 14 | 46 | 28 | 86 | 33 | 83 | 40 | 63 | 28 | 65 |
| Belgium | 7 | 11 | 6 | 10 | 10 | 5 | 5 | 11 | 7 | 9 | 17 | 14 | 14 | 13 | 24 | 10 | 22 | 15 |
| Denmark | 16 | 20 | 14 | 18 | 8 | 25 | 28 | 37 | 59 | 33 | 88 | 50 | 78 | 60 | 101 | 68 | 94 | 86 |
| Finland | 5 | 19 | 4 | 11 | 8 | 25 | 8 | 25 | 8 | 18 | 16 | 25 | 4 | 26 | 12 | 28 | 12 | 24 |
| France | 126 | 432 | 116 | 396 | 139 | 428 | 179 | 425 | 201 | 517 | 248 | 596 | 221 | 572 | 314 | 642 | 299 | 748 |
| Germany | 510 | 700 | 493 | 614 | 441 | 575 | 534 | 544 | 546 | 477 | 699 | 652 | 730 | 769 | 773 | 903 | 759 | 854 |
| Hungary | 0 | 2 | 0 | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 0 | 3 | 3 | 4 | 5 | 2 | 5 | 0 |
| Ireland | 1 | 0 | 2 | 1 | 1 | 1 | 2 | 4 | 3 | 3 | 1 | 2 | 3 | 6 | 5 | 7 | 3 | 9 |
| Italy | 52 | 38 | 56 | 45 | 48 | 52 | 69 | 103 | 71 | 156 | 87 | 118 | 81 | 51 | 93 | 51 | 89 | 41 |
| Netherlands | 11 | 39 | 13 | 44 | 7 | 55 | 17 | 44 | 16 | 63 | 33 | 46 | 24 | 37 | 28 | 28 | 32 | 31 |
| Spain | 4 | 53 | 4 | 65 | 5 | 75 | 10 | 78 | 18 | 83 | 18 | 97 | 23 | 103 | 30 | 144 | 30 | 102 |
| Sweden | 41 | 67 | 37 | 62 | 43 | 70 | 43 | 62 | 40 | 55 | 46 | 55 | 68 | 43 | 56 | 41 | 49 | 57 |
| United Kingdom | 107 | 74 | 102 | 84 | 103 | 89 | 168 | 100 | 162 | 131 | 229 | 114 | 225 | 92 | 277 | 94 | 240 | 131 |
| All others | 7 | 126 | 12 | 124 | 6 | 142 | 16 | 162 | 10 | 152 | 20 | 142 | 21 | 139 | 14 | 175 | 19 | 155 |
| Other Europe | 47 | 1,027 | 54 | 1,175 | 56 | 1,255 | 63 | 1,135 | 68 | 917 | 74 | 1,013 | 102 | 1,051 | 92 | 1,111 | 95 | 1,311 |
| Former Soviet Union | 2 | 144 | 2 | 176 | 3 | 192 | 2 | 162 | 1 | 108 | 1 | 84 | 2 | 96 | 1 | 82 | 1 | 59 |
| Norway | 1 | 21 | 7 | 31 | 6 | 34 | 9 | 36 | 6 | 42 | 8 | 22 | 21 | 33 | 14 | 37 | 10 | 17 |
| Russia | 8 | 836 | 6 | 946 | 6 | 1,005 | 13 | 913 | 13 | 742 | 18 | 867 | 14 | 894 | 10 | 964 | 15 | 1,037 |
| Switzerland | 33 | 23 | 35 | 18 | 40 | 20 | 39 | 14 | 45 | 20 | 46 | 32 | 63 | 22 | 62 | 20 | 63 | 19 |
| All others | 2 | 2 | 4 | 5 | 1 | 5 | 1 | 10 | 4 | 4 | 2 | 8 | 2 | 7 | 4 | 8 | 6 | 10 |
| Asia | 1,225 | 6,897 | 1,166 | 6,835 | 1,017 | 6,781 | 1,254 | 7,501 | 1,237 | 8,453 | 1,563 | 9,476 | 1,604 | 9,639 | 1,748 | 9,208 | 1,740 | 9,627 |

| Region, country, or economy | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|
| | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| World | 6,664 | 17,263 | 7,641 | 17,437 | 7,902 | 16,906 |
| North America | 3,155 | 1,694 | 3,480 | 1,732 | 3,647 | 1,764 |
| Canada | 132 | 73 | 179 | 89 | 164 | 77 |
| Mexico | 2 | 8 | 10 | 8 | 12 | 8 |
| Puerto Rico | 1 | 0 | 0 | 0 | 2 | 0 |
| United States | 3,014 | 1,610 | 3,294 | 1,631 | 3,473 | 1,676 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 |
| Central and South America | 18 | 15 | 20 | 15 | 18 | 27 |
| Argentina | 2 | 0 | 0 | 0 | 2 | 0 |
| Brazil | 10 | 11 | 14 | 17 | 13 | 14 |
| All others | 5 | 1 | 2 | 2 | 2 | 2 |
| Europe | 1,748 | 3,260 | 2,052 | 3,616 | 2,106 | 3,465 |
| EU | 1,646 | 2,379 | 1,943 | 2,535 | 1,991 | 2,557 |
| Austria | 32 | 77 | 37 | 61 | 38 | 85 |
| Belgium | 16 | 20 | 26 | 23 | 40 | 51 |
| Denmark | 89 | 89 | 109 | 92 | 100 | 80 |
| Finland | 15 | 14 | 14 | 15 | 19 | 15 |
| France | 288 | 622 | 337 | 587 | 350 | 793 |
| Germany | 763 | 959 | 865 | 961 | 842 | 846 |
| Hungary | 4 | 1 | 2 | 5 | 2 | 1 |
| Ireland | 3 | 3 | 3 | 3 | 4 | 4 |
| Italy | 85 | 75 | 109 | 271 | 145 | 232 |
| Netherlands | 26 | 39 | 26 | 52 | 27 | 20 |
| Spain | 30 | 102 | 31 | 106 | 43 | 95 |
| Sweden | 50 | 60 | 56 | 79 | 78 | 88 |
| United Kingdom | 224 | 134 | 290 | 130 | 271 | 105 |
| All others | 20 | 179 | 21 | 164 | 32 | 140 |
| Other Europe | 110 | 881 | 109 | 1,081 | 115 | 908 |
| Former Soviet Union | 2 | 72 | 0 | 78 | 2 | 39 |
| Norway | 13 | 22 | 12 | 28 | 15 | 12 |
| Russia | 15 | 746 | 15 | 923 | 14 | 796 |
| Switzerland | 69 | 34 | 80 | 46 | 79 | 53 |
| All others | 6 | 10 | 3 | 7 | 2 | 6 |
| Asia | 1,667 | 12,232 | 2,011 | 12,041 | 2,069 | 11,624 |

**TABLE SB-31**

## USPTO patents and patent families granted in engines, pumps, turbines, by region, country, or economy: 1998–2018

(Number)

| Region, country, or economy | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| China | 1 | 21 | 1 | 30 | 4 | 69 | 8 | 91 | 10 | 95 | 8 | 156 | 13 | 198 | 5 | 225 | 7 | 225 | 13 | 392 | 21 | 726 | 21 | 892 | 33 | 1,015 | 42 | 1,556 | 65 | 2,131 | 63 | 2,016 | 69 | 1,861 | 82 | 4,106 | 74 | 5,617 | 119 | 5,870 | 120 | 5,714 |
| India | 0 | 1 | 1 | 1 | 1 | 0 | 3 | 2 | 0 | 0 | 3 | 1 | 2 | 2 | 3 | 1 | 4 | 2 | 7 | 6 | 4 | 2 | 8 | 5 | 13 | 6 | 30 | 21 | 42 | 29 | 55 | 37 | 68 | 53 | 68 | 49 | 58 | 44 | 63 | 44 | 75 | 50 |
| Japan | 968 | 3,890 | 975 | 3,977 | 1,099 | 3,180 | 1,225 | 2,870 | 1,192 | 2,638 | 1,278 | 2,541 | 1,203 | 3,047 | 1,081 | 2,972 | 1,237 | 3,915 | 1,047 | 4,675 | 972 | 4,979 | 831 | 5,032 | 1,038 | 5,325 | 955 | 5,232 | 1,182 | 5,289 | 1,223 | 5,082 | 1,297 | 4,861 | 1,254 | 3,555 | 1,211 | 4,687 | 1,437 | 4,289 | 1,432 | 4,040 |
| Malaysia | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 3 | 2 | 3 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 9 | 0 | 3 | 1 | 1 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 3 | 1 | 3 |
| Singapore | 2 | 0 | 2 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 2 | 0 | 1 | 2 | 1 | 0 | 2 | 1 | 1 | 2 | 1 | 2 | 1 | 0 | 3 | 1 | 5 | 0 | 11 | 0 | 11 | 4 | 12 | 1 | 14 | 3 | 11 | 2 | 7 | 1 | 7 | 2 |
| South Korea | 55 | 424 | 47 | 1,834 | 35 | 800 | 64 | 757 | 72 | 536 | 80 | 1,111 | 114 | 941 | 97 | 1,383 | 102 | 1,848 | 79 | 1,658 | 98 | 1,012 | 78 | 707 | 86 | 971 | 108 | 1,437 | 135 | 1,799 | 149 | 2,236 | 198 | 2,199 | 194 | 1,629 | 218 | 1,570 | 268 | 1,574 | 330 | 1,612 |
| Taiwan | 32 | 45 | 49 | 60 | 77 | 88 | 97 | 100 | 86 | 109 | 103 | 121 | 89 | 110 | 67 | 114 | 91 | 146 | 76 | 158 | 70 | 111 | 78 | 140 | 79 | 179 | 98 | 194 | 127 | 221 | 102 | 260 | 100 | 226 | 123 | 279 | 90 | 304 | 111 | 254 | 99 | 197 |
| All others | 1 | 8 | 1 | 4 | 1 | 2 | 1 | 3 | 3 | 3 | 2 | 4 | 2 | 4 | 4 | 1 | 4 | 2 | 1 | 4 | 1 | 3 | 1 | 4 | 2 | 4 | 0 | 3 | 0 | 5 | 2 | 3 | 3 | 4 | 3 | 4 | 3 | 5 | 4 | 6 | 5 | 6 |
| Middle East | 14 | 12 | 12 | 7 | 12 | 31 | 18 | 31 | 10 | 16 | 20 | 18 | 8 | 6 | 10 | 17 | 6 | 7 | 10 | 18 | 16 | 16 | 11 | 6 | 19 | 9 | 13 | 15 | 26 | 25 | 28 | 20 | 33 | 16 | 27 | 30 | 36 | 20 | 41 | 15 | 34 | 15 |
| Israel | 13 | 11 | 11 | 4 | 9 | 3 | 17 | 7 | 9 | 4 | 14 | 7 | 6 | 2 | 9 | 5 | 5 | 2 | 10 | 3 | 13 | 5 | 8 | 5 | 17 | 5 | 9 | 4 | 19 | 5 | 19 | 7 | 21 | 4 | 13 | 4 | 21 | 4 | 17 | 1 | 16 | 4 |
| All others | 1 | 2 | 1 | 3 | 3 | 28 | 1 | 24 | 1 | 12 | 6 | 11 | 3 | 4 | 1 | 12 | 1 | 5 | 0 | 16 | 2 | 10 | 2 | 1 | 2 | 4 | 5 | 11 | 7 | 20 | 9 | 13 | 12 | 14 | 12 | 26 | 15 | 16 | 23 | 14 | 18 | 11 |
| Africa | 4 | 9 | 1 | 13 | 2 | 8 | 2 | 11 | 1 | 19 | 3 | 10 | 3 | 12 | 3 | 6 | 1 | 8 | 3 | 5 | 1 | 6 | 3 | 7 | 3 | 12 | 3 | 10 | 2 | 6 | 5 | 11 | 7 | 10 | 3 | 2 | 3 | 9 | 5 | 0 | 4 | 3 |
| South Africa | 4 | 7 | 1 | 9 | 1 | 2 | 1 | 4 | 1 | 7 | 3 | 2 | 3 | 4 | 2 | 4 | 1 | 5 | 3 | 2 | 0 | 4 | 2 | 7 | 3 | 6 | 3 | 0 | 2 | 2 | 5 | 1 | 5 | 0 | 3 | 1 | 3 | 2 | 4 | 0 | 2 | 0 |
| All others | 0 | 2 | 0 | 5 | 1 | 6 | 1 | 8 | 0 | 13 | 0 | 8 | 0 | 8 | 1 | 2 | 0 | 2 | 0 | 3 | 1 | 2 | 1 | 0 | 0 | 6 | 0 | 10 | 0 | 5 | 1 | 11 | 2 | 10 | 0 | 2 | 0 | 7 | 1 | 0 | 2 | 3 |
| Australia and Oceania | 30 | 8 | 22 | 14 | 27 | 10 | 22 | 16 | 33 | 20 | 27 | 13 | 25 | 24 | 34 | 12 | 26 | 25 | 23 | 26 | 14 | 13 | 14 | 15 | 21 | 21 | 14 | 27 | 32 | 37 | 34 | 31 | 36 | 22 | 33 | 25 | 35 | 29 | 31 | 19 | 20 | 6 |
| Australia | 27 | 7 | 21 | 14 | 26 | 10 | 19 | 16 | 30 | 20 | 21 | 9 | 22 | 23 | 30 | 11 | 21 | 23 | 15 | 25 | 13 | 13 | 10 | 15 | 16 | 21 | 13 | 27 | 28 | 36 | 28 | 29 | 29 | 21 | 29 | 25 | 31 | 27 | 27 | 19 | 18 | 6 |
| New Zealand | 3 | 1 | 1 | 0 | 1 | 0 | 3 | 0 | 3 | 0 | 5 | 3 | 2 | 1 | 4 | 0 | 4 | 2 | 8 | 1 | 1 | 0 | 4 | 1 | 5 | 0 | 1 | 0 | 3 | 1 | 5 | 3 | 7 | 2 | 4 | 0 | 4 | 2 | 5 | 0 | 1 | 0 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Unclassified | 3 | 18 | 0 | 131 | 1 | 31 | 1 | 39 | 0 | 4 | 0 | 2 | 0 | 60 | 0 | 104 | 0 | 56 | 2 | 2 | 0 | 1 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 2 | 1 | 5 | 1 | 0 | 3 | 3 |

EU = European Union; USPTO = U.S. Patent and Trademark Office.

**Note(s)**

USPTO patents are allocated according to patent inventorship information. USPTO patents are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named inventors. Patents are classified under the World Intellectual Property Organization (WIPO) classification of patents, which classifies International Patent Classification (IPC) codes under 35 technical fields. IPC reformed codes take into account changes that were made to the WIPO classification in 2006 under the eighth version of the classification and were used to prepare these data. However, because PatentsView only provides the original IPC codes as they appeared on patents and not the IPC reformed codes, current Cooperative Patent Classification codes on patents were converted back to the most recent IPC classification to prepare these statistics. Fractional counts of patents were assigned to each technological field on patents to assign the proper weight of a patent to the corresponding technological fields under the classification. International Patent Documentation (INPADOC) patent families across all patent offices covered in the Worldwide Patent Statistical Database (PATSTAT) are counted according to the year of the first granted patent in the patent family. Patent families are allocated according to patent inventorship information found on the priority patent of the INPADOC patent families. To account for missing ownership information in PATSTAT for some offices, a method designed by de Rassenfosse et al. (2012) is used to fill in missing information on priority patents using information in successive filings within the patent families (see technical documentation for details). Patent families are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named inventors. Because of data coverage issues for some patent offices in PATSTAT, statistics for some countries may be underestimated partially for some years or across the whole trend. Countries with identified issues include India (missing data) and South Africa (no data for 2018). For Italy, because of data gaps regarding information on granted patents, patent applications are used instead, which slightly overestimates Italy's output and creates a small shift in the year for which its output is accounted. The EU includes 28 member countries. China includes Hong Kong.

**Source(s)**

Science-Metrix; PATSTAT, accessed April 2019; PatentsView, USPTO, accessed June 2019.

TABLE S8-32

## USPTO patents and patent families granted in textile and paper machines, by region, country, or economy: 1998–2018

(Number)

| Region, country, or economy | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| World | 3,764 | 7,562 | 3,760 | 8,818 | 4,135 | 6,785 | 4,377 | 6,311 | 4,280 | 5,987 | 4,010 | 6,199 | 3,842 | 6,757 | 3,070 | 6,990 | 3,225 | 7,359 | 2,893 | 7,189 | 2,992 | 6,843 | 2,878 | 7,287 | 3,822 | 8,729 | 3,891 | 9,963 | 3,896 | 10,329 | 3,958 | 10,060 | 4,348 | 10,401 | 3,915 | 10,754 | 3,469 | 12,191 | 3,155 | 11,723 | 3,097 | 11,456 |
| North America | 1,594 | 1,188 | 1,514 | 1,086 | 1,608 | 1,133 | 1,691 | 1,138 | 1,631 | 1,025 | 1,537 | 968 | 1,471 | 896 | 1,113 | 689 | 1,091 | 629 | 871 | 498 | 783 | 492 | 769 | 399 | 1,053 | 578 | 1,022 | 482 | 1,135 | 568 | 1,230 | 504 | 1,363 | 608 | 1,059 | 459 | 1,004 | 349 | 948 | 270 | 924 | 224 |
| Canada | 58 | 44 | 44 | 44 | 53 | 35 | 54 | 43 | 54 | 34 | 42 | 28 | 32 | 20 | 30 | 21 | 41 | 22 | 26 | 19 | 32 | 24 | 27 | 17 | 43 | 27 | 29 | 18 | 45 | 24 | 47 | 18 | 42 | 22 | 43 | 28 | 39 | 20 | 34 | 19 | 25 | 7 |
| Mexico | 4 | 2 | 2 | 2 | 1 | 2 | 2 | 1 | 3 | 2 | 1 | 2 | 4 | 3 | 3 | 2 | 1 | 1 | 1 | 1 | 3 | 1 | 1 | 0 | 1 | 0 | 2 | 0 | 3 | 0 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 3 | 1 | 3 |
| Puerto Rico | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 5 | 0 | 5 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 2 | 0 |
| United States | 1,532 | 1,143 | 1,468 | 1,042 | 1,552 | 1,097 | 1,635 | 1,085 | 1,574 | 989 | 1,491 | 937 | 1,434 | 873 | 1,075 | 665 | 1,044 | 606 | 841 | 478 | 747 | 468 | 740 | 382 | 1,008 | 551 | 990 | 464 | 1,086 | 544 | 1,180 | 486 | 1,320 | 586 | 1,014 | 430 | 962 | 327 | 909 | 248 | 895 | 214 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Central and South America | 5 | 4 | 2 | 1 | 1 | 3 | 5 | 4 | 5 | 4 | 3 | 1 | 8 | 4 | 3 | 3 | 5 | 1 | 6 | 3 | 8 | 4 | 6 | 8 | 9 | 10 | 16 | 13 | 4 | 10 | 11 | 10 | 7 | 9 | 6 | 9 | 7 | 10 | 6 | 12 | 6 | 13 |
| Argentina | 2 | 2 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Brazil | 2 | 1 | 2 | 1 | 0 | 3 | 3 | 3 | 4 | 4 | 2 | 1 | 5 | 2 | 3 | 3 | 5 | 1 | 4 | 3 | 8 | 4 | 6 | 8 | 9 | 9 | 15 | 12 | 3 | 10 | 7 | 9 | 5 | 9 | 3 | 7 | 6 | 9 | 5 | 11 | 4 | 13 |
| All others | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 2 | 1 | 1 | 0 | 2 | 1 | 1 | 0 | 2 | 2 | 1 | 0 | 2 | 1 | 1 | 0 |
| Europe | 993 | 1,365 | 968 | 1,548 | 1,091 | 1,460 | 1,082 | 1,231 | 995 | 1,181 | 917 | 1,304 | 847 | 1,530 | 660 | 1,361 | 609 | 1,106 | 474 | 1,025 | 495 | 953 | 445 | 892 | 585 | 857 | 573 | 870 | 599 | 839 | 600 | 844 | 609 | 754 | 577 | 677 | 503 | 693 | 562 | 862 | 542 | 833 |
| EU | 931 | 1,147 | 892 | 1,351 | 1,056 | 1,268 | 1,003 | 1,039 | 932 | 1,007 | 852 | 1,064 | 801 | 1,268 | 617 | 1,168 | 560 | 937 | 438 | 825 | 469 | 767 | 415 | 692 | 549 | 696 | 544 | 739 | 566 | 716 | 564 | 679 | 563 | 633 | 540 | 577 | 473 | 600 | 517 | 751 | 503 | 712 |
| Austria | 31 | 32 | 28 | 41 | 26 | 38 | 28 | 23 | 22 | 22 | 19 | 33 | 22 | 31 | 11 | 20 | 16 | 39 | 9 | 19 | 18 | 26 | 9 | 22 | 13 | 22 | 2 | 7 | 22 | 17 | 25 | 20 | 27 | 13 | 20 | 16 | 24 | 18 | 20 | 11 | 18 | 16 | 23 |
| Belgium | 36 | 16 | 28 | 15 | 66 | 14 | 53 | 17 | 53 | 10 | 34 | 22 | 46 | 23 | 31 | 14 | 39 | 15 | 24 | 19 | 26 | 15 | 23 | 22 | 22 | 9 | 26 | 18 | 28 | 15 | 20 | 28 | 23 | 9 | 27 | 8 | 18 | 10 | 23 | 20 | 20 | 35 |
| Denmark | 7 | 6 | 18 | 2 | 11 | 3 | 3 | 3 | 9 | 2 | 10 | 7 | 6 | 2 | 7 | 5 | 6 | 5 | 6 | 6 | 6 | 3 | 5 | 4 | 6 | 3 | 5 | 2 | 2 | 8 | 4 | 18 | 8 | 7 | 5 | 11 | 8 | 9 | 9 | 5 | 9 | 2 |
| Finland | 61 | 84 | 70 | 100 | 75 | 91 | 91 | 81 | 65 | 143 | 80 | 108 | 49 | 144 | 44 | 85 | 32 | 68 | 37 | 90 | 32 | 78 | 40 | 85 | 37 | 89 | 31 | 46 | 31 | 43 | 33 | 39 | 26 | 60 | 29 | 50 | 24 | 55 | 24 | 55 | 24 | 55 |
| France | 82 | 133 | 68 | 140 | 68 | 157 | 64 | 139 | 74 | 118 | 70 | 130 | 51 | 144 | 38 | 127 | 49 | 147 | 35 | 110 | 44 | 89 | 30 | 98 | 48 | 102 | 45 | 96 | 50 | 79 | 50 | 72 | 54 | 87 | 54 | 96 | 48 | 73 | 63 | 65 | 52 | 57 |
| Germany | 477 | 370 | 440 | 388 | 462 | 330 | 471 | 363 | 405 | 359 | 408 | 370 | 381 | 368 | 296 | 466 | 239 | 452 | 199 | 404 | 203 | 321 | 196 | 258 | 256 | 284 | 234 | 319 | 239 | 274 | 208 | 279 | 208 | 268 | 192 | 242 | 159 | 240 | 152 | 248 | 149 | 243 |
| Hungary | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 2 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 2 | 1 | 1 | 0 | 0 | 0 | 1 |
| Ireland | 0 | 15 | 2 | 5 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 2 | 0 | 1 | 2 | 1 | 4 | 2 | 8 | 2 | 3 | 1 | 3 | 1 | 2 | 3 | 4 | 1 | 26 | 14 | 7 | 3 | 5 | 6 | 4 | 2 | 13 | 1 | 8 | 0 |
| Italy | 58 | 221 | 56 | 382 | 85 | 395 | 59 | 147 | 52 | 173 | 54 | 144 | 49 | 360 | 42 | 168 | 47 | 27 | 35 | 22 | 34 | 33 | 36 | 25 | 39 | 50 | 48 | 69 | 39 | 50 | 50 | 21 | 38 | 17 | 42 | 9 | 46 | 18 | 143 | 51 | 143 | 37 |
| Netherlands | 22 | 42 | 19 | 33 | 31 | 44 | 28 | 36 | 31 | 26 | 19 | 22 | 27 | 34 | 20 | 27 | 23 | 30 | 13 | 18 | 27 | 18 | 25 | 22 | 29 | 22 | 30 | 17 | 24 | 13 | 34 | 15 | 30 | 14 | 40 | 11 | 38 | 14 | 40 | 17 | 44 | 13 |
| Spain | 7 | 40 | 15 | 48 | 26 | 41 | 29 | 61 | 31 | 39 | 45 | 69 | 28 | 60 | 31 | 60 | 15 | 52 | 12 | 53 | 14 | 41 | 6 | 43 | 11 | 35 | 20 | 36 | 23 | 43 | 23 | 50 | 36 | 58 | 31 | 49 | 35 | 42 | 42 | 33 | 54 | 39 |
| Sweden | 45 | 75 | 58 | 83 | 88 | 69 | 78 | 75 | 68 | 85 | 44 | 53 | 47 | 58 | 35 | 47 | 30 | 32 | 34 | 33 | 29 | 27 | 25 | 32 | 28 | 31 | 44 | 24 | 43 | 22 | 32 | 16 | 48 | 9 | 30 | 19 | 22 | 20 | 26 | 28 | 32 | 33 |
| United Kingdom | 89 | 27 | 91 | 35 | 74 | 28 | 101 | 39 | 93 | 30 | 79 | 28 | 59 | 36 | 54 | 44 | 48 | 18 | 33 | 19 | 29 | 15 | 28 | 18 | 46 | 16 | 39 | 20 | 53 | 45 | 60 | 20 | 63 | 15 | 59 | 17 | 43 | 18 | 49 | 33 | 43 | 20 |
| All others | 5 | 84 | 1 | 57 | 7 | 46 | 3 | 44 | 1 | 46 | 3 | 44 | 4 | 42 | 3 | 44 | 2 | 33 | 2 | 52 | 1 | 75 | 2 | 62 | 6 | 42 | 3 | 28 | 8 | 52 | 6 | 73 | 5 | 82 | 5 | 45 | 7 | 73 | 9 | 89 | 13 | 69 |
| Other Europe | 72 | 198 | 76 | 197 | 85 | 192 | 79 | 193 | 64 | 174 | 65 | 240 | 47 | 262 | 42 | 193 | 50 | 169 | 36 | 200 | 26 | 186 | 30 | 200 | 36 | 161 | 29 | 130 | 33 | 123 | 37 | 165 | 45 | 121 | 37 | 100 | 30 | 93 | 45 | 112 | 39 | 121 |
| Former Soviet Union | 0 | 6 | 0 | 6 | 0 | 2 | 0 | 7 | 0 | 9 | 0 | 26 | 0 | 72 | 0 | 21 | 0 | 13 | 0 | 22 | 0 | 16 | 0 | 21 | 0 | 15 | 0 | 12 | 1 | 12 | 0 | 13 | 0 | 12 | 0 | 8 | 1 | 14 | 0 | 9 | 0 | 6 |
| Norway | 3 | 3 | 2 | 1 | 1 | 2 | 1 | 1 | 1 | 2 | 0 | 2 | 0 | 1 | 0 | 1 | 1 | 2 | 2 | 3 | 0 | 3 | 1 | 2 | 1 | 1 | 2 | 0 | 2 | 0 | 2 | 1 | 1 | 0 | 2 | 2 | 1 | 0 | 0 | 0 | 0 | 1 |
| Russia | 2 | 175 | 2 | 147 | 1 | 137 | 6 | 121 | 2 | 126 | 4 | 168 | 2 | 151 | 1 | 132 | 1 | 110 | 1 | 127 | 1 | 117 | 1 | 145 | 1 | 115 | 1 | 99 | 1 | 86 | 0 | 122 | 1 | 85 | 1 | 64 | 0 | 61 | 0 | 86 | 0 | 98 |
| Switzerland | 66 | 34 | 71 | 43 | 83 | 49 | 71 | 63 | 60 | 37 | 58 | 44 | 42 | 39 | 40 | 38 | 48 | 44 | 33 | 47 | 24 | 46 | 28 | 31 | 34 | 28 | 26 | 19 | 28 | 24 | 32 | 26 | 39 | 23 | 33 | 23 | 25 | 15 | 42 | 14 | 33 | 14 |
| All others | 1 | 0 | 1 | 0 | 0 | 3 | 2 | 1 | 1 | 1 | 2 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 3 | 1 | 2 | 0 | 2 | 0 | 0 | 1 | 1 | 2 | 2 | 4 | 1 | 1 | 2 | 4 | 2 | 2 | 2 | 6 | 2 |
| Asia | 1,127 | 4,977 | 1,242 | 6,159 | 1,402 | 4,156 | 1,507 | 3,906 | 1,541 | 3,716 | 1,455 | 3,891 | 1,409 | 4,288 | 1,156 | 4,895 | 1,247 | 5,572 | 1,244 | 5,583 | 1,338 | 5,267 | 1,385 | 5,925 | 1,718 | 7,169 | 1,836 | 8,540 | 2,007 | 8,868 | 2,010 | 8,663 | 2,292 | 8,989 | 2,202 | 9,568 | 1,887 | 11,104 | 1,581 | 10,559 | 1,558 | 10,368 |

TABLE S8-32

## USPTO patents and patent families granted in textile and paper machines, by region, country, or economy: 1998–2018

(Number)

| | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Region, country, or economy | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| China | 2 | 52 | 2 | 48 | 5 | 98 | 3 | 117 | 5 | 149 | 3 | 205 | 8 | 340 | 8 | 403 | 9 | 500 | 13 | 612 | 10 | 744 | 16 | 1,029 | 17 | 1,471 | 24 | 2,349 | 26 | 2,636 | 31 | 2,450 | 43 | 3,078 | 40 | 4,935 | 51 | 6,048 | 68 | 5,809 | 60 | 5,740 |
| India | 0 | 1 | 0 | 1 | 1 | 3 | 2 | 2 | 0 | 0 | 3 | 1 | 2 | 1 | 0 | 0 | 1 | 0 | 1 | 2 | 2 | 0 | 2 | 1 | 3 | 2 | 5 | 1 | 4 | 2 | 4 | 2 | 4 | 3 | 5 | 3 | 6 | 3 | 10 | 2 | 10 | 1 |
| Japan | 1,048 | 4,485 | 1,158 | 5,054 | 1,296 | 3,562 | 1,390 | 3,339 | 1,393 | 3,084 | 1,330 | 2,931 | 1,250 | 3,028 | 1,030 | 2,966 | 1,096 | 3,258 | 1,096 | 3,494 | 1,182 | 3,741 | 1,210 | 4,325 | 1,525 | 4,945 | 1,661 | 5,113 | 1,817 | 4,990 | 1,791 | 4,760 | 2,094 | 4,406 | 2,031 | 3,516 | 1,725 | 4,015 | 1,383 | 3,577 | 1,384 | 3,381 |
| Malaysia | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 3 | 1 | 2 | 1 | 3 | 1 | 2 | 1 | 1 | 1 | 2 | 0 | 5 | 1 | 1 | 0 | 2 | 1 | 2 | 0 | 2 | 1 | 2 | 0 | 5 | 2 | 2 |
| Singapore | 2 | 6 | 3 | 3 | 3 | 2 | 7 | 5 | 14 | 10 | 14 | 13 | 12 | 6 | 7 | 5 | 6 | 5 | 10 | 7 | 5 | 5 | 2 | 1 | 6 | 2 | 5 | 2 | 9 | 5 | 11 | 9 | 15 | 9 | 9 | 3 | 11 | 6 | 20 | 6 | 21 | 8 |
| South Korea | 32 | 366 | 42 | 971 | 53 | 397 | 44 | 317 | 62 | 326 | 47 | 600 | 56 | 732 | 55 | 1,366 | 75 | 1,597 | 75 | 1,236 | 91 | 666 | 96 | 460 | 109 | 584 | 82 | 866 | 95 | 1,089 | 95 | 1,252 | 69 | 1,292 | 65 | 907 | 55 | 823 | 47 | 946 | 43 | 1,080 |
| Taiwan | 40 | 66 | 37 | 79 | 42 | 91 | 60 | 123 | 66 | 145 | 57 | 139 | 79 | 177 | 54 | 151 | 57 | 207 | 46 | 224 | 45 | 107 | 58 | 103 | 54 | 160 | 54 | 197 | 53 | 144 | 76 | 186 | 63 | 193 | 50 | 199 | 33 | 206 | 49 | 212 | 35 | 154 |
| All others | 1 | 1 | 0 | 3 | 2 | 3 | 0 | 3 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 6 | 1 | 2 | 0 | 4 | 2 | 2 | 4 | 7 | 2 | 2 | 1 | 2 | 4 | 6 | 2 | 3 | 3 | 2 | 3 | 1 | 3 | 3 |
| Middle East | 12 | 7 | 14 | 5 | 14 | 6 | 17 | 11 | 25 | 8 | 19 | 9 | 18 | 7 | 8 | 5 | 16 | 7 | 10 | 5 | 11 | 6 | 14 | 4 | 18 | 8 | 16 | 10 | 22 | 11 | 31 | 20 | 37 | 19 | 42 | 20 | 49 | 13 | 38 | 8 | 36 | 11 |
| Israel | 11 | 7 | 13 | 5 | 13 | 2 | 17 | 7 | 24 | 5 | 19 | 6 | 17 | 6 | 8 | 4 | 16 | 6 | 10 | 2 | 11 | 5 | 14 | 4 | 18 | 8 | 16 | 8 | 22 | 10 | 30 | 18 | 35 | 19 | 40 | 17 | 48 | 12 | 37 | 7 | 29 | 8 |
| All others | 1 | 0 | 1 | 1 | 1 | 4 | 0 | 4 | 1 | 3 | 0 | 3 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 3 | 2 | 5 | 2 | 0 | 2 | 3 | 1 | 2 | 0 | 1 | 6 | 3 |
| Africa | 1 | 13 | 0 | 7 | 1 | 4 | 1 | 2 | 2 | 11 | 0 | 10 | 2 | 6 | 0 | 19 | 0 | 8 | 1 | 6 | 0 | 7 | 1 | 7 | 1 | 7 | 0 | 2 | 1 | 3 | 2 | 5 | 3 | 4 | 3 | 1 | 1 | 1 | 0 | 1 | 0 | 3 |
| South Africa | 1 | 8 | 0 | 4 | 1 | 3 | 1 | 1 | 2 | 1 | 0 | 4 | 2 | 3 | 0 | 16 | 0 | 8 | 1 | 4 | 0 | 2 | 0 | 4 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 3 | 1 | 3 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| All others | 0 | 5 | 0 | 3 | 0 | 1 | 0 | 1 | 1 | 10 | 0 | 6 | 0 | 3 | 0 | 3 | 0 | 0 | 0 | 2 | 0 | 5 | 1 | 3 | 1 | 5 | 0 | 2 | 0 | 3 | 0 | 4 | 0 | 3 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 3 |
| Australia and Oceania | 30 | 5 | 19 | 6 | 17 | 15 | 73 | 26 | 80 | 40 | 79 | 14 | 87 | 26 | 130 | 17 | 258 | 34 | 287 | 68 | 358 | 113 | 259 | 52 | 440 | 100 | 428 | 38 | 129 | 31 | 74 | 14 | 38 | 17 | 25 | 20 | 18 | 20 | 19 | 11 | 32 | 3 |
| Australia | 25 | 5 | 18 | 1 | 15 | 12 | 71 | 26 | 77 | 40 | 78 | 14 | 86 | 26 | 128 | 17 | 258 | 33 | 287 | 68 | 357 | 113 | 259 | 51 | 437 | 100 | 426 | 38 | 129 | 31 | 74 | 14 | 35 | 17 | 25 | 19 | 17 | 20 | 16 | 9 | 31 | 3 |
| New Zealand | 3 | 0 | 2 | 1 | 2 | 3 | 2 | 0 | 3 | 0 | 1 | 0 | 1 | 0 | 2 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 3 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 3 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 0 | 0 |
| Unclassified | 3 | 1 | 5 | 0 | 8 | 1 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 3 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |

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**Source(s)**

Science-Metrix; PATSTAT, accessed April 2019; PatentsView, USPTO, accessed June 2019.

TABLE S8-33

## USPTO patents and patent families granted in other special machines, by region, country, or economy: 1998–2018

(Number)

| Region, country, or economy | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| World | 5,151 | 11,611 | 5,192 | 12,642 | 4,992 | 10,866 | 5,083 | 10,314 | 4,984 | 10,294 | 5,115 | 11,245 | 4,646 | 12,617 | 3,716 | 11,961 | 2,618 | 12,796 | 3,585 | 12,971 | 3,452 | 12,442 | 3,448 | 12,386 | 4,974 | 13,610 | 5,160 | 15,674 | 5,512 | 18,212 | 5,954 | 19,693 | 6,471 | 20,348 | 6,305 | 22,026 | 6,747 | 24,413 | 7,136 | 25,578 | 7,178 | 24,705 |
| North America | 3,302 | 2,484 | 3,433 | 2,404 | 3,223 | 2,166 | 3,272 | 2,071 | 3,117 | 1,904 | 3,237 | 1,909 | 2,889 | 1,650 | 2,413 | 1,310 | 2,618 | 1,297 | 2,266 | 1,088 | 2,220 | 982 | 2,193 | 962 | 3,094 | 1,327 | 3,175 | 1,219 | 3,332 | 1,209 | 3,621 | 1,262 | 3,908 | 1,351 | 3,741 | 1,330 | 4,080 | 1,290 | 4,335 | 1,383 | 4,290 | 1,287 |
| Canada | 163 | 131 | 182 | 160 | 192 | 136 | 217 | 144 | 201 | 135 | 152 | 107 | 149 | 109 | 138 | 113 | 156 | 122 | 160 | 115 | 162 | 120 | 138 | 98 | 191 | 107 | 171 | 81 | 184 | 94 | 178 | 91 | 218 | 117 | 181 | 92 | 198 | 89 | 223 | 101 | 239 | 86 |
| Mexico | 6 | 2 | 5 | 2 | 1 | 0 | 0 | 0 | 6 | 4 | 4 | 1 | 4 | 2 | 1 | 2 | 6 | 2 | 1 | 0 | 1 | 0 | 4 | 1 | 8 | 1 | 3 | 1 | 4 | 1 | 9 | 4 | 5 | 1 | 4 | 2 | 8 | 15 | 11 | 24 | 8 | 17 |
| Puerto Rico | 2 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 2 | 0 | 2 | 0 | 3 | 0 | 1 | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 2 | 0 | 2 | 0 | 2 | 0 | 2 | 0 | 3 | 0 | 0 | 0 | 1 | 0 |
| United States | 3,132 | 2,349 | 3,246 | 2,241 | 3,030 | 2,030 | 3,055 | 1,928 | 2,911 | 1,766 | 3,079 | 1,800 | 2,735 | 1,539 | 2,273 | 1,195 | 2,454 | 1,172 | 2,102 | 972 | 2,057 | 861 | 2,051 | 863 | 2,893 | 1,219 | 2,999 | 1,138 | 3,142 | 1,113 | 3,434 | 1,166 | 3,684 | 1,233 | 3,555 | 1,235 | 3,871 | 1,187 | 4,100 | 1,258 | 4,042 | 1,184 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Central and South America | 11 | 6 | 11 | 9 | 13 | 23 | 10 | 12 | 9 | 10 | 14 | 11 | 6 | 14 | 7 | 12 | 11 | 14 | 9 | 9 | 8 | 23 | 8 | 55 | 19 | 59 | 12 | 70 | 22 | 64 | 10 | 55 | 24 | 57 | 19 | 58 | 28 | 60 | 38 | 91 | 22 | 146 |
| Argentina | 2 | 1 | 3 | 0 | 6 | 6 | 2 | 2 | 6 | 2 | 5 | 1 | 2 | 2 | 3 | 0 | 1 | 0 | 1 | 0 | 3 | 0 | 4 | 1 | 3 | 2 | 4 | 1 | 5 | 1 | 4 | 2 | 2 | 0 | 4 | 0 | 9 | 4 | 11 | 5 | 2 | 2 |
| Brazil | 5 | 0 | 5 | 5 | 2 | 15 | 5 | 7 | 4 | 8 | 7 | 8 | 3 | 10 | 4 | 7 | 6 | 12 | 5 | 8 | 5 | 23 | 4 | 8 | 5 | 57 | 6 | 70 | 10 | 59 | 6 | 52 | 13 | 54 | 8 | 85 | 16 | 142 | 8 | 152 | 8 | 142 |
| All others | 5 | 5 | 4 | 4 | 5 | 2 | 3 | 3 | 0 | 1 | 1 | 2 | 1 | 2 | 0 | 4 | 3 | 2 | 3 | 0 | 1 | 1 | 4 | 1 | 5 | 1 | 3 | 0 | 7 | 4 | 1 | 9 | 3 | 7 | 2 | 7 | 7 | 2 | 5 | 1 | 4 | 2 |
| Europe | 913 | 4,066 | 929 | 3,848 | 917 | 3,680 | 984 | 3,153 | 984 | 3,323 | 969 | 3,877 | 934 | 4,651 | 691 | 3,778 | 775 | 3,408 | 673 | 3,408 | 578 | 3,712 | 614 | 3,534 | 899 | 3,299 | 954 | 3,026 | 1,048 | 3,405 | 1,225 | 3,501 | 1,360 | 3,516 | 1,361 | 3,633 | 1,362 | 3,372 | 1,396 | 4,119 | 1,456 | 3,723 |
| 835 | 2,538 | 866 | 2,721 | 849 | 2,605 | 916 | 2,226 | 926 | 2,226 | 915 | 2,193 | 884 | 2,469 | 655 | 2,208 | 734 | 1,948 | 631 | 1,891 | 541 | 1,779 | 576 | 1,714 | 839 | 2,167 | 1,822 | 888 | 1,770 | 982 | 1,989 | 1,159 | 1,936 | 1,283 | 2,079 | 1,274 | 1,926 | 1,288 | 2,126 | 1,305 | 2,532 | 1,364 | 2,231 |
| Austria | 23 | 73 | 33 | 55 | 34 | 63 | 32 | 76 | 36 | 67 | 29 | 84 | 30 | 64 | 24 | 61 | 29 | 81 | 20 | 39 | 12 | 62 | 18 | 64 | 20 | 76 | 23 | 71 | 24 | 92 | 29 | 69 | 31 | 78 | 35 | 130 | 45 | 98 | 54 | 113 | 54 | 104 |
| Belgium | 28 | 22 | 28 | 15 | 23 | 21 | 34 | 18 | 34 | 19 | 20 | 24 | 30 | 17 | 25 | 20 | 31 | 19 | 25 | 29 | 19 | 17 | 31 | 22 | 36 | 19 | 41 | 20 | 35 | 20 | 46 | 13 | 51 | 16 | 56 | 23 | 56 | 19 | 71 | 44 | 105 | 97 |
| Denmark | 9 | 17 | 18 | 29 | 15 | 23 | 15 | 26 | 12 | 31 | 19 | 31 | 14 | 30 | 10 | 16 | 19 | 18 | 16 | 25 | 17 | 26 | 10 | 12 | 12 | 19 | 23 | 13 | 24 | 24 | 21 | 33 | 36 | 33 | 43 | 34 | 40 | 28 | 36 | 25 | 47 | 34 |
| Finland | 11 | 51 | 16 | 38 | 16 | 39 | 22 | 35 | 17 | 49 | 19 | 44 | 25 | 44 | 19 | 45 | 18 | 25 | 7 | 32 | 7 | 7 | 8 | 32 | 10 | 47 | 12 | 40 | 16 | 44 | 25 | 29 | 17 | 31 | 18 | 34 | 22 | 41 | 24 | 43 | 27 | 38 |
| France | 119 | 490 | 126 | 562 | 131 | 439 | 136 | 423 | 129 | 359 | 133 | 399 | 120 | 381 | 88 | 389 | 106 | 522 | 86 | 464 | 96 | 349 | 89 | 370 | 133 | 366 | 140 | 370 | 136 | 508 | 181 | 487 | 180 | 513 | 203 | 481 | 206 | 517 | 186 | 564 | 192 | 437 |
| Germany | 350 | 654 | 343 | 640 | 347 | 626 | 345 | 615 | 357 | 694 | 373 | 610 | 347 | 607 | 264 | 631 | 293 | 598 | 272 | 591 | 211 | 522 | 223 | 490 | 347 | 452 | 333 | 396 | 358 | 472 | 435 | 493 | 504 | 598 | 473 | 512 | 463 | 543 | 454 | 493 | 439 | 491 |
| Hungary | 0 | 4 | 0 | 11 | 0 | 5 | 0 | 15 | 2 | 16 | 2 | 11 | 0 | 3 | 1 | 8 | 2 | 10 | 0 | 3 | 0 | 1 | 0 | 3 | 0 | 8 | 1 | 9 | 2 | 4 | 3 | 3 | 3 | 9 | 1 | 7 | 5 | 7 | 4 | 11 | 4 | 5 |
| Ireland | 1 | 25 | 8 | 15 | 3 | 11 | 5 | 1 | 5 | 1 | 3 | 3 | 10 | 10 | 3 | 5 | 3 | 0 | 0 | 5 | 4 | 2 | 1 | 4 | 4 | 3 | 4 | 1 | 1 | 11 | 8 | 26 | 6 | 14 | 3 | 14 | 3 | 7 | 4 | 4 | 5 | 10 |
| Italy | 72 | 381 | 55 | 602 | 60 | 614 | 69 | 298 | 298 | 90 | 267 | 71 | 228 | 102 | 511 | 56 | 272 | 60 | 39 | 53 | 47 | 50 | 51 | 46 | 80 | 98 | 81 | 158 | 97 | 117 | 109 | 35 | 110 | 26 | 115 | 26 | 26 | 115 | 29 | 361 | 106 | 307 |
| Netherlands | 68 | 241 | 55 | 216 | 65 | 256 | 79 | 244 | 63 | 236 | 57 | 241 | 58 | 215 | 36 | 224 | 46 | 190 | 43 | 217 | 29 | 207 | 35 | 192 | 59 | 204 | 63 | 210 | 81 | 182 | 114 | 206 | 117 | 187 | 99 | 155 | 119 | 224 | 120 | 260 | 120 | 142 |
| Spain | 17 | 116 | 11 | 132 | 6 | 138 | 13 | 138 | 17 | 98 | 21 | 121 | 17 | 137 | 10 | 168 | 13 | 142 | 10 | 173 | 15 | 156 | 14 | 139 | 21 | 150 | 20 | 144 | 23 | 149 | 26 | 165 | 27 | 148 | 35 | 124 | 25 | 149 | 24 | 133 | 33 | 125 |
| Sweden | 48 | 139 | 58 | 125 | 50 | 111 | 60 | 97 | 60 | 112 | 70 | 106 | 46 | 148 | 45 | 74 | 37 | 53 | 35 | 50 | 28 | 51 | 24 | 65 | 41 | 80 | 47 | 61 | 69 | 50 | 55 | 39 | 61 | 43 | 61 | 31 | 58 | 39 | 83 | 46 | 58 | 46 |
| United Kingdom | 83 | 103 | 105 | 102 | 91 | 86 | 98 | 77 | 93 | 88 | 87 | 128 | 70 | 129 | 64 | 110 | 63 | 97 | 55 | 68 | 52 | 71 | 52 | 59 | 62 | 87 | 86 | 68 | 94 | 93 | 93 | 87 | 90 | 125 | 96 | 116 | 101 | 110 | 122 | 117 | 91 | 141 |
| All others | 5 | 223 | 8 | 178 | 7 | 172 | 7 | 174 | 10 | 190 | 10 | 162 | 16 | 171 | 10 | 185 | 13 | 152 | 7 | 147 | 8 | 201 | 14 | 216 | 12 | 213 | 13 | 208 | 12 | 222 | 15 | 250 | 20 | 285 | 15 | 253 | 23 | 304 | 21 | 344 | 28 | 307 |
| Other Europe | 79 | 1,928 | 63 | 1,727 | 67 | 1,075 | 68 | 917 | 59 | 1,097 | 55 | 1,684 | 50 | 2,182 | 36 | 1,571 | 40 | 1,460 | 42 | 1,518 | 31 | 1,971 | 38 | 1,820 | 61 | 1,477 | 67 | 1,256 | 66 | 1,416 | 67 | 1,566 | 76 | 1,438 | 87 | 1,707 | 74 | 1,245 | 91 | 1,588 | 91 | 1,493 |
| Former Soviet Union | 4 | 82 | 1 | 35 | 1 | 38 | 1 | 40 | 3 | 78 | 1 | 195 | 0 | 575 | 0 | 144 | 1 | 119 | 2 | 279 | 1 | 275 | 1 | 200 | 1 | 208 | 2 | 165 | 0 | 157 | 2 | 186 | 1 | 198 | 1 | 160 | 0 | 120 | 6 | 108 | 3 | 123 |
| Norway | 12 | 30 | 12 | 29 | 13 | 34 | 8 | 37 | 4 | 35 | 11 | 29 | 5 | 19 | 8 | 32 | 6 | 24 | 4 | 17 | 4 | 27 | 6 | 19 | 13 | 30 | 9 | 31 | 9 | 27 | 6 | 18 | 11 | 26 | 11 | 27 | 10 | 33 | 8 | 36 | 14 | 59 |
| Russia | 7 | 1,362 | 6 | 1,011 | 6 | 954 | 4 | 781 | 2 | 929 | 4 | 1,424 | 6 | 1,554 | 2 | 1,359 | 2 | 1,269 | 2 | 1,178 | 3 | 1,619 | 3 | 1,564 | 6 | 1,197 | 9 | 1,028 | 3 | 1,193 | 5 | 1,325 | 5 | 1,173 | 5 | 1,482 | 8 | 1,043 | 8 | 1,395 | 7 | 1,251 |
| Switzerland | 54 | 50 | 41 | 47 | 45 | 46 | 52 | 54 | 47 | 52 | 36 | 33 | 35 | 33 | 25 | 33 | 29 | 47 | 32 | 40 | 22 | 44 | 25 | 34 | 37 | 30 | 45 | 26 | 52 | 30 | 49 | 25 | 49 | 33 | 63 | 28 | 48 | 37 | 61 | 42 | 59 | 49 |
| All others | 2 | 4 | 2 | 6 | 3 | 5 | 4 | 4 | 2 | 2 | 3 | 4 | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 3 | 1 | 6 | 3 | 3 | 4 | 12 | 2 | 7 | 2 | 9 | 4 | 12 | 10 | 7 | 8 | 9 | 8 | 13 | 8 | 7 | 9 | 11 |
| Asia | 848 | 4,921 | 736 | 6,230 | 748 | 4,831 | 726 | 4,944 | 789 | 4,944 | 794 | 5,335 | 740 | 6,188 | 536 | 6,726 | 689 | 7,970 | 562 | 8,366 | 574 | 7,602 | 558 | 7,734 | 861 | 8,826 | 909 | 11,242 | 979 | 13,405 | 979 | 14,769 | 1,024 | 15,319 | 1,062 | 16,880 | 1,145 | 19,546 | 1,221 | 19,900 | 1,262 | 19,454 |

**TABLE S8-33**

## USPTO patents and patent families granted in other special machines, by region, country, or economy: 1998–2018

(Number)

| | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Region, country, or economy | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| China | 9 | 71 | 10 | 90 | 10 | 201 | 12 | 219 | 13 | 212 | 14 | 334 | 10 | 548 | 14 | 567 | 16 | 735 | 16 | 919 | 19 | 1,186 |
| India | 1 | 2 | 1 | 0 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 5 | 4 | 6 | 2 | 5 | 4 | 3 | 3 | 2 | 2 |
| Japan | 731 | 4,257 | 615 | 5,063 | 629 | 3,914 | 597 | 4,093 | 605 | 4,018 | 631 | 3,994 | 573 | 4,330 | 395 | 4,130 | 511 | 4,335 | 424 | 4,676 | 430 | 4,339 |
| Malaysia | 2 | 2 | 2 | 1 | 2 | 1 | 1 | 0 | 1 | 1 | 1 | 2 | 4 | 3 | 0 | 1 | 3 | 11 | 2 | 13 | 3 | 4 |
| Singapore | 3 | 2 | 2 | 1 | 2 | 1 | 4 | 1 | 7 | 5 | 9 | 2 | 12 | 5 | 9 | 3 | 4 | 1 | 2 | 2 | 3 | 2 |
| South Korea | 27 | 434 | 28 | 932 | 24 | 543 | 36 | 404 | 46 | 517 | 37 | 778 | 35 | 1,057 | 38 | 1,775 | 40 | 2,553 | 41 | 2,422 | 40 | 1,883 |
| Taiwan | 74 | 147 | 76 | 137 | 77 | 165 | 72 | 218 | 113 | 184 | 99 | 219 | 98 | 241 | 72 | 240 | 106 | 331 | 73 | 327 | 76 | 184 |
| All others | 1 | 6 | 1 | 7 | 1 | 5 | 2 | 4 | 2 | 5 | 1 | 4 | 2 | 1 | 2 | 7 | 3 | 2 | 1 | 4 | 1 | 2 |
| Middle East | 26 | 15 | 20 | 14 | 26 | 24 | 29 | 28 | 32 | 25 | 39 | 30 | 29 | 8 | 26 | 6 | 27 | 8 | 24 | 6 | 27 | 9 |
| Israel | 26 | 13 | 19 | 9 | 25 | 6 | 27 | 9 | 32 | 15 | 37 | 9 | 29 | 8 | 26 | 6 | 27 | 8 | 24 | 6 | 27 | 9 |
| All others | 0 | 2 | 1 | 5 | 2 | 17 | 2 | 19 | 0 | 10 | 2 | 20 | 0 | 7 | 3 | 11 | 0 | 6 | 0 | 12 | 0 | 17 |
| Africa | 5 | 21 | 5 | 34 | 7 | 19 | 7 | 21 | 8 | 18 | 9 | 26 | 4 | 22 | 4 | 20 | 7 | 19 | 2 | 20 | 9 | 23 |
| South Africa | 5 | 14 | 5 | 20 | 6 | 10 | 7 | 11 | 6 | 7 | 8 | 11 | 3 | 11 | 4 | 16 | 7 | 9 | 2 | 14 | 9 | 13 |
| All others | 0 | 6 | 0 | 15 | 1 | 9 | 0 | 11 | 1 | 10 | 1 | 16 | 1 | 11 | 0 | 4 | 0 | 10 | 0 | 6 | 0 | 10 |
| Australia and Oceania | 44 | 46 | 57 | 44 | 57 | 59 | 54 | 82 | 44 | 67 | 53 | 54 | 45 | 74 | 36 | 57 | 41 | 61 | 49 | 61 | 36 | 69 |
| Australia | 38 | 45 | 47 | 44 | 46 | 56 | 45 | 80 | 36 | 66 | 41 | 50 | 36 | 74 | 30 | 57 | 34 | 61 | 41 | 59 | 30 | 66 |
| New Zealand | 6 | 2 | 9 | 1 | 11 | 3 | 10 | 2 | 8 | 1 | 12 | 3 | 9 | 0 | 6 | 1 | 7 | 0 | 8 | 2 | 6 | 2 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Unclassified | 0 | 51 | 1 | 58 | 2 | 64 | 0 | 3 | 0 | 4 | 0 | 4 | 0 | 4 | 0 | 39 | 0 | 12 | 0 | 0 | 0 | 0 |

| | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Region, country, or economy | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| China | 16 | 1,705 | 36 | 2,293 | 44 | 3,699 | 44 | 4,606 | 65 | 5,638 | 69 | 6,408 | 93 | 10,346 | 102 | 12,626 | 124 | 12,681 | 157 | 12,128 |
| India | 3 | 2 | 4 | 3 | 6 | 3 | 7 | 3 | 16 | 5 | 17 | 5 | 15 | 4 | 17 | 6 | 19 | 6 | 25 | 9 |
| Japan | 393 | 4,302 | 628 | 4,584 | 627 | 5,049 | 680 | 5,435 | 637 | 5,141 | 660 | 4,854 | 671 | 3,761 | 740 | 3,747 | 735 | 3,304 | 764 | 3,229 |
| Malaysia | 1 | 3 | 4 | 7 | 5 | 20 | 7 | 17 | 5 | 23 | 8 | 21 | 6 | 13 | 6 | 8 | 10 | 17 | 9 | 19 |
| Singapore | 6 | 3 | 6 | 4 | 10 | 3 | 7 | 2 | 10 | 3 | 13 | 3 | 13 | 3 | 15 | 3 | 10 | 1 | 11 | 3 |
| South Korea | 49 | 1,457 | 64 | 1,683 | 84 | 2,185 | 93 | 3,039 | 110 | 3,553 | 127 | 3,690 | 133 | 2,374 | 130 | 2,758 | 170 | 3,359 | 163 | 3,662 |
| Taiwan | 88 | 259 | 115 | 250 | 132 | 281 | 138 | 297 | 131 | 402 | 125 | 330 | 124 | 370 | 130 | 390 | 146 | 528 | 128 | 395 |
| All others | 3 | 5 | 3 | 2 | 2 | 2 | 4 | 7 | 5 | 4 | 5 | 8 | 8 | 9 | 4 | 7 | 6 | 5 | 5 | 10 |
| Middle East | 27 | 10 | 39 | 12 | 44 | 20 | 64 | 30 | 61 | 21 | 79 | 15 | 63 | 26 | 63 | 36 | 71 | 26 | 80 | 25 |
| Israel | 24 | 4 | 38 | 4 | 38 | 4 | 55 | 8 | 53 | 6 | 66 | 4 | 51 | 9 | 47 | 10 | 54 | 9 | 58 | 13 |
| All others | 8 | 13 | 9 | 8 | 6 | 16 | 9 | 22 | 9 | 15 | 14 | 11 | 11 | 18 | 16 | 26 | 17 | 17 | 22 | 12 |
| Africa | 8 | 13 | 9 | 18 | 5 | 14 | 7 | 20 | 6 | 10 | 7 | 11 | 10 | 4 | 10 | 12 | 11 | 10 | 6 | 1 |
| South Africa | 8 | 13 | 8 | 11 | 5 | 3 | 7 | 7 | 6 | 3 | 6 | 3 | 9 | 1 | 9 | 2 | 10 | 0 | 5 | 0 |
| All others | 0 | 1 | 1 | 7 | 0 | 11 | 0 | 9 | 0 | 8 | 0 | 8 | 2 | 2 | 1 | 10 | 1 | 9 | 1 | 1 |
| Australia and Oceania | 39 | 76 | 53 | 67 | 60 | 80 | 60 | 77 | 50 | 74 | 69 | 78 | 47 | 95 | 56 | 94 | 65 | 47 | 61 | 68 |
| Australia | 35 | 76 | 48 | 65 | 51 | 77 | 44 | 76 | 37 | 72 | 51 | 76 | 36 | 94 | 40 | 90 | 50 | 45 | 43 | 66 |
| New Zealand | 4 | 0 | 5 | 2 | 9 | 4 | 15 | 1 | 12 | 1 | 18 | 2 | 11 | 1 | 16 | 4 | 15 | 3 | 19 | 3 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Unclassified | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 2 | 3 | 0 | 1 | 1 | 0 |

EU = European Union; USPTO = U.S. Patent and Trademark Office.

**Note(s)**

USPTO patents are allocated according to patent inventorship information. USPTO patents are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named inventors. Patents are classified under the World Intellectual Property Organization (WIPO) classification of patents, which classifies International Patent Classification (IPC) codes under 35 technical fields. IPC reformed codes take into account changes that were made to the WIPO classification in 2006 under the eighth version of the classification and were used to prepare these data. However, because PatentsView only provides the original IPC codes as they appeared on patents and not the IPC reformed codes, current Cooperative Patent Classification codes on patents were converted back to the most recent IPC classification to prepare these statistics. Fractional counts of patents were assigned to each technological field on patents to assign the proper weight of a patent to the corresponding technological fields under the classification. International Patent Documentation (INPADOC) patent families across all patent offices covered in the Worldwide Patent Statistical Database (PATSTAT) are counted according to the year of the first granted patent in the patent family. Patent families are allocated according to patent inventorship information found on the priority patent of the INPADOC patent families. To account for missing ownership information in PATSTAT for some offices, a method designed by de Rassenfosse et al. (2012) is used to fill in missing information on priority patents using information in successive filings within the patent families (see technical documentation for details). Patent families are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named inventors. Because of data coverage issues for some patent offices in PATSTAT, statistics for some countries may be underestimated partially for some years or across the whole trend. Countries with identified issues include India (missing data) and South Africa (no data for 2018). For Italy, because of data gaps regarding information on granted patents, patent applications are used instead, which slightly overestimates Italy's output and creates a small shift in the year for which its output is accounted. The EU includes 28 member countries. China includes Hong Kong.

**Source(s)**

Science-Metrix; PATSTAT, accessed April 2019; PatentsView, USPTO, accessed June 2019.

TABLE 5B-34

## USPTO patents and patent families granted in thermal processes and apparatus, by region, country, or economy: 1998–2018

(Number)

| Region, country, or economy | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| World | 1,648 | 6,056 | 1,755 | 7,676 | 1,766 | 6,039 | 1,842 | 5,434 | 1,653 | 5,298 | 1,614 | 5,623 | 1,505 | 6,236 | 1,427 | 6,752 | 1,489 | 8,689 | 1,242 | 8,575 | 1,038 | 7,443 | 1,071 | 7,451 | 1,488 | 7,346 | 1,458 | 8,505 | 1,681 | 10,429 | 1,904 | 10,888 | 2,088 | 11,539 | 2,238 | 10,899 | 2,362 | 13,115 | 2,941 | 14,359 | 2,989 | 13,712 |
| North America | 943 | 755 | 951 | 740 | 954 | 672 | 995 | 676 | 906 | 603 | 920 | 604 | 868 | 566 | 797 | 484 | 847 | 478 | 659 | 364 | 547 | 281 | 588 | 277 | 804 | 373 | 759 | 349 | 886 | 348 | 1,035 | 379 | 1,097 | 419 | 1,145 | 459 | 1,194 | 471 | 1,415 | 518 | 1,393 | 467 |
| Canada | 69 | 63 | 59 | 54 | 64 | 47 | 63 | 40 | 48 | 38 | 45 | 32 | 52 | 48 | 49 | 31 | 58 | 33 | 45 | 44 | 36 | 35 | 36 | 30 | 49 | 30 | 37 | 24 | 53 | 32 | 51 | 28 | 48 | 31 | 63 | 32 | 78 | 31 | 78 | 36 | 77 | 36 |
| Mexico | 1 | 0 | 3 | 3 | 7 | 6 | 5 | 4 | 5 | 3 | 2 | 1 | 2 | 2 | 1 | 0 | 5 | 2 | 3 | 0 | 2 | 0 | 0 | 0 | 2 | 1 | 6 | 0 | 2 | 1 | 2 | 0 | 7 | 1 | 4 | 2 | 1 | 12 | 8 | 17 | 8 | 8 |
| Puerto Rico | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| United States | 872 | 692 | 887 | 683 | 883 | 618 | 927 | 632 | 853 | 562 | 871 | 571 | 814 | 516 | 747 | 453 | 783 | 444 | 611 | 320 | 510 | 245 | 550 | 248 | 753 | 342 | 716 | 325 | 831 | 315 | 982 | 351 | 1,042 | 387 | 1,077 | 425 | 1,114 | 428 | 1,329 | 465 | 1,309 | 423 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Central and South America | 3 | 1 | 3 | 1 | 13 | 8 | 17 | 3 | 7 | 2 | 8 | 7 | 5 | 5 | 2 | 5 | 5 | 5 | 1 | 6 | 1 | 8 | 4 | 13 | 5 | 22 | 6 | 20 | 3 | 15 | 3 | 12 | 9 | 12 | 7 | 13 | 5 | 4 | 9 | 14 | 6 | 15 |
| Argentina | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Brazil | 1 | 0 | 1 | 1 | 12 | 5 | 16 | 2 | 7 | 1 | 3 | 3 | 3 | 3 | 1 | 2 | 4 | 4 | 1 | 5 | 1 | 8 | 3 | 12 | 4 | 21 | 4 | 19 | 3 | 13 | 2 | 10 | 8 | 11 | 6 | 11 | 1 | 3 | 8 | 13 | 5 | 13 |
| All others | 2 | 1 | 2 | 0 | 1 | 2 | 1 | 1 | 1 | 1 | 3 | 1 | 2 | 2 | 1 | 2 | 2 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 2 | 1 | 2 | 0 | 1 | 1 | 2 | 4 | 1 | 2 | 1 | 1 | 2 |
| Europe | 316 | 1,626 | 342 | 1,599 | 348 | 1,609 | 354 | 1,464 | 287 | 1,524 | 302 | 1,521 | 251 | 1,721 | 216 | 1,511 | 226 | 1,359 | 216 | 1,394 | 175 | 1,358 | 172 | 1,463 | 232 | 1,392 | 253 | 1,344 | 315 | 1,535 | 360 | 1,526 | 437 | 1,443 | 471 | 1,460 | 443 | 1,285 | 557 | 1,571 | 565 | 1,564 |
| EU | 280 | 1,140 | 296 | 1,185 | 308 | 1,211 | 320 | 1,097 | 259 | 1,082 | 281 | 944 | 239 | 1,086 | 202 | 1,009 | 207 | 902 | 201 | 865 | 162 | 797 | 153 | 802 | 217 | 895 | 229 | 930 | 299 | 1,127 | 331 | 1,031 | 403 | 1,033 | 437 | 977 | 408 | 983 | 519 | 1,131 | 517 | 1,149 |
| Austria | 4 | 58 | 6 | 63 | 5 | 55 | 10 | 53 | 3 | 79 | 4 | 64 | 4 | 31 | 2 | 37 | 5 | 37 | 5 | 24 | 4 | 40 | 5 | 47 | 4 | 66 | 6 | 39 | 7 | 69 | 7 | 54 | 10 | 45 | 9 | 36 | 11 | 43 | 18 | 37 | 14 | 30 |
| Belgium | 3 | 4 | 4 | 6 | 5 | 6 | 7 | 3 | 4 | 7 | 4 | 6 | 2 | 6 | 2 | 5 | 3 | 4 | 1 | 5 | 1 | 6 | 2 | 4 | 2 | 6 | 2 | 8 | 3 | 7 | 6 | 11 | 15 | 5 | 10 | 7 | 9 | 7 | 15 | 23 | 14 | 35 |
| Denmark | 12 | 12 | 8 | 7 | 10 | 9 | 5 | 11 | 3 | 14 | 6 | 10 | 5 | 15 | 5 | 12 | 3 | 16 | 7 | 10 | 4 | 16 | 2 | 9 | 5 | 9 | 8 | 7 | 15 | 6 | 10 | 22 | 15 | 14 | 17 | 14 | 16 | 27 | 22 | 12 | 17 | 18 |
| Finland | 15 | 39 | 8 | 30 | 6 | 24 | 11 | 24 | 6 | 28 | 9 | 29 | 16 | 31 | 7 | 20 | 6 | 12 | 5 | 27 | 4 | 17 | 3 | 23 | 2 | 23 | 3 | 32 | 10 | 33 | 9 | 34 | 8 | 30 | 16 | 43 | 11 | 31 | 11 | 26 | 15 | 33 |
| France | 50 | 235 | 59 | 219 | 54 | 213 | 60 | 215 | 53 | 151 | 45 | 123 | 34 | 145 | 23 | 142 | 34 | 180 | 31 | 154 | 21 | 135 | 18 | 114 | 27 | 134 | 30 | 98 | 41 | 277 | 43 | 220 | 55 | 241 | 60 | 211 | 72 | 176 | 79 | 246 | 76 | 306 |
| Germany | 103 | 357 | 113 | 372 | 120 | 373 | 118 | 393 | 113 | 413 | 125 | 391 | 101 | 369 | 89 | 368 | 96 | 350 | 93 | 319 | 76 | 256 | 72 | 234 | 102 | 235 | 107 | 206 | 116 | 245 | 142 | 263 | 146 | 248 | 162 | 256 | 136 | 225 | 187 | 226 | 188 | 204 |
| Hungary | 0 | 5 | 2 | 3 | 2 | 4 | 1 | 4 | 0 | 4 | 0 | 1 | 0 | 1 | 1 | 0 | 2 | 0 | 2 | 0 | 1 | 0 | 2 | 0 | 2 | 0 | 1 | 0 | 2 | 0 | 4 | 0 | 6 | 2 | 7 | 0 | 6 | 1 | 4 | 1 | 3 | 2 |
| Ireland | 1 | 5 | 0 | 4 | 3 | 1 | 2 | 0 | 0 | 0 | 0 | 1 | 1 | 2 | 1 | 0 | 0 | 2 | 1 | 1 | 0 | 6 | 1 | 12 | 2 | 6 | 1 | 6 | 3 | 4 | 4 | 10 | 2 | 7 | 3 | 6 | 3 | 7 | 2 | 4 | 5 | 5 |
| Italy | 22 | 132 | 21 | 198 | 24 | 225 | 29 | 107 | 21 | 99 | 26 | 64 | 19 | 216 | 21 | 117 | 16 | 22 | 19 | 24 | 12 | 27 | 15 | 30 | 26 | 54 | 18 | 98 | 26 | 84 | 30 | 17 | 35 | 17 | 50 | 26 | 37 | 20 | 56 | 187 | 59 | 143 |
| Netherlands | 11 | 63 | 5 | 66 | 11 | 85 | 8 | 72 | 8 | 57 | 11 | 60 | 10 | 67 | 10 | 54 | 10 | 65 | 5 | 55 | 10 | 49 | 6 | 43 | 11 | 55 | 10 | 64 | 12 | 72 | 14 | 58 | 16 | 41 | 12 | 53 | 20 | 50 | 18 | 49 | 26 | 18 |
| Spain | 5 | 29 | 3 | 36 | 5 | 35 | 4 | 31 | 5 | 30 | 6 | 32 | 4 | 31 | 4 | 59 | 2 | 57 | 3 | 65 | 2 | 71 | 3 | 68 | 4 | 105 | 4 | 120 | 13 | 100 | 14 | 100 | 13 | 139 | 21 | 93 | 14 | 94 | 12 | 88 | 11 | 59 |
| Sweden | 22 | 47 | 27 | 44 | 28 | 38 | 25 | 53 | 13 | 73 | 14 | 64 | 15 | 69 | 10 | 32 | 10 | 46 | 9 | 38 | 11 | 35 | 11 | 53 | 12 | 47 | 16 | 46 | 15 | 28 | 17 | 23 | 28 | 20 | 21 | 32 | 28 | 24 | 35 | 31 | 26 | 43 |
| United Kingdom | 30 | 53 | 36 | 44 | 34 | 55 | 35 | 35 | 25 | 38 | 26 | 35 | 23 | 39 | 25 | 59 | 19 | 29 | 17 | 23 | 16 | 23 | 14 | 33 | 13 | 40 | 17 | 41 | 31 | 55 | 26 | 44 | 43 | 31 | 40 | 49 | 39 | 76 | 48 | 53 | 45 | 61 |
| All others | 4 | 100 | 3 | 93 | 2 | 89 | 4 | 97 | 4 | 87 | 4 | 63 | 5 | 65 | 2 | 103 | 3 | 82 | 2 | 118 | 2 | 114 | 2 | 129 | 6 | 116 | 4 | 163 | 7 | 148 | 7 | 168 | 14 | 187 | 15 | 147 | 11 | 199 | 13 | 147 | 20 | 193 |
| Other Europe | 35 | 486 | 47 | 414 | 39 | 398 | 34 | 367 | 27 | 442 | 20 | 576 | 12 | 635 | 13 | 502 | 18 | 457 | 15 | 529 | 13 | 561 | 19 | 662 | 14 | 497 | 24 | 414 | 16 | 408 | 30 | 495 | 33 | 410 | 34 | 483 | 35 | 303 | 39 | 440 | 47 | 415 |
| Former Soviet Union | 1 | 14 | 3 | 15 | 1 | 9 | 2 | 19 | 0 | 30 | 1 | 64 | 1 | 203 | 1 | 70 | 0 | 32 | 0 | 74 | 0 | 79 | 1 | 112 | 0 | 95 | 0 | 66 | 0 | 53 | 0 | 66 | 0 | 46 | 0 | 55 | 0 | 43 | 0 | 44 | 1 | 35 |
| Norway | 4 | 14 | 6 | 11 | 7 | 11 | 4 | 9 | 6 | 10 | 1 | 15 | 2 | 7 | 2 | 7 | 3 | 9 | 3 | 9 | 2 | 8 | 3 | 5 | 1 | 10 | 0 | 9 | 2 | 6 | 4 | 12 | 4 | 8 | 3 | 9 | 4 | 9 | 5 | 11 | 5 | 4 |
| Russia | 4 | 434 | 4 | 370 | 5 | 352 | 4 | 306 | 2 | 372 | 1 | 463 | 1 | 402 | 2 | 405 | 2 | 385 | 2 | 418 | 0 | 441 | 3 | 521 | 2 | 373 | 3 | 318 | 2 | 327 | 3 | 392 | 1 | 326 | 1 | 392 | 1 | 222 | 3 | 356 | 4 | 338 |
| Switzerland | 27 | 22 | 34 | 17 | 23 | 25 | 23 | 30 | 18 | 29 | 18 | 31 | 8 | 21 | 8 | 18 | 14 | 30 | 10 | 25 | 11 | 28 | 10 | 20 | 9 | 15 | 18 | 15 | 12 | 19 | 18 | 19 | 26 | 27 | 28 | 22 | 27 | 26 | 25 | 28 | 29 | 33 |
| All others | 0 | 2 | 0 | 2 | 4 | 2 | 0 | 3 | 0 | 1 | 0 | 3 | 1 | 1 | 0 | 2 | 1 | 1 | 1 | 3 | 0 | 5 | 1 | 4 | 2 | 4 | 3 | 6 | 0 | 2 | 5 | 6 | 3 | 4 | 2 | 4 | 4 | 3 | 6 | 2 | 8 | 5 |
| Asia | 370 | 3,647 | 429 | 5,284 | 417 | 3,696 | 445 | 3,250 | 416 | 3,126 | 365 | 3,463 | 363 | 3,908 | 388 | 4,711 | 402 | 6,631 | 347 | 6,771 | 301 | 5,756 | 294 | 5,664 | 433 | 5,521 | 413 | 6,756 | 447 | 8,479 | 473 | 8,919 | 514 | 9,613 | 571 | 8,914 | 667 | 11,307 | 894 | 12,218 | 968 | 11,638 |

**TABLE S8-34**

## USPTO patents and patent families granted in thermal processes and apparatus, by region, country, or economy: 1998–2018

(Number)

| | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Region, country, or economy | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| China | 9 | 23 | 5 | 28 | 10 | 99 | 15 | 86 | 11 | 81 | 15 | 288 | 17 | 377 | 16 | 399 | 14 | 487 | 19 | 558 | 25 | 964 | 19 | 1,756 | 33 | 1,568 | 35 | 1,862 | 44 | 2,647 | 43 | 2,619 | 55 | 2,669 | 52 | 4,507 | 77 | 6,027 | 95 | 7,170 | 116 | 7,135 |
| India | 1 | 1 | 1 | 2 | 2 | 3 | 0 | 0 | 0 | 0 | 2 | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 4 | 2 | 2 | 2 | 2 | 4 | 2 | 5 | 4 | 6 | 3 | 10 | 2 | 9 | 6 | 8 | 4 | 12 | 5 | 15 | 4 | 19 | 10 |
| Japan | 243 | 2,986 | 305 | 3,339 | 315 | 2,869 | 319 | 2,666 | 275 | 2,522 | 244 | 2,175 | 201 | 2,413 | 227 | 2,699 | 214 | 3,467 | 177 | 3,346 | 149 | 3,000 | 138 | 2,860 | 235 | 2,716 | 226 | 3,226 | 221 | 3,512 | 233 | 3,786 | 266 | 4,274 | 304 | 2,506 | 360 | 3,179 | 515 | 2,980 | 523 | 2,645 |
| Malaysia | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 2 | 0 | 1 | 0 | 8 | 0 | 6 | 0 | 0 | 0 | 2 | 0 | 3 | 0 | 3 | 1 | 0 | 1 | 5 | 1 | 5 | 0 | 5 | 0 | 1 | 3 | 2 | 2 | 7 |
| Singapore | 0 | 0 | 1 | 1 | 2 | 1 | 1 | 2 | 4 | 2 | 2 | 1 | 2 | 2 | 0 | 2 | 3 | 0 | 0 | 1 | 0 | 1 | 2 | 0 | 3 | 1 | 1 | 0 | 2 | 1 | 1 | 2 | 4 | 1 | 2 | 0 | 1 | 0 | 1 | 1 | 1 | 0 |
| South Korea | 81 | 590 | 81 | 1,859 | 58 | 679 | 46 | 398 | 60 | 441 | 47 | 913 | 78 | 1,012 | 86 | 1,505 | 104 | 2,479 | 106 | 2,669 | 81 | 1,653 | 78 | 889 | 102 | 1,083 | 107 | 1,537 | 118 | 2,156 | 126 | 2,495 | 114 | 2,430 | 133 | 1,692 | 158 | 1,822 | 199 | 1,766 | 223 | 1,611 |
| Taiwan | 34 | 44 | 36 | 55 | 30 | 42 | 62 | 96 | 64 | 78 | 54 | 78 | 64 | 98 | 56 | 102 | 64 | 186 | 43 | 187 | 44 | 136 | 53 | 153 | 55 | 146 | 40 | 123 | 54 | 158 | 59 | 208 | 63 | 226 | 70 | 197 | 58 | 268 | 65 | 289 | 80 | 228 |
| All others | 1 | 1 | 1 | 0 | 0 | 2 | 2 | 2 | 1 | 1 | 0 | 5 | 0 | 2 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 1 | 1 | 3 | 1 | 3 | 1 | 2 | 0 | 2 | 0 | 2 | 2 | 3 | 3 | 2 | 1 | 4 | 2 | 6 | 3 | 2 |
| Middle East | 3 | 2 | 12 | 4 | 11 | 7 | 9 | 7 | 10 | 8 | 7 | 3 | 7 | 4 | 12 | 8 | 5 | 3 | 5 | 8 | 7 | 4 | 2 | 4 | 6 | 5 | 11 | 2 | 11 | 7 | 20 | 13 | 19 | 10 | 27 | 11 | 29 | 18 | 44 | 21 | 33 | 9 |
| Israel | 3 | 1 | 11 | 3 | 7 | 2 | 7 | 2 | 7 | 2 | 6 | 3 | 6 | 2 | 11 | 4 | 3 | 1 | 3 | 2 | 5 | 1 | 1 | 1 | 6 | 2 | 10 | 0 | 5 | 1 | 10 | 2 | 12 | 1 | 15 | 3 | 12 | 3 | 17 | 2 | 14 | 1 |
| All others | 0 | 1 | 1 | 2 | 4 | 5 | 2 | 5 | 3 | 6 | 0 | 0 | 1 | 3 | 1 | 4 | 2 | 2 | 2 | 6 | 2 | 3 | 1 | 3 | 1 | 4 | 1 | 2 | 5 | 6 | 10 | 11 | 7 | 9 | 12 | 8 | 17 | 15 | 27 | 20 | 19 | 8 |
| Africa | 0 | 9 | 0 | 8 | 4 | 14 | 3 | 9 | 2 | 11 | 1 | 13 | 4 | 5 | 3 | 3 | 1 | 5 | 3 | 8 | 0 | 6 | 1 | 8 | 1 | 6 | 2 | 7 | 2 | 7 | 3 | 11 | 0 | 13 | 1 | 2 | 4 | 1 | 4 | 4 | 6 | 4 |
| South Africa | 0 | 6 | 0 | 4 | 4 | 10 | 2 | 5 | 1 | 4 | 1 | 4 | 2 | 3 | 2 | 2 | 1 | 3 | 2 | 7 | 0 | 6 | 1 | 7 | 1 | 5 | 2 | 0 | 2 | 2 | 3 | 4 | 0 | 1 | 1 | 0 | 4 | 0 | 4 | 0 | 6 | 0 |
| All others | 0 | 3 | 0 | 5 | 0 | 4 | 1 | 4 | 1 | 7 | 0 | 9 | 2 | 2 | 1 | 1 | 0 | 2 | 1 | 2 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 7 | 0 | 5 | 0 | 6 | 0 | 12 | 0 | 2 | 0 | 0 | 1 | 4 | 0 | 4 |
| Australia and Oceania | 14 | 7 | 19 | 16 | 20 | 20 | 19 | 20 | 26 | 20 | 11 | 13 | 7 | 24 | 10 | 20 | 5 | 18 | 11 | 18 | 7 | 26 | 10 | 19 | 7 | 26 | 13 | 25 | 17 | 38 | 10 | 29 | 13 | 28 | 15 | 28 | 20 | 28 | 17 | 13 | 18 | 14 |
| Australia | 13 | 7 | 18 | 15 | 16 | 19 | 17 | 20 | 24 | 20 | 9 | 13 | 6 | 24 | 9 | 19 | 5 | 18 | 11 | 18 | 7 | 26 | 8 | 18 | 7 | 26 | 10 | 25 | 14 | 37 | 8 | 29 | 12 | 28 | 13 | 28 | 15 | 28 | 13 | 12 | 16 | 13 |
| New Zealand | 2 | 0 | 1 | 1 | 4 | 0 | 1 | 0 | 2 | 0 | 2 | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 3 | 0 | 2 | 0 | 1 | 0 | 2 | 0 | 4 | 1 | 3 | 1 | 3 | 1 |
| All others | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Unclassified | 0 | 9 | 23 | 0 | 14 | 1 | 6 | 0 | 4 | 0 | 0 | 0 | 1 | 4 | 0 | 9 | 0 | 189 | 0 | 6 | 0 | 4 | 0 | 3 | 1 | 1 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 12 | 1 | 1 | 0 | 0 | 0 | 0 |

EU = European Union; USPTO = U.S. Patent and Trademark Office.

**Note(s)**

USPTO patents are allocated according to patent inventorship information. USPTO patents are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named inventors. Patents are classified under the World Intellectual Property Organization (WIPO) classification of patents, which classifies International Patent Classification (IPC) codes under 35 technical fields. IPC reformed codes take into account changes that were made to the WIPO classification in 2006 under the eighth version of the classification and were used to prepare these data. However, because PatentsView only provides the original IPC codes as they appeared on patents and not the IPC reformed codes, current Cooperative Patent Classification codes on patents were converted back to the most recent IPC classification to prepare these statistics. Fractional counts of patents were assigned to each technological field on patents to assign the proper weight of a patent to the corresponding technological fields under the classification. International Patent Documentation (INPADOC) patent families across all patent offices covered in the Worldwide Patent Statistical Database (PATSTAT) are counted according to the year of the first granted patent in the patent family. Patent families are allocated according to patent inventorship information found on the priority patent of the INPADOC patent families. To account for missing ownership information in PATSTAT for some offices, a method designed by de Rassenfosse et al. (2012) is used to fill in missing information on priority patents using information in successive filings within the patent families (see technical documentation for details). Patent families are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named inventors. Because of data coverage issues for some patent offices in PATSTAT, statistics for some countries may be underestimated partially for some years or across the whole trend. Countries with identified issues include India (missing data) and South Africa (no data for 2018). For Italy, because of data gaps regarding information on granted patents, patent applications are used instead, which slightly overestimates Italy's output and creates a small shift in the year for which its output is accounted. The EU includes 28 member countries. China includes Hong Kong.

**Source(s)**

Science-Metrix; PATSTAT, accessed April 2019; PatentsView, USPTO, accessed June 2019.

TABLE SB-35

## USPTO patents and patent families granted in mechanical elements, by region, country, or economy: 1998–2018

(Number)

| Region, country, or economy | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| World | 4,244 | 8,842 | 4,555 | 10,384 | 4,811 | 8,717 | 4,886 | 7,984 | 4,943 | 7,833 | 4,611 | 8,916 | 4,261 | 9,268 | 3,753 | 9,777 | 4,161 | 10,237 | 3,491 | 10,406 | 3,280 | 10,896 | 3,304 | 11,143 | 4,263 | 11,708 | 4,435 | 12,957 | 5,274 | 15,404 | 5,854 | 15,072 | 6,307 | 14,394 | 6,830 | 16,001 | 6,761 | 19,059 | 7,527 | 20,266 | 7,246 | 20,036 |
| North America | 2,105 | 1,737 | 2,229 | 1,789 | 2,319 | 1,746 | 2,282 | 1,620 | 2,237 | 1,545 | 2,085 | 1,423 | 1,956 | 1,321 | 1,730 | 1,059 | 1,957 | 1,177 | 1,562 | 922 | 1,403 | 806 | 1,408 | 842 | 1,876 | 1,030 | 1,911 | 966 | 2,192 | 1,102 | 2,544 | 1,243 | 2,670 | 1,208 | 2,994 | 1,345 | 3,012 | 1,293 | 3,350 | 1,386 | 3,224 | 1,359 |
| Canada | 79 | 69 | 94 | 92 | 86 | 62 | 92 | 64 | 115 | 71 | 95 | 70 | 94 | 69 | 87 | 54 | 90 | 65 | 78 | 56 | 53 | 52 | 65 | 52 | 80 | 69 | 88 | 48 | 111 | 57 | 111 | 74 | 137 | 73 | 145 | 70 | 153 | 70 | 184 | 73 | 161 | 63 |
| Mexico | 4 | 3 | 3 | 1 | 5 | 2 | 5 | 2 | 6 | 3 | 3 | 3 | 5 | 5 | 7 | 5 | 2 | 1 | 4 | 2 | 6 | 3 | 1 | 0 | 3 | 1 | 2 | 2 | 3 | 1 | 4 | 2 | 8 | 6 | 8 | 4 | 10 | 10 | 12 | 10 | 19 | 16 |
| Puerto Rico | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 |
| United States | 2,022 | 1,665 | 2,133 | 1,696 | 2,226 | 1,683 | 2,185 | 1,553 | 2,116 | 1,471 | 1,986 | 1,350 | 1,857 | 1,247 | 1,637 | 1,000 | 1,863 | 1,110 | 1,480 | 864 | 1,344 | 750 | 1,342 | 789 | 1,792 | 960 | 1,821 | 916 | 2,076 | 1,045 | 2,429 | 1,168 | 2,523 | 1,129 | 2,840 | 1,271 | 2,848 | 1,213 | 3,152 | 1,303 | 3,043 | 1,280 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Central and South America | 12 | 7 | 11 | 6 | 12 | 16 | 14 | 12 | 8 | 8 | 13 | 9 | 15 | 10 | 6 | 6 | 14 | 10 | 8 | 7 | 6 | 11 | 8 | 29 | 7 | 47 | 9 | 36 | 17 | 21 | 21 | 28 | 14 | 17 | 22 | 27 | 25 | 32 | 25 | 23 | 22 | 38 |
| Argentina | 1 | 1 | 3 | 2 | 4 | 3 | 2 | 0 | 0 | 2 | 2 | 0 | 1 | 0 | 2 | 0 | 1 | 1 | 1 | 2 | 2 | 3 | 1 | 0 | 2 | 2 | 1 | 4 | 2 | 0 | 2 | 1 | 2 | 0 | 3 | 0 | 3 | 1 | 0 | 1 | 1 | 0 |
| Brazil | 9 | 3 | 7 | 2 | 4 | 10 | 10 | 9 | 6 | 3 | 10 | 9 | 14 | 9 | 4 | 5 | 7 | 6 | 5 | 4 | 3 | 6 | 4 | 27 | 2 | 43 | 7 | 32 | 14 | 20 | 15 | 25 | 9 | 16 | 15 | 25 | 18 | 29 | 22 | 22 | 18 | 37 |
| All others | 3 | 3 | 1 | 3 | 4 | 3 | 2 | 3 | 2 | 3 | 1 | 1 | 1 | 0 | 1 | 1 | 5 | 3 | 2 | 1 | 2 | 1 | 3 | 2 | 3 | 2 | 4 | 1 | 2 | 1 | 4 | 2 | 3 | 1 | 3 | 2 | 4 | 2 | 4 | 1 | 3 | 1 |
| Europe | 1,054 | 3,091 | 1,097 | 3,066 | 1,269 | 2,960 | 1,342 | 2,789 | 1,319 | 2,859 | 1,157 | 3,030 | 1,082 | 3,510 | 959 | 3,162 | 1,004 | 3,191 | 841 | 2,903 | 836 | 2,882 | 819 | 2,876 | 1,082 | 2,738 | 1,144 | 2,473 | 1,419 | 3,036 | 1,556 | 2,779 | 1,680 | 2,965 | 1,773 | 3,171 | 1,746 | 3,257 | 1,926 | 3,679 | 1,799 | 3,658 |
| EU 28 | 997 | 2,369 | 1,056 | 2,433 | 1,209 | 2,392 | 1,282 | 2,232 | 1,263 | 2,201 | 1,105 | 2,176 | 1,046 | 2,499 | 927 | 2,422 | 963 | 2,327 | 810 | 2,119 | 807 | 2,098 | 789 | 2,047 | 1,039 | 1,974 | 1,084 | 1,866 | 1,359 | 2,245 | 1,478 | 2,057 | 1,592 | 2,178 | 1,678 | 2,346 | 1,672 | 2,443 | 1,834 | 2,778 | 1,711 | 2,662 |
| Austria | 22 | 54 | 20 | 48 | 22 | 51 | 28 | 54 | 28 | 38 | 28 | 39 | 17 | 39 | 28 | 82 | 14 | 42 | 17 | 56 | 22 | 58 | 32 | 69 | 29 | 75 | 41 | 87 | 46 | 88 | 58 | 61 | 52 | 79 | 45 | 61 | 58 | 85 | 62 | 102 |
| Belgium | 12 | 11 | 12 | 5 | 12 | 6 | 10 | 9 | 11 | 12 | 9 | 7 | 10 | 14 | 11 | 30 | 16 | 25 | 12 | 16 | 10 | 16 | 9 | 17 | 12 | 24 | 10 | 13 | 16 | 9 | 16 | 18 | 13 | 16 | 12 | 23 | 11 | 26 | 12 | 37 | 17 | 26 |
| Denmark | 15 | 10 | 10 | 13 | 13 | 22 | 14 | 17 | 12 | 25 | 11 | 24 | 14 | 14 | 11 | 30 | 16 | 25 | 12 | 16 | 10 | 19 | 4 | 17 | 17 | 17 | 16 | 13 | 21 | 14 | 24 | 20 | 26 | 16 | 23 | 30 | 35 | 18 | 31 | 26 | 28 | 29 |
| Finland | 10 | 29 | 11 | 24 | 13 | 23 | 19 | 21 | 14 | 20 | 13 | 29 | 13 | 25 | 7 | 38 | 9 | 21 | 5 | 17 | 4 | 32 | 3 | 23 | 11 | 22 | 3 | 23 | 11 | 21 | 25 | 15 | 3 | 25 | 15 | 39 | 19 | 32 | 24 | 28 | 19 | 29 |
| France | 160 | 560 | 148 | 492 | 157 | 509 | 159 | 542 | 154 | 470 | 137 | 451 | 115 | 482 | 107 | 375 | 111 | 516 | 80 | 521 | 83 | 554 | 87 | 565 | 117 | 461 | 124 | 379 | 161 | 532 | 154 | 477 | 204 | 540 | 243 | 644 | 209 | 673 | 259 | 668 | 226 | 706 |
| Germany | 512 | 967 | 598 | 920 | 677 | 900 | 743 | 940 | 707 | 947 | 651 | 1,014 | 605 | 991 | 554 | 1,209 | 561 | 1,200 | 471 | 1,037 | 491 | 948 | 463 | 907 | 604 | 856 | 637 | 746 | 785 | 968 | 874 | 897 | 869 | 972 | 897 | 1,010 | 859 | 1,025 | 936 | 1,009 | 811 | 1,061 |
| Hungary | 0 | 7 | 0 | 4 | 1 | 6 | 3 | 7 | 2 | 11 | 2 | 4 | 1 | 2 | 1 | 10 | 3 | 4 | 1 | 5 | 0 | 5 | 2 | 2 | 3 | 4 | 2 | 5 | 4 | 8 | 6 | 2 | 2 | 8 | 1 | 6 | 3 | 7 | 3 | 7 | 3 | 6 |
| Ireland | 0 | 4 | 2 | 3 | 1 | 1 | 3 | 1 | 3 | 0 | 2 | 1 | 3 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 2 | 1 | 3 | 3 | 3 | 1 | 4 | 3 | 4 | 5 | 8 | 8 | 8 | 1 | 7 | 3 | 5 | 1 |
| Italy | 41 | 224 | 45 | 404 | 64 | 385 | 61 | 197 | 68 | 189 | 50 | 147 | 61 | 393 | 47 | 200 | 44 | 34 | 51 | 32 | 43 | 42 | 49 | 40 | 61 | 100 | 66 | 116 | 84 | 110 | 103 | 40 | 103 | 34 | 99 | 26 | 118 | 32 | 315 | 123 | 123 | 227 |
| Netherlands | 24 | 83 | 24 | 91 | 24 | 90 | 26 | 99 | 30 | 76 | 28 | 76 | 32 | 99 | 25 | 76 | 24 | 63 | 24 | 70 | 15 | 61 | 14 | 71 | 20 | 65 | 29 | 72 | 36 | 66 | 37 | 77 | 43 | 82 | 41 | 56 | 60 | 81 | 57 | 86 | 58 | 42 |
| Spain | 19 | 48 | 8 | 64 | 7 | 57 | 12 | 43 | 14 | 32 | 9 | 51 | 10 | 50 | 7 | 64 | 6 | 60 | 4 | 84 | 9 | 60 | 7 | 68 | 8 | 54 | 13 | 68 | 12 | 82 | 13 | 78 | 19 | 105 | 19 | 82 | 16 | 64 | 14 | 69 | 21 | 50 |
| Sweden | 52 | 111 | 53 | 148 | 81 | 92 | 62 | 91 | 57 | 110 | 37 | 133 | 42 | 160 | 37 | 104 | 40 | 92 | 50 | 75 | 41 | 92 | 28 | 92 | 22 | 81 | 37 | 77 | 57 | 73 | 57 | 55 | 78 | 36 | 65 | 66 | 66 | 73 | 96 | 105 | 79 | 83 |
| United Kingdom | 127 | 87 | 118 | 91 | 132 | 107 | 142 | 86 | 157 | 126 | 119 | 87 | 103 | 128 | 91 | 138 | 95 | 114 | 80 | 85 | 80 | 89 | 83 | 69 | 111 | 99 | 104 | 137 | 128 | 134 | 125 | 139 | 148 | 108 | 169 | 132 | 183 | 138 | 177 | 140 | 222 | 115 |
| All others | 4 | 173 | 6 | 127 | 5 | 143 | 2 | 126 | 5 | 134 | 9 | 92 | 8 | 102 | 5 | 121 | 5 | 96 | 7 | 118 | 4 | 130 | 7 | 122 | 7 | 135 | 8 | 136 | 9 | 125 | 12 | 146 | 14 | 174 | 22 | 156 | 26 | 218 | 34 | 222 | 27 | 184 |
| Other Europe | 56 | 722 | 40 | 633 | 61 | 569 | 60 | 557 | 56 | 658 | 53 | 854 | 36 | 1,010 | 33 | 740 | 41 | 865 | 32 | 785 | 29 | 783 | 30 | 830 | 43 | 764 | 61 | 607 | 60 | 792 | 79 | 722 | 88 | 767 | 96 | 825 | 74 | 814 | 92 | 900 | 88 | 996 |
| Former Soviet Union | 1 | 23 | 1 | 6 | 1 | 15 | 2 | 20 | 1 | 42 | 1 | 86 | 1 | 258 | 1 | 72 | 0 | 59 | 1 | 105 | 0 | 100 | 0 | 87 | 0 | 93 | 0 | 67 | 0 | 33 | 1 | 26 | 2 | 54 | 0 | 51 | 1 | 47 | 0 | 58 | 1 | 39 |
| Norway | 16 | 23 | 13 | 39 | 7 | 25 | 11 | 37 | 12 | 34 | 16 | 24 | 10 | 17 | 15 | 25 | 16 | 56 | 9 | 33 | 7 | 29 | 9 | 24 | 15 | 43 | 19 | 30 | 17 | 33 | 15 | 26 | 29 | 37 | 23 | 31 | 20 | 43 | 28 | 35 | 24 | 40 |
| Russia | 3 | 625 | 3 | 536 | 4 | 480 | 5 | 467 | 2 | 550 | 2 | 688 | 4 | 699 | 0 | 602 | 3 | 695 | 4 | 606 | 2 | 609 | 1 | 674 | 1 | 588 | 6 | 464 | 6 | 640 | 10 | 579 | 8 | 652 | 7 | 698 | 4 | 685 | 6 | 771 | 6 | 867 |
| Switzerland | 35 | 49 | 23 | 39 | 46 | 46 | 41 | 29 | 39 | 29 | 31 | 51 | 18 | 32 | 16 | 41 | 20 | 54 | 18 | 40 | 20 | 41 | 18 | 39 | 25 | 38 | 35 | 39 | 34 | 37 | 39 | 57 | 38 | 42 | 39 | 57 | 38 | 43 | 36 | 50 | 32 | 51 | 42 |
| All others | 1 | 3 | 0 | 2 | 2 | 3 | 1 | 4 | 2 | 2 | 2 | 5 | 3 | 4 | 1 | 1 | 2 | 0 | 1 | 1 | 0 | 5 | 2 | 5 | 3 | 2 | 1 | 8 | 3 | 9 | 3 | 5 | 8 | 5 | 8 | 7 | 6 | 4 | 8 | 5 | 7 | 9 |
| Asia | 1,038 | 3,920 | 1,173 | 5,435 | 1,169 | 3,912 | 1,197 | 3,486 | 1,340 | 3,363 | 1,318 | 4,408 | 1,168 | 4,351 | 1,020 | 5,405 | 1,146 | 5,735 | 1,047 | 6,517 | 1,003 | 7,130 | 1,032 | 7,332 | 1,256 | 7,819 | 1,327 | 9,393 | 1,592 | 11,143 | 1,676 | 10,940 | 1,868 | 10,113 | 1,964 | 11,362 | 1,888 | 14,402 | 2,130 | 15,107 | 2,108 | 14,936 |

**TABLE 5B-35**

## USPTO patents and patent families granted in mechanical elements, by region, country, or economy: 1998–2018

(Number)

| | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Region, country, or economy | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| China | 2 | 26 | 5 | 42 | 9 | 52 | 11 | 107 | 6 | 93 | 11 | 175 | 11 | 159 | 13 | 253 | 11 | 311 | 11 | 516 | 18 | 835 | 15 | 1,186 | 39 | 1,344 | 57 | 1,842 | 89 | 2,836 | 113 | 2,761 | 90 | 2,683 | 121 | 5,698 | 126 | 7,539 | 179 | 7,944 | 177 | 8,058 |
| India | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 2 | 2 | 0 | 5 | 0 | 1 | 0 | 3 | 1 | 2 | 1 | 1 | 1 | 4 | 1 | 6 | 1 | 6 | 5 | 10 | 7 | 14 | 13 | 17 | 14 | 24 | 16 | 20 | 8 | 31 | 18 | 34 | 16 |
| Japan | 862 | 3,382 | 975 | 3,895 | 1,010 | 3,041 | 1,010 | 2,655 | 1,101 | 2,606 | 1,098 | 3,259 | 965 | 3,264 | 820 | 3,547 | 943 | 3,442 | 822 | 4,201 | 753 | 4,760 | 761 | 4,885 | 936 | 5,100 | 999 | 5,872 | 1,163 | 6,158 | 1,192 | 5,421 | 1,276 | 4,708 | 1,286 | 3,595 | 1,239 | 4,269 | 1,314 | 4,171 | 1,330 | 3,872 |
| Malaysia | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 2 | 1 | 2 | 0 | 5 | 3 | 12 | 2 | 2 | 1 | 5 | 1 | 13 | 2 | 3 | 2 | 7 | 2 | 6 | 2 | 2 | 1 | 2 | 2 | 1 | 2 | 9 | 2 | 11 |
| Singapore | 1 | 3 | 1 | 1 | 1 | 1 | 0 | 1 | 3 | 2 | 4 | 4 | 3 | 1 | 2 | 0 | 2 | 1 | 1 | 2 | 0 | 1 | 3 | 1 | 1 | 2 | 2 | 3 | 4 | 2 | 2 | 1 | 3 | 7 | 3 | 5 | 3 | 5 | 3 | 4 | 1 | 1 |
| South Korea | 85 | 407 | 93 | 1,383 | 52 | 696 | 53 | 563 | 83 | 496 | 68 | 789 | 52 | 750 | 56 | 1,371 | 55 | 1,620 | 78 | 1,510 | 89 | 1,292 | 95 | 934 | 127 | 1,024 | 108 | 1,357 | 131 | 1,782 | 148 | 2,230 | 230 | 2,281 | 271 | 1,634 | 286 | 2,023 | 406 | 2,501 | 380 | 2,651 |
| Taiwan | 87 | 99 | 97 | 111 | 94 | 119 | 119 | 155 | 143 | 162 | 135 | 180 | 130 | 170 | 127 | 230 | 132 | 353 | 128 | 271 | 137 | 234 | 153 | 315 | 144 | 331 | 154 | 310 | 191 | 349 | 204 | 504 | 247 | 418 | 250 | 411 | 207 | 555 | 191 | 460 | 179 | 326 |
| All others | 1 | 3 | 1 | 3 | 2 | 2 | 3 | 5 | 2 | 1 | 0 | 0 | 1 | 5 | 0 | 2 | 0 | 4 | 0 | 5 | 2 | 4 | 0 | 5 | 3 | 4 | 1 | 1 | 2 | 3 | 1 | 4 | 4 | 3 | 4 | 4 | 3 | 3 | 2 | 1 | 3 | 1 |
| Middle East | 8 | 5 | 16 | 8 | 12 | 8 | 15 | 9 | 11 | 8 | 11 | 8 | 7 | 7 | 6 | 7 | 10 | 9 | 5 | 9 | 7 | 15 | 12 | 6 | 12 | 10 | 16 | 12 | 16 | 22 | 16 | 7 | 33 | 13 | 33 | 15 | 40 | 11 | 47 | 23 | 35 | 18 |
| Israel | 8 | 4 | 13 | 6 | 12 | 5 | 15 | 5 | 10 | 5 | 11 | 2 | 7 | 3 | 4 | 2 | 8 | 3 | 5 | 3 | 4 | 3 | 10 | 3 | 11 | 5 | 12 | 5 | 11 | 4 | 9 | 1 | 21 | 6 | 26 | 7 | 29 | 5 | 32 | 12 | 23 | 8 |
| All others | 0 | 0 | 3 | 2 | 0 | 4 | 1 | 4 | 1 | 4 | 0 | 5 | 0 | 4 | 2 | 5 | 1 | 6 | 0 | 5 | 3 | 12 | 2 | 3 | 1 | 5 | 4 | 6 | 5 | 18 | 7 | 6 | 12 | 7 | 8 | 9 | 11 | 6 | 15 | 11 | 11 | 10 |
| Africa | 2 | 30 | 1 | 21 | 3 | 17 | 3 | 17 | 2 | 22 | 3 | 15 | 5 | 15 | 3 | 13 | 5 | 11 | 4 | 8 | 5 | 14 | 5 | 12 | 7 | 12 | 2 | 8 | 1 | 17 | 6 | 12 | 4 | 10 | 3 | 1 | 5 | 3 | 4 | 2 | 4 | 0 |
| South Africa | 2 | 21 | 1 | 13 | 3 | 7 | 3 | 14 | 2 | 11 | 3 | 4 | 5 | 12 | 2 | 9 | 5 | 10 | 4 | 5 | 5 | 13 | 5 | 11 | 5 | 6 | 1 | 1 | 1 | 4 | 6 | 4 | 3 | 8 | 3 | 1 | 4 | 0 | 4 | 0 | 3 | 0 |
| All others | 0 | 9 | 0 | 7 | 0 | 10 | 0 | 3 | 0 | 11 | 1 | 11 | 0 | 3 | 0 | 3 | 0 | 1 | 0 | 3 | 0 | 1 | 0 | 1 | 2 | 6 | 1 | 8 | 1 | 7 | 8 | 1 | 1 | 2 | 0 | 1 | 0 | 3 | 0 | 2 | 1 | 0 |
| Australia and Oceania | 23 | 28 | 28 | 24 | 25 | 26 | 33 | 46 | 27 | 24 | 24 | 20 | 28 | 46 | 29 | 46 | 26 | 37 | 23 | 36 | 20 | 38 | 19 | 46 | 23 | 51 | 25 | 67 | 36 | 61 | 34 | 64 | 37 | 69 | 39 | 79 | 44 | 60 | 42 | 45 | 50 | 28 |
| Australia | 20 | 28 | 25 | 24 | 24 | 26 | 28 | 46 | 23 | 24 | 20 | 19 | 26 | 46 | 23 | 45 | 23 | 35 | 19 | 35 | 14 | 37 | 14 | 46 | 19 | 50 | 23 | 66 | 31 | 60 | 27 | 62 | 31 | 66 | 33 | 78 | 33 | 58 | 33 | 45 | 36 | 26 |
| New Zealand | 3 | 0 | 3 | 0 | 1 | 0 | 4 | 0 | 4 | 1 | 4 | 0 | 2 | 0 | 7 | 1 | 3 | 2 | 4 | 1 | 5 | 1 | 5 | 1 | 4 | 1 | 2 | 1 | 5 | 1 | 7 | 2 | 7 | 2 | 5 | 1 | 11 | 2 | 8 | 0 | 14 | 2 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| Unclassified | 0 | 24 | 0 | 35 | 1 | 31 | 1 | 4 | 0 | 4 | 0 | 2 | 0 | 8 | 0 | 78 | 0 | 66 | 0 | 4 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 3 | 1 | 3 | 1 |

EU = European Union; USPTO = U.S. Patent and Trademark Office.

**Note(s)**

USPTO patents are allocated according to patent inventorship information. USPTO patents are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named inventors. Patents are classified under the World Intellectual Property Organization (WIPO) classification of patents, which classifies International Patent Classification (IPC) codes under 35 technical fields. IPC reformed codes take into account changes that were made to the WIPO classification in 2006 under the eighth version of the classification and were used to prepare these data. However, because PatentsView only provides the original IPC codes as they appeared on patents and not the IPC reformed codes, current Cooperative Patent Classification codes on patents were converted back to the most recent IPC classification to prepare these statistics. Fractional counts of patents were assigned to each technological field on patents to assign the proper weight of a patent to the corresponding technological fields under the classification. International Patent Documentation (INPADOC) patent families across all patent offices covered in the Worldwide Patent Statistical Database (PATSTAT) are counted according to the year of the first granted patent in the patent family. Patent families are allocated according to patent inventorship information found on the priority patent of the INPADOC patent families. To account for missing ownership information in PATSTAT for some offices, a method designed by de Rassenfosse et al. (2012) is used to fill in missing information on priority patents using information in successive filings within the patent families (see technical documentation for details). Patent families are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named inventors. Because of data coverage issues for some patent offices in PATSTAT, statistics for some countries may be underestimated partially for some years or across the whole trend. Countries with identified issues include India (missing data) and South Africa (no data for 2018). For Italy, because of data gaps regarding information on granted patents, patent applications are used instead, which slightly overestimates Italy's output and creates a small shift in the year for which its output is accounted. The EU includes 28 member countries. China includes Hong Kong.

**Source(s)**

Science-Metrix; PATSTAT, accessed April 2019; PatentsView, USPTO, accessed June 2019.

TABLE SB-36

## USPTO patents and patent families granted in transport, by region, country, or economy: 1998–2018

(Number)

| Region, country, or economy | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| World | 6,281 | 14,405 | 6,419 | 17,059 | 7,211 | 13,912 | 7,863 | 12,766 | 7,731 | 12,926 | 7,414 | 14,955 | 7,057 | 15,465 | 6,515 | 17,704 | 7,009 | 17,662 | 6,357 | 18,552 | 6,142 | 19,188 | 6,030 | 18,349 | 7,791 | 19,373 | 7,649 | 19,728 | 8,620 | 22,983 | 9,892 | 25,651 | 11,027 | 25,612 | 12,012 | 25,116 | 12,112 | 30,954 | 13,391 | 32,862 | 13,400 | 32,571 |
| North America | 3,629 | 3,110 | 3,555 | 2,749 | 4,014 | 3,047 | 4,112 | 2,932 | 3,901 | 2,640 | 3,808 | 2,385 | 3,636 | 2,277 | 3,426 | 2,033 | 3,665 | 1,981 | 3,287 | 1,768 | 3,016 | 1,565 | 2,912 | 1,482 | 3,749 | 1,819 | 3,603 | 1,555 | 3,936 | 1,675 | 4,410 | 1,833 | 4,792 | 1,976 | 5,238 | 2,320 | 5,435 | 2,494 | 6,065 | 2,834 | 6,230 | 3,032 |
| Canada | 160 | 151 | 152 | 137 | 179 | 157 | 188 | 148 | 174 | 131 | 208 | 126 | 213 | 122 | 184 | 116 | 200 | 112 | 170 | 111 | 168 | 112 | 164 | 112 | 186 | 85 | 195 | 99 | 191 | 99 | 231 | 99 | 237 | 102 | 247 | 108 | 233 | 112 | 274 | 113 | 297 | 126 |
| Mexico | 4 | 3 | 1 | 1 | 4 | 3 | 10 | 8 | 4 | 4 | 4 | 4 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 5 | 4 | 2 | 0 | 6 | 1 | 5 | 2 | 3 | 2 | 9 | 5 | 13 | 5 | 21 | 12 | 19 | 23 | 53 | 55 | 86 | 82 |
| Puerto Rico | 1 | 1 | 1 | 0 | 3 | 0 | 1 | 0 | 1 | 0 | 4 | 0 | 1 | 0 | 3 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 1 | 0 | 2 | 0 | 2 | 0 | 4 | 0 |
| United States | 3,465 | 2,956 | 3,400 | 2,611 | 3,828 | 2,887 | 3,913 | 2,775 | 3,722 | 2,505 | 3,592 | 2,257 | 3,419 | 2,152 | 3,236 | 1,915 | 3,462 | 1,866 | 3,114 | 1,656 | 2,843 | 1,449 | 2,746 | 1,371 | 3,557 | 1,733 | 3,404 | 1,454 | 3,741 | 1,575 | 4,167 | 1,729 | 4,542 | 1,869 | 4,969 | 2,200 | 5,179 | 2,359 | 5,737 | 2,667 | 5,842 | 2,824 |
| All others | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Central and South America | 10 | 4 | 11 | 5 | 11 | 10 | 16 | 13 | 13 | 11 | 23 | 13 | 14 | 13 | 6 | 8 | 9 | 9 | 9 | 7 | 9 | 14 | 4 | 23 | 13 | 29 | 20 | 40 | 12 | 42 | 20 | 30 | 22 | 31 | 21 | 28 | 27 | 37 | 37 | 25 | 35 | 32 |
| Argentina | 2 | 0 | 1 | 0 | 1 | 0 | 4 | 2 | 2 | 0 | 3 | 2 | 2 | 1 | 0 | 0 | 1 | 1 | 2 | 0 | 3 | 1 | 0 | 0 | 1 | 1 | 1 | 2 | 1 | 1 | 2 | 3 | 1 | 1 | 1 | 1 | 1 | 3 | 0 | 0 | 3 | 2 |
| Brazil | 8 | 2 | 4 | 1 | 8 | 7 | 7 | 7 | 9 | 9 | 15 | 8 | 7 | 8 | 4 | 4 | 6 | 6 | 5 | 5 | 6 | 5 | 12 | 2 | 10 | 27 | 17 | 39 | 8 | 38 | 15 | 25 | 16 | 26 | 16 | 27 | 20 | 31 | 22 | 33 | 25 | 70 |
| All others | 0 | 2 | 6 | 5 | 2 | 3 | 5 | 5 | 2 | 2 | 1 | 3 | 5 | 4 | 1 | 3 | 3 | 3 | 3 | 1 | 2 | 1 | 2 | 2 | 3 | 1 | 3 | 0 | 3 | 3 | 4 | 2 | 5 | 4 | 4 | 1 | 6 | 2 | 4 | 2 | 4 | 2 |
| Europe | 1,232 | 4,528 | 1,312 | 4,257 | 1,569 | 4,542 | 1,896 | 4,067 | 1,860 | 4,193 | 1,791 | 4,434 | 1,576 | 5,066 | 1,331 | 5,128 | 1,400 | 5,324 | 1,239 | 5,147 | 1,231 | 5,147 | 1,192 | 5,377 | 1,610 | 5,192 | 1,657 | 4,333 | 2,031 | 5,011 | 2,451 | 4,963 | 2,612 | 5,306 | 2,869 | 5,237 | 2,668 | 5,374 | 2,935 | 6,233 | 2,769 | 6,559 |
| EU 28 | 1,182 | 3,678 | 1,265 | 3,515 | 1,518 | 3,901 | 1,843 | 3,469 | 1,804 | 3,499 | 1,737 | 3,536 | 1,535 | 3,992 | 1,296 | 4,144 | 1,364 | 4,291 | 1,209 | 4,222 | 1,204 | 4,106 | 1,156 | 4,227 | 1,563 | 4,114 | 1,603 | 3,529 | 1,977 | 4,042 | 2,376 | 3,925 | 2,524 | 4,186 | 2,778 | 3,959 | 2,588 | 4,422 | 2,846 | 5,130 | 2,690 | 5,242 |
| Austria | 11 | 86 | 19 | 79 | 25 | 84 | 23 | 70 | 25 | 50 | 30 | 68 | 29 | 82 | 17 | 51 | 13 | 62 | 26 | 60 | 41 | 72 | 36 | 63 | 34 | 72 | 36 | 63 | 34 | 83 | 51 | 94 | 38 | 83 | 44 | 99 | 50 | 98 | 48 | 96 | 63 | 129 |
| Belgium | 17 | 22 | 14 | 15 | 17 | 16 | 19 | 17 | 19 | 20 | 30 | 10 | 20 | 7 | 21 | 19 | 17 | 31 | 15 | 28 | 13 | 19 | 17 | 25 | 20 | 14 | 26 | 24 | 32 | 21 | 42 | 16 | 41 | 23 | 44 | 17 | 54 | 32 | 59 | 34 | 37 | 56 |
| Denmark | 7 | 14 | 7 | 4 | 11 | 9 | 13 | 10 | 15 | 10 | 11 | 13 | 6 | 13 | 3 | 13 | 5 | 8 | 5 | 18 | 3 | 13 | 7 | 15 | 10 | 11 | 10 | 10 | 9 | 9 | 12 | 20 | 10 | 9 | 21 | 24 | 19 | 19 | 22 | 20 | 17 | 20 |
| Finland | 14 | 36 | 10 | 27 | 14 | 18 | 11 | 25 | 14 | 51 | 12 | 48 | 13 | 39 | 10 | 45 | 18 | 20 | 11 | 17 | 7 | 24 | 7 | 17 | 9 | 22 | 7 | 31 | 12 | 24 | 12 | 39 | 16 | 40 | 16 | 57 | 17 | 36 | 27 | 46 | 21 | 38 |
| France | 194 | 1,010 | 208 | 960 | 239 | 994 | 239 | 933 | 260 | 867 | 260 | 1,013 | 254 | 910 | 206 | 808 | 211 | 1,366 | 209 | 1,348 | 197 | 1,451 | 176 | 1,943 | 260 | 1,653 | 289 | 1,324 | 387 | 1,628 | 452 | 1,486 | 545 | 1,548 | 533 | 1,549 | 466 | 1,724 | 548 | 1,763 | 526 | 1,830 |
| Germany | 680 | 1,377 | 750 | 1,162 | 888 | 1,429 | 1,147 | 1,394 | 1,084 | 1,403 | 1,029 | 1,460 | 893 | 1,536 | 694 | 2,031 | 737 | 1,991 | 653 | 1,930 | 668 | 1,651 | 637 | 1,361 | 874 | 1,419 | 852 | 1,044 | 1,020 | 1,253 | 1,260 | 1,324 | 1,279 | 1,563 | 1,465 | 1,333 | 1,304 | 1,500 | 1,426 | 1,668 | 1,300 | 1,724 |
| Hungary | 2 | 6 | 1 | 2 | 1 | 4 | 4 | 7 | 3 | 9 | 0 | 8 | 3 | 6 | 1 | 10 | 3 | 10 | 1 | 10 | 1 | 11 | 2 | 8 | 3 | 10 | 3 | 12 | 5 | 7 | 7 | 10 | 4 | 13 | 6 | 10 | 11 | 6 | 5 | 11 | 5 | 13 |
| Ireland | 2 | 5 | 4 | 4 | 4 | 5 | 5 | 4 | 4 | 2 | 3 | 3 | 3 | 2 | 1 | 6 | 2 | 3 | 0 | 4 | 0 | 6 | 1 | 4 | 2 | 0 | 5 | 3 | 5 | 1 | 4 | 7 | 3 | 5 | 1 | 4 | 7 | 7 | 10 | 3 | 10 | 4 |
| Italy | 60 | 401 | 59 | 526 | 69 | 612 | 82 | 250 | 250 | 78 | 244 | 96 | 173 | 85 | 554 | 80 | 288 | 100 | 52 | 74 | 75 | 82 | 90 | 73 | 89 | 81 | 157 | 100 | 193 | 129 | 142 | 162 | 64 | 155 | 63 | 171 | 48 | 145 | 65 | 65 | 137 | 166 |
| Netherlands | 15 | 147 | 15 | 159 | 27 | 195 | 29 | 174 | 47 | 167 | 30 | 139 | 24 | 177 | 26 | 164 | 23 | 141 | 25 | 149 | 28 | 158 | 30 | 134 | 25 | 151 | 29 | 154 | 38 | 142 | 48 | 155 | 58 | 129 | 54 | 112 | 61 | 128 | 60 | 149 | 58 | 98 |
| Spain | 20 | 102 | 14 | 106 | 15 | 94 | 14 | 110 | 24 | 59 | 17 | 103 | 12 | 101 | 21 | 148 | 29 | 119 | 34 | 190 | 22 | 122 | 38 | 124 | 38 | 140 | 32 | 177 | 45 | 170 | 46 | 208 | 47 | 238 | 47 | 161 | 45 | 193 | 49 | 169 | 44 | 192 |
| Sweden | 49 | 172 | 57 | 178 | 56 | 153 | 68 | 124 | 83 | 175 | 82 | 171 | 72 | 251 | 46 | 198 | 57 | 158 | 47 | 122 | 69 | 161 | 53 | 136 | 72 | 179 | 72 | 139 | 75 | 176 | 93 | 144 | 96 | 130 | 119 | 150 | 119 | 163 | 126 | 226 | 112 | 243 |
| United Kingdom | 106 | 142 | 105 | 141 | 139 | 139 | 180 | 191 | 137 | 222 | 120 | 171 | 112 | 204 | 121 | 174 | 116 | 161 | 96 | 111 | 78 | 120 | 87 | 118 | 114 | 107 | 118 | 174 | 169 | 174 | 165 | 177 | 202 | 184 | 157 | 225 | 209 | 249 | 176 | 261 | 239 | 283 |
| All others | 6 | 159 | 3 | 152 | 14 | 150 | 8 | 160 | 11 | 179 | 16 | 144 | 15 | 142 | 19 | 174 | 15 | 153 | 19 | 172 | 19 | 196 | 15 | 196 | 14 | 179 | 23 | 181 | 18 | 212 | 23 | 182 | 31 | 193 | 31 | 185 | 41 | 276 | 45 | 267 | 48 | 251 |
| Other Europe | 49 | 850 | 47 | 741 | 51 | 640 | 53 | 598 | 56 | 694 | 54 | 899 | 41 | 1,074 | 35 | 984 | 36 | 1,033 | 29 | 925 | 26 | 1,041 | 36 | 1,149 | 47 | 1,078 | 54 | 804 | 54 | 969 | 74 | 1,038 | 88 | 1,121 | 91 | 1,278 | 80 | 951 | 89 | 1,103 | 79 | 1,318 |
| Former Soviet Union | 2 | 18 | 0 | 12 | 1 | 21 | 1 | 23 | 2 | 39 | 1 | 85 | 1 | 234 | 0 | 100 | 0 | 47 | 0 | 97 | 0 | 124 | 0 | 108 | 19 | 21 | 19 | 106 | 0 | 87 | 0 | 61 | 6 | 86 | 3 | 87 | 1 | 86 | 1 | 60 | 0 | 63 |
| Norway | 15 | 48 | 22 | 31 | 20 | 37 | 21 | 47 | 22 | 46 | 16 | 39 | 15 | 35 | 26 | 19 | 39 | 12 | 40 | 9 | 5 | 25 | 17 | 28 | 19 | 21 | 19 | 33 | 21 | 51 | 16 | 81 | 25 | 40 | 23 | 73 | 26 | 49 | 23 | 41 | 24 | 42 |
| Russia | 6 | 755 | 6 | 661 | 3 | 553 | 1 | 492 | 3 | 568 | 5 | 739 | 5 | 780 | 0 | 809 | 3 | 900 | 2 | 753 | 4 | 844 | 2 | 962 | 1 | 903 | 4 | 634 | 4 | 812 | 4 | 872 | 1 | 946 | 9 | 1,076 | 4 | 764 | 6 | 958 | 7 | 1,165 |
| Switzerland | 23 | 25 | 16 | 34 | 25 | 28 | 29 | 35 | 24 | 38 | 27 | 29 | 18 | 33 | 12 | 32 | 18 | 42 | 16 | 41 | 14 | 39 | 15 | 48 | 23 | 39 | 24 | 44 | 24 | 33 | 45 | 35 | 50 | 40 | 42 | 30 | 39 | 36 | 49 | 39 | 33 | 34 |
| All others | 3 | 3 | 3 | 4 | 2 | 2 | 2 | 2 | 2 | 6 | 4 | 7 | 1 | 1 | 3 | 4 | 4 | 4 | 3 | 5 | 2 | 9 | 2 | 11 | 3 | 10 | 6 | 5 | 5 | 7 | 9 | 15 | 12 | 9 | 16 | 11 | 9 | 15 | 11 | 5 | 15 | 15 |
| Asia | 1,346 | 6,640 | 1,478 | 9,888 | 1,548 | 6,143 | 1,780 | 5,635 | 1,901 | 5,974 | 1,721 | 8,020 | 1,769 | 7,842 | 1,686 | 10,190 | 1,869 | 10,178 | 1,746 | 11,515 | 1,824 | 12,357 | 1,863 | 11,355 | 2,337 | 12,209 | 2,281 | 13,681 | 2,559 | 16,105 | 2,900 | 18,689 | 3,470 | 18,148 | 3,761 | 17,387 | 3,841 | 22,901 | 4,210 | 23,636 | 4,221 | 22,797 |

TABLE S8-36

## USPTO patents and patent families granted in transport, by region, country, or economy: 1998–2018

(Number)

| Region, country, or economy | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| China | 2 | 18 | 6 | 34 | 7 | 64 | 11 | 70 | 14 | 87 | 6 | 141 | 11 | 166 | 17 | 183 | 15 | 257 | 13 | 459 | 29 | 775 | 32 | 973 | 28 | 1,251 | 46 | 1,731 | 64 | 2,504 | 111 | 2,850 | 112 | 2,520 | 137 | 5,969 | 156 | 9,098 | 216 | 10,022 | 287 | 10,256 |
| India | 0 | 0 | 1 | 1 | 0 | 0 | 2 | 0 | 0 | 1 | 0 | 0 | 4 | 0 | 4 | 2 | 3 | 1 | 8 | 6 | 3 | 1 | 6 | 2 | 10 | 5 | 6 | 4 | 19 | 10 | 27 | 11 | 19 | 13 | 29 | 18 | 32 | 25 | 55 | 32 | 57 | 35 |
| Japan | 1,092 | 4,134 | 1,248 | 5,052 | 1,280 | 4,292 | 1,458 | 4,419 | 1,545 | 4,403 | 1,423 | 4,743 | 1,458 | 5,026 | 1,402 | 5,365 | 1,530 | 5,293 | 1,459 | 6,958 | 1,531 | 7,708 | 1,551 | 7,995 | 1,953 | 8,158 | 1,876 | 8,711 | 2,031 | 9,432 | 2,258 | 9,878 | 2,720 | 9,408 | 2,856 | 6,456 | 2,791 | 8,293 | 2,987 | 8,112 | 2,959 | 7,555 |
| Malaysia | 0 | 0 | 3 | 0 | 3 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 4 | 1 | 2 | 1 | 5 | 0 | 13 | 0 | 1 | 0 | 6 | 2 | 8 | 2 | 10 | 2 | 4 | 2 | 10 | 2 | 7 | 3 | 8 | 1 | 5 | 4 | 9 | 3 | 8 |
| Singapore | 1 | 1 | 1 | 0 | 3 | 2 | 2 | 3 | 6 | 1 | 2 | 2 | 3 | 2 | 2 | 0 | 1 | 0 | 6 | 2 | 4 | 2 | 2 | 1 | 5 | 2 | 9 | 1 | 4 | 2 | 5 | 0 | 8 | 4 | 8 | 2 | 10 | 3 | 14 | 5 | 5 | 4 |
| South Korea | 76 | 2,289 | 56 | 4,601 | 50 | 1,547 | 70 | 869 | 96 | 1,218 | 73 | 2,850 | 72 | 2,371 | 95 | 4,290 | 121 | 4,154 | 100 | 3,648 | 110 | 3,456 | 125 | 2,012 | 165 | 2,381 | 194 | 2,848 | 218 | 3,679 | 288 | 5,444 | 411 | 5,807 | 529 | 4,476 | 636 | 4,851 | 724 | 4,811 | 693 | 4,451 |
| Taiwan | 171 | 195 | 164 | 199 | 205 | 236 | 234 | 272 | 235 | 260 | 216 | 281 | 219 | 271 | 163 | 344 | 196 | 465 | 160 | 425 | 142 | 408 | 145 | 358 | 166 | 398 | 145 | 370 | 219 | 470 | 209 | 492 | 191 | 385 | 196 | 452 | 208 | 622 | 204 | 639 | 208 | 481 |
| All others | 3 | 4 | 0 | 1 | 1 | 1 | 2 | 1 | 5 | 3 | 2 | 1 | 2 | 2 | 3 | 4 | 3 | 1 | 1 | 3 | 3 | 6 | 4 | 7 | 7 | 6 | 3 | 7 | 1 | 3 | 2 | 4 | 5 | 5 | 3 | 6 | 6 | 4 | 5 | 6 | 8 | 7 |
| Middle East | 16 | 10 | 19 | 10 | 15 | 27 | 13 | 13 | 10 | 14 | 16 | 15 | 9 | 7 | 12 | 13 | 7 | 8 | 19 | 15 | 7 | 11 | 14 | 7 | 19 | 8 | 33 | 12 | 28 | 16 | 42 | 16 | 52 | 18 | 51 | 26 | 60 | 25 | 63 | 29 | 66 | 20 |
| Israel | 12 | 5 | 15 | 6 | 11 | 6 | 12 | 3 | 8 | 6 | 14 | 6 | 8 | 4 | 12 | 3 | 5 | 2 | 14 | 3 | 4 | 1 | 13 | 6 | 18 | 2 | 26 | 4 | 24 | 8 | 28 | 3 | 33 | 6 | 39 | 7 | 51 | 14 | 46 | 14 | 55 | 13 |
| All others | 4 | 6 | 4 | 4 | 4 | 22 | 1 | 10 | 2 | 9 | 2 | 9 | 1 | 3 | 0 | 10 | 2 | 7 | 5 | 11 | 3 | 10 | 2 | 1 | 1 | 6 | 6 | 8 | 4 | 8 | 15 | 13 | 19 | 12 | 12 | 19 | 9 | 11 | 17 | 15 | 10 | 7 |
| Africa | 7 | 32 | 8 | 24 | 9 | 25 | 4 | 22 | 2 | 26 | 4 | 28 | 5 | 22 | 5 | 21 | 8 | 17 | 3 | 16 | 8 | 22 | 4 | 13 | 6 | 21 | 3 | 13 | 2 | 22 | 6 | 15 | 6 | 16 | 3 | 4 | 8 | 7 | 12 | 4 | 14 | 13 |
| South Africa | 7 | 21 | 8 | 18 | 9 | 14 | 4 | 14 | 2 | 16 | 3 | 14 | 5 | 11 | 5 | 18 | 8 | 13 | 3 | 10 | 8 | 19 | 4 | 13 | 5 | 12 | 3 | 5 | 2 | 7 | 5 | 7 | 5 | 9 | 3 | 0 | 7 | 3 | 10 | 3 | 9 | 4 |
| All others | 0 | 10 | 0 | 6 | 0 | 11 | 0 | 8 | 0 | 11 | 1 | 14 | 0 | 12 | 0 | 3 | 0 | 3 | 0 | 7 | 0 | 3 | 0 | 0 | 1 | 9 | 0 | 9 | 0 | 15 | 1 | 10 | 1 | 8 | 1 | 3 | 1 | 4 | 2 | 1 | 5 | 8 |
| Australia and Oceania | 39 | 37 | 34 | 33 | 44 | 38 | 42 | 81 | 43 | 55 | 50 | 59 | 48 | 81 | 47 | 85 | 50 | 96 | 54 | 83 | 47 | 67 | 40 | 90 | 56 | 95 | 52 | 94 | 52 | 110 | 63 | 104 | 71 | 115 | 66 | 114 | 73 | 117 | 80 | 90 | 69 | 77 |
| Australia | 37 | 36 | 28 | 31 | 35 | 37 | 36 | 81 | 39 | 54 | 44 | 58 | 38 | 79 | 37 | 84 | 40 | 93 | 50 | 81 | 39 | 67 | 35 | 90 | 49 | 92 | 45 | 90 | 44 | 107 | 50 | 97 | 55 | 114 | 47 | 112 | 58 | 111 | 56 | 87 | 50 | 74 |
| New Zealand | 3 | 0 | 6 | 2 | 8 | 1 | 6 | 0 | 5 | 1 | 7 | 1 | 10 | 2 | 10 | 1 | 10 | 3 | 4 | 2 | 8 | 0 | 6 | 0 | 7 | 3 | 7 | 3 | 8 | 3 | 13 | 7 | 16 | 1 | 18 | 3 | 15 | 5 | 24 | 3 | 19 | 3 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Unclassified | 1 | 43 | 1 | 92 | 2 | 81 | 0 | 3 | 0 | 12 | 0 | 1 | 0 | 157 | 1 | 225 | 1 | 48 | 0 | 1 | 0 | 3 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 3 | 1 | 1 | 0 | 0 | 2 | 1 | 0 |

EU = European Union; USPTO = U.S. Patent and Trademark Office.

**Note(s)**

USPTO patents are allocated according to patent inventorship information. USPTO patents are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named inventors. Patents are classified under the World Intellectual Property Organization (WIPO) classification of patents, which classifies International Patent Classification (IPC) codes under 35 technical fields. IPC reformed codes take into account changes that were made to the WIPO classification in 2006 under the eighth version of the classification and were used to prepare these data. However, because PatentsView only provides the original IPC codes as they appeared on patents and not the IPC reformed codes, current Cooperative Patent Classification codes on patents were converted back to the most recent IPC classification to prepare these statistics. Fractional counts of patents were assigned to each technological field on patents to assign the proper weight of a patent to the corresponding technological fields under the classification. International Patent Documentation (INPADOC) patent families across all patent offices covered in the Worldwide Patent Statistical Database (PATSTAT) are counted according to the year of the first granted patent in the patent family. Patent families are allocated according to patent inventorship information found on the priority patent of the INPADOC patent families. To account for missing ownership information in PATSTAT for some offices, a method designed by de Rassenfosse et al. (2012) is used to fill in missing information on priority patents using information in successive filings within the patent families (see technical documentation for details). Patent families are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named inventors. Because of data coverage issues for some patent offices in PATSTAT, statistics for some countries may be underestimated partially for some years or across the whole trend. Countries with identified issues include India (missing data) and South Africa (no data for 2018). For Italy, because of data gaps regarding information on granted patents, patent applications are used instead, which slightly overestimates Italy's output and creates a small shift in the year for which its output is accounted. The EU includes 28 member countries. China includes Hong Kong.

**Source(s)**

Science-Metrix; PATSTAT, accessed April 2019; PatentsView, USPTO, accessed June 2019.

TABLE S8-37

## USPTO patents and patent families granted in furniture, games, by region, country, or economy: 1998–2018

(Number)

| Region, country, or economy | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| World | 4,826 | 9,296 | 4,849 | 9,471 | 4,868 | 8,296 | 4,564 | 7,127 | 4,640 | 6,802 | 4,670 | 7,492 | 4,209 | 8,434 | 3,487 | 8,641 | 3,919 | 9,623 | 3,423 | 10,448 | 3,203 | 10,311 | 3,153 | 11,414 | 4,485 | 12,735 | 4,473 | 14,596 | 4,699 | 16,515 | 5,076 | 18,320 | 5,720 | 19,471 | 5,597 | 18,087 | 5,677 | 21,492 | 6,138 | 21,277 | 5,879 | 21,324 |
| North America | 3,570 | 3,015 | 3,619 | 2,831 | 3,592 | 2,666 | 3,227 | 2,193 | 3,256 | 2,072 | 3,202 | 2,048 | 2,903 | 1,813 | 2,426 | 1,481 | 2,783 | 1,568 | 2,427 | 1,350 | 2,228 | 1,157 | 2,201 | 1,220 | 3,127 | 1,518 | 3,107 | 1,365 | 3,143 | 1,365 | 3,456 | 1,438 | 3,920 | 1,548 | 3,852 | 1,487 | 3,944 | 1,378 | 4,234 | 1,332 | 4,004 | 1,252 |
| Canada | 164 | 161 | 174 | 160 | 167 | 158 | 167 | 128 | 153 | 113 | 139 | 116 | 114 | 91 | 105 | 106 | 120 | 89 | 100 | 87 | 96 | 73 | 95 | 83 | 144 | 84 | 134 | 87 | 116 | 68 | 165 | 90 | 187 | 104 | 166 | 85 | 173 | 83 | 197 | 81 | 180 | 74 |
| Mexico | 4 | 4 | 3 | 1 | 6 | 4 | 4 | 1 | 4 | 3 | 2 | 2 | 6 | 6 | 4 | 1 | 0 | 0 | 1 | 1 | 4 | 3 | 5 | 4 | 6 | 2 | 3 | 1 | 7 | 1 | 9 | 3 | 6 | 2 | 10 | 3 | 10 | 6 | 5 | 11 | 5 | 7 |
| Puerto Rico | 4 | 4 | 1 | 1 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 4 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 3 | 0 | 3 | 0 | 3 | 0 | 0 | 0 | 4 | 0 | 3 | 0 | 2 | 0 | 3 | 0 | 2 | 0 |
| United States | 3,398 | 2,846 | 3,441 | 2,671 | 3,418 | 2,504 | 3,054 | 2,065 | 3,099 | 1,956 | 3,062 | 1,931 | 2,781 | 1,716 | 2,316 | 1,374 | 2,659 | 1,480 | 2,325 | 1,262 | 2,129 | 1,081 | 2,100 | 1,132 | 2,976 | 1,432 | 2,967 | 1,277 | 3,016 | 1,296 | 3,283 | 1,345 | 3,732 | 1,442 | 3,674 | 1,400 | 3,759 | 1,288 | 4,030 | 1,240 | 3,818 | 1,171 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Central and South America | 11 | 8 | 13 | 11 | 5 | 7 | 6 | 7 | 9 | 12 | 12 | 5 | 7 | 12 | 12 | 11 | 5 | 12 | 5 | 7 | 7 | 16 | 4 | 15 | 8 | 10 | 8 | 11 | 6 | 7 | 8 | 14 | 15 | 16 | 7 | 16 | 9 | 17 | 7 | 17 | 9 | 18 |
| Argentina | 1 | 0 | 3 | 1 | 0 | 0 | 0 | 0 | 5 | 3 | 1 | 0 | 3 | 1 | 3 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 2 | 1 | 1 | 1 | 0 | 1 | 0 | 2 | 1 |
| Brazil | 3 | 1 | 3 | 3 | 2 | 7 | 1 | 4 | 1 | 7 | 4 | 3 | 1 | 10 | 3 | 8 | 2 | 7 | 0 | 2 | 0 | 10 | 2 | 12 | 4 | 2 | 4 | 7 | 3 | 7 | 6 | 13 | 6 | 9 | 0 | 9 | 0 | 14 | 5 | 15 | 3 | 16 |
| All others | 7 | 7 | 7 | 7 | 3 | 1 | 5 | 3 | 3 | 3 | 7 | 2 | 3 | 2 | 6 | 2 | 1 | 3 | 3 | 3 | 4 | 5 | 2 | 3 | 3 | 2 | 5 | 4 | 3 | 1 | 1 | 0 | 8 | 6 | 3 | 2 | 3 | 2 | 3 | 2 | 3 | 1 |
| Europe | 448 | 2,140 | 530 | 2,168 | 510 | 2,123 | 515 | 1,824 | 437 | 1,799 | 463 | 1,885 | 378 | 2,244 | 294 | 1,901 | 369 | 1,610 | 283 | 1,505 | 297 | 1,465 | 326 | 1,538 | 415 | 1,535 | 496 | 1,469 | 559 | 1,750 | 647 | 1,630 | 727 | 1,482 | 730 | 1,442 | 695 | 1,546 | 717 | 1,945 | 731 | 1,707 |
| EU 28 | 419 | 1,850 | 485 | 1,950 | 464 | 1,906 | 466 | 1,628 | 386 | 1,579 | 418 | 1,581 | 343 | 1,938 | 268 | 1,606 | 345 | 1,395 | 263 | 1,276 | 264 | 1,250 | 297 | 1,250 | 374 | 1,258 | 453 | 1,274 | 516 | 1,534 | 572 | 1,434 | 632 | 1,249 | 624 | 1,214 | 604 | 1,338 | 631 | 1,642 | 638 | 1,406 |
| Austria | 15 | 58 | 29 | 60 | 23 | 58 | 22 | 70 | 10 | 18 | 71 | 23 | 72 | 13 | 61 | 15 | 52 | 25 | 68 | 16 | 47 | 17 | 72 | 21 | 65 | 24 | 61 | 36 | 84 | 23 | 105 | 38 | 74 | 43 | 52 | 43 | 71 | 29 | 83 | 42 | 70 | 32 |
| Belgium | 7 | 8 | 6 | 10 | 3 | 6 | 7 | 10 | 6 | 7 | 4 | 5 | 3 | 8 | 4 | 3 | 3 | 12 | 2 | 11 | 7 | 12 | 3 | 9 | 9 | 9 | 11 | 8 | 11 | 6 | 11 | 13 | 9 | 7 | 11 | 8 | 8 | 8 | 15 | 26 | 15 | 36 |
| Denmark | 16 | 15 | 17 | 12 | 15 | 14 | 19 | 9 | 7 | 10 | 5 | 11 | 24 | 14 | 19 | 5 | 13 | 6 | 9 | 4 | 8 | 4 | 9 | 5 | 8 | 3 | 6 | 10 | 9 | 11 | 13 | 15 | 17 | 16 | 17 | 13 | 19 | 14 | 14 | 17 | 21 | 9 |
| Finland | 7 | 20 | 6 | 21 | 3 | 12 | 5 | 20 | 10 | 26 | 7 | 24 | 6 | 15 | 6 | 11 | 7 | 9 | 5 | 11 | 4 | 14 | 6 | 13 | 6 | 5 | 5 | 6 | 2 | 5 | 2 | 7 | 12 | 7 | 12 | 11 | 24 | 13 | 20 | 16 | 17 | 13 |
| France | 67 | 510 | 92 | 473 | 74 | 449 | 84 | 375 | 73 | 362 | 77 | 391 | 63 | 349 | 34 | 294 | 52 | 421 | 35 | 299 | 41 | 263 | 39 | 260 | 36 | 263 | 53 | 225 | 61 | 421 | 57 | 369 | 62 | 318 | 76 | 299 | 73 | 312 | 54 | 312 | 50 | 267 |
| Germany | 107 | 373 | 126 | 362 | 113 | 370 | 117 | 373 | 101 | 397 | 106 | 374 | 88 | 364 | 58 | 344 | 86 | 354 | 75 | 351 | 66 | 315 | 85 | 285 | 99 | 259 | 118 | 227 | 142 | 297 | 167 | 339 | 167 | 305 | 152 | 337 | 141 | 345 | 147 | 292 | 153 | 257 |
| Hungary | 0 | 5 | 3 | 4 | 1 | 2 | 1 | 4 | 1 | 4 | 1 | 5 | 1 | 6 | 1 | 6 | 3 | 0 | 6 | 0 | 2 | 2 | 4 | 2 | 6 | 0 | 2 | 1 | 2 | 4 | 0 | 4 | 4 | 4 | 2 | 10 | 3 | 1 | 3 | 2 | 6 | 1 |
| Ireland | 2 | 15 | 5 | 5 | 5 | 4 | 5 | 3 | 3 | 2 | 1 | 0 | 2 | 3 | 4 | 2 | 5 | 2 | 1 | 0 | 2 | 3 | 1 | 2 | 2 | 1 | 6 | 3 | 3 | 7 | 4 | 10 | 6 | 11 | 7 | 5 | 7 | 10 | 6 | 5 | 5 | 7 |
| Italy | 61 | 344 | 57 | 424 | 69 | 474 | 51 | 224 | 43 | 200 | 56 | 162 | 50 | 487 | 44 | 268 | 49 | 23 | 32 | 46 | 34 | 30 | 43 | 43 | 64 | 130 | 63 | 175 | 60 | 112 | 60 | 42 | 78 | 26 | 79 | 26 | 90 | 35 | 74 | 364 | 91 | 279 |
| Netherlands | 17 | 113 | 28 | 127 | 25 | 136 | 29 | 145 | 11 | 125 | 16 | 118 | 17 | 130 | 13 | 120 | 12 | 132 | 8 | 126 | 13 | 110 | 11 | 136 | 19 | 113 | 23 | 111 | 43 | 105 | 36 | 103 | 31 | 74 | 47 | 47 | 38 | 89 | 49 | 112 | 43 | 52 |
| Spain | 17 | 76 | 16 | 98 | 15 | 84 | 14 | 86 | 13 | 52 | 12 | 74 | 9 | 80 | 8 | 19 | 13 | 98 | 6 | 130 | 11 | 99 | 14 | 118 | 7 | 88 | 10 | 81 | 11 | 115 | 11 | 119 | 15 | 109 | 15 | 80 | 13 | 87 | 17 | 77 | 22 | 77 |
| Sweden | 37 | 72 | 25 | 93 | 29 | 56 | 27 | 64 | 21 | 71 | 16 | 86 | 16 | 128 | 14 | 75 | 15 | 46 | 16 | 56 | 11 | 53 | 12 | 64 | 14 | 82 | 23 | 45 | 20 | 58 | 35 | 42 | 54 | 34 | 36 | 47 | 40 | 36 | 36 | 51 | 46 | 59 |
| United Kingdom | 63 | 125 | 70 | 155 | 85 | 150 | 82 | 149 | 77 | 136 | 77 | 140 | 54 | 165 | 58 | 187 | 64 | 129 | 58 | 101 | 48 | 108 | 57 | 110 | 80 | 110 | 88 | 166 | 110 | 180 | 123 | 181 | 125 | 146 | 119 | 130 | 117 | 161 | 126 | 159 | 116 | 143 |
| All others | 3 | 102 | 3 | 106 | 3 | 88 | 3 | 92 | 4 | 111 | 11 | 106 | 6 | 122 | 4 | 87 | 7 | 87 | 4 | 88 | 4 | 117 | 1 | 133 | 6 | 117 | 6 | 127 | 11 | 92 | 10 | 71 | 10 | 131 | 17 | 108 | 17 | 138 | 13 | 144 | 13 | 139 |
| Other Europe | 29 | 290 | 45 | 218 | 46 | 218 | 49 | 196 | 51 | 220 | 45 | 303 | 35 | 306 | 26 | 295 | 24 | 215 | 24 | 230 | 33 | 262 | 29 | 287 | 40 | 277 | 42 | 195 | 43 | 216 | 75 | 196 | 95 | 233 | 106 | 228 | 90 | 208 | 86 | 303 | 92 | 302 |
| Former Soviet Union | 0 | 11 | 0 | 5 | 0 | 3 | 0 | 5 | 0 | 13 | 0 | 32 | 0 | 60 | 0 | 17 | 1 | 12 | 0 | 21 | 0 | 30 | 1 | 27 | 1 | 20 | 0 | 21 | 0 | 21 | 1 | 11 | 3 | 12 | 4 | 11 | 2 | 9 | 3 | 19 | 3 | 10 |
| Norway | 5 | 18 | 12 | 26 | 11 | 27 | 8 | 36 | 13 | 29 | 9 | 30 | 5 | 13 | 6 | 20 | 3 | 24 | 4 | 25 | 8 | 20 | 5 | 17 | 8 | 25 | 9 | 15 | 8 | 9 | 9 | 14 | 9 | 23 | 18 | 22 | 5 | 30 | 10 | 21 | 7 | 22 |
| Russia | 3 | 208 | 1 | 132 | 0 | 133 | 3 | 101 | 3 | 114 | 3 | 200 | 1 | 180 | 1 | 196 | 0 | 122 | 0 | 142 | 1 | 148 | 0 | 182 | 4 | 147 | 3 | 119 | 5 | 131 | 7 | 118 | 3 | 134 | 6 | 155 | 4 | 112 | 9 | 205 | 3 | 213 |
| Switzerland | 21 | 51 | 31 | 53 | 33 | 50 | 34 | 48 | 33 | 63 | 31 | 47 | 28 | 48 | 20 | 61 | 20 | 54 | 17 | 37 | 23 | 60 | 22 | 54 | 24 | 74 | 29 | 36 | 30 | 45 | 55 | 47 | 70 | 56 | 69 | 40 | 66 | 53 | 53 | 53 | 73 | 56 |
| All others | 0 | 2 | 1 | 2 | 2 | 5 | 4 | 6 | 1 | 1 | 3 | 5 | 1 | 3 | 0 | 1 | 1 | 3 | 0 | 4 | 1 | 3 | 0 | 8 | 3 | 10 | 2 | 5 | 0 | 11 | 2 | 6 | 10 | 8 | 9 | 2 | 13 | 3 | 11 | 4 | 6 | 2 |
| Asia | 709 | 4,024 | 627 | 4,356 | 702 | 3,994 | 756 | 2,948 | 883 | 2,805 | 933 | 3,433 | 875 | 4,178 | 709 | 5,090 | 707 | 6,312 | 663 | 7,444 | 632 | 7,532 | 585 | 8,500 | 879 | 9,502 | 792 | 11,560 | 900 | 13,154 | 878 | 15,053 | 942 | 16,236 | 902 | 14,906 | 937 | 18,418 | 1,084 | 17,877 | 1,033 | 18,247 |

TABLE S8-37

## USPTO patents and patent families granted in furniture, games, by region, country, or economy: 1998–2018

(Number)

| | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Region, country, or economy | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| China | 32 | 35 | 32 | 40 | 36 | 67 | 55 | 101 | 57 | 89 | 72 | 197 | 54 | 188 | 55 | 202 | 60 | 255 | 56 | 241 | 64 | 454 | 69 | 791 | 101 | 766 | 80 | 1,052 | 139 | 1,313 | 117 | 1,145 | 136 | 1,492 | 145 | 2,593 | 188 | 3,717 | 230 | 4,395 | 235 | 5,297 |
| India | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 3 | 1 | 1 | 2 | 1 | 0 | 1 | 0 | 1 | 0 | 2 | 1 | 1 | 0 | 1 | 1 | 4 | 2 | 7 | 4 | 2 | 1 | 6 | 3 | 7 | 4 | 15 | 4 | 16 | 8 | 17 | 9 |
| Japan | 275 | 3,312 | 233 | 3,293 | 254 | 2,611 | 309 | 2,308 | 356 | 2,046 | 388 | 2,257 | 315 | 2,813 | 254 | 3,164 | 288 | 3,552 | 277 | 4,530 | 252 | 5,200 | 240 | 6,336 | 377 | 7,151 | 338 | 8,155 | 418 | 9,047 | 394 | 10,483 | 452 | 11,359 | 375 | 9,617 | 361 | 11,794 | 400 | 10,643 | 382 | 10,208 |
| Malaysia | 1 | 1 | 1 | 2 | 3 | 2 | 1 | 1 | 2 | 1 | 2 | 1 | 7 | 3 | 3 | 2 | 5 | 16 | 3 | 20 | 7 | 5 | 2 | 12 | 4 | 12 | 4 | 13 | 5 | 10 | 4 | 9 | 5 | 10 | 2 | 14 | 2 | 6 | 1 | 7 | 3 | 7 |
| Singapore | 2 | 1 | 1 | 3 | 1 | 1 | 1 | 1 | 1 | 0 | 2 | 2 | 3 | 0 | 4 | 0 | 2 | 1 | 3 | 2 | 4 | 3 | 3 | 3 | 4 | 3 | 1 | 1 | 1 | 1 | 3 | 3 | 2 | 2 | 7 | 1 | 4 | 2 | 9 | 4 | 3 | 2 |
| South Korea | 55 | 317 | 51 | 680 | 37 | 314 | 45 | 179 | 49 | 250 | 61 | 547 | 80 | 681 | 70 | 1,231 | 56 | 2,026 | 74 | 2,188 | 82 | 1,512 | 99 | 1,031 | 146 | 1,199 | 114 | 1,918 | 83 | 2,307 | 114 | 2,915 | 128 | 2,923 | 116 | 2,192 | 144 | 2,247 | 169 | 2,241 | 163 | 2,308 |
| Taiwan | 341 | 356 | 303 | 330 | 370 | 397 | 339 | 354 | 412 | 417 | 398 | 422 | 415 | 487 | 320 | 489 | 295 | 460 | 249 | 464 | 220 | 355 | 172 | 326 | 245 | 368 | 247 | 415 | 245 | 468 | 238 | 493 | 213 | 444 | 245 | 481 | 220 | 645 | 253 | 574 | 229 | 411 |
| All others | 2 | 1 | 5 | 6 | 1 | 2 | 5 | 4 | 6 | 3 | 6 | 6 | 1 | 4 | 3 | 2 | 1 | 2 | 1 | 0 | 1 | 2 | 1 | 0 | 2 | 2 | 3 | 3 | 2 | 3 | 6 | 4 | 3 | 3 | 5 | 3 | 3 | 3 | 7 | 5 | 2 | 6 |
| Middle East | 23 | 13 | 18 | 17 | 15 | 13 | 13 | 10 | 14 | 7 | 12 | 9 | 11 | 4 | 11 | 9 | 14 | 10 | 15 | 10 | 12 | 7 | 12 | 4 | 19 | 7 | 27 | 7 | 36 | 15 | 31 | 11 | 33 | 17 | 46 | 19 | 35 | 12 | 37 | 7 | 34 | 13 |
| Israel | 22 | 12 | 16 | 13 | 15 | 9 | 12 | 6 | 14 | 5 | 12 | 4 | 11 | 4 | 9 | 7 | 12 | 6 | 12 | 5 | 10 | 5 | 9 | 3 | 16 | 5 | 25 | 4 | 30 | 6 | 25 | 6 | 21 | 5 | 31 | 5 | 25 | 6 | 33 | 4 | 29 | 10 |
| All others | 1 | 1 | 2 | 4 | 0 | 5 | 1 | 5 | 0 | 2 | 0 | 5 | 0 | 1 | 2 | 2 | 1 | 4 | 3 | 6 | 2 | 2 | 3 | 1 | 2 | 2 | 2 | 3 | 5 | 9 | 6 | 5 | 10 | 13 | 15 | 15 | 9 | 6 | 4 | 3 | 6 | 2 |
| Africa | 11 | 39 | 8 | 32 | 4 | 27 | 7 | 26 | 6 | 23 | 10 | 45 | 7 | 40 | 7 | 34 | 6 | 16 | 5 | 19 | 4 | 23 | 3 | 20 | 5 | 29 | 3 | 9 | 9 | 25 | 4 | 15 | 10 | 17 | 3 | 7 | 4 | 1 | 2 | 2 | 1 | 4 |
| South Africa | 10 | 27 | 7 | 25 | 4 | 16 | 7 | 21 | 6 | 14 | 10 | 26 | 6 | 29 | 5 | 29 | 6 | 12 | 5 | 14 | 3 | 22 | 2 | 19 | 5 | 21 | 3 | 4 | 9 | 18 | 3 | 9 | 10 | 5 | 2 | 4 | 3 | 0 | 2 | 0 | 1 | 1 |
| All others | 1 | 12 | 1 | 7 | 0 | 11 | 0 | 5 | 0 | 9 | 1 | 19 | 1 | 11 | 2 | 5 | 1 | 4 | 0 | 5 | 1 | 0 | 1 | 1 | 0 | 7 | 0 | 5 | 0 | 7 | 1 | 5 | 0 | 12 | 0 | 3 | 1 | 1 | 0 | 2 | 0 | 3 |
| Australia and Oceania | 50 | 51 | 35 | 53 | 39 | 62 | 39 | 118 | 35 | 83 | 38 | 66 | 29 | 140 | 27 | 111 | 35 | 92 | 24 | 113 | 22 | 109 | 21 | 118 | 33 | 134 | 40 | 174 | 47 | 199 | 51 | 157 | 63 | 154 | 55 | 209 | 53 | 122 | 55 | 96 | 63 | 83 |
| Australia | 42 | 48 | 30 | 51 | 33 | 60 | 29 | 116 | 28 | 82 | 34 | 64 | 24 | 138 | 19 | 111 | 27 | 90 | 21 | 111 | 19 | 106 | 10 | 117 | 22 | 131 | 32 | 172 | 37 | 199 | 44 | 156 | 51 | 151 | 49 | 209 | 45 | 119 | 42 | 95 | 49 | 81 |
| New Zealand | 9 | 3 | 5 | 3 | 6 | 2 | 10 | 1 | 6 | 1 | 4 | 2 | 5 | 2 | 8 | 1 | 8 | 2 | 3 | 1 | 3 | 3 | 1 | 1 | 9 | 2 | 8 | 2 | 10 | 0 | 7 | 1 | 12 | 3 | 6 | 1 | 7 | 2 | 13 | 1 | 14 | 2 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 |
| Unclassified | 2 | 7 | 0 | 2 | 1 | 3 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 3 | 0 | 2 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 3 | 1 |

EU = European Union; USPTO = U.S. Patent and Trademark Office.

**Note(s)**

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**Source(s)**

Science-Metrix; PATSTAT, accessed April 2019; PatentsView, USPTO, accessed June 2019.

TABLE S8-38

## USPTO patents and patent families granted in other consumer goods, by region, country, or economy: 1998–2018

(Number)

| Region, country, or economy | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| World | 3,562 | 6,751 | 3,958 | 8,217 | 3,673 | 6,640 | 3,533 | 5,903 | 3,327 | 5,469 | 2,953 | 6,210 | 2,891 | 6,651 | 2,401 | 7,180 | 2,675 | 7,898 | 2,457 | 8,428 | 2,409 | 7,044 | 2,330 | 7,409 | 3,175 | 7,537 | 3,089 | 9,267 | 3,446 | 11,252 | 3,688 | 9,754 | 3,899 | 9,603 | 4,062 | 9,393 | 4,280 | 11,316 | 4,573 | 11,425 | 4,575 | 11,893 |
| North America | 2,321 | 1,911 | 2,584 | 2,031 | 2,411 | 1,817 | 2,191 | 1,596 | 2,033 | 1,365 | 1,831 | 1,195 | 1,793 | 1,139 | 1,506 | 874 | 1,626 | 987 | 1,477 | 894 | 1,382 | 760 | 1,358 | 744 | 1,897 | 933 | 1,756 | 853 | 2,029 | 943 | 2,141 | 948 | 2,296 | 908 | 2,481 | 974 | 2,605 | 989 | 2,674 | 954 | 2,753 | 969 |
| Canada | 77 | 69 | 93 | 82 | 102 | 82 | 86 | 61 | 79 | 59 | 81 | 56 | 80 | 60 | 47 | 52 | 50 | 50 | 59 | 53 | 49 | 46 | 46 | 52 | 68 | 47 | 59 | 45 | 81 | 45 | 86 | 60 | 91 | 62 | 90 | 46 | 104 | 52 | 103 | 57 | 94 | 47 |
| Mexico | 2 | 2 | 3 | 1 | 2 | 1 | 4 | 3 | 9 | 3 | 5 | 3 | 3 | 3 | 4 | 1 | 2 | 2 | 2 | 0 | 1 | 0 | 0 | 1 | 3 | 1 | 5 | 1 | 3 | 1 | 5 | 3 | 7 | 1 | 5 | 2 | 11 | 16 | 6 | 11 | 8 | 9 |
| Puerto Rico | 2 | 1 | 1 | 1 | 2 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 2 | 0 |
| United States | 2,241 | 1,839 | 2,488 | 1,947 | 2,304 | 1,733 | 2,100 | 1,532 | 1,944 | 1,302 | 1,744 | 1,139 | 1,704 | 1,076 | 1,455 | 821 | 1,574 | 935 | 1,414 | 841 | 1,330 | 714 | 1,312 | 693 | 1,825 | 884 | 1,692 | 806 | 1,942 | 897 | 2,050 | 885 | 2,196 | 845 | 2,386 | 926 | 2,491 | 921 | 2,563 | 886 | 2,649 | 912 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Central and South America | 3 | 1 | 8 | 6 | 9 | 10 | 4 | 8 | 8 | 7 | 8 | 12 | 6 | 12 | 7 | 6 | 6 | 9 | 9 | 4 | 5 | 10 | 8 | 22 | 8 | 21 | 8 | 20 | 8 | 13 | 12 | 15 | 15 | 10 | 15 | 13 | 8 | 8 | 15 | 8 | 19 | 18 |
| Argentina | 1 | 0 | 2 | 1 | 2 | 2 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 4 | 0 | 1 | 1 | 4 | 1 | 1 | 1 | 1 | 1 | 3 | 2 | 6 | 1 | 3 | 1 | 0 | 3 | 0 | 2 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 0 |
| Brazil | 1 | 1 | 4 | 1 | 3 | 5 | 1 | 3 | 6 | 6 | 8 | 3 | 3 | 4 | 4 | 2 | 3 | 5 | 7 | 3 | 3 | 1 | 3 | 1 | 0 | 5 | 3 | 15 | 4 | 11 | 8 | 14 | 12 | 10 | 13 | 1 | 4 | 7 | 10 | 7 | 14 | 16 |
| All others | 1 | 0 | 2 | 3 | 4 | 4 | 3 | 5 | 1 | 2 | 4 | 2 | 5 | 2 | 3 | 2 | 1 | 1 | 3 | 1 | 3 | 3 | 2 | 3 | 2 | 1 | 3 | 2 | 4 | 2 | 1 | 1 | 0 | 1 | 1 | 1 | 3 | 1 | 3 | 1 | 4 | 2 |
| Europe | 471 | 1,665 | 479 | 1,596 | 538 | 1,639 | 574 | 1,466 | 517 | 1,392 | 435 | 1,485 | 436 | 1,847 | 345 | 1,644 | 388 | 1,520 | 362 | 1,500 | 356 | 1,300 | 337 | 1,486 | 470 | 1,262 | 515 | 1,712 | 572 | 2,851 | 648 | 1,173 | 668 | 1,268 | 616 | 1,298 | 660 | 1,536 | 728 | 1,645 | 726 | 1,637 |
| EU | 438 | 1,333 | 449 | 1,242 | 499 | 1,418 | 525 | 1,221 | 489 | 1,189 | 399 | 1,243 | 409 | 1,520 | 322 | 1,354 | 354 | 1,237 | 333 | 1,088 | 325 | 1,033 | 311 | 893 | 422 | 998 | 471 | 1,043 | 518 | 1,102 | 591 | 984 | 608 | 1,035 | 547 | 1,070 | 603 | 1,123 | 640 | 1,395 | 633 | 1,367 |
| Austria | 12 | 30 | 14 | 32 | 21 | 27 | 21 | 43 | 19 | 37 | 14 | 31 | 9 | 31 | 5 | 22 | 14 | 53 | 12 | 42 | 16 | 44 | 4 | 27 | 15 | 30 | 13 | 47 | 15 | 40 | 19 | 42 | 19 | 22 | 18 | 42 | 27 | 40 | 27 | 42 | 23 | 34 |
| Belgium | 8 | 4 | 11 | 5 | 6 | 5 | 7 | 6 | 10 | 9 | 4 | 4 | 9 | 6 | 5 | 6 | 5 | 6 | 5 | 4 | 3 | 3 | 4 | 7 | 9 | 6 | 14 | 15 | 10 | 9 | 5 | 13 | 8 | 7 | 13 | 7 | 20 | 8 | 17 | 18 | 18 | 36 |
| Denmark | 7 | 2 | 9 | 3 | 5 | 5 | 3 | 3 | 4 | 4 | 4 | 11 | 4 | 6 | 5 | 6 | 5 | 5 | 2 | 6 | 5 | 7 | 4 | 4 | 4 | 6 | 4 | 3 | 8 | 5 | 13 | 8 | 8 | 7 | 7 | 7 | 6 | 10 | 5 | 8 | 8 | 3 |
| Finland | 4 | 16 | 5 | 12 | 3 | 8 | 4 | 11 | 7 | 16 | 4 | 13 | 6 | 9 | 3 | 15 | 8 | 14 | 7 | 12 | 6 | 11 | 4 | 9 | 7 | 4 | 4 | 6 | 6 | 10 | 7 | 12 | 7 | 10 | 6 | 13 | 11 | 13 | 15 | 8 | 12 | 13 |
| France | 94 | 372 | 127 | 350 | 110 | 334 | 108 | 308 | 99 | 286 | 78 | 325 | 72 | 354 | 66 | 327 | 81 | 386 | 60 | 392 | 76 | 303 | 53 | 237 | 78 | 269 | 96 | 311 | 83 | 337 | 87 | 265 | 114 | 352 | 78 | 386 | 91 | 340 | 95 | 305 | 99 | 350 |
| Germany | 130 | 289 | 125 | 258 | 142 | 280 | 175 | 261 | 168 | 328 | 135 | 301 | 156 | 277 | 100 | 312 | 114 | 368 | 123 | 282 | 101 | 255 | 116 | 222 | 156 | 250 | 174 | 188 | 201 | 235 | 215 | 240 | 220 | 259 | 190 | 249 | 201 | 295 | 180 | 303 | 196 | 279 |
| Hungary | 0 | 3 | 0 | 2 | 0 | 3 | 1 | 1 | 0 | 3 | 1 | 4 | 1 | 3 | 1 | 4 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 4 | 1 | 0 | 2 | 2 | 0 | 2 | 0 | 0 | 1 | 2 | 1 | 3 | 1 | 1 | 0 | 0 |
| Ireland | 3 | 8 | 3 | 4 | 3 | 0 | 4 | 1 | 3 | 2 | 0 | 0 | 1 | 0 | 0 | 4 | 2 | 0 | 1 | 1 | 2 | 1 | 2 | 1 | 2 | 0 | 1 | 0 | 2 | 2 | 0 | 7 | 1 | 5 | 1 | 4 | 3 | 3 | 4 | 1 | 3 | 6 |
| Italy | 65 | 288 | 48 | 386 | 72 | 418 | 64 | 222 | 55 | 200 | 45 | 207 | 57 | 470 | 44 | 252 | 43 | 37 | 44 | 37 | 41 | 58 | 58 | 108 | 48 | 156 | 65 | 110 | 55 | 60 | 64 | 75 | 71 | 62 | 80 | 89 | 80 | 89 | 92 | 345 | 76 | 293 |
| Netherlands | 14 | 76 | 21 | 54 | 21 | 59 | 17 | 66 | 11 | 59 | 11 | 70 | 7 | 81 | 8 | 79 | 11 | 80 | 8 | 74 | 15 | 81 | 15 | 77 | 12 | 50 | 16 | 61 | 20 | 72 | 22 | 65 | 25 | 40 | 25 | 39 | 31 | 42 | 30 | 62 | 35 | 41 |
| Spain | 7 | 48 | 11 | 60 | 6 | 88 | 11 | 84 | 6 | 40 | 9 | 57 | 11 | 57 | 14 | 38 | 10 | 29 | 8 | 30 | 4 | 33 | 5 | 35 | 14 | 31 | 17 | 15 | 14 | 20 | 30 | 21 | 22 | 12 | 15 | 16 | 25 | 15 | 27 | 23 | 14 | 22 |
| Sweden | 17 | 39 | 13 | 33 | 18 | 23 | 23 | 43 | 11 | 31 | 15 | 38 | 11 | 57 | 14 | 38 | 10 | 29 | 8 | 30 | 4 | 33 | 5 | 35 | 14 | 31 | 17 | 15 | 14 | 20 | 30 | 21 | 22 | 12 | 15 | 16 | 25 | 15 | 27 | 23 | 14 | 22 |
| United Kingdom | 76 | 84 | 59 | 81 | 86 | 98 | 84 | 97 | 90 | 93 | 76 | 120 | 62 | 100 | 58 | 113 | 45 | 101 | 55 | 58 | 44 | 72 | 43 | 78 | 56 | 78 | 64 | 80 | 70 | 90 | 107 | 99 | 90 | 72 | 90 | 88 | 85 | 98 | 118 | 140 | 124 | 122 |
| All others | 2 | 74 | 4 | 61 | 6 | 69 | 5 | 64 | 6 | 71 | 2 | 63 | 4 | 71 | 2 | 84 | 5 | 80 | 7 | 83 | 7 | 71 | 4 | 74 | 1 | 86 | 8 | 65 | 8 | 74 | 12 | 58 | 11 | 88 | 11 | 84 | 13 | 100 | 14 | 89 | 16 | 105 |
| Other Europe | 33 | 333 | 30 | 254 | 39 | 221 | 48 | 245 | 27 | 203 | 36 | 243 | 27 | 326 | 24 | 290 | 34 | 283 | 31 | 286 | 26 | 593 | 48 | 264 | 44 | 669 | 53 | 1,749 | 58 | 189 | 59 | 233 | 69 | 227 | 58 | 413 | 88 | 355 | 94 | 270 |
| Former Soviet Union | 0 | 12 | 0 | 18 | 0 | 6 | 0 | 13 | 0 | 17 | 0 | 25 | 0 | 78 | 0 | 25 | 0 | 21 | 0 | 20 | 0 | 16 | 0 | 25 | 0 | 28 | 1 | 33 | 1 | 14 | 0 | 13 | 0 | 13 | 0 | 12 | 0 | 11 | 0 | 16 | 2 | 6 |
| Norway | 3 | 7 | 2 | 10 | 1 | 6 | 6 | 14 | 3 | 13 | 4 | 13 | 4 | 3 | 2 | 7 | 1 | 8 | 1 | 8 | 1 | 8 | 2 | 3 | 2 | 5 | 0 | 10 | 3 | 5 | 4 | 7 | 6 | 11 | 6 | 7 | 2 | 8 | 2 | 7 | 2 | 3 |
| Russia | 1 | 275 | 0 | 186 | 1 | 169 | 0 | 167 | 1 | 125 | 4 | 170 | 1 | 203 | 1 | 219 | 0 | 186 | 2 | 339 | 2 | 200 | 0 | 507 | 1 | 183 | 1 | 594 | 4 | 1,695 | 2 | 124 | 1 | 160 | 2 | 162 | 2 | 349 | 4 | 169 | 6 | 201 |
| Switzerland | 28 | 37 | 27 | 36 | 33 | 39 | 39 | 49 | 21 | 44 | 26 | 32 | 19 | 38 | 19 | 36 | 31 | 68 | 24 | 44 | 26 | 61 | 23 | 55 | 44 | 46 | 38 | 31 | 45 | 32 | 43 | 43 | 43 | 46 | 42 | 43 | 39 | 44 | 65 | 53 | 68 | 49 |
| All others | 1 | 1 | 1 | 4 | 3 | 2 | 3 | 2 | 2 | 4 | 2 | 2 | 3 | 1 | 1 | 3 | 3 | 1 | 2 | 1 | 2 | 1 | 1 | 3 | 1 | 2 | 4 | 1 | 1 | 3 | 8 | 2 | 9 | 2 | 18 | 4 | 15 | 0 | 17 | 6 | 15 | 9 |
| Asia | 722 | 3,109 | 843 | 4,525 | 689 | 3,108 | 722 | 2,746 | 727 | 2,612 | 629 | 3,450 | 604 | 3,564 | 503 | 4,548 | 614 | 5,285 | 572 | 5,939 | 629 | 4,865 | 591 | 5,069 | 747 | 5,208 | 757 | 6,596 | 786 | 7,332 | 814 | 7,501 | 836 | 7,322 | 873 | 6,990 | 939 | 8,673 | 1,085 | 8,740 | 1,000 | 9,193 |

**TABLE 58-38**

## USPTO patents and patent families granted in other consumer goods, by region, country, or economy: 1998–2018

(Number)

| | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Region, country, or economy | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| China | 31 | 63 | 35 | 67 | 23 | 89 | 37 | 133 | 33 | 125 | 26 | 217 | 35 | 311 | 30 | 400 | 38 | 310 | 33 | 292 | 37 | 556 | 40 | 961 | 60 | 928 | 62 | 1,238 | 69 | 1,603 | 69 | 1,435 | 76 | 1,537 | 106 | 3,006 | 149 | 4,132 | 219 | 4,111 | 218 | 4,688 |
| India | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 2 | 2 | 1 | 1 | 3 | 1 | 1 | 2 | 4 | 2 | 2 | 2 | 5 | 3 | 4 | 2 | 10 | 4 | 14 | 2 | 5 | 4 | 15 | 6 | 14 | 6 | 14 | 9 | 19 | 9 |
| Japan | 382 | 2,268 | 436 | 2,442 | 356 | 2,174 | 362 | 1,928 | 361 | 1,798 | 316 | 2,069 | 283 | 2,035 | 246 | 2,300 | 294 | 2,395 | 274 | 2,784 | 310 | 2,588 | 324 | 2,909 | 374 | 2,966 | 341 | 3,103 | 301 | 2,942 | 317 | 3,020 | 354 | 2,837 | 339 | 1,881 | 347 | 2,206 | 341 | 2,162 | 304 | 2,176 |
| Malaysia | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 2 | 4 | 0 | 1 | 2 | 2 | 1 | 16 | 1 | 3 | 2 | 5 | 3 | 12 | 1 | 8 | 2 | 2 | 1 | 5 | 2 | 7 | 3 | 9 | 2 | 2 | 6 | 8 | 5 | 11 |
| Singapore | 2 | 1 | 4 | 1 | 6 | 1 | 1 | 1 | 4 | 2 | 6 | 0 | 1 | 0 | 5 | 1 | 10 | 3 | 3 | 1 | 6 | 1 | 7 | 1 | 10 | 1 | 7 | 1 | 7 | 2 | 10 | 3 | 8 | 1 | 3 | 2 | 2 | 2 | 4 | 1 | 3 | 1 |
| South Korea | 120 | 567 | 131 | 1,750 | 90 | 619 | 63 | 432 | 74 | 434 | 78 | 921 | 90 | 963 | 86 | 1,621 | 122 | 2,300 | 132 | 2,584 | 160 | 1,521 | 126 | 1,021 | 185 | 1,113 | 216 | 2,064 | 280 | 2,571 | 272 | 2,794 | 274 | 2,724 | 292 | 1,857 | 295 | 2,029 | 375 | 2,139 | 331 | 2,074 |
| Taiwan | 184 | 207 | 232 | 260 | 209 | 220 | 255 | 249 | 249 | 250 | 197 | 239 | 191 | 247 | 132 | 209 | 138 | 268 | 125 | 256 | 110 | 194 | 87 | 170 | 108 | 182 | 122 | 176 | 113 | 206 | 126 | 238 | 112 | 209 | 106 | 225 | 126 | 292 | 117 | 308 | 113 | 231 |
| All others | 3 | 4 | 4 | 4 | 4 | 5 | 4 | 3 | 3 | 3 | 4 | 3 | 1 | 2 | 3 | 14 | 6 | 5 | 2 | 3 | 2 | 1 | 3 | 0 | 2 | 3 | 4 | 4 | 4 | 2 | 5 | 3 | 5 | 3 | 9 | 4 | 5 | 4 | 8 | 2 | 7 | 4 |
| Middle East | 16 | 11 | 13 | 8 | 8 | 10 | 14 | 13 | 15 | 12 | 18 | 12 | 15 | 7 | 12 | 6 | 9 | 3 | 10 | 4 | 14 | 11 | 13 | 3 | 13 | 3 | 13 | 10 | 21 | 6 | 31 | 16 | 40 | 15 | 38 | 17 | 37 | 15 | 34 | 15 | 39 | 12 |
| Israel | 16 | 9 | 11 | 7 | 8 | 6 | 13 | 8 | 15 | 7 | 18 | 10 | 15 | 7 | 12 | 4 | 9 | 2 | 10 | 2 | 8 | 6 | 13 | 3 | 10 | 2 | 10 | 3 | 18 | 5 | 16 | 7 | 32 | 5 | 27 | 8 | 23 | 6 | 27 | 8 | 32 | 5 |
| All others | 0 | 2 | 2 | 1 | 1 | 4 | 1 | 5 | 0 | 4 | 0 | 2 | 0 | 1 | 1 | 2 | 0 | 1 | 0 | 2 | 6 | 5 | 0 | 0 | 3 | 1 | 3 | 7 | 3 | 1 | 15 | 9 | 8 | 9 | 12 | 8 | 15 | 9 | 7 | 7 | 7 | 7 |
| Africa | 2 | 19 | 4 | 16 | 4 | 19 | 4 | 16 | 2 | 22 | 2 | 22 | 2 | 15 | 2 | 15 | 2 | 13 | 0 | 14 | 3 | 11 | 3 | 15 | 3 | 18 | 4 | 8 | 1 | 8 | 4 | 7 | 5 | 13 | 5 | 4 | 3 | 3 | 1 | 4 | 6 | 6 |
| South Africa | 2 | 12 | 3 | 8 | 4 | 8 | 4 | 14 | 2 | 10 | 1 | 9 | 2 | 10 | 1 | 12 | 2 | 7 | 0 | 13 | 3 | 8 | 3 | 13 | 2 | 15 | 2 | 1 | 0 | 5 | 4 | 2 | 4 | 2 | 4 | 2 | 3 | 0 | 1 | 0 | 5 | 1 |
| All others | 0 | 7 | 1 | 8 | 0 | 12 | 0 | 2 | 0 | 11 | 1 | 13 | 0 | 5 | 1 | 3 | 0 | 6 | 0 | 1 | 0 | 3 | 0 | 2 | 1 | 3 | 2 | 7 | 1 | 3 | 1 | 5 | 0 | 5 | 2 | 2 | 1 | 3 | 0 | 4 | 2 | 4 |
| Australia and Oceania | 26 | 27 | 27 | 27 | 14 | 35 | 23 | 54 | 27 | 58 | 25 | 40 | 28 | 71 | 28 | 80 | 28 | 76 | 26 | 70 | 20 | 85 | 21 | 68 | 38 | 92 | 36 | 68 | 30 | 99 | 37 | 92 | 40 | 68 | 34 | 99 | 26 | 92 | 36 | 58 | 31 | 58 |
| Australia | 19 | 26 | 21 | 26 | 13 | 34 | 15 | 52 | 19 | 56 | 21 | 39 | 25 | 71 | 25 | 79 | 23 | 76 | 22 | 70 | 19 | 85 | 18 | 67 | 35 | 92 | 32 | 67 | 26 | 98 | 32 | 92 | 34 | 67 | 29 | 99 | 20 | 91 | 29 | 58 | 24 | 57 |
| New Zealand | 7 | 1 | 6 | 1 | 1 | 1 | 8 | 1 | 8 | 2 | 4 | 2 | 3 | 0 | 3 | 0 | 5 | 0 | 4 | 0 | 1 | 0 | 2 | 2 | 3 | 1 | 4 | 1 | 3 | 1 | 5 | 0 | 6 | 1 | 5 | 0 | 6 | 1 | 7 | 0 | 6 | 1 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| Unclassified | 1 | 8 | 0 | 9 | 0 | 2 | 0 | 5 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 8 | 0 | 5 | 0 | 3 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |

EU = European Union; USPTO = U.S. Patent and Trademark Office.

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**Source(s)**

Science-Metrix; PATSTAT, accessed April 2019; PatentsView, USPTO, accessed June 2019.

TABLE S8-39

## USPTO patents and patent families granted in civil engineering, by region, country, or economy: 1998–2018

(Number)

| Region, country, or economy | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| World | 4,034 | 15,752 | 4,221 | 17,002 | 4,478 | 13,461 | 4,502 | 12,732 | 4,452 | 12,683 | 4,247 | 13,986 | 3,949 | 14,769 | 3,497 | 15,697 | 3,946 | 18,468 |
| North America | 2,921 | 2,378 | 3,071 | 2,286 | 3,235 | 2,258 | 3,223 | 2,141 | 3,073 | 1,994 | 2,919 | 1,771 | 2,811 | 1,662 | 2,471 | 1,438 | 2,794 | 1,434 |
| Canada | 224 | 196 | 231 | 222 | 248 | 198 | 289 | 216 | 232 | 188 | 205 | 164 | 206 | 172 | 186 | 172 | 188 | 171 |
| Mexico | 4 | 3 | 4 | 2 | 3 | 1 | 5 | 1 | 5 | 4 | 3 | 1 | 2 | 0 | 1 | 1 | 1 | 2 |
| Puerto Rico | 0 | 0 | 5 | 0 | 4 | 0 | 2 | 0 | 2 | 0 | 4 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| United States | 2,694 | 2,180 | 2,831 | 2,062 | 2,980 | 2,058 | 2,928 | 1,924 | 2,834 | 1,803 | 2,707 | 1,606 | 2,602 | 1,490 | 2,284 | 1,266 | 2,605 | 1,261 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Central and South America | 5 | 3 | 15 | 12 | 15 | 16 | 15 | 18 | 10 | 13 | 13 | 12 | 10 | 18 | 9 | 13 | 9 | 12 |
| Argentina | 1 | 0 | 3 | 2 | 3 | 0 | 2 | 1 | 3 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 0 |
| Brazil | 2 | 1 | 7 | 3 | 9 | 14 | 4 | 7 | 4 | 8 | 4 | 5 | 4 | 13 | 1 | 4 | 6 | 10 |
| All others | 2 | 2 | 5 | 7 | 4 | 3 | 8 | 9 | 3 | 5 | 8 | 7 | 6 | 4 | 6 | 8 | 2 | 2 |
| Europe | 619 | 5,036 | 652 | 4,762 | 749 | 4,310 | 792 | 4,389 | 869 | 4,540 | 801 | 4,701 | 634 | 5,396 | 559 | 4,756 | 670 | 4,501 |
| EU | 563 | 3,387 | 600 | 3,463 | 674 | 3,175 | 709 | 3,076 | 804 | 3,050 | 730 | 2,959 | 586 | 3,349 | 522 | 3,074 | 614 | 2,785 |
| Austria | 20 | 153 | 29 | 148 | 21 | 138 | 32 | 140 | 30 | 143 | 37 | 150 | 27 | 90 | 21 | 118 | 27 | 177 |
| Belgium | 15 | 17 | 9 | 14 | 9 | 12 | 24 | 11 | 13 | 17 | 12 | 11 | 12 | 19 | 14 | 19 | 10 | 20 |
| Denmark | 13 | 9 | 11 | 12 | 8 | 11 | 21 | 18 | 16 | 22 | 19 | 21 | 9 | 19 | 8 | 15 | 9 | 23 |
| Finland | 19 | 53 | 17 | 44 | 10 | 44 | 16 | 39 | 16 | 53 | 15 | 46 | 11 | 44 | 11 | 53 | 13 | 46 |
| France | 59 | 785 | 75 | 741 | 79 | 616 | 91 | 581 | 79 | 454 | 74 | 597 | 67 | 656 | 61 | 567 | 74 | 620 |
| Germany | 197 | 823 | 214 | 943 | 233 | 855 | 234 | 925 | 293 | 1,062 | 248 | 959 | 182 | 826 | 160 | 806 | 173 | 883 |
| Hungary | 1 | 16 | 0 | 19 | 0 | 15 | 0 | 11 | 0 | 8 | 2 | 12 | 0 | 11 | 1 | 14 | 0 | 17 |
| Ireland | 1 | 25 | 3 | 13 | 4 | 4 | 3 | 2 | 4 | 10 | 3 | 3 | 4 | 5 | 1 | 4 | 3 | 5 |
| Italy | 40 | 376 | 39 | 479 | 42 | 527 | 30 | 264 | 66 | 271 | 59 | 202 | 30 | 603 | 29 | 305 | 35 | 27 |
| Netherlands | 21 | 271 | 21 | 271 | 38 | 234 | 40 | 251 | 39 | 258 | 34 | 183 | 31 | 253 | 31 | 236 | 45 | 211 |
| Spain | 10 | 158 | 7 | 147 | 11 | 131 | 11 | 170 | 10 | 98 | 14 | 143 | 10 | 156 | 21 | 215 | 9 | 181 |
| Sweden | 45 | 222 | 44 | 120 | 41 | 117 | 53 | 110 | 40 | 123 | 41 | 123 | 44 | 208 | 26 | 153 | 22 | 91 |
| United Kingdom | 121 | 198 | 130 | 210 | 170 | 212 | 147 | 250 | 193 | 282 | 172 | 276 | 158 | 250 | 133 | 301 | 189 | 245 |
| All others | 1 | 283 | 3 | 301 | 8 | 257 | 8 | 306 | 4 | 249 | 4 | 231 | 1 | 209 | 6 | 268 | 3 | 239 |
| Other Europe | 57 | 1,648 | 51 | 1,299 | 75 | 1,135 | 82 | 1,314 | 66 | 1,490 | 70 | 1,743 | 48 | 2,048 | 37 | 1,682 | 56 | 1,716 |
| Former Soviet Union | 0 | 45 | 1 | 44 | 1 | 14 | 0 | 42 | 3 | 62 | 0 | 166 | 0 | 509 | 1 | 99 | 1 | 94 |
| Norway | 22 | 62 | 18 | 77 | 33 | 54 | 41 | 82 | 33 | 83 | 34 | 99 | 23 | 51 | 23 | 87 | 34 | 90 |
| Russia | 3 | 1,471 | 3 | 1,115 | 5 | 982 | 4 | 1,050 | 2 | 1,250 | 3 | 1,385 | 6 | 1,419 | 2 | 1,429 | 7 | 1,447 |
| Switzerland | 31 | 64 | 29 | 60 | 35 | 81 | 36 | 138 | 26 | 92 | 33 | 90 | 17 | 68 | 10 | 65 | 13 | 85 |
| All others | 1 | 6 | 1 | 3 | 0 | 4 | 1 | 2 | 2 | 2 | 2 | 3 | 2 | 1 | 1 | 2 | 2 | 1 |
| Asia | 386 | 8,173 | 406 | 9,642 | 387 | 6,535 | 373 | 5,949 | 421 | 5,966 | 422 | 7,337 | 401 | 7,452 | 386 | 9,254 | 386 | 12,304 |

| Region, country, or economy | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| World | 3,324 | 19,876 | 3,201 | 17,131 | 3,462 | 16,951 | 4,854 | 19,728 | 4,537 | 22,272 | 5,150 | 24,487 | 5,905 | 24,575 | 6,493 | 25,356 | 6,606 | 28,383 |
| North America | 2,437 | 1,147 | 3,425 | 1,590 | 3,133 | 1,297 | 3,511 | 1,445 | 3,963 | 1,547 | 4,329 | 1,576 | 4,422 | 1,639 | 4,440 | 1,528 | 4,644 | 1,581 |
| Canada | 169 | 136 | 150 | 153 | 191 | 142 | 249 | 170 | 255 | 154 | 270 | 178 | 290 | 174 | 305 | 175 | 349 | 165 |
| Mexico | 4 | 1 | 2 | 1 | 4 | 0 | 4 | 1 | 5 | 1 | 8 | 2 | 11 | 3 | 10 | 3 | 10 | 3 |
| Puerto Rico | 4 | 0 | 0 | 0 | 2 | 0 | 3 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 1 | 0 | 2 | 0 |
| United States | 2,144 | 1,032 | 2,076 | 962 | 2,240 | 1,005 | 3,170 | 1,419 | 2,862 | 1,142 | 3,231 | 1,265 | 3,661 | 1,370 | 4,013 | 1,397 | 4,061 | 1,470 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Central and South America | 11 | 10 | 18 | 15 | 11 | 40 | 15 | 28 | 19 | 29 | 21 | 39 | 29 | 43 | 33 | 39 | 37 | 45 |
| Argentina | 2 | 0 | 5 | 0 | 1 | 0 | 5 | 3 | 4 | 0 | 6 | 2 | 2 | 0 | 9 | 0 | 4 | 1 |
| Brazil | 4 | 4 | 7 | 7 | 7 | 1 | 4 | 39 | 6 | 21 | 6 | 27 | 5 | 29 | 15 | 39 | 12 | 35 |
| All others | 4 | 4 | 7 | 7 | 3 | 7 | 4 | 4 | 9 | 8 | 9 | 3 | 10 | 8 | 12 | 3 | 17 | 6 |
| Europe | 538 | 4,363 | 503 | 4,519 | 580 | 4,648 | 851 | 4,548 | 844 | 4,254 | 959 | 4,663 | 1,160 | 4,485 | 1,246 | 4,570 | 1,225 | 4,585 |
| EU | 488 | 2,735 | 453 | 2,788 | 526 | 2,658 | 759 | 2,660 | 755 | 2,792 | 856 | 2,917 | 1,031 | 2,665 | 1,105 | 2,725 | 1,073 | 2,775 |
| Austria | 4 | 91 | 13 | 120 | 18 | 129 | 20 | 141 | 38 | 145 | 31 | 175 | 40 | 122 | 36 | 108 | 26 | 140 |
| Belgium | 11 | 21 | 9 | 12 | 15 | 22 | 32 | 17 | 13 | 13 | 30 | 12 | 22 | 12 | 33 | 15 | 36 | 23 |
| Denmark | 6 | 19 | 13 | 23 | 6 | 19 | 13 | 21 | 24 | 13 | 19 | 20 | 12 | 25 | 22 | 25 | 44 | 30 |
| Finland | 11 | 26 | 5 | 32 | 6 | 11 | 67 | 19 | 59 | 9 | 50 | 14 | 66 | 24 | 71 | 19 | 62 | 22 |
| France | 74 | 553 | 96 | 496 | 91 | 523 | 101 | 648 | 135 | 674 | 151 | 637 | 138 | 848 | 119 | 675 | 126 | 515 |
| Germany | 153 | 817 | 136 | 718 | 174 | 637 | 224 | 625 | 230 | 539 | 265 | 579 | 338 | 540 | 352 | 674 | 362 | 650 |
| Hungary | 1 | 8 | 0 | 10 | 0 | 5 | 2 | 24 | 1 | 19 | 1 | 9 | 1 | 10 | 2 | 16 | 11 | 13 |
| Ireland | 1 | 5 | 2 | 0 | 3 | 2 | 5 | 3 | 3 | 4 | 5 | 4 | 4 | 20 | 7 | 16 | 11 | 13 |
| Italy | 36 | 24 | 29 | 31 | 45 | 39 | 63 | 143 | 63 | 274 | 56 | 176 | 74 | 29 | 70 | 28 | 80 | 30 |
| Netherlands | 41 | 264 | 30 | 273 | 27 | 203 | 33 | 190 | 26 | 245 | 52 | 225 | 43 | 251 | 46 | 189 | 40 | 167 |
| Spain | 26 | 130 | 30 | 131 | 23 | 97 | 52 | 133 | 58 | 113 | 48 | 115 | 78 | 69 | 60 | 63 | 53 | 77 |
| Sweden | 26 | 130 | 30 | 131 | 23 | 97 | 52 | 133 | 58 | 113 | 48 | 115 | 78 | 69 | 60 | 63 | 53 | 77 |
| United Kingdom | 119 | 150 | 118 | 153 | 106 | 183 | 176 | 213 | 171 | 264 | 201 | 291 | 206 | 184 | 258 | 201 | 222 | 220 |
| All others | 2 | 299 | 12 | 346 | 8 | 376 | 6 | 337 | 8 | 334 | 9 | 327 | 14 | 365 | 19 | 422 | 18 | 301 |
| Other Europe | 6 | 1,628 | 50 | 1,731 | 55 | 1,990 | 92 | 1,888 | 90 | 1,462 | 103 | 1,746 | 129 | 1,820 | 141 | 1,845 | 152 | 1,810 |
| Former Soviet Union | 1 | 150 | 1 | 165 | 0 | 186 | 0 | 154 | 0 | 142 | 1 | 144 | 1 | 141 | 1 | 114 | 1 | 97 |
| Norway | 29 | 67 | 32 | 83 | 34 | 50 | 52 | 70 | 50 | 60 | 60 | 71 | 69 | 175 | 79 | 128 | 100 | 96 |
| Russia | 6 | 1,329 | 4 | 1,396 | 6 | 1,662 | 12 | 1,555 | 7 | 1,203 | 8 | 1,649 | 12 | 1,428 | 13 | 1,508 | 14 | 1,517 |
| Switzerland | 13 | 77 | 13 | 77 | 12 | 80 | 27 | 91 | 31 | 50 | 31 | 67 | 41 | 67 | 39 | 80 | 32 | 89 |
| All others | 1 | 5 | 1 | 9 | 2 | 12 | 1 | 19 | 1 | 7 | 3 | 16 | 4 | 9 | 8 | 15 | 6 | 11 |
| Asia | 392 | 14,114 | 380 | 11,248 | 368 | 10,871 | 455 | 13,332 | 432 | 16,445 | 505 | 18,047 | 588 | 18,230 | 667 | 18,907 | 711 | 21,847 |

| Region, country, or economy | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|
| | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| World | 6,716 | 33,100 | 7,026 | 34,121 | 7,051 | 33,341 |
| North America | 4,440 | 1,528 | 4,644 | 1,581 | 4,724 | 1,444 |
| Canada | 353 | 191 | 400 | 180 | 407 | 160 |
| Mexico | 17 | 24 | 13 | 24 | 20 | 21 |
| Puerto Rico | 0 | 3 | 0 | 2 | 0 | 1 |
| United States | 4,067 | 1,314 | 4,229 | 1,378 | 4,296 | 1,262 |
| All others | 0 | 0 | 0 | 0 | 0 | 1 |
| Central and South America | 26 | 60 | 21 | 57 | 26 | 85 |
| Argentina | 8 | 1 | 4 | 1 | 3 | 2 |
| Brazil | 9 | 55 | 11 | 53 | 14 | 80 |
| All others | 9 | 3 | 6 | 3 | 9 | 3 |
| Europe | 1,270 | 4,365 | 1,269 | 4,847 | 1,252 | 4,506 |
| EU | 1,105 | 2,845 | 1,102 | 3,067 | 1,086 | 2,755 |
| Austria | 23 | 121 | 30 | 194 | 34 | 128 |
| Belgium | 36 | 23 | 37 | 26 | 32 | 77 |
| Denmark | 37 | 51 | 54 | 50 | 35 | 30 |
| Finland | 62 | 85 | 23 | 67 | 30 | 72 |
| France | 138 | 848 | 119 | 675 | 126 | 515 |
| Germany | 362 | 650 | 323 | 662 | 351 | 548 |
| Hungary | 1 | 15 | 2 | 12 | 3 | 5 |
| Ireland | 4 | 14 | 11 | 14 | 10 | 5 |
| Italy | 80 | 88 | 49 | 73 | 461 | 82 |
| Netherlands | 42 | 167 | 56 | 222 | 56 | 237 |
| Spain | 28 | 170 | 23 | 177 | 31 | 156 |
| Sweden | 53 | 77 | 77 | 101 | 58 | 105 |
| United Kingdom | 201 | 220 | 222 | 220 | 244 | 245 |
| All others | 18 | 301 | 27 | 432 | 19 | 396 |
| Other Europe | 152 | 1,810 | 165 | 1,650 | 167 | 1,776 |
| Former Soviet Union | 1 | 97 | 2 | 87 | 1 | 98 |
| Norway | 79 | 128 | 100 | 96 | 109 | 133 |
| Russia | 14 | 1,517 | 20 | 1,203 | 15 | 1,419 |
| Switzerland | 39 | 80 | 32 | 89 | 29 | 86 |
| All others | 6 | 11 | 5 | 12 | 8 | 14 |
| Asia | 711 | 21,847 | 766 | 26,869 | 873 | 27,418 |

**TABLE S8-39**

## USPTO patents and patent families granted in civil engineering, by region, country, or economy: 1998–2018

(Number)

| | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Region, country, or economy | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| China | 4 | 58 | 5 | 93 | 8 | 163 | 13 | 219 | 9 | 210 | 12 | 414 | 16 | 489 | 14 | 587 | 25 | 726 |
| India | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 1 | 1 | 0 |
| Japan | 232 | 7,577 | 234 | 8,218 | 235 | 5,678 | 211 | 5,171 | 205 | 4,911 | 182 | 5,338 | 163 | 5,210 | 171 | 5,980 | 180 | 6,450 |
| Malaysia | 3 | 3 | 0 | 1 | 1 | 0 | 1 | 2 | 3 | 0 | 0 | 5 | 2 | 5 | 1 | 8 | 1 | 16 |
| Singapore | 2 | 6 | 1 | 3 | 4 | 2 | 3 | 3 | 4 | 5 | 3 | 0 | 9 | 3 | 3 | 4 | 5 | 3 |
| South Korea | 27 | 327 | 33 | 1,132 | 34 | 511 | 32 | 315 | 40 | 588 | 57 | 1,363 | 40 | 1,502 | 42 | 2,449 | 38 | 4,844 |
| Taiwan | 113 | 184 | 129 | 187 | 102 | 176 | 112 | 235 | 159 | 244 | 166 | 214 | 169 | 238 | 151 | 222 | 133 | 261 |
| All others | 2 | 16 | 4 | 10 | 2 | 5 | 2 | 2 | 2 | 2 | 7 | 2 | 1 | 4 | 1 | 4 | 2 | 5 |
| Middle East | 12 | 20 | 8 | 15 | 17 | 32 | 22 | 34 | 18 | 18 | 17 | 19 | 18 | 17 | 16 | 15 | 17 | 11 |
| Israel | 11 | 7 | 6 | 5 | 14 | 8 | 21 | 11 | 17 | 7 | 15 | 4 | 12 | 5 | 11 | 4 | 13 | 4 |
| All others | 1 | 13 | 3 | 10 | 3 | 23 | 1 | 23 | 1 | 11 | 2 | 15 | 5 | 12 | 5 | 11 | 4 | 7 |
| Africa | 19 | 53 | 14 | 61 | 10 | 46 | 11 | 45 | 8 | 43 | 15 | 52 | 9 | 47 | 9 | 40 | 11 | 30 |
| South Africa | 19 | 44 | 14 | 46 | 10 | 31 | 10 | 29 | 8 | 25 | 14 | 29 | 7 | 25 | 9 | 33 | 9 | 23 |
| All others | 0 | 9 | 1 | 15 | 0 | 15 | 1 | 16 | 0 | 19 | 1 | 22 | 2 | 21 | 0 | 7 | 1 | 8 |
| Australia and Oceania | 71 | 75 | 55 | 64 | 64 | 99 | 66 | 147 | 52 | 105 | 60 | 90 | 65 | 170 | 47 | 172 | 58 | 164 |
| Australia | 63 | 75 | 46 | 63 | 61 | 99 | 55 | 147 | 47 | 104 | 53 | 87 | 60 | 169 | 40 | 170 | 49 | 163 |
| New Zealand | 8 | 0 | 9 | 1 | 4 | 0 | 10 | 0 | 6 | 1 | 8 | 2 | 5 | 1 | 7 | 2 | 9 | 1 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Unclassified | 0 | 14 | 1 | 159 | 0 | 165 | 1 | 8 | 0 | 5 | 0 | 4 | 0 | 7 | 0 | 10 | 1 | 11 |

| | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Region, country, or economy | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| China | 33 | 851 | 38 | 1,214 | 30 | 2,113 | 56 | 2,844 | 60 | 4,011 | 85 | 4,936 | 100 | 4,492 | 120 | 6,317 | 120 | 12,237 | 148 | 16,237 | 196 | 16,300 | 207 | 15,775 |
| India | 2 | 1 | 0 | 0 | 2 | 1 | 4 | 2 | 7 | 3 | 9 | 6 | 11 | 8 | 17 | 11 | 19 | 12 | 19 | 9 | 40 | 10 | 36 | 9 |
| Japan | 160 | 7,423 | 149 | 6,849 | 167 | 5,968 | 203 | 6,658 | 198 | 7,218 | 203 | 7,080 | 249 | 7,317 | 279 | 6,812 | 317 | 4,792 | 313 | 5,447 | 339 | 5,420 | 293 | 5,611 |
| Malaysia | 2 | 31 | 3 | 5 | 2 | 19 | 4 | 24 | 3 | 29 | 2 | 12 | 8 | 25 | 4 | 17 | 8 | 16 | 7 | 22 | 7 | 23 | 5 | 33 |
| Singapore | 2 | 1 | 6 | 1 | 3 | 1 | 7 | 1 | 6 | 5 | 5 | 3 | 8 | 5 | 18 | 3 | 19 | 3 | 19 | 6 | 23 | 8 | 20 | 2 |
| South Korea | 51 | 5,533 | 43 | 2,973 | 36 | 2,547 | 62 | 3,541 | 43 | 4,938 | 63 | 5,754 | 69 | 6,107 | 90 | 5,462 | 99 | 4,433 | 125 | 4,733 | 138 | 5,241 | 119 | 5,379 |
| Taiwan | 139 | 271 | 138 | 202 | 123 | 219 | 119 | 257 | 110 | 239 | 129 | 251 | 138 | 270 | 135 | 282 | 125 | 347 | 128 | 407 | 125 | 399 | 120 | 310 |
| All others | 2 | 3 | 2 | 3 | 4 | 4 | 2 | 6 | 4 | 2 | 8 | 5 | 7 | 6 | 4 | 2 | 3 | 6 | 6 | 7 | 5 | 16 | 3 | 10 |
| Middle East | 14 | 14 | 21 | 20 | 16 | 15 | 28 | 24 | 26 | 18 | 51 | 37 | 48 | 41 | 72 | 44 | 68 | 40 | 85 | 44 | 82 | 71 | 113 | 39 |
| Israel | 9 | 3 | 10 | 3 | 8 | 8 | 18 | 7 | 15 | 5 | 28 | 1 | 18 | 5 | 28 | 11 | 24 | 6 | 24 | 6 | 25 | 4 | 29 | 7 |
| All others | 11 | 11 | 11 | 18 | 8 | 7 | 10 | 17 | 11 | 13 | 24 | 36 | 30 | 36 | 44 | 33 | 44 | 33 | 61 | 39 | 58 | 67 | 83 | 32 |
| Africa | 6 | 28 | 9 | 40 | 6 | 35 | 5 | 36 | 17 | 30 | 12 | 45 | 12 | 28 | 20 | 32 | 10 | 14 | 11 | 9 | 14 | 6 | 12 | 9 |
| South Africa | 5 | 21 | 8 | 37 | 6 | 32 | 5 | 27 | 16 | 10 | 10 | 32 | 11 | 10 | 16 | 14 | 9 | 7 | 9 | 1 | 13 | 2 | 11 | 2 |
| All others | 1 | 7 | 1 | 3 | 0 | 4 | 0 | 9 | 1 | 20 | 2 | 13 | 2 | 18 | 4 | 18 | 1 | 7 | 2 | 8 | 0 | 5 | 2 | 7 |
| Australia and Oceania | 43 | 178 | 40 | 172 | 43 | 175 | 72 | 170 | 75 | 198 | 92 | 211 | 105 | 201 | 125 | 188 | 132 | 211 | 117 | 221 | 123 | 140 | 120 | 129 |
| Australia | 38 | 174 | 36 | 171 | 39 | 172 | 64 | 169 | 63 | 197 | 81 | 210 | 86 | 199 | 105 | 187 | 117 | 209 | 103 | 220 | 108 | 137 | 102 | 128 |
| New Zealand | 5 | 4 | 4 | 1 | 4 | 2 | 8 | 1 | 11 | 2 | 11 | 1 | 18 | 2 | 19 | 1 | 15 | 2 | 15 | 1 | 15 | 3 | 18 | 2 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Unclassified | 0 | 0 | 1 | 1 | 1 | 20 | 2 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 2 | 4 | 0 | 0 | 1 | 0 |

EU = European Union; USPTO = U.S. Patent and Trademark Office.

**Note(s)**

USPTO patents are allocated according to patent inventorship information. USPTO patents are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named inventors. Patents are classified under the World Intellectual Property Organization (WIPO) classification of patents, which classifies International Patent Classification (IPC) codes under 35 technical fields. IPC reformed codes take into account changes that were made to the WIPO classification in 2006 under the eighth version of the classification and were used to prepare these data. However, because PatentsView only provides the original IPC codes as they appeared on patents and not the IPC reformed codes, current Cooperative Patent Classification codes on patents were converted back to the most recent IPC classification to prepare these statistics. Fractional counts of patents were assigned to each technological field on patents to assign the proper weight of a patent to the corresponding technological fields under the classification. International Patent Documentation (INPADOC) patent families across all patent offices covered in the Worldwide Patent Statistical Database (PATSTAT) are counted according to the year of the first granted patent in the patent family. Patent families are allocated according to patent inventorship information found on the priority patent of the INPADOC patent families. To account for missing ownership information in PATSTAT for some offices, a method designed by de Rassenfosse et al. (2012) is used to fill in missing information on priority patents using information in successive filings within the patent families (see technical documentation for details). Patent families are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named inventors. Because of data coverage issues for some patent offices in PATSTAT, statistics for some countries may be underestimated partially for some years or across the whole trend. Countries with identified issues include India (missing data) and South Africa (no data for 2018). For Italy, because of data gaps regarding information on granted patents, patent applications are used instead, which slightly overestimates Italy's output and creates a small shift in the year for which its output is accounted. The EU includes 28 member countries. China includes Hong Kong.

**Source(s)**

Science-Metrix; PATSTAT, accessed April 2019; PatentsView, USPTO, accessed June 2019.

TABLE S8-40

## Unclassified USPTO patents and patent families granted, by region, country, or economy: 1998–2018

(Number)

| Region, country, or economy | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| World | 259 | 1,844 | 321 | 2,446 | 411 | 2,681 | 433 | 4,607 | 428 | 4,068 | 467 | 3,643 | 554 | 6,021 | 555 | 3,943 | 620 | 6,295 | 564 | 10,835 | 588 | 10,468 | 821 | 9,248 | 1,109 | 7,571 | 1,272 | 7,009 | 1,390 | 7,059 | 1,307 | 8,327 | 871 | 7,828 | 1,254 | 3,922 | 1,476 | 444 | 1,645 | 1,245 | 1,535 | 887 |
| North America | 115 | 54 | 164 | 90 | 168 | 58 | 192 | 38 | 162 | 48 | 180 | 42 | 185 | 45 | 189 | 60 | 218 | 83 | 192 | 110 | 160 | 86 | 248 | 98 | 362 | 64 | 439 | 55 | 528 | 58 | 471 | 66 | 326 | 45 | 461 | 23 | 564 | 11 | 696 | 16 | 611 | 9 |
| Canada | 11 | 2 | 13 | 7 | 6 | 5 | 3 | 5 | 7 | 2 | 4 | 3 | 4 | 3 | 6 | 1 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 5 | 7 | 1 | 13 | 1 | 17 | 1 | 23 | 4 | 11 | 2 | 21 | 2 | 29 | 0 | 32 | 1 | 26 | 1 |
| Mexico | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| Puerto Rico | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| United States | 103 | 52 | 151 | 83 | 162 | 53 | 189 | 32 | 155 | 45 | 176 | 40 | 181 | 42 | 183 | 60 | 214 | 80 | 189 | 106 | 157 | 84 | 244 | 93 | 355 | 64 | 426 | 54 | 511 | 56 | 448 | 62 | 315 | 43 | 440 | 20 | 533 | 11 | 664 | 14 | 584 | 8 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Central and South America | 0 | 1 | 0 | 2 | 1 | 2 | 0 | 8 | 0 | 4 | 0 | 4 | 0 | 5 | 0 | 7 | 0 | 11 | 0 | 7 | 0 | 12 | 0 | 5 | 1 | 9 | 0 | 8 | 1 | 8 | 1 | 8 | 2 | 5 | 1 | 2 | 0 | 2 | 0 | 2 | 0 | 2 |
| Argentina | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 3 | 0 | 4 | 0 | 2 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 3 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Brazil | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 2 | 0 | 5 | 0 | 6 | 0 | 9 | 0 | 2 | 0 | 5 | 0 | 3 | 1 | 1 | 1 | 6 | 2 | 4 | 1 | 1 | 0 | 2 | 0 | 2 | 0 | 2 |
| All others | 0 | 0 | 0 | 2 | 1 | 1 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 5 | 0 | 1 | 0 | 1 | 0 | 3 | 1 | 1 | 0 | 4 | 0 | 6 | 0 | 2 | 1 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| Europe | 15 | 1,423 | 21 | 1,875 | 24 | 2,168 | 38 | 3,529 | 27 | 3,378 | 24 | 2,538 | 33 | 5,103 | 24 | 3,864 | 31 | 5,011 | 24 | 9,960 | 29 | 9,685 | 39 | 8,613 | 75 | 7,281 | 87 | 6,729 | 99 | 6,858 | 113 | 8,124 | 72 | 7,715 | 127 | 3,796 | 147 | 168 | 147 | 899 | 168 | 722 |
| EU | 14 | 1,410 | 20 | 1,858 | 23 | 2,140 | 38 | 3,055 | 26 | 3,313 | 23 | 2,504 | 33 | 5,066 | 23 | 2,833 | 30 | 4,978 | 24 | 9,916 | 28 | 9,640 | 39 | 8,571 | 73 | 7,253 | 82 | 6,699 | 90 | 6,823 | 106 | 8,067 | 67 | 7,669 | 114 | 3,773 | 138 | 154 | 139 | 882 | 151 | 709 |
| Austria | 0 | 4 | 0 | 7 | 0 | 2 | 0 | 8 | 0 | 7 | 0 | 1 | 1 | 2 | 0 | 1 | 1 | 220 | 1 | 325 | 0 | 5 | 0 | 8 | 3 | 2 | 0 | 1 | 2 | 5 | 2 | 2 | 0 | 3 | 2 | 6 | 9 | 1 | 5 | 2 | 7 | 14 |
| Belgium | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 1 | 1 | 0 | 2 | 2 | 0 | 1 | 5 | 2 | 1 | 6 | 3 | 3 | 1 | 2 | 5 | 3 | 1 | 1 | 0 | 2 | 7 | 7 | 1 | 6 | 3 | 6 | 0 |
| Denmark | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 2 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 3 | 0 | 1 | 0 | 2 | 3 | 2 | 1 | 0 | 5 | 0 | 3 | 1 | 1 | 5 | 2 | 1 | 3 | 2 | 3 | 3 | 3 | 0 |
| Finland | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 2 | 2 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 3 | 2 | 1 | 4 | 2 | 0 | 3 | 6 | 3 | 2 | 0 | 4 | 1 | 7 | 0 |
| France | 1 | 5 | 2 | 5 | 1 | 6 | 5 | 10 | 4 | 9 | 4 | 18 | 5 | 24 | 0 | 20 | 7 | 36 | 4 | 85 | 4 | 50 | 8 | 57 | 4 | 30 | 11 | 34 | 12 | 20 | 9 | 15 | 5 | 16 | 18 | 10 | 18 | 5 | 16 | 1 | 10 | 5 |
| Germany | 6 | 23 | 9 | 10 | 8 | 10 | 13 | 6 | 12 | 14 | 8 | 6 | 10 | 3 | 9 | 8 | 4 | 21 | 6 | 31 | 12 | 13 | 7 | 16 | 23 | 5 | 28 | 22 | 30 | 11 | 43 | 20 | 31 | 19 | 46 | 6 | 51 | 6 | 48 | 1 | 50 | 2 |
| Hungary | 0 | 3 | 0 | 4 | 0 | 1 | 0 | 1 | 0 | 2 | 0 | 3 | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 3 | 2 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 2 | 1 | 0 |
| Ireland | 0 | 5 | 0 | 2 | 0 | 1 | 1 | 0 | 0 | 2 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 3 | 1 | 0 | 0 | 3 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 4 | 0 |
| Italy | 1 | 1,311 | 2 | 1,758 | 2 | 2,063 | 5 | 2,955 | 1 | 3,117 | 0 | 2,433 | 0 | 4,991 | 1 | 2,749 | 1 | 4,571 | 0 | 9,315 | 2 | 9,366 | 4 | 8,420 | 5 | 7,164 | 4 | 6,609 | 7 | 6,743 | 5 | 7,981 | 3 | 7,575 | 4 | 3,707 | 6 | 103 | 3 | 845 | 7 | 666 |
| Netherlands | 3 | 1 | 3 | 0 | 1 | 1 | 2 | 0 | 1 | 5 | 2 | 5 | 3 | 2 | 4 | 1 | 1 | 6 | 2 | 6 | 2 | 6 | 5 | 5 | 9 | 2 | 9 | 7 | 6 | 4 | 9 | 0 | 5 | 5 | 5 | 2 | 7 | 10 | 13 | 7 | 5 | 7 |
| Spain | 0 | 14 | 0 | 25 | 0 | 13 | 0 | 14 | 1 | 13 | 0 | 12 | 0 | 10 | 0 | 15 | 0 | 7 | 0 | 17 | 0 | 12 | 0 | 13 | 0 | 7 | 0 | 4 | 1 | 2 | 0 | 5 | 1 | 2 | 5 | 0 | 3 | 2 | 2 | 3 | 5 | 3 |
| Sweden | 3 | 5 | 1 | 2 | 0 | 0 | 3 | 3 | 3 | 4 | 0 | 0 | 2 | 0 | 2 | 0 | 2 | 0 | 0 | 8 | 1 | 8 | 2 | 10 | 4 | 1 | 5 | 1 | 3 | 0 | 5 | 1 | 2 | 2 | 3 | 1 | 7 | 0 | 8 | 0 | 11 | 2 |
| United Kingdom | 0 | 3 | 3 | 9 | 10 | 2 | 7 | 3 | 5 | 13 | 4 | 6 | 7 | 4 | 5 | 3 | 13 | 7 | 6 | 12 | 5 | 15 | 8 | 22 | 15 | 4 | 19 | 5 | 19 | 4 | 16 | 8 | 16 | 8 | 24 | 5 | 24 | 1 | 23 | 3 | 35 | 0 |
| All others | 0 | 36 | 0 | 34 | 0 | 42 | 0 | 55 | 0 | 127 | 1 | 20 | 2 | 28 | 0 | 31 | 0 | 106 | 0 | 110 | 0 | 158 | 1 | 13 | 2 | 33 | 3 | 9 | 1 | 21 | 2 | 30 | 0 | 29 | 1 | 20 | 2 | 23 | 5 | 9 | 1 | 12 |
| Other Europe | 1 | 13 | 1 | 17 | 1 | 28 | 0 | 474 | 1 | 66 | 1 | 34 | 0 | 36 | 1 | 31 | 2 | 32 | 0 | 44 | 1 | 45 | 0 | 41 | 2 | 28 | 5 | 30 | 8 | 35 | 7 | 56 | 5 | 45 | 13 | 23 | 9 | 15 | 9 | 17 | 17 | 13 |
| Former Soviet Union | 0 | 3 | 0 | 2 | 0 | 9 | 0 | 19 | 0 | 26 | 0 | 20 | 0 | 9 | 0 | 13 | 0 | 0 | 0 | 2 | 0 | 5 | 0 | 8 | 0 | 10 | 0 | 9 | 1 | 8 | 0 | 6 | 0 | 1 | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 1 |
| Norway | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 3 | 1 | 0 | 1 | 4 | 0 | 2 | 1 | 1 | 1 | 3 | 2 | 0 | 0 | 1 | 1 | 2 | 1 | 2 |
| Russia | 0 | 5 | 0 | 1 | 0 | 0 | 0 | 433 | 0 | 4 | 0 | 1 | 0 | 5 | 0 | 3 | 0 | 4 | 0 | 7 | 0 | 10 | 0 | 3 | 0 | 1 | 1 | 2 | 1 | 0 | 1 | 4 | 2 | 1 | 4 | 1 | 3 | 6 | 4 | 10 | 4 | 4 |
| Switzerland | 0 | 2 | 1 | 8 | 1 | 5 | 0 | 10 | 1 | 12 | 0 | 5 | 0 | 11 | 1 | 7 | 2 | 22 | 0 | 26 | 1 | 22 | 0 | 20 | 1 | 11 | 3 | 11 | 6 | 17 | 4 | 36 | 2 | 34 | 7 | 19 | 5 | 4 | 3 | 3 | 11 | 5 |
| All others | 0 | 2 | 1 | 6 | 0 | 12 | 0 | 12 | 0 | 24 | 0 | 8 | 0 | 11 | 0 | 8 | 0 | 6 | 0 | 9 | 0 | 8 | 0 | 7 | 0 | 6 | 0 | 5 | 0 | 9 | 1 | 9 | 1 | 6 | 0 | 3 | 0 | 2 | 1 | 1 | 1 | 2 |
| Asia | 128 | 201 | 133 | 365 | 216 | 378 | 202 | 955 | 238 | 475 | 260 | 646 | 335 | 693 | 339 | 839 | 368 | 941 | 345 | 591 | 396 | 528 | 528 | 337 | 665 | 145 | 728 | 155 | 748 | 96 | 702 | 104 | 450 | 26 | 625 | 43 | 738 | 178 | 774 | 216 | 725 | 149 |

TABLE S8-40

## Unclassified USPTO patents and patent families granted, by region, country, or economy: 1998–2018

(Number)

| Region, country, or economy | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families | USPTO patents | Patent families |
| China | 0 | 41 | 0 | 80 | 0 | 111 | 1 | 98 | 0 | 45 | 0 | 74 | 1 | 102 | 0 | 120 | 1 | 9 | 2 | 15 | 3 | 56 | 10 | 31 | 14 | 14 | 20 | 38 | 22 | 34 | 47 | 29 | 64 | 4 | 72 | 12 | 87 | 10 | 94 | 26 | 82 | 1 |
| India | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 2 | 0 | 4 | 1 | 11 | 3 | 5 | 5 | 4 | 10 | 9 | 1 | 9 | 3 | 13 | 3 | 18 | 8 | 15 | 3 | 17 | 5 | 9 | 1 | 11 | 1 | 11 | 0 |
| Japan | 91 | 67 | 89 | 72 | 145 | 66 | 132 | 55 | 151 | 77 | 145 | 60 | 199 | 32 | 187 | 39 | 178 | 23 | 142 | 44 | 146 | 82 | 222 | 80 | 273 | 81 | 384 | 7 | 430 | 7 | 403 | 4 | 195 | 1 | 382 | 3 | 402 | 3 | 421 | 1 | 367 | 4 |
| Malaysia | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 6 | 0 | 2 | 0 | 9 | 0 | 5 | 1 | 14 | 2 | 148 | 2 | 129 | 1 | 4 | 0 | 50 | 0 | 28 | 0 | 9 | 0 | 9 | 3 | 9 | 1 | 30 | 0 | 13 | 3 | 23 |
| Singapore | 0 | 0 | 0 | 0 | 3 | 1 | 3 | 0 | 7 | 1 | 2 | 0 | 2 | 1 | 1 | 0 | 0 | 1 | 1 | 2 | 2 | 5 | 4 | 5 | 3 | 0 | 4 | 1 | 2 | 0 | 5 | 0 | 4 | 3 | 3 | 0 | 2 | 0 | 6 | 0 | 2 | 0 |
| South Korea | 24 | 72 | 29 | 168 | 41 | 161 | 45 | 724 | 61 | 219 | 82 | 371 | 87 | 448 | 100 | 579 | 105 | 788 | 118 | 442 | 151 | 130 | 182 | 30 | 244 | 17 | 195 | 5 | 174 | 18 | 153 | 45 | 118 | 1 | 118 | 8 | 195 | 115 | 193 | 163 | 224 | 98 |
| Taiwan | 13 | 19 | 15 | 41 | 27 | 37 | 21 | 76 | 19 | 130 | 30 | 133 | 43 | 108 | 48 | 75 | 80 | 89 | 69 | 67 | 87 | 99 | 103 | 50 | 121 | 29 | 116 | 51 | 106 | 6 | 75 | 7 | 53 | 4 | 30 | 5 | 40 | 19 | 48 | 10 | 36 | 22 |
| All others | 0 | 0 | 0 | 3 | 0 | 1 | 0 | 1 | 0 | 2 | 1 | 2 | 1 | 0 | 0 | 17 | 0 | 24 | 0 | 4 | 1 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 1 | 2 | 0 | 1 | 2 | 1 | 0 |
| Middle East | 0 | 1 | 1 | 0 | 0 | 10 | 1 | 6 | 1 | 5 | 4 | 2 | 1 | 1 | 3 | 4 | 1 | 3 | 2 | 2 | 3 | 5 | 4 | 3 | 3 | 7 | 13 | 6 | 9 | 6 | 13 | 7 | 13 | 2 | 15 | 1 | 20 | 2 | 21 | 5 | 23 | 0 |
| Israel | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 3 | 0 | 1 | 0 | 3 | 1 | 1 | 1 | 2 | 1 | 3 | 0 | 4 | 1 | 3 | 4 | 11 | 3 | 8 | 0 | 12 | 6 | 11 | 0 | 14 | 0 | 19 | 0 | 18 | 0 | 21 | 0 |
| All others | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 6 | 0 | 4 | 1 | 2 | 0 | 1 | 0 | 3 | 0 | 3 | 0 | 1 | 0 | 5 | 0 | 2 | 0 | 2 | 2 | 3 | 1 | 6 | 1 | 1 | 2 | 2 | 0 | 1 | 2 | 2 | 3 | 5 | 2 | 0 |
| Africa | 0 | 32 | 0 | 29 | 0 | 31 | 0 | 35 | 0 | 37 | 0 | 46 | 0 | 42 | 0 | 29 | 0 | 206 | 0 | 162 | 0 | 132 | 0 | 183 | 0 | 63 | 0 | 51 | 0 | 11 | 0 | 16 | 0 | 34 | 0 | 57 | 0 | 75 | 0 | 100 | 0 | 4 |
| South Africa | 0 | 20 | 0 | 17 | 0 | 6 | 0 | 7 | 0 | 9 | 0 | 21 | 0 | 18 | 0 | 10 | 0 | 38 | 0 | 21 | 0 | 22 | 0 | 27 | 0 | 11 | 0 | 49 | 0 | 8 | 0 | 2 | 0 | 14 | 0 | 52 | 0 | 74 | 0 | 97 | 0 | 0 |
| All others | 0 | 12 | 0 | 12 | 0 | 25 | 0 | 28 | 0 | 28 | 0 | 25 | 0 | 24 | 0 | 19 | 0 | 168 | 0 | 141 | 0 | 110 | 0 | 156 | 0 | 53 | 0 | 2 | 0 | 3 | 0 | 14 | 0 | 20 | 0 | 5 | 0 | 1 | 0 | 3 | 0 | 4 |
| Australia and Oceania | 0 | 4 | 1 | 2 | 1 | 7 | 0 | 25 | 0 | 60 | 0 | 93 | 0 | 69 | 0 | 79 | 1 | 5 | 1 | 1 | 1 | 7 | 2 | 8 | 2 | 1 | 4 | 4 | 6 | 21 | 7 | 1 | 8 | 2 | 26 | 1 | 6 | 4 | 7 | 7 | 7 | 1 |
| Australia | 0 | 4 | 0 | 2 | 1 | 7 | 0 | 25 | 0 | 60 | 0 | 93 | 0 | 69 | 0 | 79 | 1 | 5 | 1 | 1 | 1 | 6 | 2 | 1 | 2 | 1 | 4 | 3 | 6 | 20 | 7 | 1 | 8 | 2 | 24 | 1 | 4 | 4 | 5 | 7 | 5 | 1 |
| New Zealand | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 2 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 2 | 0 | 2 | 0 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Unclassified | 0 | 127 | 0 | 83 | 0 | 26 | 0 | 11 | 0 | 60 | 0 | 71 | 0 | 62 | 0 | 62 | 0 | 34 | 0 | 0 | 0 | 12 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 |

EU = European Union; USPTO = U.S. Patent and Trademark Office.

**Note(s)**

USPTO patents are allocated according to patent inventorship information. USPTO patents are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named inventors. Patents are classified under the World Intellectual Property Organization (WIPO) classification of patents, which classifies International Patent Classification (IPC) codes under 35 technical fields. IPC reformed codes take into account changes that were made to the WIPO classification in 2006 under the eighth version of the classification and were used to prepare these data. However, because PatentsView only provides the original IPC codes as they appeared on patents and not the IPC reformed codes, current Cooperative Patent Classification codes on patents were converted back to the most recent IPC classification to prepare these statistics. Fractional counts of patents were assigned to each technological field on patents to assign the proper weight of a patent to the corresponding technological fields under the classification. International Patent Documentation (INPADOC) patent families across all patent offices covered in the Worldwide Patent Statistical Database (PATSTAT) are counted according to the year of the first granted patent in the patent family. Patent families are allocated according to patent inventorship information found on the priority patent of the INPADOC patent families. To account for missing ownership information in PATSTAT for some offices, a method designed by de Rassenfosse et al. (2012) is used to fill in missing information on priority patents using information in successive filings within the patent families (see technical documentation for details). Patent families are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named inventors. Because of data coverage issues for some patent offices in PATSTAT, statistics for some countries may be underestimated partially for some years or across the whole trend. Countries with identified issues include India (missing data) and South Africa (no data for 2018). For Italy, because of data gaps regarding information on granted patents, patent applications are used instead, which slightly overestimates Italy's output and creates a small shift in the year for which its output is accounted. The EU includes 28 member countries. China includes Hong Kong.

**Source(s)**

Science-Metrix; PATSTAT, accessed April 2019; PatentsView, USPTO, accessed June 2019.

TABLE S8-41

## U.S. patent families granted, by WIPO technical field: 1998–2018

(Number)

| WIPO technical field | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| All technical fields | 59,221 | 58,006 | 56,025 | 53,545 | 50,589 | 49,800 | 47,332 | 39,805 | 46,149 | 39,689 | 37,632 | 39,363 | 48,734 | 45,279 | 49,911 | 51,827 | 54,759 | 52,150 | 50,367 | 49,328 | 45,755 |
| Analysis of biological materials | 439 | 379 | 293 | 296 | 237 | 235 | 197 | 138 | 143 | 125 | 107 | 110 | 130 | 117 | 93 | 86 | 87 | 116 | 114 | 119 | 110 |
| Audio-visual technology | 2,500 | 2,349 | 2,386 | 2,258 | 2,125 | 2,288 | 2,322 | 1,912 | 2,267 | 1,877 | 1,675 | 1,772 | 1,952 | 2,026 | 2,597 | 2,503 | 2,947 | 2,631 | 2,327 | 2,273 | 1,954 |
| Basic communication processes | 1,127 | 1,092 | 1,172 | 1,256 | 1,291 | 1,307 | 1,289 | 1,041 | 1,317 | 1,254 | 1,037 | 1,018 | 1,145 | 914 | 865 | 1,009 | 997 | 833 | 875 | 788 | 616 |
| Basic materials chemistry | 1,227 | 1,197 | 1,029 | 932 | 845 | 786 | 654 | 447 | 497 | 407 | 336 | 331 | 466 | 436 | 454 | 465 | 559 | 502 | 421 | 373 | 316 |
| Biotechnology | 1,306 | 1,127 | 823 | 696 | 583 | 412 | 318 | 249 | 347 | 316 | 305 | 319 | 332 | 333 | 388 | 388 | 370 | 401 | 345 | 386 | 330 |
| Chemical engineering | 1,414 | 1,434 | 1,225 | 1,104 | 997 | 951 | 847 | 687 | 745 | 670 | 635 | 628 | 802 | 791 | 763 | 729 | 719 | 674 | 638 | 639 | 545 |
| Civil engineering | 2,180 | 2,062 | 2,058 | 1,924 | 1,803 | 1,606 | 1,490 | 1,266 | 1,261 | 1,032 | 962 | 1,005 | 1,419 | 1,142 | 1,265 | 1,370 | 1,397 | 1,470 | 1,314 | 1,378 | 1,262 |
| Computer technology | 6,012 | 5,983 | 5,553 | 5,659 | 5,547 | 6,015 | 6,409 | 5,897 | 8,486 | 7,268 | 7,771 | 8,898 | 11,049 | 10,421 | 12,144 | 12,653 | 13,620 | 11,913 | 11,539 | 10,316 | 9,214 |
| Control | 1,154 | 1,116 | 1,113 | 994 | 907 | 987 | 991 | 820 | 1,040 | 879 | 966 | 908 | 1,088 | 1,057 | 1,185 | 1,157 | 1,297 | 1,199 | 1,218 | 1,464 | 1,470 |
| Digital communication | 1,312 | 1,517 | 1,714 | 1,610 | 1,729 | 1,853 | 2,249 | 2,037 | 2,329 | 1,958 | 2,089 | 2,240 | 2,640 | 2,450 | 3,050 | 3,335 | 4,346 | 4,999 | 5,143 | 5,078 | 4,970 |
| Electrical machinery, apparatus, energy | 3,072 | 3,110 | 3,121 | 3,065 | 2,890 | 2,718 | 2,782 | 2,179 | 2,529 | 2,183 | 2,073 | 2,207 | 2,433 | 2,223 | 2,210 | 2,350 | 2,433 | 2,474 | 2,635 | 2,684 | 2,477 |
| Engines, pumps, turbines | 1,233 | 1,096 | 1,339 | 1,493 | 1,598 | 1,418 | 1,296 | 1,148 | 1,185 | 951 | 868 | 901 | 1,091 | 1,160 | 1,405 | 1,330 | 1,345 | 1,601 | 1,610 | 1,631 | 1,676 |
| Environmental technology | 776 | 693 | 643 | 589 | 572 | 504 | 461 | 374 | 401 | 381 | 391 | 399 | 478 | 426 | 434 | 466 | 485 | 471 | 434 | 418 | 376 |
| Food chemistry | 486 | 588 | 567 | 473 | 352 | 316 | 336 | 264 | 257 | 249 | 228 | 252 | 237 | 301 | 392 | 420 | 364 | 425 | 314 | 367 | 418 |
| Furniture, games | 2,846 | 2,671 | 2,504 | 2,065 | 1,956 | 1,931 | 1,716 | 1,374 | 1,480 | 1,262 | 1,081 | 1,132 | 1,432 | 1,277 | 1,296 | 1,345 | 1,442 | 1,400 | 1,288 | 1,240 | 1,171 |
| Handling | 1,909 | 1,967 | 1,760 | 1,583 | 1,408 | 1,287 | 1,033 | 966 | 1,066 | 928 | 822 | 878 | 1,018 | 1,016 | 940 | 1,068 | 995 | 873 | 834 | 780 | 812 |
| IT methods for management | 309 | 367 | 401 | 322 | 359 | 385 | 353 | 460 | 453 | 457 | 604 | 610 | 1,143 | 1,055 | 1,302 | 1,564 | 1,509 | 1,028 | 988 | 1,304 | 1,337 |
| Machine tools | 1,606 | 1,695 | 1,605 | 1,514 | 1,219 | 1,265 | 1,160 | 991 | 1,161 | 943 | 666 | 699 | 939 | 986 | 1,098 | 1,169 | 1,212 | 1,033 | 822 | 765 | 623 |
| Macromolecular chemistry, polymers | 797 | 756 | 708 | 678 | 667 | 562 | 456 | 330 | 334 | 306 | 251 | 267 | 356 | 299 | 263 | 275 | 286 | 242 | 207 | 173 | 137 |
| Materials, metallurgy | 662 | 607 | 539 | 531 | 504 | 465 | 421 | 315 | 321 | 270 | 230 | 261 | 333 | 289 | 286 | 260 | 277 | 287 | 245 | 243 | 236 |
| Measurement | 2,901 | 2,660 | 2,626 | 2,565 | 2,603 | 2,728 | 2,528 | 2,172 | 2,551 | 2,333 | 2,299 | 2,185 | 2,335 | 2,111 | 2,143 | 2,102 | 2,200 | 2,183 | 2,189 | 2,227 | 2,080 |
| Mechanical elements | 1,665 | 1,696 | 1,683 | 1,553 | 1,471 | 1,350 | 1,247 | 1,000 | 1,110 | 864 | 750 | 789 | 960 | 916 | 1,045 | 1,168 | 1,129 | 1,271 | 1,213 | 1,303 | 1,280 |
| Medical technology | 3,935 | 3,558 | 3,387 | 2,944 | 2,701 | 2,876 | 2,186 | 1,759 | 1,846 | 1,632 | 1,358 | 1,588 | 2,438 | 2,359 | 2,560 | 2,582 | 2,383 | 2,262 | 2,124 | 1,991 | 1,815 |
| Microstructural and nanotechnology | 17 | 24 | 38 | 51 | 61 | 96 | 98 | 74 | 38 | 20 | 22 | 19 | 29 | 42 | 52 | 81 | 127 | 135 | 117 | 92 | 52 |
| Optics | 2,117 | 2,049 | 1,925 | 1,962 | 1,901 | 2,057 | 1,977 | 1,529 | 1,595 | 1,389 | 1,263 | 1,164 | 1,280 | 1,062 | 1,026 | 984 | 980 | 913 | 876 | 804 | 745 |
| Organic fine chemistry | 1,210 | 1,106 | 874 | 806 | 748 | 578 | 462 | 358 | 466 | 348 | 371 | 323 | 380 | 336 | 314 | 359 | 395 | 336 | 269 | 209 | 173 |
| Other consumer goods | 1,839 | 1,947 | 1,733 | 1,532 | 1,302 | 1,139 | 1,076 | 821 | 935 | 841 | 714 | 693 | 884 | 806 | 897 | 885 | 845 | 926 | 921 | 886 | 912 |
| Other special machines | 2,349 | 2,241 | 2,030 | 1,928 | 1,766 | 1,800 | 1,539 | 1,195 | 1,172 | 972 | 861 | 863 | 1,219 | 1,138 | 1,113 | 1,166 | 1,233 | 1,235 | 1,187 | 1,258 | 1,184 |
| Pharmaceuticals | 1,286 | 1,156 | 902 | 858 | 688 | 560 | 397 | 280 | 305 | 255 | 215 | 202 | 264 | 223 | 258 | 249 | 289 | 230 | 186 | 167 | 157 |
| Semiconductors | 1,819 | 2,241 | 2,535 | 2,759 | 2,724 | 2,657 | 2,486 | 2,059 | 2,139 | 1,929 | 1,716 | 1,782 | 2,331 | 1,954 | 1,721 | 2,034 | 2,296 | 2,311 | 2,487 | 2,314 | 1,852 |
| Surface technology, coating | 803 | 833 | 815 | 829 | 797 | 767 | 689 | 578 | 595 | 601 | 587 | 602 | 830 | 761 | 772 | 781 | 675 | 570 | 500 | 449 | 395 |
| Telecommunications | 2,071 | 2,268 | 2,267 | 2,192 | 2,135 | 2,096 | 2,280 | 1,994 | 2,781 | 2,229 | 2,133 | 2,225 | 2,615 | 2,555 | 3,089 | 2,868 | 2,637 | 2,129 | 1,863 | 1,816 | 1,590 |
| Textile and paper machines | 1,143 | 1,042 | 1,097 | 1,085 | 989 | 937 | 873 | 665 | 606 | 478 | 468 | 382 | 551 | 464 | 544 | 486 | 586 | 430 | 327 | 248 | 214 |
| Thermal processes and apparatus | 692 | 683 | 618 | 632 | 562 | 571 | 516 | 453 | 444 | 320 | 245 | 248 | 342 | 325 | 315 | 351 | 387 | 425 | 428 | 465 | 423 |
| Transport | 2,956 | 2,611 | 2,887 | 2,775 | 2,505 | 2,257 | 2,152 | 1,915 | 1,866 | 1,656 | 1,449 | 1,371 | 1,733 | 1,454 | 1,575 | 1,729 | 1,869 | 2,200 | 2,359 | 2,667 | 2,824 |

TABLE S8-41

## U.S. patent families granted, by WIPO technical field: 1998–2018

(Number)

| WIPO technical field | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Unclassified | 52 | 83 | 53 | 32 | 45 | 40 | 42 | 60 | 80 | 106 | 84 | 93 | 64 | 54 | 56 | 62 | 43 | 20 | 11 | 14 | 8 |

IT = Information Technology; WIPO = World Intellectual Property Organization.

**Note(s)**

International Patent Documentation (INPADOC) patent families across all patent offices covered in the Worldwide Patent Statistical Database (PATSTAT) are counted according to the year of the first granted patent in the patent family. Patent families are allocated according to patent inventorship information found on the priority patent of the INPADOC patent families.

**Source(s)**

Science-Metrix; PATSTAT, accessed April 2019.

*Science and Engineering Indicators*

TABLE S8-42

## U.S. specialization index of patent families, by WIPO technical field: 1998–2018

(Index)

| WIPO technical field | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| All technical fields | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Analysis of biological materials | 1.59 | 1.63 | 1.24 | 1.34 | 0.99 | 1.02 | 0.83 | 0.80 | 0.81 | 0.78 | 0.70 | 0.67 | 0.65 | 0.63 | 0.44 | 0.37 | 0.33 | 0.37 | 0.44 | 0.49 | 0.49 |
| Audio-visual technology | 0.75 | 0.67 | 0.83 | 0.95 | 0.95 | 1.02 | 1.06 | 0.95 | 0.87 | 0.83 | 0.88 | 0.90 | 0.83 | 0.97 | 1.25 | 1.25 | 1.51 | 1.72 | 1.66 | 1.63 | 1.48 |
| Basic communication processes | 1.26 | 1.25 | 1.36 | 1.39 | 1.54 | 1.74 | 1.97 | 1.98 | 2.30 | 2.59 | 2.50 | 2.28 | 2.02 | 1.92 | 1.89 | 2.16 | 2.14 | 2.10 | 2.33 | 2.15 | 1.97 |
| Basic materials chemistry | 1.03 | 1.05 | 1.01 | 0.94 | 0.89 | 0.77 | 0.66 | 0.54 | 0.54 | 0.52 | 0.48 | 0.45 | 0.51 | 0.50 | 0.41 | 0.31 | 0.36 | 0.35 | 0.33 | 0.35 | 0.31 |
| Biotechnology | 1.99 | 2.03 | 1.46 | 1.57 | 1.55 | 0.82 | 0.60 | 0.54 | 0.67 | 0.81 | 0.80 | 0.88 | 0.62 | 0.61 | 0.54 | 0.46 | 0.44 | 0.53 | 0.55 | 0.71 | 0.57 |
| Chemical engineering | 0.99 | 1.06 | 0.96 | 0.85 | 0.78 | 0.80 | 0.75 | 0.74 | 0.77 | 0.78 | 0.75 | 0.72 | 0.76 | 0.79 | 0.66 | 0.63 | 0.57 | 0.48 | 0.48 | 0.48 | 0.43 |
| Civil engineering | 0.64 | 0.65 | 0.72 | 0.69 | 0.68 | 0.63 | 0.62 | 0.61 | 0.53 | 0.49 | 0.53 | 0.55 | 0.60 | 0.54 | 0.56 | 0.61 | 0.58 | 0.57 | 0.52 | 0.55 | 0.56 |
| Computer technology | 1.86 | 1.87 | 1.81 | 1.83 | 1.92 | 2.06 | 2.22 | 2.43 | 2.72 | 2.80 | 2.91 | 3.00 | 2.94 | 3.06 | 3.20 | 3.25 | 3.23 | 3.06 | 2.97 | 2.47 | 2.34 |
| Control | 0.97 | 1.02 | 1.06 | 0.98 | 0.96 | 1.03 | 1.09 | 1.19 | 1.34 | 1.33 | 1.52 | 1.25 | 1.19 | 1.23 | 1.21 | 1.16 | 1.19 | 1.18 | 1.12 | 1.22 | 1.27 |
| Digital communication | 1.44 | 1.46 | 1.40 | 1.50 | 1.67 | 1.53 | 1.70 | 1.92 | 1.61 | 1.58 | 1.70 | 1.56 | 1.45 | 1.38 | 1.58 | 1.74 | 1.96 | 2.27 | 2.57 | 2.49 | 2.28 |
| Electrical machinery, apparatus, energy | 0.89 | 0.91 | 0.90 | 0.89 | 0.86 | 0.85 | 0.95 | 0.90 | 0.86 | 0.81 | 0.83 | 0.86 | 0.75 | 0.71 | 0.63 | 0.62 | 0.61 | 0.67 | 0.71 | 0.70 | 0.71 |
| Engines, pumps, turbines | 0.69 | 0.61 | 0.81 | 0.89 | 1.03 | 0.94 | 0.93 | 1.00 | 0.89 | 0.84 | 0.78 | 0.79 | 0.79 | 0.98 | 1.09 | 1.02 | 1.01 | 1.19 | 1.22 | 1.28 | 1.46 |
| Environmental technology | 0.87 | 0.78 | 0.72 | 0.68 | 0.62 | 0.56 | 0.52 | 0.47 | 0.47 | 0.50 | 0.56 | 0.55 | 0.54 | 0.49 | 0.46 | 0.47 | 0.48 | 0.45 | 0.43 | 0.45 | 0.43 |
| Food chemistry | 0.65 | 0.76 | 0.68 | 0.59 | 0.51 | 0.34 | 0.40 | 0.33 | 0.33 | 0.37 | 0.32 | 0.26 | 0.24 | 0.31 | 0.31 | 0.29 | 0.25 | 0.36 | 0.28 | 0.57 | 0.66 |
| Furniture, games | 1.43 | 1.52 | 1.42 | 1.32 | 1.37 | 1.40 | 1.25 | 1.21 | 1.19 | 1.14 | 0.99 | 0.92 | 0.94 | 0.91 | 0.85 | 0.80 | 0.78 | 0.85 | 0.78 | 0.80 | 0.81 |
| Handling | 0.90 | 1.02 | 1.02 | 0.93 | 0.84 | 0.84 | 0.73 | 0.83 | 0.85 | 0.82 | 0.75 | 0.75 | 0.73 | 0.82 | 0.70 | 0.80 | 0.67 | 0.59 | 0.53 | 0.48 | 0.54 |
| IT methods for management | 2.10 | 2.56 | 2.37 | 2.04 | 2.03 | 1.96 | 1.92 | 2.41 | 1.87 | 1.50 | 1.84 | 1.94 | 2.48 | 2.38 | 2.49 | 2.73 | 2.42 | 2.04 | 1.67 | 2.04 | 2.14 |
| Machine tools | 0.74 | 0.87 | 0.86 | 0.84 | 0.70 | 0.78 | 0.75 | 0.77 | 0.81 | 0.84 | 0.60 | 0.57 | 0.65 | 0.73 | 0.71 | 0.74 | 0.69 | 0.49 | 0.39 | 0.37 | 0.34 |
| Macromolecular chemistry, polymers | 0.86 | 0.84 | 0.80 | 0.79 | 0.76 | 0.65 | 0.62 | 0.52 | 0.48 | 0.53 | 0.50 | 0.54 | 0.55 | 0.45 | 0.34 | 0.33 | 0.35 | 0.31 | 0.25 | 0.24 | 0.20 |
| Materials, metallurgy | 0.42 | 0.43 | 0.38 | 0.39 | 0.38 | 0.36 | 0.33 | 0.32 | 0.29 | 0.27 | 0.20 | 0.22 | 0.24 | 0.21 | 0.18 | 0.15 | 0.16 | 0.15 | 0.14 | 0.15 | 0.17 |
| Measurement | 1.04 | 0.98 | 0.98 | 0.97 | 1.02 | 1.11 | 1.10 | 1.15 | 1.31 | 1.38 | 1.30 | 1.12 | 0.95 | 0.86 | 0.79 | 0.73 | 0.71 | 0.69 | 0.74 | 0.69 | 0.68 |
| Mechanical elements | 0.88 | 0.88 | 0.91 | 0.89 | 0.90 | 0.82 | 0.82 | 0.78 | 0.84 | 0.78 | 0.65 | 0.66 | 0.68 | 0.74 | 0.74 | 0.85 | 0.83 | 0.88 | 0.83 | 0.88 | 0.94 |
| Medical technology | 1.79 | 1.94 | 1.67 | 1.64 | 1.50 | 1.52 | 1.25 | 1.39 | 1.38 | 1.49 | 1.22 | 1.28 | 1.53 | 1.73 | 1.71 | 1.66 | 1.44 | 1.44 | 1.44 | 1.30 | 1.29 |
| Microstructural and nanotechnology | 1.54 | 1.54 | 1.87 | 1.90 | 1.81 | 2.25 | 2.05 | 1.67 | 0.66 | 0.33 | 0.36 | 0.29 | 0.28 | 0.34 | 0.40 | 0.57 | 0.75 | 0.80 | 0.77 | 0.64 | 0.47 |
| Optics | 0.82 | 0.85 | 0.86 | 0.90 | 0.88 | 0.98 | 1.05 | 0.97 | 0.86 | 0.80 | 0.76 | 0.72 | 0.63 | 0.57 | 0.53 | 0.50 | 0.52 | 0.66 | 0.66 | 0.65 | 0.69 |
| Organic fine chemistry | 1.18 | 1.22 | 1.03 | 1.06 | 1.08 | 0.87 | 0.62 | 0.60 | 0.60 | 0.54 | 0.60 | 0.56 | 0.55 | 0.48 | 0.36 | 0.40 | 0.40 | 0.31 | 0.29 | 0.26 | 0.23 |
| Other consumer goods | 1.27 | 1.28 | 1.23 | 1.19 | 1.14 | 1.00 | 0.99 | 0.87 | 0.91 | 0.94 | 0.95 | 0.87 | 0.98 | 0.91 | 0.87 | 0.99 | 0.93 | 1.09 | 1.06 | 1.06 | 1.13 |
| Other special machines | 0.94 | 0.95 | 0.88 | 0.85 | 0.82 | 0.87 | 0.75 | 0.76 | 0.71 | 0.70 | 0.65 | 0.65 | 0.75 | 0.76 | 0.67 | 0.65 | 0.64 | 0.62 | 0.64 | 0.67 | 0.71 |
| Pharmaceuticals | 1.65 | 1.69 | 0.99 | 1.02 | 0.92 | 0.74 | 0.46 | 0.42 | 0.35 | 0.36 | 0.32 | 0.29 | 0.29 | 0.21 | 0.24 | 0.23 | 0.23 | 0.21 | 0.22 | 0.24 | 0.23 |
| Semiconductors | 0.69 | 0.74 | 0.83 | 0.88 | 1.03 | 1.11 | 1.22 | 1.07 | 0.85 | 0.91 | 0.97 | 1.08 | 1.12 | 1.00 | 0.86 | 1.02 | 1.09 | 1.32 | 1.46 | 1.44 | 1.37 |
| Surface technology, coating | 0.75 | 0.83 | 0.78 | 0.80 | 0.88 | 0.89 | 0.91 | 0.93 | 0.84 | 0.91 | 0.93 | 0.89 | 0.91 | 0.90 | 0.86 | 0.88 | 0.70 | 0.61 | 0.55 | 0.55 | 0.52 |
| Telecommunications | 1.07 | 1.05 | 1.02 | 1.10 | 1.18 | 1.15 | 1.29 | 1.34 | 1.24 | 1.26 | 1.49 | 1.60 | 1.46 | 1.58 | 1.90 | 1.89 | 1.72 | 1.69 | 1.73 | 1.83 | 1.67 |
| Textile and paper machines | 0.70 | 0.64 | 0.76 | 0.79 | 0.79 | 0.82 | 0.79 | 0.72 | 0.64 | 0.63 | 0.64 | 0.49 | 0.53 | 0.49 | 0.57 | 0.53 | 0.59 | 0.44 | 0.35 | 0.29 | 0.28 |
| Thermal processes and apparatus | 0.53 | 0.48 | 0.48 | 0.53 | 0.51 | 0.55 | 0.51 | 0.51 | 0.39 | 0.35 | 0.31 | 0.31 | 0.39 | 0.40 | 0.33 | 0.35 | 0.35 | 0.43 | 0.43 | 0.44 | 0.46 |

TABLE S8-42

## U.S. specialization index of patent families, by WIPO technical field: 1998–2018

(Index)

| WIPO technical field | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Transport | 0.96 | 0.82 | 0.98 | 0.99 | 0.93 | 0.82 | 0.85 | 0.82 | 0.82 | 0.84 | 0.71 | 0.70 | 0.75 | 0.77 | 0.75 | 0.74 | 0.77 | 0.97 | 1.00 | 1.11 | 1.28 |

IT = Information Technology; WIPO = World Intellectual Property Organization.

**Note(s)**

International Patent Documentation (INPADOC) patent families across all patent offices covered in the Worldwide Patent Statistical Database (PATSTAT) are counted according to the year of the first granted patent in the patent family. Patent families are allocated according to patent inventorship information found on the priority patent of the INPADOC patent families. To account for missing ownership information in PATSTAT for some offices, a method designed by de Rassenfosse et al. (2012) is used to fill in missing information on priority patents using information in successive filings within the patent families (see technical documentation for details). Patent families are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named inventors. Patent families unclassified under the WIPO classification are not accounted for in the total when normalization is performed in the computation of the specialization index to avoid underestimating specialization for countries where these unclassified families are more prominent because of data gaps in International Patent Classification codes availability in PATSTAT.

**Source(s)**

Science-Metrix; PATSTAT, accessed April 2019.

*Science and Engineering Indicators*

TABLE S8-43

## USPTO design patents granted, by region, country, or economy: 1998–2018

(Number)

| Region, country, or economy | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| World | 14,768 | 14,735 | 17,416 | 16,873 | 15,451 | 16,576 | 15,695 | 12,953 | 20,967 | 24,063 | 25,565 | 23,120 | 22,804 | 21,361 | 21,959 | 23,478 | 23,666 | 26,000 | 28,886 | 30,879 | 30,513 |
| North America | 10,458 | 10,097 | 11,759 | 10,779 | 9,713 | 10,446 | 9,617 | 7,829 | 12,173 | 14,009 | 14,284 | 12,658 | 13,185 | 12,416 | 13,055 | 13,946 | 13,981 | 14,903 | 16,637 | 18,205 | 17,183 |
| Canada | 543 | 432 | 475 | 442 | 418 | 442 | 393 | 284 | 503 | 594 | 656 | 660 | 627 | 692 | 655 | 697 | 606 | 666 | 596 | 734 | 641 |
| Mexico | 21 | 17 | 24 | 7 | 12 | 10 | 15 | 14 | 23 | 33 | 25 | 24 | 16 | 27 | 33 | 54 | 52 | 34 | 48 | 60 | 47 |
| Puerto Rico | 1 | 9 | 5 | 1 | 7 | 1 | 1 | 7 | 1 | 2 | 4 | 6 | 4 | 1 | 5 | 1 | 4 | 9 | 4 | 2 | 6 |
| United States | 9,893 | 9,638 | 11,256 | 10,330 | 9,277 | 9,994 | 9,209 | 7,523 | 11,645 | 13,380 | 13,598 | 11,966 | 12,539 | 11,695 | 12,361 | 13,194 | 13,320 | 14,194 | 15,989 | 17,410 | 16,490 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Central and South America | 24 | 14 | 34 | 35 | 33 | 64 | 66 | 39 | 40 | 55 | 64 | 66 | 64 | 54 | 84 | 54 | 54 | 106 | 105 | 78 | 91 |
| Argentina | 3 | 2 | 9 | 8 | 5 | 7 | 3 | 5 | 6 | 15 | 11 | 4 | 4 | 2 | 4 | 5 | 8 | 7 | 7 | 8 | 12 |
| Brazil | 14 | 6 | 13 | 15 | 14 | 48 | 53 | 22 | 25 | 22 | 29 | 41 | 41 | 40 | 66 | 35 | 36 | 62 | 75 | 46 | 53 |
| All others | 7 | 6 | 13 | 13 | 14 | 10 | 10 | 12 | 9 | 17 | 24 | 21 | 19 | 12 | 14 | 14 | 10 | 38 | 23 | 24 | 26 |
| Europe | 1,768 | 1,867 | 2,121 | 2,388 | 2,082 | 2,079 | 2,092 | 1,876 | 3,040 | 3,797 | 4,170 | 4,523 | 4,048 | 3,599 | 3,660 | 3,691 | 3,565 | 4,177 | 4,511 | 4,808 | 5,001 |
| EU | 1,631 | 1,726 | 1,965 | 2,223 | 1,880 | 1,928 | 1,943 | 1,738 | 2,824 | 3,503 | 3,836 | 4,226 | 3,695 | 3,330 | 3,413 | 3,428 | 3,287 | 3,752 | 4,141 | 4,423 | 4,569 |
| Austria | 19 | 26 | 34 | 41 | 27 | 47 | 38 | 29 | 49 | 94 | 103 | 260 | 177 | 171 | 130 | 122 | 102 | 109 | 118 | 99 | 90 |
| Belgium | 46 | 64 | 52 | 74 | 66 | 66 | 55 | 55 | 70 | 94 | 82 | 93 | 69 | 136 | 121 | 75 | 76 | 85 | 76 | 70 | 92 |
| Denmark | 66 | 84 | 46 | 47 | 46 | 53 | 40 | 39 | 33 | 62 | 126 | 124 | 138 | 88 | 102 | 152 | 148 | 134 | 112 | 84 | 95 |
| Finland | 34 | 43 | 30 | 39 | 43 | 78 | 35 | 30 | 50 | 89 | 79 | 127 | 78 | 63 | 58 | 64 | 116 | 99 | 121 | 127 | 110 |
| France | 284 | 253 | 347 | 384 | 345 | 234 | 289 | 224 | 394 | 559 | 610 | 618 | 588 | 460 | 442 | 430 | 386 | 415 | 429 | 518 | 564 |
| Germany | 403 | 476 | 502 | 593 | 508 | 508 | 478 | 483 | 775 | 820 | 983 | 1,219 | 1,085 | 920 | 1,062 | 985 | 948 | 1,078 | 1,253 | 1,245 | 1,197 |
| Hungary | 2 | 0 | 2 | 1 | 0 | 0 | 3 | 2 | 0 | 4 | 6 | 2 | 7 | 11 | 7 | 7 | 12 | 7 | 7 | 8 | 5 |
| Ireland | 7 | 10 | 16 | 22 | 13 | 19 | 9 | 10 | 24 | 12 | 20 | 10 | 18 | 13 | 17 | 27 | 26 | 38 | 44 | 30 | 29 |
| Italy | 233 | 179 | 249 | 258 | 210 | 306 | 369 | 304 | 435 | 552 | 599 | 516 | 456 | 445 | 417 | 424 | 397 | 430 | 477 | 548 | 573 |
| Netherlands | 79 | 82 | 67 | 100 | 70 | 72 | 50 | 62 | 107 | 127 | 131 | 105 | 115 | 148 | 114 | 165 | 103 | 187 | 168 | 153 | 196 |
| Spain | 61 | 42 | 47 | 69 | 55 | 48 | 38 | 42 | 83 | 90 | 105 | 83 | 58 | 87 | 80 | 56 | 60 | 90 | 99 | 112 | 94 |
| Sweden | 119 | 133 | 158 | 184 | 142 | 110 | 97 | 62 | 112 | 203 | 194 | 203 | 150 | 149 | 182 | 164 | 186 | 231 | 269 | 285 | 360 |
| United Kingdom | 237 | 308 | 379 | 381 | 324 | 364 | 417 | 367 | 662 | 732 | 731 | 806 | 696 | 585 | 612 | 702 | 628 | 750 | 843 | 992 | 969 |
| All others | 41 | 25 | 36 | 31 | 29 | 22 | 25 | 27 | 29 | 64 | 67 | 59 | 59 | 52 | 70 | 55 | 99 | 99 | 125 | 152 | 196 |
| Other Europe | 137 | 141 | 155 | 165 | 202 | 151 | 149 | 138 | 217 | 293 | 335 | 297 | 352 | 269 | 247 | 263 | 278 | 425 | 370 | 385 | 432 |
| Former Soviet Union | 1 | 3 | 0 | 0 | 1 | 1 | 1 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 1 | 3 | 1 | 28 | 12 | 22 | 13 |
| Norway | 36 | 20 | 18 | 16 | 19 | 15 | 11 | 21 | 26 | 39 | 23 | 27 | 43 | 44 | 26 | 41 | 51 | 55 | 61 | 17 | 39 |
| Russia | 4 | 4 | 1 | 5 | 3 | 0 | 3 | 2 | 2 | 4 | 4 | 8 | 12 | 9 | 6 | 14 | 4 | 32 | 26 | 27 | 19 |
| Switzerland | 96 | 111 | 130 | 132 | 167 | 127 | 126 | 108 | 175 | 237 | 282 | 238 | 273 | 200 | 199 | 191 | 191 | 275 | 253 | 272 | 308 |
| All others | 0 | 3 | 6 | 12 | 12 | 8 | 8 | 7 | 10 | 12 | 26 | 25 | 25 | 16 | 14 | 14 | 31 | 34 | 17 | 48 | 53 |
| Asia | 2,320 | 2,569 | 3,278 | 3,452 | 3,423 | 3,774 | 3,693 | 3,043 | 5,439 | 5,806 | 6,588 | 5,387 | 5,075 | 4,853 | 4,758 | 5,319 | 5,584 | 6,291 | 7,100 | 7,225 | 7,633 |
| China | 234 | 269 | 414 | 467 | 479 | 552 | 531 | 480 | 773 | 905 | 1,076 | 884 | 935 | 854 | 942 | 941 | 926 | 1,118 | 1,544 | 1,864 | 2,574 |
| India | 7 | 1 | 0 | 1 | 6 | 9 | 9 | 16 | 18 | 22 | 31 | 36 | 38 | 29 | 34 | 48 | 50 | 62 | 62 | 105 | 109 |

TABLE S8-43

## USPTO design patents granted, by region, country, or economy: 1998–2018

(Number)

| Region, country, or economy | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Japan | 1,211 | 1,318 | 1,512 | 1,541 | 1,364 | 1,570 | 1,567 | 1,384 | 2,394 | 2,410 | 2,766 | 2,403 | 1,890 | 1,882 | 1,894 | 2,082 | 1,953 | 1,877 | 1,988 | 2,143 | 2,035 |
| Malaysia | 10 | 4 | 5 | 17 | 7 | 13 | 11 | 11 | 20 | 15 | 16 | 21 | 25 | 22 | 11 | 17 | 10 | 12 | 13 | 9 | 15 |
| Singapore | 16 | 9 | 22 | 9 | 15 | 30 | 38 | 29 | 57 | 57 | 46 | 59 | 30 | 47 | 30 | 58 | 65 | 72 | 52 | 38 | 72 |
| South Korea | 103 | 110 | 151 | 217 | 209 | 189 | 241 | 234 | 595 | 1,005 | 1,196 | 808 | 773 | 897 | 866 | 1,104 | 1,630 | 2,229 | 2,486 | 2,060 | 1,976 |
| Taiwan | 712 | 839 | 1,139 | 1,166 | 1,294 | 1,379 | 1,263 | 868 | 1,559 | 1,360 | 1,418 | 1,155 | 1,364 | 1,090 | 960 | 1,032 | 913 | 891 | 925 | 974 | 807 |
| All others | 28 | 19 | 35 | 35 | 48 | 31 | 33 | 23 | 23 | 32 | 38 | 22 | 21 | 30 | 22 | 38 | 36 | 30 | 30 | 32 | 45 |
| Middle East | 57 | 46 | 45 | 45 | 59 | 52 | 53 | 47 | 68 | 80 | 125 | 96 | 85 | 106 | 91 | 133 | 129 | 174 | 181 | 214 | 208 |
| Israel | 51 | 41 | 45 | 43 | 59 | 50 | 49 | 42 | 66 | 77 | 122 | 92 | 80 | 91 | 84 | 118 | 115 | 147 | 160 | 183 | 191 |
| All others | 6 | 5 | 0 | 2 | 0 | 2 | 5 | 5 | 2 | 3 | 3 | 4 | 5 | 15 | 7 | 15 | 14 | 27 | 21 | 31 | 17 |
| Africa | 15 | 16 | 15 | 12 | 9 | 23 | 25 | 17 | 13 | 31 | 32 | 41 | 29 | 19 | 20 | 27 | 29 | 35 | 38 | 35 | 36 |
| South Africa | 11 | 15 | 12 | 12 | 9 | 15 | 13 | 16 | 13 | 30 | 31 | 39 | 23 | 18 | 12 | 20 | 26 | 32 | 22 | 31 | 23 |
| All others | 4 | 1 | 3 | 0 | 0 | 9 | 12 | 1 | 0 | 1 | 1 | 3 | 6 | 1 | 8 | 7 | 3 | 3 | 15 | 4 | 13 |
| Australia and Oceania | 123 | 124 | 159 | 157 | 130 | 136 | 146 | 102 | 195 | 283 | 298 | 344 | 318 | 314 | 287 | 306 | 321 | 311 | 313 | 308 | 356 |
| Australia | 96 | 113 | 139 | 125 | 103 | 119 | 119 | 91 | 163 | 239 | 253 | 300 | 283 | 268 | 234 | 270 | 277 | 254 | 246 | 261 | 291 |
| New Zealand | 27 | 11 | 18 | 31 | 27 | 17 | 27 | 12 | 32 | 40 | 45 | 44 | 35 | 46 | 53 | 35 | 44 | 58 | 67 | 47 | 64 |
| All others | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Unclassified | 3 | 3 | 5 | 4 | 2 | 1 | 2 | 0 | 0 | 3 | 4 | 4 | 0 | 0 | 4 | 2 | 2 | 3 | 2 | 6 | 4 |

EU = European Union; USPTO = U.S. Patent and Trademark Office.

**Note(s)**

Design patents are allocated according to patent inventorship information. Patents are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named inventors. The EU includes 28 member countries. China includes Hong Kong.

**Source(s)**

Science-Metrix; PatentsView, USPTO, accessed June 2019.

*Science and Engineering Indicators*

TABLE S8-44

## U.S. registered USPTO design patents, by design class: 1998–2018

(Number)

| Design class | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| All classes | 9,893 | 9,638 | 11,256 | 10,330 | 9,277 | 9,994 | 9,209 | 7,523 | 11,645 | 13,380 | 13,598 | 11,966 | 12,539 | 11,695 | 12,361 | 13,194 | 13,320 | 14,194 | 15,989 | 17,410 | 16,490 |
| Edible Products | 32 | 38 | 46 | 40 | 36 | 33 | 88 | 56 | 109 | 42 | 39 | 85 | 62 | 70 | 29 | 60 | 82 | 40 | 70 | 83 | 65 |
| Apparel and Haberdashery | 606 | 479 | 416 | 406 | 349 | 430 | 423 | 336 | 635 | 667 | 707 | 644 | 691 | 725 | 712 | 730 | 665 | 752 | 1,009 | 1,580 | 1,171 |
| Travel Goods, Personal Belongings, and Storage or Carrying Articles | 333 | 398 | 368 | 387 | 346 | 362 | 344 | 289 | 457 | 423 | 406 | 408 | 468 | 389 | 437 | 443 | 464 | 502 | 579 | 577 | 582 |
| Brushware | 94 | 75 | 101 | 103 | 150 | 99 | 56 | 61 | 93 | 75 | 122 | 93 | 76 | 76 | 99 | 95 | 85 | 86 | 157 | 133 | 142 |
| Textile or Paper Yard Goods; Sheet Material | 38 | 32 | 63 | 50 | 27 | 19 | 50 | 37 | 69 | 58 | 37 | 37 | 68 | 103 | 108 | 74 | 83 | 59 | 81 | 76 | 64 |
| Furnishings | 1,050 | 1,057 | 1,217 | 1,223 | 1,105 | 1,084 | 1,050 | 773 | 1,116 | 1,396 | 1,304 | 1,078 | 1,010 | 865 | 1,108 | 991 | 990 | 941 | 889 | 1,110 | 1,020 |
| Equipment for Preparing or Serving Food or Drink Not Elsewhere Specified | 482 | 472 | 625 | 615 | 479 | 593 | 552 | 454 | 689 | 862 | 866 | 717 | 926 | 729 | 858 | 917 | 798 | 866 | 868 | 1,051 | 1,204 |
| Tools and Hardware | 755 | 691 | 861 | 586 | 574 | 688 | 729 | 512 | 776 | 963 | 1,046 | 825 | 760 | 735 | 689 | 629 | 834 | 882 | 913 | 941 | 923 |
| Packages and Containers for Goods | 467 | 482 | 609 | 627 | 486 | 610 | 453 | 497 | 704 | 827 | 871 | 863 | 936 | 856 | 871 | 863 | 831 | 880 | 928 | 880 | 913 |
| Measuring, Testing, or Signaling Instruments | 409 | 330 | 329 | 362 | 288 | 248 | 247 | 253 | 303 | 334 | 406 | 323 | 292 | 275 | 304 | 253 | 331 | 400 | 354 | 354 | 309 |
| Jewelry, Symbolic Insignia, and Ornaments | 273 | 234 | 233 | 270 | 252 | 224 | 232 | 195 | 270 | 287 | 300 | 247 | 251 | 270 | 305 | 293 | 364 | 368 | 335 | 409 | 319 |
| Transportation | 689 | 630 | 783 | 683 | 619 | 634 | 752 | 484 | 708 | 812 | 745 | 663 | 720 | 555 | 563 | 675 | 748 | 852 | 927 | 1,144 | 1,205 |
| Equipment for Production, Distribution, or Transformation of Energy | 252 | 321 | 324 | 255 | 302 | 300 | 223 | 231 | 438 | 472 | 511 | 450 | 450 | 452 | 441 | 497 | 561 | 585 | 571 | 564 | 632 |
| Recording, Communication, or Information Retrieval Equipment | 693 | 636 | 762 | 661 | 636 | 734 | 618 | 486 | 862 | 1,064 | 1,158 | 1,227 | 1,096 | 1,050 | 1,189 | 1,670 | 1,580 | 1,699 | 2,609 | 2,382 | 1,995 |
| Machines Not Elsewhere Specified | 178 | 186 | 240 | 207 | 212 | 199 | 193 | 174 | 260 | 337 | 270 | 208 | 249 | 248 | 278 | 323 | 319 | 379 | 393 | 390 | 381 |
| Photography and Optical Equipment | 147 | 144 | 170 | 105 | 74 | 141 | 90 | 76 | 97 | 208 | 151 | 178 | 162 | 122 | 178 | 189 | 304 | 241 | 302 | 243 | 237 |
| Musical Instruments | 34 | 36 | 17 | 27 | 24 | 40 | 22 | 15 | 43 | 32 | 56 | 33 | 38 | 39 | 30 | 30 | 32 | 42 | 49 | 53 | 47 |
| Printing and Office Machinery | 57 | 93 | 104 | 68 | 64 | 98 | 59 | 46 | 105 | 125 | 84 | 61 | 79 | 98 | 46 | 72 | 37 | 33 | 42 | 40 | 45 |
| Office Supplies; Artists' and Teachers' Materials | 188 | 211 | 206 | 193 | 176 | 184 | 207 | 162 | 217 | 248 | 310 | 192 | 183 | 205 | 196 | 213 | 211 | 161 | 184 | 163 | 158 |
| Sales and Advertising Equipment | 117 | 92 | 128 | 91 | 73 | 136 | 100 | 89 | 88 | 87 | 70 | 82 | 119 | 130 | 144 | 152 | 101 | 65 | 96 | 84 | 87 |
| Games, Toys, and Sports Goods | 742 | 643 | 735 | 605 | 491 | 582 | 516 | 430 | 706 | 727 | 783 | 638 | 503 | 641 | 574 | 625 | 668 | 647 | 630 | 800 | 796 |
| Arms, Pyrotechnics, Hunting and Fishing Equipment | 122 | 148 | 140 | 129 | 124 | 155 | 121 | 103 | 138 | 148 | 141 | 174 | 203 | 228 | 227 | 265 | 307 | 318 | 388 | 405 | 352 |
| Environmental Heating and Cooling, Fluid Handling and Sanitary Equipment | 495 | 540 | 611 | 541 | 554 | 560 | 437 | 517 | 1,001 | 748 | 802 | 629 | 701 | 594 | 559 | 639 | 619 | 620 | 630 | 712 | 709 |
| Medical and Laboratory Equipment | 406 | 423 | 489 | 526 | 443 | 465 | 348 | 218 | 304 | 481 | 551 | 546 | 738 | 653 | 643 | 771 | 732 | 922 | 987 | 973 | 958 |
| Building Units and Construction Elements | 232 | 269 | 272 | 304 | 315 | 280 | 265 | 258 | 228 | 314 | 322 | 266 | 319 | 229 | 307 | 307 | 269 | 338 | 317 | 374 | 289 |
| Lighting | 322 | 336 | 512 | 527 | 421 | 397 | 344 | 274 | 446 | 651 | 656 | 491 | 495 | 449 | 473 | 568 | 524 | 566 | 669 | 808 | 703 |
| Tobacco and Smokers' Supplies | 57 | 63 | 32 | 42 | 47 | 31 | 45 | 36 | 74 | 85 | 41 | 31 | 49 | 26 | 31 | 47 | 20 | 76 | 121 | 74 | 96 |
| Cosmetic Products and Toilet Articles | 120 | 119 | 247 | 195 | 143 | 128 | 157 | 112 | 140 | 143 | 160 | 127 | 188 | 176 | 189 | 137 | 159 | 167 | 191 | 201 | 249 |
| Equipment for Safety, Protection, and Rescue | 52 | 62 | 57 | 46 | 67 | 41 | 49 | 43 | 75 | 83 | 96 | 112 | 68 | 104 | 124 | 108 | 92 | 160 | 147 | 146 | 129 |
| Animal Husbandry | 90 | 88 | 152 | 83 | 91 | 99 | 88 | 106 | 125 | 159 | 174 | 142 | 214 | 196 | 218 | 195 | 199 | 158 | 155 | 180 | 262 |
| Washing, Cleaning, or Drying Machines | 143 | 122 | 218 | 168 | 146 | 178 | 149 | 86 | 193 | 278 | 216 | 197 | 222 | 185 | 212 | 215 | 149 | 200 | 201 | 239 | 242 |
| Material or Article Handling Equipment | 159 | 142 | 132 | 115 | 120 | 135 | 104 | 65 | 128 | 216 | 157 | 175 | 145 | 167 | 164 | 96 | 110 | 133 | 141 | 185 | 150 |
| Miscellaneous | 55 | 46 | 54 | 88 | 42 | 84 | 95 | 46 | 49 | 29 | 38 | 23 | 56 | 52 | 47 | 45 | 47 | 50 | 46 | 46 | 44 |
| Unclassified | 2 | 2 | 2 | 2 | 0 | 0 | 0 | 2 | 2 | 0 | 0 | 1 | 2 | 5 | 4 | 6 | 4 | 10 | 9 | 6 | 13 |

USPTO = U.S. Patent and Trademark Office.

**Note(s)**

Design patents are allocated according to patent inventorship information. Patents are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named inventors.

**Source(s)**

Science-Metrix; PatentsView, USPTO, accessed June 2019.

*Science and Engineering Indicators*

TABLE S8-45

## Number of registered USPTO and EUIPO trademarks, by region, country, or economy: 1998–2018

(Number)

| | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Region, country, or economy | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO |
| World | 88,761 | 24,275 | 88,621 | 34,297 | 110,488 | 34,782 | 106,745 | 38,575 | 146,871 | 35,915 | 130,946 | 34,374 | 113,691 | 34,481 | 121,572 | 59,802 | 153,331 | 61,665 | 170,784 | 68,081 | 194,473 | 81,581 | 177,379 | 90,033 | 165,227 | 100,913 | 180,081 | 93,893 | 187,602 | 95,706 | 194,337 | 98,173 | 204,704 | 103,897 | 213,797 | 109,440 | 232,552 | 126,099 | 255,069 | 128,450 | 273,079 | 132,874 |
| North America | 78,191 | 6,357 | 77,580 | 8,401 | 97,172 | 8,684 | 93,936 | 9,080 | 126,410 | 8,466 | 109,217 | 7,766 | 94,666 | 7,480 | 102,230 | 11,983 | 127,965 | 11,566 | 142,451 | 12,454 | 162,186 | 14,095 | 147,006 | 14,519 | 137,261 | 13,875 | 151,004 | 13,294 | 156,790 | 13,766 | 161,302 | 13,988 | 169,897 | 14,276 | 174,468 | 14,805 | 181,142 | 17,353 | 188,521 | 16,123 | 190,534 | 16,112 |
| Canada | 2,138 | 215 | 2,046 | 349 | 2,399 | 400 | 2,243 | 390 | 3,327 | 399 | 3,252 | 422 | 3,037 | 370 | 3,090 | 598 | 3,650 | 641 | 3,609 | 656 | 4,182 | 743 | 4,030 | 891 | 3,780 | 898 | 4,196 | 855 | 3,907 | 862 | 4,029 | 919 | 4,107 | 943 | 4,346 | 1,033 | 4,520 | 1,064 | 5,038 | 1,042 | 4,942 | 1,217 |
| Mexico | 272 | 45 | 254 | 35 | 323 | 75 | 248 | 98 | 386 | 80 | 423 | 67 | 396 | 119 | 506 | 127 | 543 | 127 | 724 | 155 | 907 | 200 | 795 | 245 | 803 | 180 | 927 | 203 | 923 | 194 | 1,010 | 216 | 1,048 | 217 | 1,087 | 217 | 1,104 | 262 | 1,162 | 228 | 1,166 | 251 |
| Puerto Rico | 43 | 1 | 65 | 4 | 51 | 9 | 83 | 6 | 111 | 9 | 61 | 6 | 72 | 7 | 66 | 4 | 89 | 6 | 146 | 2 | 120 | 11 | 113 | 5 | 134 | 8 | 165 | 3 | 192 | 2 | 180 | 6 | 218 | 2 | 264 | 3 | 281 | 8 | 334 | 2 | 261 | 9 |
| United States | 75,738 | 6,096 | 75,214 | 8,013 | 94,399 | 8,198 | 91,363 | 8,585 | 122,586 | 7,977 | 105,482 | 7,270 | 91,161 | 6,983 | 98,567 | 11,249 | 123,683 | 10,791 | 137,971 | 11,639 | 156,977 | 13,141 | 142,067 | 13,378 | 132,543 | 12,789 | 145,715 | 12,232 | 151,769 | 12,702 | 156,082 | 12,846 | 164,524 | 13,112 | 168,770 | 13,552 | 175,237 | 16,016 | 181,987 | 14,851 | 184,166 | 14,635 |
| All others | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 4 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 5 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 |
| Central and South America | 365 | 158 | 379 | 249 | 396 | 263 | 367 | 333 | 703 | 360 | 837 | 338 | 843 | 457 | 834 | 791 | 992 | 839 | 1,105 | 789 | 1,331 | 752 | 1,117 | 950 | 1,061 | 961 | 1,089 | 763 | 1,203 | 676 | 1,177 | 718 | 1,198 | 625 | 1,350 | 770 | 1,356 | 719 | 1,471 | 754 | 1,505 | 765 |
| Argentina | 61 | 17 | 33 | 27 | 48 | 23 | 40 | 61 | 87 | 36 | 118 | 46 | 116 | 90 | 96 | 122 | 126 | 170 | 145 | 116 | 171 | 118 | 130 | 160 | 143 | 136 | 156 | 105 | 147 | 80 | 162 | 99 | 123 | 72 | 134 | 90 | 141 | 84 | 134 | 85 | 179 | 91 |
| Brazil | 54 | 51 | 63 | 52 | 73 | 57 | 55 | 69 | 134 | 110 | 160 | 93 | 165 | 119 | 159 | 246 | 201 | 224 | 195 | 258 | 224 | 243 | 212 | 299 | 196 | 346 | 173 | 231 | 231 | 205 | 237 | 254 | 279 | 209 | 316 | 270 | 299 | 211 | 354 | 260 | 375 | 230 |
| All others | 250 | 90 | 282 | 170 | 275 | 183 | 271 | 203 | 482 | 214 | 560 | 199 | 562 | 248 | 579 | 422 | 664 | 445 | 765 | 414 | 936 | 391 | 775 | 490 | 722 | 479 | 759 | 426 | 825 | 391 | 778 | 364 | 796 | 344 | 900 | 409 | 915 | 424 | 983 | 409 | 951 | 443 |
| Europe | 6,287 | 15,180 | 6,224 | 21,685 | 7,717 | 21,973 | 7,688 | 25,083 | 13,003 | 23,728 | 13,813 | 23,043 | 11,711 | 23,222 | 12,104 | 42,262 | 16,456 | 44,325 | 18,168 | 49,465 | 20,371 | 60,266 | 19,652 | 66,993 | 17,711 | 78,102 | 18,103 | 72,001 | 18,793 | 72,644 | 19,853 | 74,541 | 20,293 | 78,852 | 21,249 | 82,676 | 23,528 | 91,407 | 23,606 | 91,872 | 25,058 | 93,773 |
| EU | 5,658 | 14,208 | 5,601 | 20,541 | 6,890 | 20,921 | 6,950 | 23,974 | 11,618 | 22,594 | 12,267 | 21,841 | 10,409 | 22,013 | 10,655 | 39,931 | 14,395 | 41,637 | 15,838 | 46,280 | 17,752 | 56,685 | 17,193 | 62,769 | 15,584 | 73,976 | 15,796 | 67,461 | 16,311 | 68,013 | 17,259 | 69,413 | 17,591 | 73,481 | 18,302 | 77,146 | 20,396 | 85,099 | 20,693 | 85,803 | 21,719 | 87,608 |
| Austria | 79 | 402 | 99 | 507 | 132 | 469 | 101 | 483 | 216 | 511 | 261 | 448 | 188 | 431 | 203 | 894 | 294 | 1,226 | 320 | 1,496 | 384 | 1,824 | 363 | 1,891 | 324 | 2,599 | 333 | 2,337 | 350 | 2,598 | 378 | 2,453 | 399 | 2,566 | 415 | 2,548 | 470 | 2,713 | 471 | 2,945 | 415 | 2,937 |
| Belgium | 107 | 343 | 118 | 529 | 121 | 620 | 131 | 586 | 263 | 539 | 239 | 486 | 189 | 447 | 187 | 977 | 286 | 883 | 329 | 1,041 | 379 | 1,243 | 350 | 1,539 | 334 | 1,965 | 304 | 1,714 | 331 | 1,611 | 385 | 1,736 | 389 | 1,801 | 315 | 1,984 | 411 | 2,161 | 445 | 2,321 | 520 | 2,369 |
| Denmark | 127 | 383 | 114 | 531 | 141 | 536 | 145 | 543 | 220 | 417 | 264 | 694 | 207 | 508 | 241 | 779 | 340 | 826 | 361 | 930 | 406 | 1,039 | 436 | 1,162 | 398 | 1,293 | 352 | 1,197 | 346 | 1,195 | 391 | 1,294 | 376 | 1,284 | 436 | 1,507 | 528 | 1,640 | 453 | 1,684 | 470 | 1,652 |
| Finland | 80 | 162 | 58 | 308 | 88 | 386 | 102 | 386 | 192 | 324 | 195 | 384 | 135 | 307 | 158 | 385 | 156 | 436 | 232 | 601 | 207 | 762 | 211 | 737 | 205 | 975 | 224 | 891 | 220 | 938 | 233 | 988 | 243 | 972 | 256 | 1,089 | 335 | 1,336 | 321 | 1,572 | 392 | 1,438 |
| France | 942 | 1,184 | 904 | 1,887 | 1,171 | 2,181 | 1,156 | 2,497 | 1,817 | 2,326 | 1,923 | 2,395 | 1,522 | 2,136 | 1,507 | 4,655 | 2,089 | 4,810 | 2,260 | 4,745 | 2,436 | 5,612 | 2,299 | 6,330 | 2,221 | 7,458 | 2,269 | 6,901 | 2,237 | 6,869 | 2,427 | 6,835 | 2,383 | 6,939 | 2,337 | 7,159 | 2,473 | 7,818 | 2,586 | 7,849 | 2,708 | 7,972 |
| Germany | 1,299 | 4,191 | 1,411 | 5,462 | 1,799 | 4,756 | 1,780 | 6,410 | 3,128 | 6,172 | 3,367 | 5,578 | 2,828 | 5,235 | 2,871 | 9,869 | 3,825 | 10,460 | 3,966 | 12,017 | 4,484 | 14,516 | 4,428 | 15,828 | 3,726 | 18,638 | 3,685 | 17,360 | 3,695 | 18,183 | 3,767 | 17,545 | 3,610 | 17,236 | 3,649 | 17,091 | 3,970 | 18,609 | 4,129 | 19,199 | 4,110 | 19,083 |
| Hungary | 8 | 21 | 9 | 15 | 7 | 10 | 13 | 18 | 18 | 18 | 19 | 7 | 16 | 13 | 23 | 89 | 40 | 137 | 32 | 110 | 47 | 156 | 35 | 254 | 46 | 309 | 37 | 308 | 40 | 273 | 51 | 335 | 49 | 411 | 46 | 452 | 40 | 464 | 56 | 551 | 68 | 550 |
| Ireland | 104 | 206 | 74 | 310 | 99 | 344 | 123 | 413 | 161 | 356 | 155 | 300 | 160 | 360 | 134 | 562 | 196 | 486 | 236 | 617 | 276 | 711 | 265 | 791 | 218 | 977 | 245 | 748 | 274 | 679 | 282 | 867 | 292 | 1,022 | 400 | 1,001 | 394 | 1,049 | 391 | 1,061 | 485 | 960 |
| Italy | 623 | 1,475 | 648 | 2,675 | 771 | 2,758 | 677 | 3,249 | 1,162 | 2,953 | 1,140 | 2,681 | 954 | 2,885 | 1,046 | 5,067 | 1,622 | 5,187 | 1,946 | 5,470 | 2,154 | 6,958 | 1,824 | 7,521 | 1,544 | 8,434 | 1,753 | 7,789 | 1,724 | 7,153 | 1,816 | 7,849 | 1,864 | 8,208 | 1,927 | 8,884 | 2,044 | 10,737 | 2,094 | 10,083 | 2,227 | 11,612 |
| Netherlands | 319 | 460 | 356 | 1,036 | 408 | 920 | 440 | 967 | 740 | 887 | 750 | 815 | 596 | 874 | 723 | 2,184 | 887 | 2,172 | 942 | 2,624 | 937 | 3,066 | 995 | 3,354 | 892 | 4,378 | 879 | 3,748 | 961 | 3,653 | 842 | 3,509 | 925 | 3,705 | 944 | 3,822 | 1,090 | 4,335 | 1,028 | 4,271 | 1,092 | 4,346 |
| Spain | 269 | 1,875 | 276 | 1,644 | 278 | 2,108 | 306 | 2,301 | 535 | 2,440 | 543 | 2,425 | 457 | 3,282 | 493 | 5,432 | 739 | 5,215 | 831 | 5,433 | 946 | 6,443 | 839 | 7,065 | 781 | 8,132 | 819 | 7,278 | 930 | 6,834 | 969 | 7,093 | 935 | 7,498 | 1,040 | 8,030 | 1,198 | 8,672 | 1,127 | 8,850 | 1,049 | 9,040 |
| Sweden | 232 | 339 | 223 | 930 | 263 | 817 | 324 | 793 | 494 | 741 | 497 | 782 | 447 | 648 | 413 | 1,051 | 495 | 1,075 | 528 | 1,374 | 638 | 1,696 | 604 | 1,669 | 587 | 2,119 | 578 | 2,097 | 663 | 2,173 | 668 | 2,112 | 612 | 2,297 | 672 | 2,609 | 812 | 2,868 | 791 | 3,187 | 818 | 3,046 |
| United Kingdom | 1,334 | 2,880 | 1,185 | 4,189 | 1,452 | 4,392 | 1,504 | 4,651 | 2,396 | 4,281 | 2,605 | 4,148 | 2,443 | 4,230 | 2,335 | 6,360 | 2,905 | 6,570 | 3,174 | 6,974 | 3,618 | 8,514 | 3,720 | 9,230 | 3,597 | 9,794 | 3,492 | 9,016 | 3,571 | 9,388 | 3,985 | 9,880 | 4,324 | 10,987 | 4,473 | 11,628 | 5,069 | 12,101 | 5,277 | 10,802 | 5,493 | 10,588 |
| All others | 135 | 286 | 125 | 516 | 162 | 624 | 147 | 673 | 276 | 628 | 308 | 696 | 267 | 657 | 322 | 1,627 | 521 | 2,154 | 681 | 2,847 | 839 | 4,144 | 825 | 5,397 | 710 | 6,907 | 825 | 6,078 | 968 | 6,466 | 1,064 | 6,916 | 1,189 | 8,555 | 1,392 | 9,341 | 1,562 | 10,595 | 1,523 | 11,427 | 1,872 | 12,014 |
| Other Europe | 630 | 971 | 623 | 1,144 | 827 | 1,052 | 737 | 1,109 | 1,386 | 1,134 | 1,547 | 1,202 | 1,302 | 1,209 | 1,449 | 2,331 | 2,061 | 2,688 | 2,330 | 3,186 | 2,619 | 3,582 | 2,459 | 4,224 | 2,127 | 4,127 | 2,307 | 4,540 | 2,482 | 4,631 | 2,594 | 5,128 | 2,702 | 5,371 | 2,946 | 5,530 | 3,131 | 6,309 | 2,913 | 6,068 | 3,339 | 6,165 |
| Former Soviet Union | 2 | 2 | 0 | 1 | 2 | 1 | 2 | 0 | 10 | 0 | 3 | 1 | 4 | 0 | 12 | 4 | 42 | 13 | 36 | 10 | 43 | 12 | 32 | 11 | 37 | 19 | 59 | 33 | 53 | 59 | 60 | 67 | 85 | 62 | 71 | 87 | 102 | 123 | 132 | 148 | 287 | 191 |
| Norway | 41 | 36 | 55 | 107 | 70 | 79 | 58 | 64 | 128 | 77 | 117 | 81 | 75 | 102 | 71 | 152 | 112 | 164 | 163 | 207 | 182 | 230 | 190 | 292 | 207 | 311 | 193 | 288 | 172 | 301 | 181 | 324 | 194 | 352 | 186 | 326 | 208 | 455 | 197 | 489 | 255 | 562 |
| Russia | 12 | 0 | 11 | 4 | 17 | 9 | 20 | 19 | 29 | 15 | 54 | 15 | 43 | 14 | 57 | 29 | 135 | 53 | 131 | 56 | 162 | 91 | 158 | 135 | 151 | 90 | 213 | 145 | 283 | 190 | 268 | 225 | 293 | 243 | 261 | 242 | 263 | 300 | 272 | 376 | 384 | 436 |
| Switzerland | 513 | 815 | 497 | 841 | 675 | 829 | 586 | 872 | 1,110 | 920 | 1,246 | 966 | 1,042 | 953 | 1,137 | 1,863 | 1,489 | 2,101 | 1,687 | 2,484 | 1,852 | 2,763 | 1,751 | 3,163 | 1,458 | 3,165 | 1,584 | 3,477 | 1,630 | 3,449 | 1,671 | 3,636 | 1,689 | 3,673 | 2,007 | 3,775 | 1,995 | 4,116 | 1,825 | 3,915 | 1,874 | 3,707 |
| All others | 61 | 118 | 60 | 191 | 63 | 134 | 71 | 153 | 109 | 122 | 127 | 139 | 138 | 140 | 172 | 284 | 282 | 356 | 315 | 428 | 379 | 486 | 328 | 623 | 274 | 540 | 259 | 597 | 343 | 632 | 414 | 875 | 441 | 1,042 | 420 | 1,100 | 564 | 1,315 | 488 | 1,139 | 538 | 1,269 |
| Asia | 1,980 | 1,309 | 2,003 | 1,749 | 2,523 | 1,672 | 2,591 | 1,749 | 3,673 | 1,746 | 4,216 | 2,066 | 4,005 | 2,119 | 4,309 | 3,232 | 5,389 | 3,483 | 6,379 | 3,704 | 7,423 | 4,700 | 6,760 | 5,452 | 6,599 | 5,957 | 7,203 | 5,847 | 8,063 | 6,563 | 9,116 | 6,732 | 10,115 | 7,798 | 13,117 | 8,752 | 22,251 | 13,140 | 37,081 | 16,435 | 50,187 | 18,956 |

TABLE S8-45

## Number of registered USPTO and EUIPO trademarks, by region, country, or economy: 1998–2018

(Number)

| | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Region, country, or economy | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO |
| China | 300 | 111 | 318 | 179 | 430 | 180 | 389 | 189 | 599 | 215 | 754 | 276 | 707 | 306 | 791 | 519 | 1,252 | 723 | 1,780 | 907 | 2,162 | 1,210 | 2,017 | 1,391 | 1,945 | 1,792 | 2,421 | 2,067 | 2,864 | 2,397 | 3,293 | 2,498 | 4,101 | 3,100 | 6,533 | 4,181 | 15,264 | 7,095 | 29,551 | 10,879 | 42,189 | 13,498 |
| India | 46 | 18 | 46 | 25 | 62 | 34 | 83 | 56 | 88 | 34 | 114 | 45 | 110 | 50 | 106 | 83 | 139 | 94 | 149 | 102 | 194 | 151 | 211 | 196 | 226 | 233 | 244 | 207 | 268 | 193 | 303 | 197 | 321 | 211 | 375 | 283 | 419 | 268 | 485 | 263 | 560 | 303 |
| Japan | 987 | 929 | 1,042 | 1,127 | 1,159 | 997 | 1,225 | 1,004 | 1,716 | 1,018 | 1,950 | 1,247 | 1,847 | 1,145 | 1,973 | 1,709 | 2,330 | 1,650 | 2,472 | 1,706 | 2,726 | 2,046 | 2,489 | 2,336 | 2,345 | 2,202 | 2,250 | 1,941 | 2,284 | 2,057 | 2,802 | 2,204 | 2,684 | 2,104 | 2,775 | 2,157 | 2,909 | 2,602 | 2,824 | 2,592 | 2,965 | 2,467 |
| Malaysia | 17 | 3 | 12 | 17 | 19 | 33 | 19 | 21 | 25 | 28 | 26 | 32 | 28 | 29 | 26 | 54 | 48 | 47 | 52 | 53 | 59 | 51 | 59 | 61 | 85 | 60 | 73 | 76 | 67 | 37 | 56 | 48 | 66 | 50 | 55 | 42 | 65 | 63 | 70 | 49 | 133 | 51 |
| Singapore | 51 | 71 | 33 | 99 | 71 | 85 | 73 | 81 | 101 | 68 | 103 | 60 | 118 | 82 | 104 | 106 | 134 | 124 | 169 | 141 | 216 | 151 | 180 | 192 | 255 | 175 | 217 | 166 | 301 | 225 | 311 | 225 | 291 | 243 | 327 | 275 | 400 | 421 | 456 | 347 | 483 | 382 |
| South Korea | 155 | 40 | 157 | 38 | 205 | 57 | 240 | 89 | 316 | 83 | 438 | 93 | 428 | 119 | 409 | 138 | 458 | 157 | 634 | 240 | 808 | 330 | 775 | 384 | 771 | 658 | 950 | 566 | 1,155 | 747 | 1,174 | 808 | 1,419 | 1,193 | 1,770 | 974 | 1,917 | 1,927 | 2,458 | 1,496 | 2,372 | 1,424 |
| Taiwan | 367 | 109 | 340 | 227 | 502 | 247 | 494 | 256 | 718 | 245 | 671 | 258 | 618 | 319 | 747 | 486 | 834 | 542 | 908 | 461 | 1,040 | 548 | 795 | 691 | 772 | 630 | 840 | 636 | 878 | 695 | 932 | 560 | 936 | 651 | 978 | 608 | 1,000 | 550 | 924 | 613 | 1,039 | 619 |
| All others | 54 | 28 | 55 | 37 | 74 | 39 | 69 | 53 | 111 | 54 | 160 | 55 | 148 | 69 | 152 | 136 | 193 | 145 | 213 | 94 | 219 | 211 | 234 | 200 | 199 | 206 | 208 | 187 | 245 | 209 | 246 | 190 | 297 | 245 | 304 | 230 | 276 | 212 | 314 | 194 | 445 | 211 |
| Middle East | 177 | 73 | 148 | 166 | 223 | 171 | 236 | 217 | 378 | 217 | 366 | 195 | 297 | 187 | 281 | 326 | 315 | 351 | 372 | 427 | 468 | 509 | 462 | 689 | 487 | 590 | 538 | 554 | 646 | 617 | 641 | 656 | 649 | 782 | 832 | 800 | 947 | 1,106 | 974 | 1,041 | 1,297 | 1,100 |
| Israel | 152 | 52 | 124 | 126 | 190 | 120 | 207 | 173 | 327 | 168 | 318 | 137 | 248 | 135 | 222 | 174 | 246 | 202 | 286 | 228 | 369 | 247 | 329 | 308 | 354 | 273 | 352 | 197 | 461 | 289 | 445 | 281 | 437 | 292 | 570 | 332 | 616 | 448 | 676 | 454 | 963 | 502 |
| All others | 25 | 21 | 24 | 40 | 33 | 51 | 29 | 44 | 52 | 49 | 48 | 58 | 49 | 52 | 59 | 152 | 69 | 149 | 85 | 199 | 99 | 262 | 133 | 381 | 133 | 316 | 186 | 356 | 184 | 328 | 196 | 375 | 212 | 490 | 262 | 468 | 332 | 658 | 298 | 587 | 335 | 597 |
| Africa | 74 | 41 | 56 | 71 | 89 | 88 | 89 | 112 | 111 | 107 | 185 | 152 | 124 | 156 | 128 | 243 | 148 | 211 | 161 | 220 | 220 | 283 | 218 | 306 | 223 | 357 | 220 | 373 | 215 | 334 | 246 | 340 | 284 | 366 | 313 | 391 | 258 | 345 | 247 | 382 | 292 | 364 |
| South Africa | 55 | 26 | 37 | 50 | 44 | 63 | 50 | 82 | 74 | 76 | 126 | 125 | 78 | 119 | 90 | 169 | 98 | 138 | 104 | 141 | 114 | 175 | 116 | 196 | 130 | 210 | 111 | 148 | 100 | 159 | 140 | 177 | 139 | 161 | 146 | 190 | 109 | 192 | 101 | 189 | 125 | 161 |
| All others | 19 | 15 | 19 | 21 | 45 | 25 | 40 | 30 | 37 | 31 | 59 | 27 | 46 | 37 | 38 | 74 | 51 | 73 | 58 | 79 | 106 | 108 | 102 | 110 | 93 | 146 | 110 | 225 | 115 | 174 | 107 | 163 | 145 | 204 | 166 | 201 | 149 | 153 | 146 | 193 | 167 | 203 |
| Australia and Oceania | 390 | 166 | 368 | 340 | 519 | 367 | 499 | 425 | 906 | 391 | 1,011 | 323 | 871 | 368 | 931 | 576 | 1,319 | 657 | 1,457 | 842 | 1,815 | 842 | 1,719 | 1,006 | 1,552 | 934 | 1,551 | 897 | 1,596 | 952 | 1,694 | 956 | 1,937 | 1,015 | 2,012 | 1,058 | 2,468 | 1,775 | 2,526 | 1,630 | 2,760 | 1,642 |
| Australia | 341 | 136 | 286 | 288 | 424 | 301 | 417 | 353 | 767 | 318 | 817 | 263 | 692 | 283 | 764 | 419 | 1,099 | 513 | 1,217 | 690 | 1,486 | 652 | 1,434 | 785 | 1,277 | 728 | 1,294 | 714 | 1,353 | 775 | 1,461 | 816 | 1,592 | 831 | 1,671 | 829 | 2,059 | 1,434 | 2,112 | 1,359 | 2,326 | 1,354 |
| New Zealand | 47 | 30 | 80 | 46 | 93 | 64 | 79 | 67 | 128 | 68 | 175 | 56 | 167 | 80 | 160 | 150 | 212 | 139 | 228 | 143 | 318 | 180 | 271 | 210 | 259 | 190 | 252 | 172 | 231 | 166 | 217 | 124 | 320 | 177 | 335 | 194 | 385 | 306 | 398 | 238 | 413 | 265 |
| All others | 2 | 0 | 2 | 6 | 3 | 2 | 2 | 5 | 11 | 5 | 19 | 4 | 12 | 5 | 8 | 7 | 8 | 5 | 11 | 9 | 12 | 9 | 13 | 11 | 15 | 15 | 6 | 11 | 11 | 10 | 16 | 16 | 24 | 7 | 5 | 34 | 24 | 35 | 16 | 32 | 21 | 22 |
| Unclassified | 1,296 | 990 | 1,864 | 1,635 | 1,848 | 1,563 | 1,338 | 1,575 | 1,686 | 899 | 1,299 | 490 | 1,173 | 492 | 754 | 388 | 747 | 232 | 691 | 179 | 659 | 133 | 446 | 116 | 334 | 138 | 373 | 163 | 297 | 154 | 309 | 242 | 331 | 182 | 456 | 189 | 602 | 252 | 642 | 213 | 1,446 | 162 |

USPTO = U.S. Patent and Trademark Office; EUIPO = European Union Intellectual Property Office; EU = European Union.

**Note(s)**

Trademarks are allocated according to holder information. Trademarks are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named holders. The EU includes 28 member countries. China includes Hong Kong. Trademarks are classified under the 11th edition of the Nice classification of goods and services, which classifies trademarks under 34 categories of goods and 11 categories of services. Fractional counts of trademarks were assigned to each category to assign the proper weight of a trademark to the corresponding category under the classification.

**Source(s)**

National Center for Science and Engineering Statistics, National Science Foundation; Science-Metrix; USPTO patent data hosted by Reed Tech (LexisNexis), accessed April 2019; EUIPO trademark data, accessed April 2019.

*Science and Engineering Indicators*

TABLE S8-46

## Nice classes, by business sector

(Nice classes)

| Business sector | Abbreviation (where applicable) | Nice class | Class description |
|---|---|---|---|
| Agricultural products and services | Agriculture | 29 | Meat, fish, poultry, and game; meat extracts; preserved, frozen, dried, and cooked fruits and vegetables; jellies, jams, compotes; eggs; milk, cheese, butter, yogurt, and other milk products; oils and fats for food |
| | | 30 | Coffee, tea, cocoa, and artificial coffee; rice, pasta, and noodles; tapioca and sago; flour and preparations made from cereals; bread, pastries, and confectionery; chocolate; ice cream, sorbets, and other edible ices; sugar, honey, treacle; yeast, baking powder; salt; seasonings, spices, preserved herbs; vinegar, sauces, and other condiments; ice (frozen water). |
| | | 31 | Raw and unprocessed agricultural, aquacultural, horticultural, and forestry products; raw and unprocessed grains and seeds; fresh fruits and vegetables, fresh herbs; natural plants and flowers; bulbs, seedlings, and seeds for planting; live animals; foodstuffs and beverages for animals; malt. |
| | | 32 | Beers; non-alcoholic beverages; mineral and aerated waters; fruit beverages and fruit juices; syrups and other non-alcoholic preparations for making beverages; |
| | | 33 | Alcoholic beverages, except beers; alcoholic preparations for making beverages. |
| | | 43 | Services for providing food and drink; temporary accommodation. |
| Chemicals | | 1 | Chemicals for use in industry, science, and photography, as well as in agriculture, horticulture, and forestry; unprocessed artificial resins, unprocessed plastics; fire extinguishing and fire prevention compositions; tempering and soldering preparations; substances for tanning animal skins and hides; adhesives for use in industry; putties and other paste fillers; compost, manures, fertilizers; biological preparations for use in industry and science. |
| | | 2 | Paints, varnishes, lacquers; preservatives against rust and against deterioration of wood; colorants; dyes; inks for printing, marking, and engraving; raw natural resins; metals in foil and powder form for use in painting, decorating, printing, and art. |
| | | 4 | Industrial oils and greases, wax; lubricants; dust-absorbing, wetting, and binding compositions; fuels and illuminants; candles and wicks for lighting. |
| Construction and infrastructure | Construction | 6 | Common metals and their alloys, ores; metal materials for building and construction; transportable buildings of metal; non-electric cables and wires of common metal; small items of metal hardware; metal containers for storage or transport; safes. |
| | | 17 | Unprocessed and semi-processed rubber, gutta-percha, gum, asbestos, mica, and substitutes for all these materials; plastics and resins in extruded form for use in manufacture; packing, stopping, and insulating materials; flexible pipes, tubes, and hoses, not of metal. |
| | | 19 | Materials, not of metal, for building and construction; rigid pipes, not of metal; for building; asphalt, pitch, tar, and bitumen; transportable buildings, not of metal; monuments, not of metal. |
| | | 37 | Building construction; repair; installation services. |
| | | 40 | Treatment of materials. |
| Household equipment | | 8 | Hand tools and implements; hand-operated cutlery; side arms, except firearms; razors. |
| | | 11 | Apparatus and installations for lighting, heating, cooling, steam generating, cooking, drying, ventilating, water supply, and sanitary purposes. |
| | | 20 | Furniture, mirrors, picture frames; containers, not of metal, for storage or transport; unwrked or semi-worked bone, horn, whalebone, or mother-of-pearl; shells; meerschaum; yellow amber. |
| | | 21 | Household or kitchen utensils and containers; cookware and tableware, except forks, knives, and spoons; combs and sponges; brushes, except paintbrushes; brush-making materials; articles for cleaning purposes; unworked or semi-worked glass, except building glass; glassware, porcelain, and earthenware. |
| Leisure, education, and training | Leisure and education | 13 | Firearms; ammunition and projectiles; explosives; fireworks. |
| | | 15 | Musical instruments; music stands and stands for musical instruments; conductors' batons. |
| | | 16 | Paper and cardboard; printed matter; bookbinding material; photographs; stationery and office requisites, except furniture; adhesives for stationery or household purposes; drawing materials and materials for artists; paintbrushes; instructional and teaching materials; plastic sheets, films, and bags for wrapping and packaging; printers' type, printing blocks. |
| | | 28 | Games, toys, and playthings; video game apparatus; gymnastics and sporting articles; decorations for Christmas trees. |
| | | 41 | Education; providing of training; entertainment; sporting and cultural activities. |
| Management, communications, real estate, and financial services | Business services | 35 | Advertising; business management; business administration; office functions. |
| | | 36 | Insurance; financial affairs; monetary affairs; real estate affairs. |
| Pharmaceuticals, health, and cosmetics | Health | 3 | Non-medicated cosmetics and toilets preparations; non-medicated dentifrices; perfumery, essential oils; bleaching preparations and other substances for laundry use; cleaning, polishing, scouring, and abrasive preparations. |
| | | 5 | Pharmaceuticals, medical, and veterinary preparations; sanitary preparations for medical purposes; dietetic food and substances adapted for medical or veterinary use, food for babies; dietary supplements for human beings and animals; plasters, materials for dressings; material for stopping teeth, dental wax; disinfectants; preparations for destroying vermin; fungicides, herbicides. |
| | | 10 | Surgical, medical, dental, and veterinary apparatus and instruments; artificial limbs, eyes, and teeth; orthopedic articles; suture materials; therapeutic and assistive devices adapted for the disabled; massage apparatus; apparatus, devices, and articles for nursing infants; sexual activity apparatus, devices, and articles. |
| | | 44 | Medical services; veterinary services; hygienic and beauty care for human beings or animals; agriculture, horticulture, and forestry services. |

TABLE S8-46

## Nice classes, by business sector

(Nice classes)

| Business sector | Abbreviation (where applicable) | Nice class | Class description |
|---|---|---|---|
| Scientific research, information, and communication technology | Research and technology | | |
| | | 9 | Scientific, research, navigation, surveying, photographic, cinematographic, audiovisual, optical, weighing, measuring, signaling, detecting, testing, inspecting, life-saving, and teaching apparatus and instruments; apparatus and instruments for conducting, switching, transforming, accumulating, regulating, or controlling the distribution or use of electricity; apparatus and instruments for recording, transmitting, reproducing, or processing sound, images, or data; recorded and downloadable media, computer software, blank digital or analogue recording and storage media; mechanisms for coin-operated apparatus; cash registers, calculating devices; computers and computer peripheral devices; diving suits, divers' masks, ear plugs for divers, nose clips for divers and swimmers, gloves for divers, breathing apparatus for underwater swimming; fire-extinguishing apparatus. |
| | | 38 | Telecommunications. |
| | | 42 | Scientific and technological services and research and design relating thereto; industrial analysis and industrial research services; design and development of computer hardware and software. |
| | | 45 | Legal services; security services for the physical protection of tangible property and individuals; personal and social services rendered by others to meet the needs of individuals. |
| Textiles – clothing and accessories | Clothing | | |
| | | 14 | Precious metals and their alloys; jewelry, precious and semi-precious stones; horological and chronometric instruments. |
| | | 18 | Leather and imitations of leather; animal skins and hides; luggage and carrying bags; umbrellas and parasols; walking sticks; whips, harnesses; and saddlery; collars, leashes, and clothing for animals. |
| | | 22 | Ropes and string; nets; tents and tarpaulins; awnings of textile or synthetic materials; sails; sacks for the transport and storage of materials in bulk; padding, cushioning, and stuffing materials, except of paper, cardboard, rubber, or plastics; raw fibrous textile materials and substitutes therefor. |
| | | 23 | Yarns and threads for textile use. |
| | | 24 | Textiles and substitutes for textiles; household linen; curtains of textile or plastic. |
| | | 25 | Clothing, footwear, headwear. |
| | | 26 | Lace, braid and embroidery, and haberdashery ribbons and bows; buttons, hooks and eyes, pins and needles; artificial flowers; hair decorations; false hair. |
| | | 27 | Carpets, rugs, mats and matting, linoleum, and other materials for covering existing floors; wall hangings, not of textile. |
| | | 34 | Tobacco and tobacco substitutes; cigarettes and cigars; electronic cigarettes and oral vaporizers for smokers; smokers' articles; matches. |
| Transportation and logistics | Transportation | | |
| | | 7 | Machines, machine tools, power-operated tools; motors and engines, except for land vehicles; machine coupling and transmission components, except for land vehicles; agricultural implements, other than hand-operated hand tools; incubators for eggs; automatic vending machines. |
| | | 12 | Vehicles; apparatus for locomotion by land, air, or water. |
| | | 39 | Transport; packaging and storage of goods; travel arrangement. |

**Note(s)**

Trademarks are classified under the 11th edition of the Nice classification of goods and services, which classifies trademarks under 34 categories of goods and 11 categories of services. Business sectors based on class groups are those defined by Edital.

**Source(s)**

World Intellectual Property Organization.

*Science and Engineering Indicators*

TABLE S8-47

## Number of U.S. registered USPTO and EUIPO trademarks, by Nice class: 1998–2018

(Number)

| | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Nice class | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO |
| All classes | 75,738 | 6,096 | 75,214 | 8,013 | 94,399 | 8,198 | 91,363 | 8,585 | 122,586 | 7,977 | 105,482 | 7,270 | 91,161 | 6,983 | 98,567 | 11,249 | 123,683 | 10,791 | 137,971 | 11,639 | 156,977 | 13,141 | 142,067 | 13,378 | 132,543 | 12,789 | 145,715 | 12,232 | 151,769 | 12,702 | 156,082 | 12,846 | 164,524 | 13,112 | 168,770 | 13,552 | 175,237 | 16,016 | 181,987 | 14,851 | 184,166 | 14,635 |
| 1 | 1,187 | 290 | 1,142 | 277 | 1,283 | 240 | 1,268 | 254 | 1,706 | 199 | 1,533 | 253 | 1,309 | 222 | 1,350 | 381 | 1,509 | 329 | 1,617 | 344 | 1,760 | 358 | 1,574 | 394 | 1,537 | 380 | 1,737 | 368 | 1,679 | 368 | 1,703 | 357 | 1,787 | 341 | 1,907 | 315 | 1,721 | 403 | 1,774 | 361 | 1,817 | 328 |
| 2 | 333 | 51 | 345 | 83 | 391 | 54 | 427 | 43 | 519 | 45 | 483 | 37 | 396 | 53 | 505 | 81 | 585 | 79 | 565 | 73 | 547 | 77 | 512 | 80 | 454 | 63 | 523 | 66 | 474 | 66 | 473 | 54 | 481 | 74 | 568 | 63 | 519 | 76 | 496 | 62 | 461 | 72 |
| 3 | 2,143 | 283 | 2,165 | 318 | 2,414 | 323 | 2,421 | 359 | 3,059 | 333 | 2,968 | 285 | 2,637 | 327 | 2,882 | 653 | 3,924 | 553 | 4,072 | 607 | 4,501 | 737 | 4,264 | 762 | 3,653 | 636 | 4,315 | 653 | 4,232 | 604 | 4,532 | 665 | 4,752 | 663 | 5,010 | 739 | 5,189 | 844 | 5,479 | 752 | 6,166 | 697 |
| 4 | 306 | 61 | 362 | 52 | 375 | 48 | 372 | 39 | 500 | 34 | 446 | 36 | 326 | 32 | 466 | 56 | 463 | 39 | 525 | 56 | 483 | 73 | 511 | 81 | 496 | 56 | 601 | 74 | 565 | 73 | 529 | 92 | 557 | 70 | 559 | 73 | 617 | 92 | 655 | 74 | 649 | 72 |
| 5 | 2,511 | 278 | 2,839 | 428 | 2,832 | 508 | 3,121 | 479 | 3,570 | 576 | 3,391 | 539 | 3,078 | 551 | 3,130 | 810 | 3,991 | 762 | 4,257 | 841 | 4,782 | 873 | 4,225 | 786 | 4,166 | 904 | 4,395 | 747 | 4,630 | 809 | 4,585 | 828 | 4,975 | 809 | 4,904 | 889 | 5,038 | 1,162 | 5,225 | 974 | 5,942 | 1,063 |
| 6 | 794 | 119 | 861 | 148 | 1,007 | 131 | 904 | 98 | 1,226 | 78 | 1,037 | 81 | 960 | 80 | 922 | 126 | 1,109 | 119 | 1,311 | 127 | 1,367 | 161 | 1,158 | 129 | 1,175 | 125 | 1,202 | 127 | 1,170 | 116 | 1,080 | 111 | 1,227 | 113 | 1,209 | 121 | 1,195 | 142 | 1,245 | 108 | 1,242 | 88 |
| 7 | 1,401 | 254 | 1,427 | 305 | 1,868 | 247 | 1,729 | 216 | 2,229 | 213 | 1,746 | 208 | 1,520 | 181 | 1,614 | 307 | 1,820 | 272 | 2,063 | 293 | 2,244 | 336 | 2,098 | 355 | 1,753 | 325 | 1,831 | 258 | 1,756 | 321 | 1,849 | 301 | 1,910 | 300 | 1,817 | 323 | 1,966 | 336 | 2,041 | 283 | 2,017 | 323 |
| 8 | 473 | 48 | 453 | 61 | 515 | 53 | 546 | 66 | 622 | 53 | 597 | 39 | 491 | 40 | 625 | 77 | 702 | 64 | 804 | 90 | 776 | 75 | 687 | 72 | 598 | 77 | 708 | 65 | 731 | 77 | 703 | 93 | 824 | 82 | 798 | 96 | 912 | 137 | 1,046 | 101 | 1,098 | 99 |
| 9 | 10,643 | 1,110 | 10,394 | 1,577 | 12,417 | 1,543 | 11,754 | 1,728 | 15,656 | 1,490 | 13,628 | 1,363 | 11,000 | 1,214 | 11,485 | 1,811 | 13,208 | 1,852 | 13,882 | 1,959 | 15,544 | 2,083 | 13,458 | 2,063 | 12,592 | 1,952 | 13,815 | 1,859 | 14,512 | 2,017 | 14,766 | 2,063 | 15,691 | 2,126 | 15,759 | 2,098 | 15,872 | 2,621 | 15,674 | 2,410 | 15,035 | 2,370 |
| 10 | 1,350 | 254 | 1,270 | 363 | 1,310 | 405 | 1,610 | 379 | 2,024 | 398 | 1,882 | 423 | 1,626 | 390 | 1,752 | 672 | 1,988 | 617 | 2,154 | 629 | 2,391 | 757 | 2,238 | 759 | 2,163 | 742 | 2,335 | 728 | 2,464 | 753 | 2,398 | 673 | 2,485 | 717 | 2,424 | 649 | 2,401 | 760 | 2,671 | 794 | 2,804 | 683 |
| 11 | 1,112 | 134 | 1,187 | 158 | 1,494 | 155 | 1,456 | 120 | 2,006 | 112 | 1,762 | 156 | 1,506 | 102 | 1,635 | 206 | 1,971 | 175 | 2,245 | 222 | 2,361 | 249 | 2,174 | 273 | 1,973 | 244 | 2,057 | 248 | 2,155 | 250 | 2,095 | 252 | 2,232 | 253 | 2,421 | 226 | 2,532 | 278 | 2,699 | 256 | 2,812 | 253 |
| 12 | 921 | 135 | 1,045 | 123 | 1,201 | 120 | 1,222 | 131 | 1,532 | 124 | 1,274 | 116 | 1,224 | 112 | 1,326 | 184 | 1,635 | 262 | 1,690 | 207 | 1,785 | 186 | 1,557 | 242 | 1,423 | 190 | 1,563 | 175 | 1,423 | 252 | 1,504 | 189 | 1,589 | 220 | 1,614 | 249 | 1,842 | 217 | 1,881 | 234 | 1,948 | 235 |
| 13 | 161 | 9 | 145 | 15 | 164 | 11 | 209 | 14 | 221 | 10 | 181 | 17 | 193 | 16 | 224 | 22 | 333 | 18 | 336 | 18 | 403 | 35 | 383 | 31 | 409 | 34 | 399 | 26 | 430 | 27 | 425 | 39 | 517 | 34 | 577 | 31 | 648 | 50 | 620 | 58 | 759 | 42 |
| 14 | 697 | 57 | 631 | 74 | 912 | 68 | 804 | 65 | 1,050 | 66 | 970 | 51 | 895 | 60 | 1,062 | 98 | 1,372 | 104 | 1,536 | 107 | 1,699 | 97 | 1,563 | 127 | 1,518 | 124 | 1,766 | 132 | 1,865 | 127 | 1,927 | 130 | 2,051 | 140 | 1,961 | 132 | 2,026 | 197 | 2,040 | 136 | 1,983 | 138 |
| 15 | 118 | 28 | 137 | 16 | 212 | 31 | 177 | 20 | 259 | 24 | 208 | 15 | 160 | 18 | 205 | 31 | 269 | 23 | 301 | 22 | 300 | 30 | 253 | 24 | 287 | 23 | 303 | 33 | 269 | 27 | 319 | 33 | 364 | 41 | 314 | 27 | 294 | 37 | 315 | 34 | 281 | 48 |
| 16 | 5,924 | 463 | 5,578 | 592 | 6,353 | 602 | 5,599 | 534 | 6,875 | 451 | 6,008 | 357 | 5,157 | 401 | 5,565 | 628 | 6,631 | 516 | 6,895 | 493 | 7,568 | 567 | 6,282 | 512 | 5,197 | 437 | 5,587 | 419 | 5,237 | 366 | 5,090 | 345 | 4,756 | 336 | 4,634 | 320 | 4,689 | 339 | 4,624 | 294 | 4,715 | 257 |
| 17 | 449 | 82 | 395 | 92 | 575 | 101 | 477 | 71 | 660 | 51 | 661 | 65 | 529 | 75 | 532 | 108 | 602 | 109 | 648 | 107 | 742 | 132 | 678 | 116 | 632 | 121 | 660 | 107 | 603 | 103 | 604 | 131 | 636 | 116 | 629 | 98 | 654 | 116 | 675 | 123 | 690 | 105 |
| 18 | 529 | 88 | 486 | 126 | 616 | 97 | 550 | 77 | 829 | 76 | 743 | 69 | 692 | 93 | 828 | 171 | 1,048 | 173 | 1,174 | 155 | 1,460 | 179 | 1,349 | 206 | 1,247 | 196 | 1,324 | 199 | 1,407 | 189 | 1,425 | 189 | 1,394 | 194 | 1,548 | 180 | 1,569 | 204 | 1,722 | 228 | 1,899 | 221 |
| 19 | 644 | 59 | 659 | 62 | 815 | 50 | 843 | 48 | 1,151 | 37 | 1,010 | 68 | 901 | 53 | 983 | 70 | 1,282 | 76 | 1,372 | 90 | 1,516 | 84 | 1,285 | 74 | 1,111 | 85 | 1,088 | 81 | 1,092 | 67 | 1,071 | 60 | 1,027 | 60 | 1,071 | 62 | 1,113 | 69 | 1,136 | 69 | 1,116 | 56 |
| 20 | 1,196 | 66 | 1,351 | 96 | 1,623 | 108 | 1,371 | 92 | 1,814 | 75 | 1,741 | 81 | 1,563 | 70 | 1,627 | 119 | 1,783 | 147 | 1,984 | 156 | 2,274 | 160 | 1,849 | 146 | 1,745 | 142 | 1,962 | 144 | 1,985 | 140 | 2,056 | 117 | 1,981 | 100 | 2,114 | 161 | 2,116 | 181 | 2,464 | 157 | 2,805 | 164 |
| 21 | 908 | 76 | 969 | 86 | 1,226 | 89 | 1,009 | 97 | 1,431 | 78 | 1,319 | 72 | 1,207 | 96 | 1,383 | 141 | 1,421 | 129 | 1,569 | 137 | 1,760 | 144 | 1,679 | 173 | 1,581 | 179 | 1,866 | 216 | 1,830 | 178 | 2,086 | 184 | 2,136 | 202 | 2,388 | 181 | 2,597 | 256 | 2,996 | 253 | 3,353 | 244 |
| 22 | 111 | 13 | 115 | 19 | 144 | 14 | 153 | 14 | 170 | 5 | 201 | 11 | 175 | 17 | 204 | 20 | 218 | 34 | 227 | 18 | 242 | 23 | 222 | 26 | 216 | 14 | 225 | 29 | 253 | 24 | 240 | 18 | 236 | 23 | 258 | 18 | 290 | 21 | 374 | 35 | 370 | 36 |
| 23 | 34 | 2 | 46 | 9 | 35 | 5 | 28 | 1 | 31 | 3 | 38 | 13 | 44 | 5 | 30 | 5 | 86 | 12 | 61 | 4 | 52 | 1 | 52 | 12 | 44 | 8 | 50 | 5 | 51 | 6 | 66 | 9 | 71 | 19 | 74 | 3 | 70 | 6 | 65 | 6 | 62 | 10 |
| 24 | 415 | 45 | 361 | 51 | 506 | 47 | 416 | 46 | 626 | 46 | 602 | 52 | 542 | 47 | 591 | 82 | 667 | 81 | 721 | 65 | 912 | 73 | 762 | 76 | 720 | 81 | 758 | 73 | 764 | 63 | 830 | 69 | 895 | 60 | 921 | 68 | 938 | 82 | 1,091 | 68 | 1,346 | 85 |
| 25 | 4,065 | 333 | 3,488 | 401 | 4,826 | 347 | 3,924 | 301 | 5,154 | 271 | 4,666 | 267 | 4,587 | 333 | 5,502 | 541 | 6,843 | 554 | 7,961 | 584 | 9,153 | 647 | 8,736 | 638 | 8,575 | 715 | 9,737 | 680 | 10,253 | 586 | 11,098 | 626 | 12,094 | 693 | 12,598 | 699 | 13,062 | 776 | 13,927 | 762 | 14,446 | 779 |
| 26 | 139 | 7 | 128 | 13 | 226 | 15 | 167 | 7 | 208 | 10 | 226 | 5 | 194 | 10 | 199 | 23 | 270 | 19 | 303 | 28 | 337 | 27 | 328 | 24 | 350 | 33 | 388 | 30 | 431 | 26 | 448 | 24 | 456 | 27 | 422 | 30 | 510 | 41 | 491 | 35 | 614 | 41 |
| 27 | 155 | 17 | 186 | 11 | 301 | 26 | 258 | 17 | 287 | 17 | 285 | 17 | 225 | 11 | 237 | 21 | 251 | 18 | 272 | 17 | 366 | 24 | 300 | 22 | 240 | 39 | 255 | 21 | 235 | 26 | 276 | 20 | 308 | 17 | 297 | 18 | 313 | 26 | 366 | 30 | 493 | 40 |
| 28 | 3,298 | 181 | 2,989 | 236 | 3,293 | 241 | 3,281 | 218 | 3,960 | 196 | 3,486 | 212 | 3,383 | 281 | 3,355 | 379 | 4,270 | 378 | 4,024 | 310 | 4,353 | 363 | 3,761 | 331 | 3,580 | 385 | 3,869 | 407 | 3,864 | 382 | 4,036 | 354 | 4,496 | 350 | 4,416 | 415 | 4,447 | 484 | 4,677 | 585 | 4,949 | 590 |
| 29 | 1,436 | 100 | 1,247 | 89 | 1,213 | 87 | 1,089 | 104 | 1,716 | 77 | 1,533 | 67 | 1,468 | 67 | 1,619 | 120 | 1,928 | 120 | 2,054 | 115 | 2,378 | 134 | 2,023 | 122 | 1,956 | 129 | 2,079 | 117 | 2,073 | 110 | 2,212 | 99 | 2,381 | 135 | 2,391 | 125 | 2,622 | 142 | 2,678 | 129 | 2,733 | 156 |
| 30 | 2,450 | 145 | 2,361 | 175 | 1,987 | 158 | 1,893 | 134 | 2,945 | 109 | 2,595 | 132 | 2,374 | 132 | 2,767 | 186 | 3,362 | 179 | 3,602 | 206 | 3,809 | 215 | 3,507 | 211 | 3,417 | 270 | 3,955 | 224 | 3,988 | 219 | 4,165 | 220 | 4,965 | 239 | 4,775 | 195 | 4,780 | 283 | 5,045 | 216 | 5,142 | 229 |
| 31 | 843 | 62 | 817 | 72 | 736 | 88 | 680 | 73 | 1,022 | 57 | 1,005 | 64 | 906 | 59 | 949 | 97 | 1,171 | 102 | 1,265 | 95 | 1,320 | 85 | 1,202 | 104 | 1,103 | 98 | 1,337 | 80 | 1,267 | 114 | 1,224 | 95 | 1,265 | 89 | 1,325 | 114 | 1,347 | 125 | 1,594 | 137 | 1,653 | 120 |
| 32 | 891 | 92 | 831 | 71 | 597 | 72 | 521 | 59 | 813 | 79 | 775 | 62 | 641 | 67 | 839 | 111 | 1,040 | 120 | 1,067 | 161 | 1,387 | 154 | 1,258 | 163 | 1,308 | 181 | 1,506 | 134 | 1,698 | 156 | 2,161 | 197 | 2,817 | 150 | 3,211 | 209 | 3,568 | 183 | 3,734 | 191 | 3,490 | 196 |
| 33 | 414 | 43 | 438 | 62 | 368 | 78 | 421 | 81 | 671 | 66 | 710 | 78 | 681 | 79 | 911 | 109 | 1,340 | 150 | 1,575 | 119 | 1,987 | 146 | 1,752 | 169 | 1,720 | 165 | 1,900 | 138 | 2,023 | 177 | 2,141 | 188 | 2,563 | 199 | 2,911 | 190 | 2,746 | 241 | 2,927 | 196 | 2,911 | 229 |

TABLE S8-47

## Number of U.S. registered USPTO and EUIPO trademarks, by Nice class: 1998–2018

(Number)

| | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Nice class | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO |
| 34 | 313 | 19 | 257 | 19 | 193 | 34 | 164 | 27 | 273 | 18 | 275 | 18 | 275 | 17 | 273 | 41 | 322 | 52 | 319 | 47 | 464 | 56 | 541 | 73 | 474 | 51 | 524 | 41 | 655 | 72 | 794 | 122 | 975 | 148 | 1,134 | 169 | 1,364 | 234 | 1,169 | 164 | 847 | 138 |
| 35 | 5,996 | 126 | 6,631 | 240 | 9,917 | 339 | 10,524 | 470 | 14,424 | 603 | 11,970 | 416 | 9,729 | 353 | 10,530 | 541 | 14,040 | 531 | 16,437 | 636 | 19,166 | 765 | 17,694 | 851 | 16,678 | 805 | 18,210 | 810 | 19,160 | 868 | 19,139 | 883 | 19,615 | 910 | 19,876 | 970 | 20,040 | 1,031 | 20,009 | 930 | 19,705 | 884 |
| 36 | 3,870 | 132 | 3,910 | 197 | 5,665 | 227 | 5,811 | 348 | 7,783 | 292 | 6,514 | 218 | 5,780 | 191 | 5,933 | 318 | 8,065 | 322 | 8,972 | 502 | 9,932 | 559 | 8,226 | 498 | 7,199 | 372 | 7,527 | 407 | 7,802 | 330 | 7,783 | 379 | 8,327 | 364 | 8,270 | 396 | 8,877 | 448 | 8,865 | 383 | 8,676 | 436 |
| 37 | 1,113 | 71 | 1,257 | 103 | 1,743 | 101 | 1,517 | 92 | 2,328 | 83 | 1,887 | 89 | 1,674 | 71 | 1,919 | 129 | 2,714 | 103 | 3,087 | 117 | 3,567 | 138 | 3,085 | 159 | 2,733 | 116 | 2,768 | 119 | 2,911 | 104 | 2,886 | 116 | 3,042 | 131 | 3,186 | 115 | 3,369 | 130 | 3,456 | 101 | 3,608 | 109 |
| 38 | 1,152 | 90 | 1,034 | 140 | 1,697 | 159 | 1,873 | 289 | 2,289 | 228 | 1,617 | 179 | 1,339 | 130 | 1,320 | 237 | 1,656 | 193 | 1,981 | 215 | 2,274 | 275 | 1,933 | 268 | 1,697 | 226 | 1,691 | 229 | 1,689 | 242 | 1,633 | 219 | 1,571 | 204 | 1,482 | 231 | 1,449 | 228 | 1,318 | 209 | 1,221 | 177 |
| 39 | 928 | 93 | 992 | 94 | 1,396 | 109 | 1,297 | 96 | 1,678 | 98 | 1,344 | 66 | 1,064 | 58 | 1,137 | 114 | 1,462 | 91 | 1,728 | 96 | 1,950 | 121 | 1,754 | 124 | 1,583 | 126 | 1,755 | 93 | 1,845 | 126 | 1,880 | 109 | 1,839 | 115 | 1,908 | 124 | 1,953 | 125 | 2,126 | 130 | 1,970 | 133 |
| 40 | 535 | 28 | 570 | 43 | 760 | 41 | 677 | 49 | 1,000 | 42 | 959 | 55 | 830 | 43 | 883 | 75 | 1,150 | 53 | 1,295 | 75 | 1,548 | 101 | 1,554 | 109 | 1,248 | 98 | 1,352 | 78 | 1,394 | 97 | 1,388 | 87 | 1,330 | 97 | 1,445 | 85 | 1,400 | 114 | 1,510 | 100 | 1,451 | 94 |
| 41 | 5,139 | 208 | 5,313 | 289 | 7,459 | 305 | 7,119 | 378 | 10,062 | 336 | 9,122 | 289 | 8,312 | 294 | 9,038 | 512 | 12,047 | 485 | 14,342 | 576 | 16,986 | 694 | 15,532 | 712 | 14,793 | 664 | 16,324 | 633 | 17,586 | 741 | 18,220 | 752 | 18,663 | 750 | 19,359 | 801 | 20,934 | 905 | 21,851 | 897 | 21,560 | 842 |
| 42 | 8,434 | 344 | 8,238 | 626 | 11,470 | 722 | 11,448 | 848 | 15,496 | 819 | 8,907 | 575 | 5,240 | 398 | 4,900 | 590 | 5,690 | 548 | 6,581 | 616 | 7,397 | 691 | 7,311 | 814 | 6,961 | 771 | 7,900 | 726 | 8,788 | 854 | 9,198 | 881 | 9,756 | 927 | 10,289 | 1,036 | 10,550 | 1,221 | 11,252 | 1,154 | 11,451 | 1,212 |
| 43 | 9 | 0 | 4 | 0 | 2 | 0 | 3 | 0 | 164 | 0 | 1,304 | 26 | 1,759 | 57 | 2,181 | 94 | 3,069 | 98 | 3,523 | 126 | 3,911 | 182 | 3,615 | 154 | 3,268 | 128 | 3,882 | 145 | 4,153 | 116 | 4,300 | 143 | 4,587 | 162 | 5,105 | 179 | 5,477 | 200 | 5,929 | 202 | 5,941 | 189 |
| 44 | 2 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 121 | 0 | 1,172 | 23 | 1,691 | 59 | 2,121 | 116 | 2,843 | 100 | 3,466 | 142 | 4,129 | 170 | 3,920 | 182 | 3,786 | 162 | 4,195 | 148 | 4,486 | 173 | 4,878 | 190 | 5,011 | 189 | 5,026 | 197 | 5,648 | 270 | 6,028 | 277 | 6,058 | 209 |
| 45 | 1 | 0 | 1 | 0 | 4 | 0 | 5 | 0 | 46 | 0 | 406 | 6 | 601 | 16 | 764 | 34 | 1,139 | 32 | 1,679 | 41 | 2,669 | 105 | 2,762 | 134 | 2,748 | 117 | 3,113 | 139 | 3,502 | 160 | 3,500 | 141 | 3,508 | 126 | 3,493 | 137 | 3,643 | 182 | 3,643 | 154 | 3,515 | 146 |
| Unclassified | 196 | 0 | 161 | 0 | 256 | 0 | 226 | 0 | 384 | 0 | 295 | 0 | 278 | 0 | 264 | 0 | 391 | 0 | 431 | 0 | 422 | 0 | 462 | 0 | 435 | 1 | 378 | 0 | 388 | 0 | 363 | 1 | 381 | 0 | 373 | 0 | 333 | 1 | 381 | 0 | 361 | 0 |

USPTO = U.S. Patent and Trademark Office; EUIPO = European Union Intellectual Property Office.

**Note(s)**

Trademarks are allocated according to holder information. Trademarks are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named holders. Trademarks are classified under the 11th edition of the Nice classification of goods and services, which classifies trademarks under 34 categories of goods and 11 categories of services. Fractional counts of trademarks were assigned to each category to assign the proper weight of a trademark to the corresponding category under the classification.

**Source(s)**

National Center for Science and Engineering Statistics, National Science Foundation; Science-Metrix; USPTO patent data hosted by Reed Tech (LexisNexis), accessed April 2019; EUIPO trademark data, accessed April 2019.

*Science and Engineering Indicators*

TABLE S8-48

## Number of registered USPTO and EUIPO trademarks in the business sector of agriculture, by region, country, or economy: 1998–2018

(Number)

| | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Region, country, or economy | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO |
| World | 7,581 | 3,151 | 7,345 | 3,736 | 6,338 | 3,710 | 5,898 | 4,059 | 9,859 | 3,452 | 10,790 | 3,899 | 10,390 | 4,542 | 12,093 | 7,954 | 15,864 | 8,205 | 17,517 | 8,380 | 19,620 | 10,167 | 17,723 | 10,957 | 16,800 | 12,672 | 18,937 | 11,804 | 19,568 | 12,164 | 21,069 | 12,692 | 23,715 | 13,787 | 25,021 | 14,872 | 26,590 | 16,467 | 28,295 | 16,915 | 28,475 | 17,437 |
| North America | 6,360 | 479 | 6,052 | 515 | 5,189 | 548 | 4,891 | 515 | 7,766 | 435 | 8,359 | 475 | 8,267 | 547 | 9,711 | 804 | 12,489 | 864 | 13,754 | 947 | 15,512 | 1,065 | 14,098 | 1,096 | 13,441 | 1,122 | 15,459 | 990 | 15,916 | 1,046 | 17,017 | 1,104 | 19,422 | 1,139 | 20,608 | 1,199 | 21,516 | 1,366 | 22,884 | 1,265 | 22,812 | 1,332 |
| Canada | 204 | 27 | 240 | 32 | 188 | 30 | 199 | 25 | 268 | 18 | 270 | 24 | 277 | 19 | 268 | 25 | 354 | 45 | 328 | 44 | 375 | 51 | 416 | 47 | 323 | 55 | 390 | 63 | 331 | 61 | 392 | 70 | 396 | 60 | 447 | 93 | 480 | 63 | 465 | 81 | 462 | 93 |
| Mexico | 103 | 9 | 103 | 14 | 86 | 33 | 78 | 39 | 145 | 29 | 154 | 22 | 147 | 64 | 165 | 58 | 210 | 48 | 308 | 82 | 330 | 91 | 303 | 127 | 316 | 92 | 375 | 86 | 342 | 88 | 382 | 90 | 413 | 103 | 387 | 93 | 444 | 125 | 443 | 113 | 422 | 114 |
| Puerto Rico | 11 | 0 | 11 | 0 | 11 | 1 | 8 | 0 | 21 | 0 | 12 | 0 | 13 | 3 | 11 | 2 | 14 | 2 | 31 | 0 | 14 | 8 | 24 | 0 | 29 | 5 | 35 | 2 | 40 | 1 | 41 | 1 | 35 | 1 | 57 | 2 | 53 | 0 | 70 | 0 | 58 | 7 |
| United States | 6,043 | 442 | 5,697 | 470 | 4,903 | 483 | 4,606 | 452 | 7,330 | 388 | 7,922 | 428 | 7,830 | 462 | 9,266 | 716 | 11,911 | 769 | 13,086 | 821 | 14,793 | 916 | 13,356 | 922 | 12,772 | 970 | 14,659 | 838 | 15,202 | 891 | 16,203 | 942 | 18,578 | 975 | 19,718 | 1,012 | 20,540 | 1,175 | 21,907 | 1,071 | 21,870 | 1,119 |
| All others | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 3 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 5 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 |
| Central and South America | 121 | 55 | 128 | 84 | 111 | 83 | 98 | 139 | 182 | 123 | 276 | 136 | 239 | 201 | 267 | 315 | 338 | 315 | 373 | 298 | 455 | 261 | 343 | 352 | 358 | 313 | 350 | 244 | 344 | 227 | 348 | 214 | 330 | 193 | 365 | 240 | 409 | 248 | 427 | 244 | 403 | 265 |
| Argentina | 31 | 13 | 13 | 13 | 24 | 11 | 21 | 34 | 40 | 18 | 58 | 25 | 63 | 54 | 42 | 66 | 77 | 104 | 84 | 52 | 88 | 70 | 73 | 86 | 76 | 68 | 77 | 36 | 77 | 30 | 78 | 40 | 62 | 33 | 61 | 49 | 69 | 44 | 66 | 40 | 77 | 45 |
| Brazil | 11 | 4 | 12 | 10 | 3 | 10 | 6 | 15 | 16 | 19 | 32 | 16 | 16 | 26 | 19 | 35 | 39 | 44 | 45 | 50 | 44 | 38 | 32 | 42 | 37 | 46 | 18 | 41 | 26 | 42 | 33 | 36 | 48 | 27 | 46 | 46 | 55 | 33 | 64 | 38 | 57 | 31 |
| All others | 80 | 38 | 103 | 61 | 83 | 63 | 70 | 90 | 126 | 86 | 186 | 95 | 160 | 121 | 206 | 214 | 222 | 167 | 244 | 195 | 323 | 154 | 239 | 224 | 244 | 199 | 255 | 167 | 240 | 156 | 237 | 138 | 220 | 134 | 257 | 145 | 284 | 170 | 296 | 166 | 269 | 190 |
| Europe | 752 | 2,414 | 818 | 2,823 | 699 | 2,792 | 609 | 3,074 | 1,338 | 2,643 | 1,435 | 2,974 | 1,236 | 3,411 | 1,413 | 6,235 | 2,089 | 6,410 | 2,357 | 6,609 | 2,550 | 8,177 | 2,297 | 8,753 | 2,026 | 10,431 | 2,185 | 9,786 | 2,372 | 10,043 | 2,633 | 10,496 | 2,734 | 11,425 | 2,740 | 12,315 | 3,121 | 13,611 | 3,205 | 14,050 | 3,176 | 14,413 |
| EU | 656 | 2,249 | 725 | 2,629 | 626 | 2,642 | 550 | 2,915 | 1,194 | 2,494 | 1,271 | 2,792 | 1,085 | 3,197 | 1,206 | 5,902 | 1,783 | 6,007 | 2,034 | 6,194 | 2,162 | 7,761 | 1,987 | 8,239 | 1,760 | 10,017 | 1,901 | 9,271 | 1,988 | 9,459 | 2,242 | 9,870 | 2,309 | 10,778 | 2,307 | 11,634 | 2,660 | 12,811 | 2,778 | 13,229 | 2,813 | 13,612 |
| Austria | 8 | 74 | 13 | 91 | 12 | 70 | 7 | 61 | 21 | 71 | 15 | 66 | 29 | 63 | 24 | 129 | 38 | 177 | 33 | 215 | 43 | 258 | 46 | 226 | 36 | 383 | 24 | 319 | 27 | 338 | 31 | 297 | 36 | 353 | 36 | 378 | 35 | 418 | 40 | 439 | 46 | 484 |
| Belgium | 23 | 78 | 20 | 86 | 20 | 92 | 23 | 75 | 29 | 72 | 37 | 73 | 35 | 73 | 30 | 179 | 49 | 132 | 59 | 141 | 53 | 152 | 60 | 206 | 40 | 253 | 48 | 243 | 58 | 224 | 64 | 192 | 77 | 260 | 48 | 260 | 65 | 303 | 59 | 335 | 50 | 364 |
| Denmark | 12 | 53 | 13 | 74 | 13 | 62 | 7 | 85 | 29 | 47 | 21 | 71 | 13 | 65 | 19 | 110 | 30 | 126 | 34 | 125 | 25 | 117 | 26 | 109 | 27 | 161 | 21 | 155 | 24 | 179 | 21 | 153 | 29 | 165 | 21 | 195 | 47 | 240 | 48 | 245 | 48 | 203 |
| Finland | 9 | 20 | 7 | 21 | 8 | 33 | 8 | 27 | 17 | 21 | 3 | 23 | 3 | 26 | 11 | 43 | 8 | 70 | 10 | 69 | 16 | 64 | 11 | 88 | 5 | 97 | 11 | 106 | 6 | 102 | 9 | 120 | 13 | 106 | 12 | 107 | 18 | 151 | 24 | 152 | 26 | 166 |
| France | 117 | 239 | 147 | 314 | 143 | 299 | 125 | 351 | 240 | 317 | 239 | 323 | 169 | 324 | 221 | 725 | 298 | 729 | 362 | 655 | 351 | 877 | 325 | 865 | 298 | 1,042 | 264 | 931 | 328 | 951 | 383 | 926 | 368 | 1,013 | 338 | 1,048 | 373 | 1,173 | 476 | 1,202 | 460 | 1,224 |
| Germany | 68 | 467 | 81 | 447 | 53 | 422 | 52 | 489 | 238 | 405 | 238 | 521 | 154 | 554 | 161 | 1,003 | 243 | 1,124 | 263 | 1,312 | 251 | 1,561 | 280 | 1,529 | 225 | 1,830 | 210 | 1,746 | 220 | 1,823 | 251 | 1,850 | 303 | 1,949 | 302 | 1,876 | 318 | 2,105 | 308 | 2,062 | 302 | 2,038 |
| Hungary | 0 | 2 | 2 | 1 | 2 | 2 | 1 | 3 | 3 | 4 | 1 | 1 | 3 | 4 | 1 | 39 | 4 | 37 | 7 | 16 | 7 | 29 | 4 | 40 | 7 | 53 | 6 | 70 | 4 | 63 | 9 | 62 | 5 | 69 | 4 | 85 | 6 | 113 | 7 | 116 | 9 | 108 |
| Ireland | 25 | 49 | 12 | 47 | 5 | 49 | 14 | 60 | 21 | 47 | 23 | 50 | 25 | 73 | 24 | 121 | 53 | 106 | 53 | 85 | 51 | 123 | 54 | 140 | 47 | 151 | 39 | 141 | 51 | 120 | 51 | 150 | 60 | 173 | 69 | 192 | 65 | 228 | 70 | 213 | 98 | 181 |
| Italy | 119 | 319 | 157 | 485 | 120 | 503 | 107 | 646 | 206 | 521 | 232 | 527 | 212 | 563 | 199 | 929 | 321 | 1,014 | 366 | 962 | 426 | 1,226 | 337 | 1,288 | 282 | 1,603 | 448 | 1,470 | 375 | 1,374 | 413 | 1,462 | 408 | 1,657 | 409 | 1,885 | 409 | 2,131 | 493 | 2,170 | 533 | 2,451 |
| Netherlands | 47 | 84 | 47 | 167 | 48 | 142 | 35 | 153 | 80 | 108 | 94 | 122 | 73 | 136 | 87 | 315 | 108 | 290 | 140 | 369 | 135 | 418 | 135 | 456 | 115 | 552 | 113 | 482 | 111 | 504 | 96 | 521 | 128 | 536 | 144 | 545 | 141 | 584 | 127 | 562 | 132 | 591 |
| Spain | 85 | 478 | 81 | 363 | 55 | 439 | 80 | 442 | 115 | 431 | 137 | 462 | 140 | 685 | 180 | 1,199 | 276 | 1,025 | 270 | 920 | 274 | 1,145 | 248 | 1,273 | 225 | 1,451 | 215 | 1,279 | 241 | 1,274 | 318 | 1,499 | 275 | 1,512 | 267 | 1,693 | 325 | 1,823 | 346 | 2,030 | 283 | 2,084 |
| Sweden | 15 | 22 | 16 | 81 | 16 | 53 | 6 | 44 | 15 | 46 | 23 | 51 | 19 | 48 | 34 | 90 | 27 | 99 | 33 | 112 | 33 | 121 | 30 | 149 | 36 | 197 | 33 | 234 | 54 | 235 | 38 | 213 | 34 | 250 | 32 | 291 | 35 | 310 | 40 | 337 | 54 | 339 |
| United Kingdom | 101 | 319 | 96 | 383 | 92 | 368 | 66 | 365 | 132 | 291 | 130 | 375 | 144 | 432 | 141 | 659 | 216 | 639 | 251 | 646 | 283 | 857 | 251 | 877 | 287 | 1,057 | 284 | 1,017 | 330 | 1,072 | 377 | 1,179 | 378 | 1,197 | 386 | 1,352 | 485 | 1,366 | 451 | 1,319 | 489 | 1,230 |
| All others | 24 | 46 | 32 | 69 | 38 | 109 | 19 | 115 | 47 | 113 | 78 | 127 | 66 | 152 | 72 | 362 | 112 | 437 | 153 | 569 | 214 | 812 | 178 | 994 | 129 | 1,189 | 186 | 1,076 | 158 | 1,200 | 179 | 1,247 | 194 | 1,537 | 239 | 1,728 | 339 | 1,865 | 288 | 2,047 | 285 | 2,149 |
| Other Europe | 96 | 165 | 93 | 194 | 73 | 150 | 59 | 159 | 145 | 149 | 165 | 181 | 151 | 214 | 207 | 332 | 306 | 404 | 323 | 414 | 388 | 416 | 310 | 514 | 267 | 414 | 284 | 515 | 385 | 584 | 391 | 626 | 425 | 647 | 433 | 680 | 462 | 800 | 427 | 821 | 363 | 801 |
| Former Soviet Union | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 2 | 0 | 0 | 0 | 5 | 0 | 27 | 4 | 21 | 0 | 20 | 4 | 11 | 1 | 13 | 1 | 18 | 13 | 20 | 16 | 12 | 23 | 18 | 22 | 23 | 19 | 34 | 47 | 24 | 57 | 29 | 51 |
| Norway | 12 | 4 | 7 | 19 | 3 | 9 | 4 | 8 | 11 | 10 | 13 | 2 | 8 | 7 | 6 | 17 | 15 | 31 | 13 | 25 | 21 | 31 | 17 | 26 | 13 | 23 | 25 | 26 | 18 | 27 | 13 | 27 | 18 | 49 | 10 | 44 | 20 | 53 | 17 | 44 | 18 | 60 |
| Russia | 4 | 0 | 3 | 0 | 2 | 5 | 2 | 8 | 10 | 2 | 17 | 6 | 15 | 6 | 14 | 9 | 53 | 13 | 42 | 11 | 52 | 27 | 45 | 11 | 33 | 14 | 42 | 24 | 75 | 53 | 60 | 66 | 50 | 35 | 67 | 52 | 95 | 83 | 83 | 129 | 88 | 101 |
| Switzerland | 67 | 112 | 65 | 122 | 51 | 102 | 45 | 103 | 91 | 106 | 102 | 140 | 92 | 158 | 139 | 246 | 156 | 252 | 181 | 280 | 202 | 282 | 160 | 357 | 155 | 287 | 145 | 314 | 195 | 365 | 219 | 346 | 221 | 384 | 235 | 363 | 166 | 325 | 203 | 343 | 126 | 325 |
| All others | 12 | 49 | 18 | 54 | 16 | 34 | 9 | 40 | 26 | 30 | 31 | 33 | 36 | 43 | 43 | 61 | 55 | 103 | 66 | 97 | 92 | 73 | 76 | 120 | 52 | 88 | 54 | 138 | 77 | 123 | 86 | 164 | 118 | 157 | 98 | 202 | 146 | 292 | 100 | 248 | 101 | 264 |
| Asia | 180 | 96 | 173 | 98 | 193 | 72 | 141 | 89 | 272 | 73 | 332 | 89 | 316 | 120 | 346 | 229 | 508 | 248 | 560 | 227 | 628 | 310 | 561 | 363 | 603 | 423 | 591 | 403 | 615 | 443 | 685 | 455 | 824 | 560 | 873 | 612 | 999 | 671 | 1,218 | 762 | 1,390 | 814 |

TABLE S8-48

## Number of registered USPTO and EUIPO trademarks in the business sector of agriculture, by region, country, or economy: 1998–2018

(Number)

| Region, country, or economy | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO |
| China | 42 | 8 | 36 | 17 | 44 | 8 | 22 | 8 | 52 | 15 | 53 | 13 | 54 | 25 | 73 | 33 | 102 | 53 | 117 | 55 | 166 | 69 | 158 | 91 | 126 | 101 | 166 | 117 | 171 | 133 | 185 | 145 | 230 | 181 | 235 | 197 | 317 | 262 | 465 | 299 | 606 | 400 |
| India | 3 | 4 | 5 | 2 | 9 | 2 | 13 | 7 | 12 | 7 | 24 | 10 | 18 | 13 | 16 | 14 | 28 | 17 | 17 | 14 | 23 | 27 | 28 | 35 | 29 | 36 | 28 | 27 | 23 | 32 | 34 | 32 | 46 | 33 | 40 | 47 | 48 | 36 | 56 | 45 | 53 | 43 |
| Japan | 53 | 57 | 63 | 37 | 70 | 26 | 45 | 32 | 97 | 19 | 111 | 24 | 97 | 32 | 97 | 80 | 173 | 66 | 183 | 68 | 179 | 65 | 174 | 111 | 199 | 133 | 137 | 102 | 175 | 98 | 181 | 117 | 198 | 116 | 268 | 156 | 259 | 171 | 278 | 184 | 283 | 156 |
| Malaysia | 4 | 1 | 2 | 1 | 2 | 3 | 0 | 2 | 5 | 1 | 2 | 4 | 2 | 5 | 4 | 6 | 16 | 13 | 15 | 13 | 23 | 20 | 10 | 17 | 14 | 15 | 17 | 6 | 11 | 5 | 10 | 7 | 9 | 10 | 5 | 5 | 16 | 13 | 10 | 10 | 12 | 11 |
| Singapore | 10 | 7 | 8 | 11 | 7 | 11 | 9 | 17 | 5 | 3 | 8 | 6 | 13 | 6 | 17 | 17 | 18 | 17 | 23 | 22 | 26 | 18 | 21 | 31 | 34 | 31 | 20 | 20 | 31 | 22 | 31 | 36 | 30 | 38 | 43 | 52 | 47 | 50 | 60 | 62 | 59 | 59 |
| South Korea | 20 | 3 | 13 | 5 | 15 | 3 | 11 | 2 | 27 | 1 | 35 | 3 | 30 | 2 | 38 | 8 | 44 | 13 | 80 | 11 | 83 | 20 | 64 | 8 | 95 | 25 | 99 | 22 | 88 | 30 | 99 | 30 | 131 | 49 | 127 | 37 | 148 | 34 | 186 | 58 | 168 | 57 |
| Taiwan | 25 | 7 | 24 | 17 | 14 | 10 | 22 | 5 | 41 | 14 | 45 | 5 | 38 | 14 | 50 | 14 | 56 | 14 | 44 | 13 | 55 | 11 | 32 | 12 | 34 | 19 | 58 | 23 | 47 | 41 | 70 | 19 | 59 | 26 | 60 | 21 | 62 | 18 | 61 | 28 | 88 | 29 |
| All others | 23 | 9 | 22 | 7 | 31 | 8 | 19 | 16 | 35 | 12 | 54 | 23 | 64 | 22 | 51 | 56 | 71 | 55 | 82 | 30 | 73 | 80 | 72 | 58 | 72 | 63 | 67 | 85 | 69 | 82 | 75 | 69 | 121 | 107 | 97 | 96 | 102 | 87 | 102 | 75 | 121 | 59 |
| Middle East | 15 | 2 | 16 | 17 | 11 | 26 | 11 | 23 | 25 | 16 | 27 | 17 | 26 | 17 | 24 | 72 | 35 | 52 | 52 | 62 | 61 | 84 | 38 | 97 | 49 | 74 | 73 | 112 | 82 | 106 | 73 | 120 | 90 | 139 | 87 | 142 | 136 | 183 | 124 | 195 | 128 | 201 |
| Israel | 7 | 0 | 5 | 8 | 3 | 6 | 3 | 13 | 10 | 9 | 13 | 3 | 13 | 4 | 9 | 15 | 19 | 11 | 24 | 11 | 31 | 23 | 25 | 12 | 25 | 16 | 20 | 22 | 35 | 27 | 22 | 28 | 34 | 17 | 22 | 16 | 40 | 33 | 36 | 35 | 34 | 40 |
| All others | 8 | 2 | 10 | 10 | 8 | 20 | 9 | 10 | 15 | 7 | 14 | 14 | 13 | 12 | 15 | 57 | 16 | 41 | 28 | 50 | 30 | 61 | 13 | 85 | 24 | 58 | 53 | 90 | 47 | 79 | 51 | 92 | 56 | 122 | 65 | 126 | 96 | 150 | 88 | 161 | 94 | 161 |
| Africa | 19 | 8 | 15 | 21 | 15 | 24 | 20 | 48 | 34 | 34 | 67 | 73 | 31 | 81 | 53 | 108 | 56 | 107 | 51 | 98 | 56 | 105 | 51 | 128 | 68 | 124 | 68 | 106 | 54 | 133 | 70 | 126 | 74 | 130 | 62 | 145 | 50 | 119 | 47 | 138 | 54 | 128 |
| South Africa | 13 | 8 | 11 | 17 | 11 | 20 | 16 | 41 | 28 | 23 | 52 | 65 | 28 | 60 | 48 | 83 | 50 | 74 | 46 | 73 | 46 | 82 | 39 | 96 | 61 | 95 | 49 | 64 | 39 | 73 | 49 | 78 | 52 | 78 | 41 | 86 | 28 | 96 | 27 | 82 | 34 | 71 |
| All others | 6 | 0 | 4 | 5 | 4 | 4 | 4 | 7 | 5 | 11 | 14 | 8 | 3 | 21 | 5 | 24 | 6 | 33 | 5 | 25 | 10 | 24 | 12 | 32 | 8 | 28 | 18 | 42 | 15 | 59 | 20 | 48 | 22 | 51 | 22 | 59 | 23 | 23 | 20 | 56 | 20 | 57 |
| Australia and Oceania | 70 | 31 | 78 | 85 | 77 | 81 | 65 | 101 | 162 | 84 | 206 | 98 | 202 | 111 | 228 | 143 | 294 | 173 | 312 | 128 | 307 | 148 | 288 | 156 | 233 | 171 | 181 | 145 | 162 | 148 | 222 | 148 | 221 | 175 | 256 | 196 | 328 | 251 | 336 | 241 | 356 | 267 |
| Australia | 55 | 24 | 62 | 74 | 56 | 59 | 43 | 82 | 127 | 60 | 151 | 75 | 152 | 80 | 185 | 92 | 228 | 128 | 240 | 92 | 224 | 91 | 222 | 92 | 162 | 117 | 107 | 84 | 116 | 96 | 157 | 113 | 154 | 124 | 193 | 141 | 236 | 174 | 246 | 179 | 253 | 195 |
| New Zealand | 14 | 7 | 16 | 11 | 21 | 20 | 21 | 18 | 34 | 24 | 47 | 23 | 50 | 30 | 42 | 49 | 66 | 44 | 69 | 36 | 81 | 55 | 66 | 63 | 70 | 52 | 72 | 59 | 45 | 50 | 64 | 35 | 65 | 50 | 63 | 42 | 89 | 69 | 89 | 58 | 97 | 68 |
| All others | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 8 | 0 | 1 | 0 | 1 | 3 | 0 | 0 | 3 | 0 | 2 | 2 | 0 | 1 | 1 | 2 | 2 | 2 | 1 | 2 | 1 | 0 | 3 | 1 | 0 | 13 | 3 | 8 | 1 | 5 | 6 | 4 |
| Unclassified | 65 | 67 | 66 | 92 | 45 | 84 | 63 | 70 | 79 | 43 | 87 | 37 | 74 | 54 | 51 | 49 | 55 | 35 | 57 | 11 | 50 | 17 | 47 | 12 | 22 | 15 | 29 | 17 | 23 | 19 | 21 | 28 | 21 | 25 | 29 | 23 | 29 | 19 | 53 | 22 | 154 | 17 |

USPTO = U.S. Patent and Trademark Office; EU = European Union; EUIPO = European Union Intellectual Property Office.

**Note(s)**

Trademarks are allocated according to holder information. Trademarks are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named holders. The EU includes 28 member countries. China includes Hong Kong. Trademarks are classified under the 11th edition of the Nice classification of goods and services, which classifies trademarks under 34 categories of goods and 11 categories of services. Fractional counts of trademarks were assigned to each category to assign the proper weight of a trademark to the corresponding category under the classification. These counts are then grouped under 10 industry sectors following a mapping defined by Edital.

**Source(s)**

National Center for Science and Engineering Statistics, National Science Foundation; Science-Metrix; USPTO trademark data hosted by Reed Tech (LexisNexis), accessed April 2019; EUIPO trademark data, accessed April 2019.

*Science and Engineering Indicators*

TABLE S8-49

## Number of registered USPTO and EUIPO trademarks in the business sector of business services, by region, country, or economy: 1998–2018

(Number)

| | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Region, country, or economy | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO |
| World | 10,429 | 1,125 | 11,090 | 1,964 | 16,420 | 2,456 | 17,276 | 3,475 | 23,877 | 3,950 | 20,309 | 3,095 | 17,008 | 2,847 | 17,996 | 4,717 | 23,991 | 5,128 | 27,585 | 6,577 | 31,752 | 8,431 | 28,613 | 9,377 | 26,319 | 10,556 | 28,322 | 9,948 | 29,783 | 10,233 | 29,947 | 10,746 | 31,061 | 11,635 | 31,488 | 12,488 | 32,883 | 13,916 | 32,992 | 13,517 | 32,760 | 14,287 |
| North America | 10,037 | 271 | 10,698 | 456 | 15,802 | 598 | 16,595 | 872 | 22,608 | 942 | 18,878 | 676 | 15,845 | 578 | 16,818 | 910 | 22,546 | 905 | 25,871 | 1,213 | 29,644 | 1,439 | 26,469 | 1,467 | 24,430 | 1,280 | 26,345 | 1,317 | 27,562 | 1,309 | 27,554 | 1,423 | 28,563 | 1,401 | 28,775 | 1,492 | 29,614 | 1,603 | 29,687 | 1,437 | 29,050 | 1,482 |
| Canada | 164 | 10 | 144 | 18 | 199 | 26 | 224 | 51 | 354 | 37 | 356 | 36 | 293 | 24 | 309 | 39 | 394 | 40 | 367 | 64 | 471 | 91 | 480 | 93 | 472 | 87 | 513 | 80 | 482 | 87 | 534 | 132 | 496 | 106 | 487 | 103 | 528 | 98 | 590 | 102 | 497 | 132 |
| Mexico | 7 | 3 | 13 | 1 | 13 | 5 | 17 | 3 | 23 | 10 | 29 | 7 | 27 | 10 | 33 | 12 | 34 | 12 | 68 | 12 | 57 | 23 | 55 | 24 | 54 | 16 | 68 | 21 | 81 | 25 | 70 | 28 | 83 | 22 | 107 | 23 | 97 | 26 | 145 | 22 | 114 | 31 |
| Puerto Rico | 1 | 0 | 1 | 0 | 9 | 2 | 20 | 0 | 24 | 0 | 9 | 0 | 16 | 0 | 13 | 0 | 13 | 0 | 28 | 0 | 18 | 1 | 15 | 0 | 27 | 0 | 27 | 0 | 38 | 0 | 27 | 1 | 41 | 0 | 36 | 0 | 71 | 0 | 78 | 0 | 58 | 0 |
| United States | 9,866 | 258 | 10,540 | 437 | 15,582 | 565 | 16,335 | 818 | 22,207 | 895 | 18,484 | 634 | 15,509 | 544 | 16,463 | 858 | 22,105 | 854 | 25,408 | 1,137 | 29,098 | 1,324 | 25,919 | 1,349 | 23,877 | 1,177 | 25,736 | 1,217 | 26,962 | 1,198 | 26,922 | 1,262 | 27,942 | 1,273 | 28,146 | 1,366 | 28,917 | 1,479 | 28,874 | 1,313 | 28,381 | 1,319 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| Central and South America | 20 | 11 | 21 | 15 | 24 | 18 | 33 | 13 | 64 | 15 | 78 | 17 | 61 | 24 | 57 | 61 | 67 | 52 | 96 | 70 | 103 | 84 | 100 | 104 | 99 | 99 | 94 | 106 | 121 | 85 | 108 | 105 | 119 | 74 | 122 | 94 | 141 | 93 | 124 | 85 | 153 | 89 |
| Argentina | 2 | 0 | 1 | 1 | 2 | 0 | 1 | 3 | 4 | 3 | 8 | 2 | 5 | 4 | 3 | 5 | 4 | 7 | 3 | 9 | 10 | 8 | 3 | 12 | 9 | 11 | 9 | 10 | 9 | 7 | 14 | 17 | 10 | 6 | 10 | 7 | 7 | 7 | 10 | 5 | 19 | 5 |
| Brazil | 4 | 7 | 3 | 3 | 8 | 3 | 8 | 5 | 8 | 1 | 13 | 4 | 9 | 5 | 5 | 21 | 13 | 17 | 11 | 22 | 18 | 33 | 17 | 40 | 21 | 37 | 25 | 46 | 32 | 30 | 33 | 43 | 31 | 37 | 36 | 37 | 35 | 37 | 34 | 36 | 38 | 36 |
| All others | 14 | 4 | 17 | 12 | 13 | 14 | 24 | 5 | 52 | 10 | 57 | 10 | 46 | 14 | 49 | 35 | 51 | 28 | 82 | 39 | 75 | 43 | 81 | 53 | 69 | 51 | 60 | 50 | 80 | 47 | 61 | 44 | 78 | 31 | 77 | 50 | 99 | 48 | 81 | 44 | 96 | 48 |
| Europe | 257 | 741 | 245 | 1,320 | 385 | 1,639 | 413 | 2,279 | 822 | 2,696 | 934 | 2,214 | 778 | 2,090 | 831 | 3,492 | 999 | 3,954 | 1,195 | 4,982 | 1,463 | 6,517 | 1,500 | 7,317 | 1,335 | 8,705 | 1,374 | 8,036 | 1,473 | 8,238 | 1,598 | 8,609 | 1,643 | 9,385 | 1,664 | 10,035 | 1,907 | 11,031 | 1,929 | 10,928 | 1,982 | 11,455 |
| EU | 227 | 676 | 205 | 1,250 | 328 | 1,552 | 375 | 2,186 | 732 | 2,586 | 825 | 2,121 | 685 | 1,986 | 718 | 3,322 | 882 | 3,741 | 1,027 | 4,711 | 1,240 | 6,212 | 1,274 | 6,955 | 1,168 | 8,310 | 1,174 | 7,607 | 1,265 | 7,799 | 1,376 | 8,088 | 1,404 | 8,832 | 1,442 | 9,440 | 1,633 | 10,357 | 1,677 | 10,291 | 1,700 | 10,765 |
| Austria | 3 | 14 | 5 | 31 | 4 | 36 | 3 | 47 | 6 | 47 | 12 | 41 | 7 | 49 | 8 | 76 | 9 | 107 | 26 | 162 | 12 | 195 | 22 | 207 | 24 | 253 | 21 | 222 | 19 | 261 | 30 | 282 | 24 | 258 | 19 | 271 | 23 | 299 | 31 | 343 | 22 | 325 |
| Belgium | 4 | 11 | 6 | 34 | 7 | 52 | 8 | 53 | 19 | 60 | 18 | 55 | 11 | 39 | 9 | 84 | 12 | 71 | 13 | 92 | 24 | 126 | 22 | 155 | 26 | 224 | 19 | 186 | 22 | 187 | 20 | 211 | 26 | 218 | 23 | 239 | 29 | 252 | 31 | 270 | 34 | 290 |
| Denmark | 1 | 16 | 0 | 13 | 5 | 36 | 4 | 33 | 7 | 33 | 8 | 55 | 7 | 36 | 9 | 39 | 13 | 47 | 12 | 84 | 22 | 79 | 22 | 104 | 20 | 105 | 15 | 105 | 16 | 121 | 29 | 123 | 19 | 124 | 27 | 165 | 48 | 212 | 38 | 205 | 49 | 187 |
| Finland | 3 | 5 | 1 | 14 | 4 | 27 | 4 | 26 | 9 | 20 | 13 | 29 | 6 | 14 | 4 | 23 | 8 | 25 | 10 | 52 | 8 | 76 | 7 | 64 | 11 | 59 | 11 | 77 | 13 | 82 | 16 | 90 | 18 | 88 | 16 | 100 | 17 | 130 | 21 | 157 | 23 | 143 |
| France | 28 | 63 | 25 | 134 | 43 | 144 | 48 | 200 | 96 | 215 | 112 | 183 | 62 | 146 | 68 | 274 | 77 | 343 | 78 | 357 | 138 | 512 | 121 | 542 | 131 | 667 | 143 | 645 | 161 | 630 | 168 | 609 | 149 | 668 | 155 | 771 | 163 | 815 | 171 | 796 | 161 | 880 |
| Germany | 44 | 193 | 34 | 355 | 62 | 357 | 100 | 603 | 128 | 713 | 165 | 495 | 157 | 421 | 189 | 700 | 216 | 736 | 208 | 992 | 232 | 1,295 | 254 | 1,422 | 199 | 1,758 | 194 | 1,714 | 176 | 1,764 | 212 | 1,808 | 199 | 1,736 | 206 | 1,773 | 209 | 1,858 | 251 | 1,971 | 233 | 2,096 |
| Hungary | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 2 | 0 | 1 | 1 | 4 | 3 | 3 | 12 | 3 | 11 | 4 | 25 | 5 | 36 | 3 | 34 | 3 | 29 | 2 | 30 | 2 | 36 | 4 | 47 | 6 | 49 | 2 | 45 | 6 | 57 | 6 | 78 |
| Ireland | 8 | 15 | 5 | 25 | 4 | 31 | 7 | 41 | 6 | 43 | 12 | 39 | 11 | 32 | 6 | 43 | 8 | 48 | 20 | 70 | 21 | 85 | 17 | 87 | 20 | 92 | 18 | 80 | 31 | 71 | 24 | 93 | 21 | 148 | 30 | 112 | 42 | 95 | 42 | 103 | 38 | 80 |
| Italy | 8 | 26 | 8 | 70 | 10 | 138 | 16 | 238 | 36 | 267 | 47 | 230 | 34 | 206 | 38 | 288 | 41 | 329 | 64 | 360 | 81 | 576 | 60 | 628 | 64 | 625 | 65 | 536 | 66 | 526 | 70 | 593 | 82 | 695 | 106 | 739 | 119 | 938 | 106 | 811 | 107 | 1,032 |
| Netherlands | 16 | 18 | 17 | 86 | 24 | 79 | 29 | 97 | 70 | 115 | 67 | 87 | 76 | 92 | 92 | 226 | 110 | 240 | 96 | 316 | 78 | 391 | 92 | 448 | 70 | 579 | 65 | 474 | 92 | 506 | 73 | 460 | 83 | 520 | 85 | 557 | 80 | 613 | 96 | 617 | 92 | 608 |
| Spain | 10 | 114 | 6 | 120 | 13 | 174 | 11 | 222 | 38 | 333 | 34 | 305 | 23 | 431 | 19 | 714 | 34 | 774 | 56 | 840 | 63 | 1,026 | 67 | 1,138 | 64 | 1,379 | 77 | 1,271 | 80 | 1,175 | 92 | 1,276 | 90 | 1,407 | 91 | 1,460 | 87 | 1,530 | 87 | 1,425 | 88 | 1,441 |
| Sweden | 7 | 11 | 3 | 34 | 6 | 50 | 11 | 72 | 25 | 80 | 22 | 61 | 23 | 40 | 24 | 59 | 21 | 74 | 31 | 122 | 31 | 146 | 32 | 176 | 30 | 207 | 30 | 220 | 46 | 237 | 39 | 229 | 41 | 243 | 51 | 289 | 50 | 347 | 58 | 392 | 65 | 359 |
| United Kingdom | 89 | 165 | 91 | 286 | 137 | 367 | 121 | 484 | 268 | 570 | 289 | 461 | 256 | 416 | 221 | 639 | 296 | 703 | 366 | 899 | 460 | 1,095 | 479 | 1,145 | 437 | 1,264 | 435 | 1,188 | 440 | 1,188 | 504 | 1,241 | 542 | 1,413 | 516 | 1,542 | 609 | 1,611 | 600 | 1,451 | 642 | 1,473 |
| All others | 5 | 22 | 3 | 48 | 9 | 61 | 11 | 72 | 23 | 90 | 25 | 82 | 11 | 63 | 27 | 156 | 32 | 233 | 44 | 354 | 66 | 586 | 75 | 804 | 70 | 1,064 | 78 | 860 | 101 | 1,022 | 98 | 1,037 | 106 | 1,267 | 112 | 1,373 | 156 | 1,612 | 138 | 1,694 | 139 | 1,776 |
| Other Europe | 31 | 66 | 40 | 70 | 57 | 86 | 39 | 92 | 90 | 109 | 109 | 93 | 93 | 104 | 113 | 170 | 116 | 213 | 169 | 271 | 223 | 304 | 226 | 361 | 166 | 395 | 200 | 429 | 208 | 439 | 222 | 520 | 239 | 553 | 222 | 595 | 274 | 674 | 252 | 637 | 282 | 690 |
| Former Soviet Union | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 3 | 3 | 1 | 7 | 1 | 3 | 1 | 4 | 3 | 4 | 6 | 5 | 8 | 5 | 9 | 14 | 7 | 10 | 10 | 9 | 17 | 14 | 14 | 15 | 23 |
| Norway | 0 | 0 | 0 | 2 | 4 | 10 | 2 | 5 | 12 | 9 | 10 | 6 | 5 | 7 | 2 | 10 | 5 | 10 | 8 | 20 | 12 | 21 | 15 | 27 | 14 | 31 | 8 | 24 | 9 | 28 | 11 | 39 | 13 | 32 | 14 | 36 | 21 | 58 | 18 | 61 | 22 | 74 |
| Russia | 1 | 0 | 1 | 0 | 0 | 0 | 2 | 0 | 1 | 2 | 6 | 1 | 2 | 0 | 5 | 3 | 8 | 3 | 10 | 4 | 17 | 8 | 11 | 12 | 19 | 12 | 27 | 11 | 28 | 17 | 35 | 30 | 31 | 32 | 20 | 28 | 23 | 21 | 22 | 38 | 37 | 45 |
| Switzerland | 27 | 62 | 37 | 61 | 50 | 72 | 31 | 80 | 73 | 92 | 87 | 76 | 79 | 87 | 92 | 141 | 91 | 172 | 125 | 211 | 158 | 233 | 161 | 253 | 110 | 293 | 141 | 329 | 128 | 316 | 141 | 336 | 131 | 354 | 138 | 395 | 162 | 401 | 141 | 360 | 160 | 383 |
| All others | 2 | 4 | 2 | 6 | 3 | 5 | 3 | 7 | 4 | 7 | 6 | 10 | 6 | 10 | 13 | 15 | 13 | 24 | 23 | 36 | 29 | 42 | 36 | 68 | 21 | 57 | 20 | 59 | 39 | 71 | 31 | 106 | 51 | 129 | 40 | 126 | 60 | 176 | 56 | 165 | 48 | 164 |
| Asia | 32 | 27 | 42 | 35 | 52 | 27 | 89 | 63 | 131 | 79 | 182 | 75 | 151 | 66 | 139 | 122 | 189 | 104 | 212 | 133 | 283 | 202 | 279 | 222 | 228 | 259 | 302 | 282 | 385 | 378 | 429 | 368 | 446 | 534 | 576 | 580 | 809 | 800 | 862 | 737 | 1,092 | 934 |

TABLE S8-49

## Number of registered USPTO and EUIPO trademarks in the business sector of business services, by region, country, or economy: 1998–2018

(Number)

| Region, country, or economy | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO |
| China | 3 | 3 | 4 | 3 | 11 | 3 | 13 | 11 | 22 | 7 | 21 | 19 | 26 | 13 | 18 | 31 | 47 | 27 | 52 | 36 | 81 | 48 | 71 | 72 | 45 | 89 | 77 | 120 | 99 | 160 | 147 | 182 | 159 | 259 | 239 | 361 | 401 | 488 | 471 | 475 | 622 | 618 |
| India | 0 | 0 | 3 | 0 | 4 | 0 | 7 | 5 | 9 | 1 | 12 | 2 | 7 | 3 | 12 | 4 | 17 | 2 | 17 | 7 | 21 | 15 | 26 | 10 | 19 | 17 | 31 | 17 | 29 | 16 | 34 | 15 | 21 | 21 | 42 | 14 | 47 | 26 | 36 | 17 | 57 | 28 |
| Japan | 21 | 13 | 26 | 18 | 19 | 14 | 35 | 22 | 42 | 42 | 81 | 30 | 54 | 27 | 56 | 38 | 60 | 26 | 64 | 35 | 71 | 58 | 71 | 56 | 69 | 52 | 83 | 47 | 77 | 60 | 95 | 64 | 88 | 67 | 89 | 66 | 128 | 100 | 105 | 101 | 141 | 98 |
| Malaysia | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 2 | 1 | 4 | 1 | 3 | 2 | 4 | 2 | 3 | 3 | 4 | 5 | 7 | 4 | 5 | 5 | 6 | 6 | 8 | 1 | 8 | 3 | 4 | 5 | 6 | 6 | 7 | 6 | 5 | 4 | 16 | 1 |
| Singapore | 1 | 8 | 2 | 9 | 4 | 5 | 9 | 8 | 13 | 6 | 13 | 5 | 7 | 6 | 7 | 6 | 15 | 9 | 14 | 11 | 22 | 22 | 24 | 17 | 22 | 17 | 23 | 17 | 62 | 43 | 37 | 19 | 27 | 28 | 30 | 38 | 55 | 55 | 58 | 42 | 59 | 65 |
| South Korea | 2 | 0 | 0 | 1 | 6 | 0 | 10 | 4 | 15 | 5 | 17 | 2 | 16 | 4 | 17 | 11 | 20 | 5 | 30 | 8 | 31 | 9 | 33 | 11 | 30 | 21 | 34 | 17 | 54 | 30 | 56 | 33 | 82 | 78 | 95 | 37 | 102 | 63 | 119 | 50 | 119 | 71 |
| Taiwan | 4 | 1 | 7 | 2 | 8 | 3 | 9 | 13 | 24 | 14 | 27 | 15 | 28 | 10 | 22 | 27 | 18 | 30 | 25 | 24 | 39 | 36 | 39 | 38 | 27 | 48 | 25 | 49 | 35 | 52 | 33 | 41 | 45 | 58 | 54 | 44 | 48 | 43 | 50 | 32 | 50 | 38 |
| All others | 0 | 1 | 0 | 1 | 1 | 1 | 5 | 0 | 6 | 4 | 9 | 1 | 9 | 3 | 4 | 3 | 8 | 4 | 6 | 8 | 15 | 10 | 8 | 15 | 11 | 9 | 22 | 9 | 21 | 17 | 19 | 10 | 19 | 18 | 21 | 14 | 20 | 19 | 16 | 15 | 29 | 14 |
| Middle East | 4 | 2 | 2 | 1 | 9 | 4 | 8 | 5 | 19 | 16 | 16 | 14 | 17 | 5 | 22 | 20 | 22 | 34 | 22 | 47 | 44 | 61 | 48 | 101 | 55 | 66 | 47 | 61 | 48 | 59 | 63 | 82 | 45 | 75 | 82 | 98 | 70 | 117 | 77 | 113 | 114 | 113 |
| Israel | 1 | 0 | 2 | 0 | 6 | 1 | 8 | 3 | 14 | 5 | 12 | 7 | 12 | 2 | 16 | 10 | 10 | 16 | 12 | 12 | 26 | 16 | 18 | 23 | 33 | 19 | 20 | 13 | 27 | 15 | 28 | 16 | 22 | 18 | 41 | 21 | 40 | 29 | 35 | 24 | 61 | 25 |
| All others | 3 | 2 | 0 | 1 | 4 | 2 | 0 | 2 | 5 | 11 | 5 | 7 | 5 | 3 | 6 | 10 | 12 | 18 | 10 | 35 | 18 | 45 | 30 | 78 | 23 | 47 | 27 | 48 | 21 | 44 | 35 | 66 | 23 | 57 | 41 | 77 | 29 | 88 | 41 | 89 | 53 | 88 |
| Africa | 9 | 3 | 5 | 6 | 9 | 4 | 4 | 8 | 6 | 19 | 8 | 11 | 5 | 12 | 6 | 19 | 9 | 12 | 21 | 27 | 25 | 31 | 33 | 48 | 24 | 62 | 26 | 56 | 21 | 41 | 26 | 40 | 30 | 37 | 34 | 52 | 30 | 40 | 28 | 45 | 24 | 42 |
| South Africa | 8 | 3 | 3 | 6 | 2 | 3 | 2 | 6 | 5 | 17 | 3 | 8 | 4 | 9 | 5 | 15 | 7 | 11 | 10 | 16 | 7 | 22 | 14 | 27 | 9 | 37 | 15 | 11 | 4 | 19 | 14 | 17 | 12 | 13 | 17 | 29 | 16 | 22 | 8 | 16 | 11 | 15 |
| All others | 1 | 0 | 2 | 0 | 6 | 1 | 3 | 1 | 1 | 2 | 6 | 3 | 1 | 3 | 1 | 3 | 2 | 1 | 11 | 11 | 17 | 9 | 18 | 21 | 15 | 25 | 11 | 44 | 17 | 22 | 12 | 22 | 19 | 24 | 16 | 23 | 14 | 18 | 20 | 29 | 13 | 28 |
| Australia and Oceania | 12 | 4 | 16 | 20 | 20 | 18 | 23 | 21 | 55 | 39 | 70 | 27 | 49 | 18 | 42 | 48 | 69 | 45 | 108 | 78 | 131 | 83 | 142 | 94 | 118 | 67 | 105 | 63 | 146 | 97 | 145 | 90 | 196 | 104 | 207 | 113 | 266 | 194 | 244 | 149 | 213 | 144 |
| Australia | 10 | 3 | 14 | 18 | 15 | 16 | 20 | 18 | 53 | 34 | 64 | 25 | 41 | 14 | 35 | 34 | 60 | 33 | 89 | 64 | 104 | 63 | 120 | 80 | 104 | 45 | 90 | 53 | 131 | 86 | 131 | 73 | 167 | 88 | 175 | 93 | 227 | 158 | 207 | 135 | 188 | 119 |
| New Zealand | 2 | 1 | 2 | 2 | 5 | 2 | 2 | 2 | 2 | 3 | 6 | 1 | 5 | 3 | 7 | 13 | 9 | 12 | 16 | 13 | 26 | 18 | 22 | 14 | 12 | 20 | 16 | 8 | 15 | 9 | 14 | 13 | 27 | 14 | 32 | 17 | 38 | 27 | 35 | 10 | 24 | 20 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 2 | 0 | 0 | 1 | 0 | 0 | 3 | 1 | 1 | 2 | 0 | 0 | 2 | 1 | 0 | 1 | 0 | 1 | 1 | 4 | 2 | 2 | 0 | 3 | 1 | 9 | 2 | 4 | 1 | 5 |
| Unclassified | 57 | 66 | 62 | 111 | 119 | 150 | 111 | 214 | 172 | 145 | 143 | 62 | 103 | 54 | 81 | 46 | 89 | 21 | 60 | 27 | 58 | 15 | 42 | 25 | 29 | 18 | 29 | 27 | 27 | 26 | 24 | 29 | 19 | 26 | 29 | 24 | 47 | 38 | 42 | 22 | 132 | 28 |

USPTO = U.S. Patent and Trademark Office; EUIPO = European Union Intellectual Property Office; EU = European Union.

**Note(s)**

Trademarks are allocated according to holder information. Trademarks are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named holders. The EU includes 28 member countries. China includes Hong Kong. Trademarks are classified under the 11th edition of the Nice classification of goods and services, which classifies trademarks under 34 categories of goods and 11 categories of services. Fractional counts of trademarks were assigned to each category to assign the proper weight of a trademark to the corresponding category under the classification. These counts are then grouped under 10 industry sectors following a mapping defined by Edital.

**Source(s)**

National Center for Science and Engineering Statistics, National Science Foundation; Science-Metrix; USPTO trademark data hosted by Reed Tech (LexisNexis), accessed April 2019; EUIPO trademark data, accessed April 2019.

*Science and Engineering Indicators*

TABLE S8-50

## Number of registered USPTO and EUIPO trademarks in the business sector of chemicals, by region, country, or economy: 1998–2018

(Number)

| Region, country, or economy | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO |
| World | 2,285 | 1,587 | 2,340 | 1,458 | 2,585 | 1,323 | 2,584 | 1,307 | 3,585 | 1,085 | 3,378 | 1,201 | 2,764 | 1,200 | 3,174 | 2,503 | 3,551 | 2,170 | 3,756 | 2,239 | 3,983 | 2,616 | 3,798 | 2,857 | 3,477 | 3,014 | 3,933 | 2,990 | 3,913 | 3,000 | 3,909 | 3,119 | 3,989 | 3,002 | 4,301 | 3,212 | 4,298 | 3,598 | 4,380 | 3,669 | 4,611 | 3,486 |
| North America | 1,902 | 411 | 1,924 | 429 | 2,129 | 357 | 2,137 | 351 | 2,831 | 290 | 2,576 | 338 | 2,135 | 317 | 2,459 | 544 | 2,688 | 471 | 2,824 | 500 | 2,944 | 533 | 2,745 | 578 | 2,584 | 528 | 2,996 | 545 | 2,841 | 539 | 2,857 | 533 | 2,940 | 514 | 3,184 | 491 | 3,018 | 606 | 3,080 | 547 | 3,073 | 518 |
| Canada | 71 | 8 | 63 | 15 | 70 | 12 | 70 | 11 | 89 | 9 | 101 | 10 | 87 | 9 | 119 | 20 | 112 | 21 | 105 | 24 | 134 | 22 | 130 | 23 | 81 | 26 | 121 | 25 | 103 | 25 | 106 | 26 | 91 | 26 | 115 | 36 | 141 | 32 | 132 | 42 | 123 | 35 |
| Mexico | 5 | 0 | 12 | 2 | 8 | 3 | 0 | 4 | 14 | 3 | 13 | 0 | 15 | 1 | 18 | 5 | 19 | 3 | 12 | 4 | 19 | 2 | 16 | 1 | 16 | 2 | 11 | 11 | 17 | 6 | 41 | 4 | 23 | 4 | 20 | 4 | 20 | 3 | 23 | 8 | 20 | 11 |
| Puerto Rico | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 2 | 0 | 1 | 0 | 3 | 0 | 2 | 0 | 5 | 0 | 0 | 0 | 16 | 0 | 1 | 0 | 0 | 0 | 2 | 0 |
| United States | 1,826 | 402 | 1,849 | 412 | 2,050 | 342 | 2,066 | 337 | 2,726 | 277 | 2,461 | 327 | 2,031 | 307 | 2,320 | 518 | 2,557 | 446 | 2,707 | 473 | 2,790 | 509 | 2,596 | 555 | 2,486 | 499 | 2,861 | 509 | 2,718 | 508 | 2,705 | 503 | 2,826 | 484 | 3,033 | 451 | 2,856 | 570 | 2,925 | 497 | 2,927 | 472 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Central and South America | 3 | 6 | 7 | 8 | 13 | 7 | 5 | 7 | 11 | 7 | 18 | 7 | 13 | 8 | 12 | 9 | 10 | 9 | 17 | 19 | 16 | 10 | 19 | 13 | 14 | 18 | 22 | 14 | 20 | 11 | 12 | 29 | 35 | 7 | 47 | 17 | 31 | 12 | 27 | 32 | 39 | 22 |
| Argentina | 2 | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 3 | 1 | 0 | 2 | 2 | 5 | 0 | 0 | 0 | 1 | 2 | 2 | 2 | 1 | 4 | 2 | 2 | 5 | 2 | 0 | 1 | 0 | 5 | 2 | 3 | 2 | 2 | 1 |
| Brazil | 1 | 3 | 5 | 2 | 8 | 4 | 1 | 6 | 4 | 6 | 9 | 5 | 3 | 4 | 3 | 3 | 3 | 5 | 7 | 11 | 3 | 5 | 11 | 6 | 2 | 9 | 2 | 8 | 2 | 6 | 3 | 21 | 20 | 3 | 30 | 9 | 11 | 5 | 8 | 20 | 19 | 15 |
| All others | 1 | 3 | 1 | 5 | 5 | 3 | 4 | 1 | 6 | 1 | 9 | 2 | 9 | 3 | 6 | 4 | 7 | 2 | 7 | 3 | 13 | 6 | 8 | 6 | 11 | 7 | 18 | 5 | 15 | 4 | 8 | 3 | 13 | 5 | 15 | 7 | 15 | 6 | 16 | 10 | 18 | 7 |
| Europe | 272 | 1,037 | 297 | 870 | 338 | 843 | 331 | 842 | 554 | 721 | 607 | 785 | 468 | 777 | 508 | 1,812 | 641 | 1,526 | 651 | 1,530 | 693 | 1,875 | 748 | 2,026 | 627 | 2,257 | 622 | 2,198 | 708 | 2,179 | 674 | 2,295 | 666 | 2,182 | 698 | 2,402 | 839 | 2,654 | 759 | 2,711 | 849 | 2,550 |
| EU | 238 | 956 | 272 | 806 | 291 | 763 | 292 | 806 | 500 | 684 | 554 | 742 | 430 | 731 | 464 | 1,683 | 547 | 1,423 | 570 | 1,399 | 615 | 1,756 | 654 | 1,865 | 566 | 2,117 | 552 | 2,048 | 625 | 2,039 | 597 | 2,143 | 581 | 2,038 | 586 | 2,214 | 738 | 2,468 | 662 | 2,500 | 740 | 2,376 |
| Austria | 2 | 12 | 3 | 13 | 3 | 16 | 3 | 12 | 4 | 10 | 2 | 15 | 4 | 20 | 4 | 43 | 12 | 45 | 5 | 35 | 14 | 49 | 6 | 38 | 9 | 61 | 8 | 62 | 11 | 65 | 5 | 53 | 6 | 67 | 10 | 57 | 8 | 66 | 13 | 59 | 8 | 46 |
| Belgium | 4 | 59 | 7 | 29 | 10 | 23 | 5 | 28 | 20 | 23 | 14 | 22 | 16 | 15 | 21 | 55 | 10 | 41 | 19 | 42 | 25 | 64 | 31 | 59 | 22 | 69 | 18 | 75 | 17 | 64 | 16 | 68 | 10 | 56 | 13 | 77 | 21 | 90 | 18 | 80 | 24 | 74 |
| Denmark | 14 | 30 | 13 | 16 | 12 | 18 | 14 | 13 | 17 | 11 | 23 | 21 | 21 | 22 | 18 | 34 | 19 | 29 | 18 | 38 | 37 | 55 | 26 | 48 | 17 | 42 | 32 | 47 | 21 | 34 | 17 | 57 | 17 | 56 | 19 | 51 | 29 | 45 | 29 | 57 | 20 | 41 |
| Finland | 8 | 17 | 2 | 19 | 5 | 22 | 7 | 14 | 11 | 10 | 9 | 18 | 6 | 10 | 8 | 20 | 4 | 15 | 4 | 18 | 6 | 25 | 11 | 21 | 10 | 26 | 9 | 28 | 8 | 27 | 10 | 35 | 7 | 39 | 5 | 31 | 22 | 38 | 5 | 40 | 17 | 53 |
| France | 34 | 48 | 29 | 68 | 29 | 84 | 41 | 79 | 63 | 72 | 75 | 71 | 50 | 61 | 55 | 192 | 71 | 130 | 68 | 144 | 66 | 148 | 65 | 195 | 61 | 184 | 87 | 185 | 76 | 239 | 101 | 261 | 83 | 247 | 84 | 210 | 87 | 262 | 107 | 267 | 140 | 269 |
| Germany | 93 | 468 | 118 | 291 | 121 | 242 | 105 | 272 | 194 | 233 | 215 | 218 | 160 | 231 | 171 | 572 | 201 | 475 | 230 | 494 | 230 | 571 | 240 | 607 | 227 | 688 | 183 | 650 | 251 | 680 | 180 | 610 | 175 | 517 | 192 | 564 | 192 | 640 | 191 | 643 | 203 | 542 |
| Hungary | 0 | 0 | 1 | 2 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 1 | 5 | 2 | 7 | 1 | 7 | 1 | 10 | 1 | 6 | 0 | 6 | 0 | 8 | 0 | 10 | 1 | 8 | 1 | 7 | 1 | 15 | 1 | 15 |
| Ireland | 1 | 7 | 1 | 5 | 3 | 4 | 1 | 6 | 3 | 4 | 2 | 8 | 3 | 8 | 4 | 6 | 3 | 7 | 3 | 6 | 4 | 12 | 1 | 11 | 2 | 23 | 2 | 22 | 3 | 24 | 8 | 22 | 7 | 17 | 8 | 31 | 14 | 28 | 13 | 35 | 13 | 36 |
| Italy | 12 | 26 | 23 | 61 | 17 | 66 | 10 | 82 | 24 | 67 | 22 | 68 | 29 | 86 | 25 | 195 | 42 | 165 | 52 | 152 | 37 | 175 | 42 | 187 | 34 | 191 | 48 | 199 | 47 | 166 | 54 | 209 | 41 | 189 | 55 | 227 | 77 | 274 | 57 | 294 | 67 | 305 |
| Netherlands | 15 | 69 | 27 | 45 | 28 | 47 | 29 | 48 | 57 | 48 | 64 | 57 | 42 | 51 | 43 | 162 | 70 | 102 | 50 | 107 | 62 | 148 | 65 | 132 | 68 | 187 | 57 | 179 | 54 | 121 | 52 | 121 | 62 | 125 | 39 | 132 | 63 | 176 | 53 | 141 | 56 | 153 |
| Spain | 4 | 62 | 5 | 35 | 2 | 60 | 7 | 60 | 10 | 48 | 13 | 72 | 9 | 71 | 11 | 122 | 9 | 126 | 10 | 89 | 18 | 132 | 18 | 155 | 13 | 162 | 14 | 169 | 18 | 166 | 22 | 179 | 15 | 180 | 22 | 266 | 36 | 231 | 38 | 275 | 25 | 241 |
| Sweden | 11 | 16 | 7 | 32 | 13 | 33 | 13 | 28 | 15 | 27 | 15 | 28 | 13 | 15 | 14 | 51 | 16 | 34 | 13 | 28 | 14 | 40 | 16 | 35 | 12 | 44 | 10 | 43 | 22 | 48 | 17 | 41 | 19 | 43 | 14 | 55 | 29 | 62 | 26 | 67 | 30 | 55 |
| United Kingdom | 41 | 136 | 31 | 173 | 47 | 137 | 50 | 148 | 75 | 124 | 95 | 124 | 74 | 118 | 81 | 175 | 80 | 176 | 86 | 161 | 85 | 229 | 114 | 227 | 71 | 255 | 69 | 198 | 85 | 228 | 101 | 287 | 101 | 259 | 99 | 264 | 128 | 270 | 88 | 241 | 104 | 245 |
| All others | 1 | 7 | 3 | 15 | 3 | 11 | 5 | 13 | 8 | 8 | 5 | 19 | 4 | 21 | 8 | 52 | 9 | 74 | 11 | 83 | 17 | 101 | 17 | 141 | 21 | 174 | 13 | 184 | 13 | 170 | 13 | 193 | 37 | 232 | 25 | 242 | 31 | 278 | 24 | 285 | 32 | 301 |
| Other Europe | 35 | 81 | 25 | 64 | 47 | 80 | 38 | 36 | 54 | 37 | 53 | 44 | 38 | 46 | 45 | 129 | 95 | 102 | 81 | 132 | 78 | 120 | 94 | 162 | 61 | 140 | 70 | 150 | 83 | 140 | 77 | 152 | 84 | 144 | 112 | 188 | 101 | 186 | 96 | 211 | 109 | 174 |
| Former Soviet Union | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 3 | 0 | 2 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 2 | 1 | 1 | 3 | 3 | 1 | 1 | 3 | 0 | 1 | 2 | 2 | 2 | 2 | 6 | 2 | 5 |
| Norway | 4 | 0 | 1 | 13 | 6 | 6 | 3 | 3 | 1 | 5 | 6 | 6 | 4 | 11 | 4 | 8 | 2 | 7 | 9 | 14 | 11 | 9 | 8 | 12 | 9 | 10 | 9 | 22 | 10 | 19 | 4 | 23 | 15 | 15 | 15 | 19 | 6 | 13 | 8 | 19 | 8 | 13 |
| Russia | 1 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 3 | 1 | 13 | 3 | 3 | 4 | 2 | 2 | 4 | 24 | 4 | 16 | 8 | 10 | 2 | 5 | 9 | 7 | 12 | 6 | 5 | 20 | 7 | 15 | 5 | 16 | 13 | 14 |
| Switzerland | 29 | 77 | 23 | 49 | 39 | 73 | 34 | 30 | 49 | 31 | 46 | 34 | 29 | 32 | 34 | 117 | 75 | 91 | 65 | 108 | 60 | 103 | 75 | 118 | 44 | 108 | 51 | 110 | 61 | 106 | 52 | 102 | 46 | 101 | 84 | 125 | 80 | 137 | 72 | 154 | 76 | 123 |
| All others | 1 | 3 | 0 | 2 | 1 | 1 | 1 | 4 | 4 | 1 | 1 | 3 | 2 | 2 | 1 | 3 | 4 | 1 | 2 | 5 | 4 | 6 | 6 | 7 | 4 | 4 | 1 | 8 | 6 | 7 | 10 | 19 | 7 | 21 | 8 | 21 | 6 | 20 | 10 | 16 | 10 | 19 |
| Asia | 72 | 73 | 70 | 87 | 71 | 53 | 71 | 65 | 115 | 35 | 122 | 50 | 101 | 65 | 160 | 111 | 164 | 125 | 209 | 153 | 269 | 159 | 243 | 191 | 212 | 175 | 249 | 191 | 291 | 223 | 313 | 208 | 297 | 254 | 317 | 251 | 349 | 271 | 449 | 310 | 556 | 323 |

TABLE S8-50

## Number of registered USPTO and EUIPO trademarks in the business sector of chemicals, by region, country, or economy: 1998–2018

(Number)

| Region, country, or economy | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO |
| China | 8 | 0 | 5 | 2 | 5 | 2 | 3 | 1 | 12 | 2 | 7 | 4 | 11 | 3 | 22 | 5 | 31 | 10 | 42 | 30 | 64 | 33 | 55 | 29 | 53 | 40 | 74 | 40 | 76 | 53 | 104 | 55 | 101 | 79 | 112 | 81 | 135 | 74 | 215 | 115 | 325 | 159 |
| India | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 3 | 0 | 2 | 2 | 1 | 1 | 1 | 2 | 2 | 4 | 3 | 1 | 4 | 2 | 6 | 1 | 5 | 1 | 8 | 8 | 4 | 6 | 5 | 7 | 7 | 6 | 6 | 8 | 11 | 7 | 5 | 11 | 5 | 7 | 1 |
| Japan | 51 | 68 | 53 | 80 | 54 | 41 | 55 | 41 | 79 | 24 | 87 | 36 | 69 | 52 | 110 | 82 | 95 | 96 | 129 | 102 | 156 | 97 | 158 | 128 | 111 | 95 | 128 | 118 | 150 | 127 | 156 | 104 | 137 | 113 | 147 | 119 | 143 | 139 | 169 | 149 | 148 | 126 |
| Malaysia | 3 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 2 | 0 | 1 | 1 | 1 | 2 | 8 | 1 | 4 | 2 | 5 | 0 | 2 | 3 | 6 | 4 | 1 | 1 | 1 | 4 | 4 | 1 | 4 | 1 | 3 | 1 | 3 | 4 | 8 | 1 | 3 | 9 | 0 |
| Singapore | 0 | 0 | 0 | 0 | 1 | 2 | 1 | 4 | 3 | 2 | 3 | 2 | 3 | 0 | 1 | 3 | 6 | 1 | 1 | 1 | 2 | 4 | 1 | 3 | 5 | 3 | 1 | 4 | 7 | 3 | 9 | 9 | 10 | 6 | 1 | 9 | 3 | 8 | 11 | 3 | 5 | 5 |
| South Korea | 4 | 2 | 3 | 1 | 1 | 1 | 7 | 4 | 13 | 1 | 8 | 2 | 7 | 1 | 10 | 5 | 15 | 3 | 14 | 5 | 25 | 8 | 17 | 10 | 22 | 11 | 21 | 11 | 16 | 13 | 19 | 15 | 28 | 25 | 28 | 12 | 40 | 27 | 30 | 20 | 39 | 17 |
| Taiwan | 5 | 2 | 7 | 3 | 8 | 5 | 4 | 7 | 9 | 1 | 7 | 4 | 7 | 5 | 13 | 4 | 10 | 8 | 18 | 6 | 21 | 8 | 6 | 8 | 15 | 13 | 14 | 10 | 23 | 6 | 12 | 8 | 11 | 14 | 15 | 10 | 13 | 9 | 10 | 9 | 20 | 10 |
| All others | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 5 | 0 | 1 | 6 | 0 | 2 | 1 | 1 | 3 | 0 | 0 | 3 | 0 | 0 | 0 | 2 | 2 | 1 | 3 | 2 | 3 | 9 | 11 | 5 | 5 | 2 | 8 | 5 | 6 | 3 | 2 | 2 | 6 | 3 | 4 |
| Middle East | 7 | 6 | 1 | 9 | 0 | 3 | 6 | 6 | 8 | 5 | 6 | 4 | 8 | 10 | 7 | 4 | 4 | 15 | 12 | 15 | 9 | 16 | 6 | 21 | 13 | 21 | 12 | 19 | 13 | 20 | 15 | 12 | 14 | 17 | 15 | 18 | 11 | 25 | 17 | 27 | 26 | 27 |
| Israel | 6 | 4 | 1 | 2 | 0 | 1 | 4 | 5 | 7 | 4 | 6 | 4 | 8 | 9 | 6 | 3 | 4 | 9 | 9 | 10 | 5 | 9 | 5 | 12 | 11 | 5 | 8 | 5 | 10 | 8 | 6 | 3 | 4 | 8 | 9 | 4 | 8 | 12 | 11 | 7 | 16 | 10 |
| All others | 1 | 2 | 0 | 7 | 0 | 2 | 2 | 2 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 5 | 4 | 5 | 4 | 7 | 1 | 9 | 2 | 16 | 4 | 14 | 3 | 13 | 10 | 9 | 10 | 9 | 6 | 14 | 4 | 13 | 6 | 20 | 10 | 17 |
| Africa | 2 | 2 | 2 | 1 | 3 | 3 | 2 | 2 | 4 | 0 | 3 | 1 | 1 | 1 | 0 | 5 | 4 | 4 | 4 | 3 | 7 | 8 | 1 | 4 | 2 | 5 | 2 | 5 | 4 | 9 | 3 | 12 | 7 | 10 | 9 | 11 | 9 | 3 | 1 | 5 | 1 | 11 |
| South Africa | 2 | 2 | 2 | 1 | 3 | 2 | 2 | 2 | 4 | 0 | 3 | 0 | 1 | 1 | 0 | 4 | 2 | 3 | 4 | 2 | 4 | 6 | 0 | 2 | 1 | 3 | 1 | 5 | 3 | 3 | 3 | 6 | 2 | 4 | 9 | 4 | 8 | 2 | 0 | 4 | 1 | 7 |
| All others | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 2 | 1 | 1 | 2 | 3 | 2 | 1 | 2 | 2 | 2 | 1 | 0 | 2 | 6 | 1 | 5 | 5 | 5 | 0 | 7 | 1 | 1 | 1 | 1 | 0 | 4 |
| Australia and Oceania | 7 | 2 | 16 | 6 | 10 | 12 | 11 | 10 | 28 | 8 | 21 | 8 | 16 | 10 | 16 | 7 | 25 | 17 | 23 | 17 | 33 | 14 | 24 | 21 | 19 | 9 | 19 | 16 | 32 | 17 | 30 | 27 | 26 | 17 | 28 | 20 | 35 | 25 | 43 | 35 | 34 | 33 |
| Australia | 5 | 2 | 9 | 6 | 10 | 10 | 10 | 10 | 25 | 8 | 18 | 8 | 14 | 10 | 15 | 5 | 22 | 15 | 20 | 13 | 30 | 13 | 17 | 19 | 18 | 8 | 17 | 13 | 25 | 13 | 28 | 25 | 21 | 14 | 21 | 11 | 30 | 18 | 34 | 25 | 29 | 28 |
| New Zealand | 2 | 0 | 7 | 0 | 1 | 2 | 1 | 1 | 3 | 1 | 3 | 1 | 2 | 0 | 0 | 2 | 3 | 2 | 3 | 4 | 4 | 1 | 8 | 3 | 2 | 1 | 2 | 2 | 7 | 4 | 2 | 2 | 5 | 2 | 7 | 8 | 6 | 4 | 9 | 2 | 4 | 4 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 3 | 0 | 7 | 0 | 0 |
| Unclassified | 21 | 52 | 24 | 48 | 22 | 45 | 23 | 24 | 33 | 18 | 25 | 7 | 21 | 13 | 12 | 11 | 15 | 3 | 15 | 1 | 11 | 1 | 12 | 2 | 5 | 1 | 10 | 2 | 3 | 2 | 3 | 3 | 4 | 1 | 3 | 2 | 6 | 2 | 4 | 2 | 34 | 1 |

USPTO = U.S. Patent and Trademark Office; EUIPO = European Union Intellectual Property Office; EU = European Union.

**Note(s)**

Trademarks are allocated according to holder information. Trademarks are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named holders. The EU includes 28 member countries. China includes Hong Kong. Trademarks are classified under the 11th edition of the Nice classification of goods and services, which classifies trademarks under 34 categories of goods and 11 categories of services. Fractional counts of trademarks were assigned to each category to assign the proper weight of a trademark to the corresponding category under the classification. These counts are then grouped under 10 industry sectors following a mapping defined by Edital.

**Source(s)**

National Center for Science and Engineering Statistics, National Science Foundation; Science-Metrix; USPTO trademark data hosted by Reed Tech (LexisNexis), accessed April 2019; EUIPO trademark data, accessed April 2019.

*Science and Engineering Indicators*

TABLE S8-51

## Number of registered USPTO and EUIPO trademarks in the business sector of clothing, by region, country, or economy: 1998–2018

(Number)

| | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Region, country, or economy | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO |
| World | 7,941 | 3,176 | 6,999 | 3,867 | 9,551 | 3,663 | 8,006 | 3,496 | 10,927 | 3,072 | 10,488 | 3,052 | 9,964 | 3,541 | 11,425 | 6,057 | 14,588 | 6,649 | 16,500 | 7,025 | 19,080 | 8,345 | 17,883 | 9,087 | 17,061 | 10,852 | 18,820 | 10,229 | 19,959 | 10,000 | 21,563 | 10,806 | 23,375 | 11,704 | 25,288 | 12,310 | 29,356 | 14,188 | 35,666 | 14,474 | 40,234 | 15,153 |
| North America | 6,701 | 606 | 5,925 | 760 | 8,055 | 697 | 6,701 | 587 | 8,945 | 551 | 8,288 | 538 | 7,935 | 647 | 9,278 | 1,058 | 11,497 | 1,157 | 13,029 | 1,104 | 15,138 | 1,225 | 14,284 | 1,316 | 13,799 | 1,370 | 15,501 | 1,317 | 16,428 | 1,215 | 17,579 | 1,299 | 18,984 | 1,421 | 19,854 | 1,433 | 20,771 | 1,723 | 21,888 | 1,588 | 22,797 | 1,629 |
| Canada | 199 | 16 | 188 | 32 | 226 | 34 | 185 | 22 | 278 | 30 | 235 | 26 | 257 | 42 | 278 | 44 | 337 | 97 | 365 | 73 | 363 | 82 | 357 | 92 | 327 | 88 | 395 | 86 | 420 | 79 | 347 | 76 | 399 | 82 | 496 | 98 | 505 | 114 | 485 | 106 | 595 | 126 |
| Mexico | 38 | 9 | 34 | 5 | 65 | 6 | 44 | 10 | 33 | 8 | 41 | 8 | 45 | 11 | 68 | 10 | 66 | 13 | 69 | 7 | 79 | 17 | 54 | 18 | 67 | 20 | 67 | 21 | 73 | 17 | 99 | 15 | 71 | 17 | 108 | 19 | 95 | 23 | 116 | 17 | 117 | 16 |
| Puerto Rico | 6 | 0 | 4 | 0 | 7 | 1 | 9 | 0 | 8 | 1 | 6 | 0 | 6 | 1 | 6 | 0 | 16 | 0 | 21 | 0 | 11 | 0 | 20 | 1 | 20 | 2 | 13 | 0 | 21 | 0 | 29 | 0 | 32 | 0 | 36 | 0 | 31 | 0 | 39 | 0 | 26 | 0 |
| United States | 6,458 | 581 | 5,698 | 723 | 7,758 | 655 | 6,464 | 556 | 8,627 | 512 | 8,007 | 505 | 7,627 | 594 | 8,925 | 1,003 | 11,077 | 1,047 | 12,574 | 1,024 | 14,686 | 1,126 | 13,853 | 1,205 | 13,385 | 1,260 | 15,026 | 1,210 | 15,914 | 1,119 | 17,104 | 1,207 | 18,483 | 1,322 | 19,213 | 1,316 | 20,141 | 1,586 | 21,247 | 1,464 | 22,059 | 1,487 |
| All others | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Central and South America | 57 | 27 | 64 | 46 | 79 | 32 | 54 | 40 | 94 | 39 | 110 | 42 | 127 | 56 | 88 | 92 | 153 | 123 | 143 | 102 | 199 | 96 | 153 | 124 | 147 | 128 | 149 | 94 | 180 | 95 | 192 | 86 | 200 | 67 | 230 | 90 | 199 | 99 | 219 | 105 | 234 | 59 |
| Argentina | 5 | 1 | 4 | 3 | 5 | 2 | 2 | 4 | 3 | 2 | 11 | 4 | 14 | 8 | 12 | 14 | 11 | 18 | 12 | 12 | 13 | 14 | 14 | 12 | 7 | 11 | 13 | 9 | 13 | 13 | 7 | 7 | 11 | 3 | 12 | 7 | 9 | 6 | 8 | 4 | 10 | 6 |
| Brazil | 9 | 11 | 14 | 13 | 16 | 9 | 12 | 11 | 38 | 15 | 34 | 18 | 42 | 28 | 24 | 41 | 50 | 51 | 44 | 51 | 42 | 44 | 34 | 58 | 40 | 59 | 31 | 32 | 46 | 38 | 44 | 40 | 52 | 30 | 65 | 34 | 51 | 38 | 44 | 42 | 63 | 16 |
| All others | 43 | 15 | 46 | 29 | 58 | 21 | 39 | 24 | 53 | 23 | 65 | 20 | 71 | 20 | 52 | 37 | 92 | 54 | 87 | 39 | 143 | 37 | 105 | 54 | 101 | 58 | 106 | 53 | 120 | 44 | 142 | 39 | 137 | 34 | 153 | 49 | 139 | 54 | 167 | 60 | 162 | 37 |
| Europe | 797 | 2,223 | 655 | 2,658 | 926 | 2,527 | 830 | 2,483 | 1,308 | 2,177 | 1,343 | 2,172 | 1,251 | 2,455 | 1,323 | 4,354 | 1,929 | 4,760 | 2,152 | 5,149 | 2,365 | 6,206 | 2,172 | 6,786 | 1,851 | 8,421 | 1,947 | 7,882 | 2,106 | 7,670 | 2,281 | 8,290 | 2,375 | 8,827 | 2,427 | 9,129 | 2,575 | 9,707 | 2,654 | 9,649 | 2,769 | 9,838 |
| EU | 716 | 2,052 | 593 | 2,493 | 826 | 2,413 | 748 | 2,361 | 1,135 | 2,071 | 1,159 | 2,052 | 1,061 | 2,325 | 1,117 | 4,086 | 1,607 | 4,419 | 1,820 | 4,776 | 2,025 | 5,761 | 1,860 | 6,249 | 1,596 | 7,858 | 1,662 | 7,217 | 1,762 | 7,043 | 1,945 | 7,585 | 2,078 | 8,111 | 2,084 | 8,400 | 2,209 | 8,872 | 2,263 | 8,857 | 2,344 | 8,974 |
| Austria | 13 | 86 | 13 | 61 | 16 | 48 | 13 | 54 | 24 | 45 | 36 | 34 | 20 | 28 | 19 | 72 | 33 | 81 | 26 | 103 | 36 | 134 | 35 | 163 | 33 | 221 | 25 | 188 | 35 | 230 | 30 | 222 | 40 | 228 | 47 | 230 | 42 | 226 | 42 | 266 | 46 | 241 |
| Belgium | 8 | 34 | 4 | 45 | 6 | 52 | 14 | 57 | 24 | 45 | 16 | 41 | 30 | 51 | 32 | 93 | 31 | 85 | 34 | 96 | 43 | 119 | 26 | 147 | 22 | 191 | 25 | 186 | 35 | 146 | 41 | 161 | 51 | 154 | 24 | 183 | 48 | 218 | 63 | 245 | 83 | 207 |
| Denmark | 11 | 60 | 4 | 76 | 8 | 76 | 14 | 64 | 16 | 57 | 17 | 64 | 11 | 67 | 21 | 91 | 24 | 111 | 35 | 120 | 38 | 124 | 46 | 135 | 33 | 163 | 29 | 148 | 28 | 140 | 38 | 206 | 44 | 178 | 47 | 204 | 49 | 187 | 42 | 179 | 47 | 222 |
| Finland | 1 | 9 | 0 | 22 | 3 | 24 | 7 | 23 | 8 | 20 | 6 | 17 | 7 | 26 | 4 | 26 | 8 | 21 | 9 | 41 | 14 | 45 | 12 | 33 | 8 | 77 | 9 | 80 | 24 | 75 | 14 | 54 | 21 | 72 | 17 | 79 | 28 | 98 | 27 | 101 | 20 | 84 |
| France | 109 | 168 | 89 | 228 | 157 | 196 | 102 | 215 | 146 | 181 | 166 | 217 | 181 | 200 | 174 | 419 | 234 | 486 | 253 | 455 | 267 | 522 | 258 | 653 | 230 | 808 | 238 | 776 | 234 | 658 | 240 | 742 | 270 | 726 | 271 | 721 | 242 | 731 | 216 | 736 | 237 | 687 |
| Germany | 107 | 452 | 80 | 444 | 123 | 375 | 106 | 451 | 170 | 408 | 180 | 377 | 166 | 400 | 148 | 757 | 226 | 830 | 233 | 1,000 | 286 | 1,155 | 268 | 1,327 | 234 | 1,640 | 242 | 1,544 | 227 | 1,612 | 269 | 1,645 | 279 | 1,693 | 252 | 1,707 | 271 | 1,701 | 308 | 1,826 | 292 | 1,833 |
| Hungary | 2 | 8 | 0 | 3 | 0 | 2 | 0 | 5 | 3 | 1 | 3 | 0 | 1 | 2 | 2 | 6 | 1 | 18 | 2 | 13 | 3 | 14 | 6 | 19 | 2 | 30 | 4 | 37 | 10 | 23 | 2 | 25 | 3 | 48 | 5 | 42 | 7 | 35 | 7 | 41 | 5 | 48 |
| Ireland | 5 | 39 | 5 | 45 | 20 | 40 | 10 | 32 | 10 | 32 | 15 | 25 | 9 | 44 | 4 | 58 | 10 | 36 | 11 | 55 | 14 | 61 | 19 | 55 | 17 | 105 | 18 | 67 | 16 | 73 | 17 | 84 | 12 | 76 | 26 | 77 | 24 | 80 | 22 | 76 | 23 | 74 |
| Italy | 191 | 363 | 150 | 556 | 200 | 541 | 177 | 517 | 301 | 395 | 258 | 410 | 212 | 420 | 247 | 880 | 338 | 901 | 453 | 999 | 527 | 1,202 | 387 | 1,245 | 330 | 1,548 | 355 | 1,409 | 326 | 1,209 | 369 | 1,409 | 384 | 1,459 | 374 | 1,537 | 410 | 1,689 | 396 | 1,563 | 361 | 1,768 |
| Netherlands | 39 | 64 | 39 | 101 | 45 | 82 | 47 | 85 | 75 | 75 | 56 | 69 | 51 | 96 | 77 | 202 | 93 | 212 | 86 | 237 | 82 | 314 | 102 | 326 | 100 | 456 | 79 | 354 | 100 | 370 | 86 | 364 | 94 | 364 | 93 | 365 | 104 | 395 | 97 | 447 | 96 | 429 |
| Spain | 55 | 277 | 57 | 250 | 60 | 286 | 50 | 254 | 78 | 289 | 83 | 232 | 48 | 336 | 52 | 481 | 83 | 516 | 103 | 506 | 105 | 542 | 77 | 573 | 64 | 711 | 89 | 682 | 92 | 617 | 94 | 650 | 97 | 717 | 114 | 714 | 115 | 798 | 97 | 821 | 112 | 832 |
| Sweden | 18 | 32 | 12 | 70 | 12 | 64 | 31 | 61 | 32 | 52 | 41 | 45 | 20 | 51 | 39 | 87 | 47 | 89 | 38 | 113 | 55 | 155 | 56 | 150 | 47 | 228 | 44 | 224 | 106 | 242 | 101 | 225 | 62 | 251 | 59 | 279 | 75 | 301 | 82 | 328 | 93 | 348 |
| United Kingdom | 135 | 408 | 113 | 490 | 143 | 519 | 146 | 439 | 204 | 395 | 233 | 413 | 261 | 514 | 245 | 678 | 394 | 761 | 412 | 689 | 421 | 884 | 471 | 915 | 406 | 1,034 | 417 | 964 | 426 | 1,070 | 523 | 1,189 | 578 | 1,373 | 576 | 1,368 | 643 | 1,432 | 706 | 1,265 | 714 | 1,207 |
| All others | 22 | 52 | 28 | 101 | 31 | 107 | 29 | 104 | 46 | 75 | 49 | 109 | 45 | 89 | 53 | 237 | 85 | 273 | 125 | 352 | 132 | 491 | 96 | 508 | 71 | 645 | 87 | 558 | 104 | 579 | 122 | 609 | 141 | 773 | 180 | 894 | 151 | 980 | 159 | 961 | 213 | 994 |
| Other Europe | 81 | 171 | 62 | 165 | 99 | 114 | 83 | 122 | 172 | 106 | 184 | 119 | 190 | 131 | 206 | 268 | 321 | 342 | 332 | 374 | 340 | 445 | 312 | 538 | 255 | 563 | 285 | 664 | 344 | 627 | 336 | 705 | 297 | 716 | 343 | 729 | 366 | 835 | 391 | 792 | 426 | 864 |
| Former Soviet Union | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 4 | 3 | 4 | 1 | 1 | 1 | 0 | 3 | 1 | 4 | 6 | 8 | 5 | 4 | 13 | 7 | 13 | 6 | 8 | 13 | 7 | 46 | 27 |
| Norway | 1 | 6 | 1 | 6 | 4 | 3 | 3 | 4 | 14 | 1 | 11 | 5 | 6 | 4 | 5 | 14 | 9 | 9 | 14 | 13 | 10 | 17 | 11 | 32 | 10 | 29 | 11 | 27 | 17 | 39 | 17 | 27 | 14 | 36 | 16 | 37 | 18 | 37 | 16 | 38 | 31 | 52 |
| Russia | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 3 | 1 | 3 | 5 | 0 | 1 | 1 | 2 | 2 | 6 | 5 | 13 | 7 | 14 | 7 | 12 | 15 | 15 | 9 | 27 | 23 | 29 | 13 | 22 | 16 | 27 | 26 | 24 | 23 | 24 | 31 | 31 | 26 | 53 | 34 |
| Switzerland | 68 | 145 | 53 | 106 | 83 | 86 | 70 | 81 | 139 | 82 | 142 | 92 | 147 | 105 | 152 | 205 | 219 | 272 | 234 | 290 | 226 | 349 | 219 | 420 | 181 | 442 | 203 | 538 | 235 | 484 | 222 | 546 | 179 | 495 | 233 | 537 | 218 | 605 | 247 | 561 | 203 | 578 |
| All others | 12 | 20 | 7 | 53 | 12 | 25 | 9 | 34 | 19 | 20 | 25 | 22 | 36 | 22 | 47 | 47 | 86 | 56 | 71 | 60 | 87 | 67 | 70 | 70 | 48 | 83 | 40 | 75 | 59 | 85 | 67 | 111 | 73 | 147 | 63 | 118 | 100 | 155 | 83 | 159 | 93 | 173 |
| Asia | 267 | 172 | 259 | 203 | 316 | 192 | 286 | 222 | 399 | 205 | 538 | 215 | 487 | 262 | 552 | 393 | 751 | 444 | 919 | 504 | 1,020 | 637 | 985 | 648 | 982 | 754 | 971 | 727 | 982 | 784 | 1,194 | 890 | 1,475 | 1,104 | 2,414 | 1,379 | 5,361 | 2,278 | 10,500 | 2,800 | 13,813 | 3,332 |

TABLE S8-51

## Number of registered USPTO and EUIPO trademarks in the business sector of clothing, by region, country, or economy: 1998–2018

(Number)

| | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Region, country, or economy | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO |
| China | 59 | 34 | 47 | 51 | 74 | 61 | 65 | 51 | 91 | 54 | 160 | 69 | 151 | 84 | 175 | 113 | 261 | 161 | 354 | 203 | 406 | 252 | 400 | 268 | 386 | 346 | 447 | 371 | 521 | 432 | 615 | 434 | 835 | 607 | 1,728 | 838 | 4,528 | 1,539 | 9,630 | 2,258 | 12,935 | 2,795 |
| India | 8 | 9 | 8 | 8 | 10 | 10 | 8 | 9 | 12 | 7 | 18 | 13 | 19 | 7 | 17 | 12 | 25 | 28 | 26 | 15 | 39 | 25 | 35 | 28 | 43 | 56 | 38 | 23 | 48 | 24 | 36 | 35 | 43 | 24 | 44 | 43 | 58 | 29 | 84 | 50 | 112 | 44 |
| Japan | 123 | 92 | 122 | 82 | 132 | 77 | 117 | 98 | 173 | 93 | 210 | 81 | 165 | 99 | 223 | 178 | 256 | 152 | 303 | 176 | 312 | 217 | 335 | 220 | 349 | 214 | 257 | 181 | 187 | 179 | 259 | 221 | 285 | 255 | 273 | 234 | 307 | 295 | 270 | 246 | 303 | 273 |
| Malaysia | 0 | 1 | 2 | 1 | 1 | 3 | 2 | 3 | 2 | 2 | 2 | 4 | 1 | 9 | 2 | 5 | 4 | 2 | 4 | 2 | 5 | 3 | 7 | 3 | 8 | 4 | 5 | 7 | 7 | 3 | 8 | 5 | 8 | 4 | 5 | 3 | 5 | 3 | 12 | 5 | 15 | 4 |
| Singapore | 2 | 8 | 0 | 6 | 9 | 4 | 3 | 4 | 1 | 5 | 3 | 6 | 5 | 5 | 5 | 7 | 7 | 8 | 12 | 14 | 23 | 20 | 16 | 11 | 16 | 12 | 16 | 22 | 11 | 12 | 14 | 13 | 26 | 20 | 18 | 18 | 24 | 25 | 28 | 28 | 48 | 20 |
| South Korea | 32 | 4 | 37 | 11 | 39 | 9 | 46 | 20 | 53 | 14 | 81 | 15 | 70 | 19 | 55 | 17 | 78 | 23 | 95 | 33 | 109 | 43 | 109 | 31 | 103 | 26 | 104 | 41 | 104 | 54 | 127 | 94 | 161 | 103 | 203 | 145 | 278 | 295 | 341 | 135 | 222 | 113 |
| Taiwan | 30 | 17 | 31 | 35 | 41 | 22 | 32 | 23 | 54 | 18 | 41 | 22 | 59 | 21 | 53 | 39 | 78 | 45 | 79 | 44 | 82 | 47 | 52 | 54 | 55 | 55 | 74 | 50 | 65 | 57 | 89 | 47 | 73 | 64 | 89 | 60 | 115 | 55 | 89 | 44 | 95 | 55 |
| All others | 12 | 8 | 12 | 9 | 9 | 6 | 13 | 12 | 13 | 12 | 23 | 4 | 16 | 17 | 22 | 22 | 42 | 25 | 46 | 16 | 44 | 30 | 31 | 34 | 22 | 41 | 31 | 32 | 40 | 22 | 47 | 41 | 44 | 27 | 55 | 39 | 46 | 36 | 44 | 34 | 84 | 27 |
| Middle East | 11 | 6 | 12 | 14 | 25 | 14 | 11 | 13 | 29 | 10 | 19 | 10 | 17 | 22 | 26 | 40 | 33 | 49 | 40 | 36 | 43 | 50 | 50 | 58 | 49 | 65 | 26 | 60 | 43 | 78 | 47 | 72 | 52 | 93 | 74 | 93 | 102 | 97 | 77 | 99 | 90 | 105 |
| Israel | 9 | 2 | 10 | 7 | 21 | 6 | 7 | 4 | 15 | 6 | 10 | 5 | 15 | 6 | 17 | 20 | 22 | 21 | 31 | 16 | 35 | 20 | 27 | 23 | 30 | 22 | 16 | 8 | 27 | 16 | 29 | 10 | 20 | 20 | 40 | 21 | 41 | 9 | 54 | 24 | 71 | 26 |
| All others | 2 | 4 | 2 | 7 | 5 | 8 | 5 | 9 | 14 | 4 | 9 | 5 | 3 | 16 | 9 | 20 | 11 | 28 | 9 | 20 | 8 | 30 | 23 | 35 | 20 | 44 | 10 | 52 | 16 | 62 | 18 | 62 | 32 | 72 | 34 | 72 | 62 | 88 | 23 | 75 | 19 | 79 |
| Africa | 6 | 7 | 8 | 10 | 6 | 9 | 9 | 8 | 11 | 9 | 18 | 13 | 12 | 11 | 11 | 16 | 13 | 18 | 24 | 14 | 16 | 25 | 19 | 21 | 20 | 22 | 15 | 26 | 25 | 26 | 28 | 26 | 35 | 39 | 40 | 38 | 27 | 48 | 33 | 44 | 51 | 31 |
| South Africa | 5 | 2 | 2 | 5 | 2 | 7 | 5 | 3 | 9 | 5 | 11 | 9 | 8 | 8 | 5 | 5 | 7 | 9 | 11 | 10 | 8 | 13 | 11 | 10 | 11 | 12 | 5 | 9 | 7 | 4 | 12 | 11 | 15 | 8 | 9 | 13 | 3 | 7 | 12 | 9 | 14 | 6 |
| All others | 1 | 5 | 6 | 5 | 4 | 3 | 3 | 4 | 2 | 4 | 6 | 4 | 3 | 3 | 5 | 11 | 6 | 9 | 13 | 4 | 9 | 12 | 9 | 11 | 9 | 10 | 11 | 17 | 18 | 22 | 15 | 15 | 20 | 31 | 31 | 25 | 24 | 41 | 21 | 35 | 37 | 26 |
| Australia and Oceania | 61 | 27 | 32 | 54 | 72 | 50 | 58 | 42 | 79 | 28 | 87 | 27 | 77 | 38 | 94 | 60 | 154 | 70 | 138 | 98 | 209 | 97 | 181 | 115 | 176 | 81 | 174 | 99 | 180 | 113 | 215 | 104 | 232 | 130 | 219 | 113 | 284 | 203 | 256 | 173 | 306 | 142 |
| Australia | 55 | 21 | 27 | 42 | 53 | 40 | 44 | 36 | 63 | 23 | 80 | 21 | 62 | 27 | 72 | 45 | 128 | 53 | 118 | 79 | 172 | 80 | 150 | 97 | 147 | 63 | 142 | 79 | 161 | 96 | 195 | 92 | 196 | 115 | 197 | 87 | 254 | 175 | 234 | 157 | 284 | 124 |
| New Zealand | 7 | 6 | 6 | 11 | 18 | 10 | 14 | 6 | 15 | 4 | 7 | 4 | 14 | 10 | 20 | 13 | 24 | 16 | 20 | 19 | 33 | 17 | 29 | 16 | 28 | 17 | 32 | 17 | 19 | 16 | 19 | 11 | 36 | 14 | 22 | 21 | 30 | 27 | 20 | 13 | 21 | 15 |
| All others | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 2 | 0 | 0 | 1 | 2 | 2 | 2 | 0 | 0 | 3 | 1 | 2 | 3 | 1 | 1 | 0 | 3 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 5 | 0 | 1 | 2 | 3 | 2 | 3 |
| Unclassified | 40 | 107 | 43 | 122 | 71 | 142 | 56 | 102 | 61 | 53 | 84 | 35 | 59 | 49 | 53 | 45 | 58 | 26 | 54 | 17 | 91 | 9 | 40 | 18 | 36 | 10 | 36 | 24 | 15 | 18 | 27 | 40 | 21 | 23 | 30 | 36 | 38 | 32 | 38 | 17 | 172 | 16 |

USPTO = U.S. Patent and Trademark Office; EUIPO = European Union Intellectual Property Office; EU = European Union.

**Note(s)**

Trademarks are allocated according to holder information. Trademarks are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named holders. The EU includes 28 member countries. China includes Hong Kong. Trademarks are classified under the 11th edition of the Nice classification of goods and services, which classifies trademarks under 34 categories of goods and 11 categories of services. Fractional counts of trademarks were assigned to each category to assign the proper weight of a trademark to the corresponding category under the classification. These counts are then grouped under 10 industry sectors following a mapping defined by Edital.

**Source(s)**

National Center for Science and Engineering Statistics, National Science Foundation; Science-Metrix; USPTO trademark data hosted by Reed Tech (LexisNexis), accessed April 2019; EUIPO trademark data, accessed April 2019.

*Science and Engineering Indicators*

TABLE S8-52

## Number of registered USPTO and EUIPO trademarks in the business sector of construction, by region, country, or economy: 1998–2018

(Number)

| Region, country, or economy | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO |
| World | 4,206 | 1,799 | 4,441 | 2,457 | 5,792 | 2,374 | 5,317 | 2,461 | 7,806 | 2,144 | 6,961 | 2,297 | 6,137 | 2,195 | 6,447 | 4,182 | 8,451 | 4,214 | 9,605 | 4,822 | 10,956 | 5,836 | 9,917 | 6,459 | 8,773 | 7,058 | 9,115 | 6,517 | 9,235 | 6,342 | 9,064 | 6,327 | 9,309 | 6,443 | 9,670 | 6,357 | 10,084 | 7,454 | 10,598 | 7,099 | 11,038 | 6,821 |
| North America | 3,690 | 375 | 3,927 | 466 | 5,126 | 469 | 4,612 | 386 | 6,692 | 324 | 5,852 | 397 | 5,179 | 358 | 5,526 | 550 | 7,179 | 501 | 8,095 | 573 | 9,165 | 674 | 8,132 | 658 | 7,289 | 604 | 7,485 | 574 | 7,536 | 538 | 7,381 | 566 | 7,611 | 585 | 7,907 | 531 | 8,106 | 633 | 8,442 | 556 | 8,480 | 509 |
| Canada | 145 | 13 | 168 | 17 | 205 | 35 | 179 | 22 | 308 | 27 | 275 | 37 | 267 | 30 | 268 | 38 | 305 | 34 | 356 | 46 | 385 | 50 | 326 | 65 | 352 | 54 | 381 | 58 | 325 | 49 | 314 | 47 | 306 | 59 | 317 | 47 | 341 | 54 | 379 | 49 | 322 | 53 |
| Mexico | 9 | 2 | 15 | 0 | 17 | 9 | 11 | 5 | 16 | 6 | 20 | 3 | 16 | 5 | 18 | 4 | 14 | 9 | 21 | 12 | 36 | 9 | 41 | 8 | 33 | 3 | 29 | 3 | 35 | 3 | 32 | 13 | 35 | 10 | 44 | 4 | 30 | 8 | 35 | 7 | 43 | 5 |
| Puerto Rico | 1 | 0 | 3 | 1 | 4 | 1 | 3 | 0 | 3 | 0 | 3 | 0 | 2 | 1 | 1 | 0 | 3 | 0 | 5 | 0 | 5 | 0 | 5 | 0 | 4 | 0 | 5 | 0 | 6 | 0 | 6 | 0 | 10 | 0 | 6 | 0 | 4 | 0 | 7 | 0 | 9 | 0 |
| United States | 3,535 | 359 | 3,742 | 448 | 4,900 | 424 | 4,419 | 359 | 6,365 | 291 | 5,554 | 357 | 4,894 | 322 | 5,239 | 509 | 6,857 | 459 | 7,712 | 515 | 8,740 | 615 | 7,760 | 586 | 6,900 | 546 | 7,070 | 513 | 7,170 | 486 | 7,030 | 505 | 7,261 | 515 | 7,540 | 480 | 7,731 | 571 | 8,021 | 501 | 8,107 | 451 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Central and South America | 11 | 6 | 9 | 8 | 9 | 9 | 11 | 11 | 25 | 20 | 30 | 16 | 37 | 16 | 30 | 33 | 26 | 20 | 42 | 32 | 43 | 19 | 45 | 22 | 23 | 31 | 29 | 21 | 48 | 23 | 33 | 16 | 30 | 18 | 44 | 18 | 39 | 17 | 50 | 19 | 27 | 15 |
| Argentina | 1 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 0 | 1 | 3 | 0 | 4 | 3 | 0 | 5 | 2 | 2 | 3 | 4 | 2 | 1 | 3 | 3 | 2 | 2 | 4 | 6 | 1 | 0 | 3 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 4 | 0 | 4 | 0 |
| Brazil | 4 | 4 | 2 | 3 | 0 | 6 | 2 | 2 | 10 | 10 | 10 | 7 | 11 | 8 | 16 | 23 | 11 | 6 | 16 | 19 | 19 | 13 | 8 | 9 | 4 | 17 | 8 | 7 | 14 | 9 | 8 | 6 | 13 | 11 | 13 | 4 | 9 | 6 | 11 | 7 | 7 | 7 |
| All others | 6 | 2 | 7 | 5 | 8 | 3 | 7 | 9 | 15 | 9 | 18 | 9 | 23 | 5 | 14 | 6 | 13 | 12 | 23 | 9 | 22 | 6 | 34 | 11 | 16 | 12 | 17 | 8 | 33 | 13 | 22 | 9 | 15 | 6 | 28 | 14 | 28 | 11 | 35 | 11 | 16 | 8 |
| Europe | 362 | 1,249 | 350 | 1,773 | 455 | 1,715 | 470 | 1,891 | 779 | 1,660 | 789 | 1,755 | 650 | 1,677 | 635 | 3,388 | 885 | 3,461 | 1,031 | 3,983 | 1,189 | 4,796 | 1,205 | 5,396 | 1,029 | 6,038 | 1,138 | 5,526 | 1,134 | 5,331 | 1,104 | 5,328 | 1,064 | 5,370 | 1,150 | 5,410 | 1,235 | 6,242 | 1,246 | 5,983 | 1,309 | 5,698 |
| EU | 330 | 1,211 | 313 | 1,704 | 410 | 1,661 | 425 | 1,817 | 707 | 1,612 | 710 | 1,691 | 598 | 1,627 | 582 | 3,288 | 799 | 3,328 | 945 | 3,813 | 1,060 | 4,567 | 1,069 | 5,144 | 921 | 5,767 | 1,017 | 5,285 | 1,022 | 5,059 | 979 | 5,022 | 924 | 5,052 | 1,033 | 5,124 | 1,095 | 5,874 | 1,099 | 5,683 | 1,143 | 5,396 |
| Austria | 11 | 49 | 10 | 64 | 10 | 62 | 10 | 42 | 21 | 57 | 17 | 48 | 25 | 48 | 28 | 111 | 32 | 135 | 40 | 171 | 45 | 184 | 39 | 174 | 37 | 216 | 33 | 221 | 34 | 243 | 30 | 231 | 42 | 233 | 38 | 214 | 48 | 238 | 31 | 223 | 41 | 211 |
| Belgium | 10 | 41 | 14 | 52 | 6 | 64 | 13 | 47 | 23 | 53 | 18 | 41 | 17 | 31 | 19 | 90 | 29 | 84 | 23 | 99 | 32 | 125 | 28 | 164 | 24 | 225 | 21 | 172 | 30 | 155 | 32 | 190 | 26 | 167 | 26 | 145 | 21 | 193 | 26 | 217 | 38 | 181 |
| Denmark | 2 | 35 | 3 | 50 | 6 | 32 | 6 | 34 | 9 | 28 | 14 | 67 | 15 | 35 | 15 | 70 | 21 | 66 | 24 | 74 | 20 | 82 | 28 | 97 | 19 | 95 | 19 | 86 | 23 | 102 | 23 | 90 | 13 | 78 | 26 | 100 | 20 | 93 | 18 | 94 | 24 | 94 |
| Finland | 2 | 23 | 3 | 28 | 4 | 42 | 4 | 49 | 11 | 27 | 15 | 44 | 6 | 36 | 15 | 48 | 12 | 43 | 18 | 71 | 21 | 81 | 23 | 80 | 17 | 103 | 31 | 89 | 21 | 104 | 26 | 102 | 17 | 98 | 19 | 111 | 22 | 111 | 28 | 138 | 27 | 123 |
| France | 42 | 85 | 40 | 130 | 58 | 169 | 68 | 194 | 88 | 142 | 86 | 178 | 68 | 160 | 65 | 349 | 102 | 329 | 96 | 362 | 105 | 404 | 102 | 434 | 97 | 495 | 118 | 456 | 132 | 458 | 114 | 436 | 91 | 418 | 89 | 392 | 107 | 450 | 100 | 459 | 109 | 449 |
| Germany | 111 | 403 | 96 | 507 | 137 | 415 | 147 | 545 | 234 | 512 | 231 | 460 | 186 | 391 | 173 | 902 | 238 | 973 | 295 | 1,081 | 378 | 1,285 | 395 | 1,500 | 294 | 1,777 | 344 | 1,652 | 318 | 1,606 | 289 | 1,555 | 264 | 1,432 | 308 | 1,390 | 345 | 1,584 | 326 | 1,631 | 331 | 1,393 |
| Hungary | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 16 | 0 | 9 | 1 | 7 | 3 | 8 | 2 | 18 | 1 | 18 | 1 | 23 | 2 | 14 | 1 | 21 | 3 | 21 | 1 | 39 | 2 | 25 | 5 | 47 | 1 | 32 |
| Ireland | 1 | 16 | 2 | 23 | 4 | 19 | 2 | 21 | 5 | 12 | 4 | 22 | 6 | 25 | 2 | 43 | 5 | 31 | 5 | 42 | 7 | 57 | 3 | 68 | 8 | 44 | 4 | 31 | 8 | 30 | 10 | 41 | 12 | 47 | 13 | 53 | 10 | 54 | 15 | 42 | 11 | 41 |
| Italy | 33 | 81 | 27 | 174 | 48 | 188 | 38 | 218 | 71 | 203 | 63 | 168 | 58 | 196 | 62 | 345 | 95 | 390 | 131 | 414 | 118 | 493 | 111 | 526 | 104 | 599 | 106 | 538 | 101 | 483 | 117 | 523 | 127 | 501 | 123 | 522 | 115 | 756 | 134 | 562 | 144 | 729 |
| Netherlands | 18 | 30 | 23 | 77 | 18 | 65 | 31 | 64 | 37 | 57 | 43 | 50 | 32 | 52 | 34 | 183 | 43 | 159 | 45 | 198 | 54 | 239 | 54 | 291 | 49 | 356 | 53 | 326 | 49 | 287 | 52 | 258 | 50 | 266 | 55 | 281 | 50 | 304 | 55 | 263 | 53 | 280 |
| Spain | 12 | 157 | 18 | 134 | 21 | 177 | 18 | 189 | 44 | 173 | 40 | 203 | 34 | 290 | 17 | 448 | 35 | 426 | 57 | 461 | 47 | 561 | 51 | 551 | 39 | 582 | 50 | 475 | 47 | 403 | 46 | 377 | 45 | 385 | 69 | 419 | 61 | 443 | 64 | 442 | 47 | 453 |
| Sweden | 15 | 39 | 15 | 86 | 15 | 74 | 14 | 62 | 33 | 52 | 32 | 67 | 33 | 51 | 32 | 100 | 28 | 90 | 51 | 122 | 41 | 144 | 35 | 131 | 33 | 173 | 48 | 181 | 46 | 160 | 45 | 166 | 38 | 199 | 50 | 182 | 42 | 217 | 50 | 219 | 51 | 196 |
| United Kingdom | 62 | 232 | 55 | 327 | 71 | 314 | 62 | 306 | 112 | 246 | 127 | 299 | 102 | 275 | 103 | 459 | 128 | 412 | 121 | 469 | 143 | 535 | 151 | 605 | 170 | 566 | 158 | 512 | 162 | 512 | 150 | 508 | 144 | 546 | 157 | 594 | 189 | 587 | 180 | 524 | 185 | 426 |
| All others | 10 | 20 | 7 | 50 | 11 | 40 | 10 | 45 | 19 | 49 | 20 | 45 | 18 | 35 | 17 | 126 | 28 | 182 | 38 | 242 | 46 | 369 | 47 | 505 | 29 | 518 | 30 | 522 | 49 | 502 | 44 | 524 | 51 | 661 | 59 | 683 | 62 | 819 | 65 | 822 | 80 | 788 |
| Other Europe | 31 | 39 | 37 | 69 | 45 | 53 | 46 | 74 | 71 | 48 | 79 | 64 | 52 | 49 | 53 | 100 | 86 | 133 | 86 | 171 | 129 | 228 | 136 | 252 | 108 | 271 | 121 | 241 | 112 | 272 | 125 | 306 | 140 | 318 | 117 | 286 | 140 | 367 | 148 | 300 | 165 | 302 |
| Former Soviet Union | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 3 | 2 | 1 | 3 | 1 | 1 | 0 | 1 | 2 | 3 | 3 | 1 | 2 | 7 | 6 | 5 | 8 | 5 | 11 | 13 |
| Norway | 6 | 4 | 1 | 13 | 8 | 10 | 9 | 4 | 11 | 7 | 10 | 14 | 7 | 9 | 4 | 17 | 9 | 13 | 10 | 26 | 16 | 33 | 20 | 28 | 20 | 42 | 17 | 22 | 13 | 28 | 20 | 33 | 15 | 24 | 15 | 22 | 19 | 41 | 12 | 30 | 18 | 40 |
| Russia | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 2 | 2 | 0 | 4 | 3 | 3 | 6 | 3 | 7 | 4 | 10 | 14 | 7 | 3 | 7 | 9 | 15 | 16 | 9 | 23 | 15 | 21 | 5 | 16 | 6 | 13 | 12 | 21 | 17 | 14 |
| Switzerland | 22 | 30 | 30 | 49 | 34 | 35 | 33 | 60 | 57 | 34 | 60 | 42 | 42 | 34 | 43 | 68 | 60 | 104 | 52 | 130 | 89 | 164 | 87 | 182 | 62 | 193 | 78 | 177 | 58 | 193 | 64 | 184 | 81 | 202 | 72 | 182 | 79 | 212 | 80 | 170 | 84 | 165 |
| All others | 2 | 5 | 4 | 7 | 3 | 8 | 4 | 9 | 3 | 6 | 8 | 6 | 1 | 5 | 6 | 11 | 13 | 12 | 18 | 12 | 16 | 27 | 16 | 25 | 18 | 29 | 18 | 33 | 27 | 34 | 31 | 63 | 27 | 69 | 24 | 59 | 31 | 97 | 36 | 73 | 36 | 71 |
| Asia | 85 | 75 | 92 | 77 | 115 | 69 | 134 | 58 | 177 | 68 | 157 | 76 | 161 | 82 | 174 | 134 | 253 | 164 | 319 | 154 | 424 | 264 | 400 | 288 | 332 | 290 | 373 | 306 | 406 | 357 | 418 | 327 | 483 | 382 | 449 | 312 | 577 | 445 | 728 | 427 | 1,038 | 509 |

TABLE S8-52

## Number of registered USPTO and EUIPO trademarks in the business sector of construction, by region, country, or economy: 1998–2018

(Number)

| Region, country, or economy | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO |
| China | 3 | 2 | 13 | 4 | 11 | 6 | 15 | 9 | 25 | 6 | 25 | 12 | 41 | 6 | 40 | 22 | 71 | 42 | 118 | 41 | 156 | 87 | 168 | 88 | 139 | 124 | 159 | 130 | 143 | 144 | 182 | 138 | 196 | 160 | 186 | 155 | 307 | 214 | 451 | 236 | 731 | 296 |
| India | 2 | 0 | 3 | 1 | 1 | 1 | 0 | 1 | 5 | 0 | 2 | 2 | 2 | 0 | 2 | 4 | 2 | 1 | 2 | 4 | 4 | 6 | 5 | 9 | 4 | 7 | 2 | 7 | 10 | 10 | 6 | 8 | 14 | 14 | 14 | 10 | 16 | 16 | 13 | 7 | 24 | 11 |
| Japan | 44 | 58 | 38 | 57 | 53 | 41 | 62 | 33 | 77 | 37 | 69 | 39 | 54 | 48 | 82 | 64 | 105 | 61 | 103 | 60 | 141 | 92 | 131 | 118 | 103 | 78 | 114 | 97 | 137 | 127 | 156 | 122 | 162 | 126 | 135 | 89 | 137 | 132 | 145 | 111 | 159 | 125 |
| Malaysia | 2 | 0 | 1 | 1 | 1 | 2 | 3 | 2 | 4 | 1 | 1 | 3 | 4 | 3 | 0 | 3 | 3 | 6 | 3 | 4 | 5 | 2 | 6 | 6 | 10 | 7 | 4 | 3 | 5 | 6 | 1 | 2 | 0 | 4 | 8 | 1 | 2 | 2 | 3 | 2 | 10 | 2 |
| Singapore | 1 | 1 | 1 | 2 | 2 | 4 | 2 | 1 | 4 | 5 | 5 | 3 | 8 | 7 | 2 | 6 | 4 | 7 | 8 | 10 | 16 | 9 | 8 | 12 | 8 | 7 | 13 | 5 | 15 | 12 | 11 | 7 | 12 | 17 | 16 | 9 | 14 | 26 | 10 | 16 | 10 | 9 |
| South Korea | 8 | 2 | 3 | 1 | 4 | 1 | 14 | 0 | 16 | 2 | 18 | 0 | 19 | 2 | 14 | 4 | 19 | 11 | 23 | 5 | 26 | 11 | 20 | 9 | 14 | 7 | 24 | 17 | 35 | 15 | 24 | 14 | 43 | 23 | 41 | 25 | 45 | 25 | 49 | 25 | 45 | 29 |
| Taiwan | 22 | 11 | 30 | 10 | 36 | 11 | 34 | 9 | 42 | 15 | 26 | 12 | 26 | 13 | 28 | 25 | 39 | 31 | 58 | 26 | 71 | 50 | 47 | 40 | 41 | 49 | 49 | 42 | 56 | 36 | 28 | 29 | 47 | 29 | 39 | 18 | 51 | 23 | 46 | 25 | 46 | 30 |
| All others | 1 | 0 | 3 | 0 | 6 | 3 | 4 | 2 | 4 | 2 | 11 | 4 | 7 | 3 | 7 | 7 | 11 | 5 | 5 | 5 | 6 | 7 | 15 | 5 | 13 | 10 | 7 | 5 | 6 | 6 | 10 | 6 | 9 | 8 | 11 | 6 | 6 | 7 | 10 | 5 | 13 | 7 |
| Middle East | 3 | 2 | 4 | 11 | 5 | 7 | 8 | 10 | 6 | 8 | 11 | 8 | 12 | 12 | 8 | 16 | 13 | 16 | 6 | 22 | 15 | 23 | 15 | 31 | 17 | 25 | 14 | 32 | 22 | 33 | 23 | 27 | 17 | 18 | 21 | 23 | 21 | 43 | 28 | 32 | 32 | 23 |
| Israel | 3 | 2 | 2 | 8 | 3 | 7 | 8 | 9 | 5 | 5 | 9 | 5 | 9 | 10 | 8 | 10 | 12 | 11 | 4 | 8 | 9 | 10 | 10 | 11 | 8 | 13 | 11 | 8 | 14 | 14 | 18 | 13 | 11 | 6 | 15 | 13 | 13 | 13 | 20 | 17 | 25 | 7 |
| All others | 0 | 0 | 2 | 3 | 2 | 1 | 0 | 1 | 1 | 3 | 2 | 4 | 3 | 2 | 0 | 6 | 1 | 5 | 2 | 14 | 6 | 13 | 5 | 19 | 9 | 11 | 2 | 23 | 7 | 18 | 5 | 14 | 6 | 13 | 6 | 10 | 8 | 30 | 8 | 16 | 7 | 15 |
| Africa | 4 | 0 | 0 | 3 | 1 | 7 | 2 | 5 | 6 | 4 | 5 | 4 | 6 | 5 | 2 | 9 | 5 | 7 | 1 | 4 | 7 | 13 | 10 | 7 | 3 | 12 | 5 | 9 | 2 | 6 | 3 | 8 | 5 | 10 | 9 | 10 | 4 | 9 | 3 | 12 | 3 | 7 |
| South Africa | 4 | 0 | 0 | 2 | 1 | 5 | 2 | 4 | 5 | 4 | 4 | 4 | 6 | 4 | 2 | 8 | 3 | 6 | 0 | 3 | 5 | 7 | 5 | 5 | 2 | 8 | 3 | 4 | 2 | 3 | 2 | 4 | 3 | 5 | 8 | 7 | 3 | 2 | 2 | 6 | 1 | 4 |
| All others | 0 | 0 | 0 | 1 | 1 | 2 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 2 | 1 | 1 | 1 | 2 | 6 | 5 | 1 | 1 | 4 | 2 | 4 | 1 | 3 | 1 | 4 | 3 | 5 | 1 | 3 | 1 | 7 | 0 | 6 | 2 | 3 |
| Australia and Oceania | 21 | 13 | 21 | 19 | 21 | 14 | 36 | 21 | 54 | 19 | 60 | 18 | 44 | 16 | 43 | 35 | 60 | 36 | 77 | 49 | 86 | 41 | 100 | 53 | 70 | 55 | 63 | 44 | 76 | 50 | 90 | 47 | 87 | 53 | 79 | 45 | 85 | 60 | 84 | 67 | 82 | 57 |
| Australia | 19 | 10 | 15 | 19 | 20 | 10 | 34 | 19 | 51 | 18 | 44 | 17 | 36 | 12 | 38 | 28 | 50 | 30 | 65 | 43 | 64 | 28 | 87 | 43 | 51 | 45 | 53 | 38 | 62 | 43 | 78 | 39 | 66 | 41 | 62 | 34 | 63 | 49 | 70 | 58 | 66 | 46 |
| New Zealand | 2 | 2 | 6 | 0 | 2 | 4 | 2 | 1 | 3 | 0 | 16 | 1 | 8 | 3 | 4 | 6 | 10 | 5 | 11 | 6 | 22 | 12 | 12 | 11 | 17 | 10 | 10 | 6 | 13 | 7 | 12 | 5 | 21 | 12 | 16 | 10 | 21 | 12 | 14 | 9 | 16 | 10 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 4 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 1 |
| Unclassified | 32 | 79 | 38 | 100 | 59 | 84 | 43 | 79 | 67 | 41 | 57 | 22 | 48 | 28 | 29 | 17 | 29 | 10 | 34 | 4 | 27 | 5 | 10 | 4 | 11 | 3 | 8 | 5 | 12 | 4 | 11 | 9 | 11 | 8 | 11 | 7 | 17 | 5 | 17 | 3 | 67 | 2 |

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Trademarks are allocated according to holder information. Trademarks are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named holders. The EU includes 28 member countries. China includes Hong Kong. Trademarks are classified under the 11th edition of the Nice classification of goods and services, which classifies trademarks under 34 categories of goods and 11 categories of services. Fractional counts of trademarks were assigned to each category to assign the proper weight of a trademark to the corresponding category under the classification. These counts are then grouped under 10 industry sectors following a mapping defined by Edital.

**Source(s)**

National Center for Science and Engineering Statistics, National Science Foundation; Science-Metrix; USPTO trademark data hosted by Reed Tech (LexisNexis), accessed April 2019; EUIPO trademark data, accessed April 2019.

*Science and Engineering Indicators*

TABLE S8-53

## Number of registered USPTO and EUIPO trademarks in the business sector of health, by region, country, or economy: 1998–2018

(Number)

| | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Region, country, or economy | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO |
| World | 7,571 | 2,738 | 7,792 | 3,857 | 8,249 | 3,910 | 8,969 | 4,066 | 11,531 | 4,039 | 12,659 | 4,444 | 12,015 | 4,688 | 13,254 | 8,579 | 17,073 | 8,703 | 18,540 | 9,294 | 20,894 | 11,050 | 19,518 | 12,047 | 18,511 | 13,127 | 19,886 | 12,144 | 20,419 | 12,346 | 21,278 | 12,764 | 22,291 | 13,363 | 23,135 | 14,514 | 24,853 | 16,495 | 26,875 | 17,095 | 29,868 | 17,477 |
| North America | 6,195 | 852 | 6,460 | 1,155 | 6,743 | 1,291 | 7,320 | 1,272 | 9,035 | 1,364 | 9,699 | 1,337 | 9,319 | 1,380 | 10,213 | 2,369 | 13,132 | 2,164 | 14,355 | 2,351 | 16,350 | 2,671 | 15,144 | 2,648 | 14,268 | 2,582 | 15,848 | 2,432 | 16,334 | 2,458 | 16,911 | 2,506 | 17,772 | 2,508 | 17,913 | 2,660 | 18,851 | 3,221 | 20,082 | 2,956 | 21,686 | 2,849 |
| Canada | 157 | 34 | 140 | 40 | 153 | 50 | 143 | 43 | 213 | 48 | 256 | 55 | 246 | 46 | 278 | 103 | 324 | 111 | 327 | 118 | 407 | 119 | 423 | 141 | 395 | 123 | 456 | 129 | 369 | 96 | 395 | 132 | 411 | 114 | 442 | 151 | 474 | 149 | 553 | 136 | 569 | 178 |
| Mexico | 24 | 3 | 15 | 4 | 29 | 5 | 11 | 9 | 28 | 2 | 22 | 6 | 34 | 5 | 42 | 14 | 55 | 16 | 64 | 12 | 108 | 15 | 60 | 18 | 92 | 15 | 131 | 25 | 125 | 22 | 108 | 16 | 120 | 16 | 87 | 34 | 70 | 30 | 93 | 21 | 120 | 19 |
| Puerto Rico | 8 | 1 | 30 | 3 | 4 | 1 | 13 | 2 | 22 | 8 | 7 | 6 | 8 | 2 | 9 | 1 | 7 | 4 | 15 | 2 | 31 | 0 | 15 | 1 | 12 | 0 | 21 | 1 | 28 | 1 | 14 | 2 | 18 | 1 | 20 | 1 | 31 | 6 | 33 | 1 | 26 | 1 |
| United States | 6,006 | 815 | 6,275 | 1,108 | 6,557 | 1,236 | 7,153 | 1,217 | 8,773 | 1,307 | 9,413 | 1,270 | 9,031 | 1,327 | 9,886 | 2,252 | 12,746 | 2,032 | 13,949 | 2,219 | 15,803 | 2,537 | 14,646 | 2,488 | 13,767 | 2,444 | 15,240 | 2,277 | 15,813 | 2,339 | 16,393 | 2,356 | 17,223 | 2,378 | 17,364 | 2,474 | 18,276 | 3,036 | 19,404 | 2,798 | 20,970 | 2,652 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Central and South America | 32 | 10 | 36 | 33 | 28 | 25 | 23 | 34 | 35 | 45 | 49 | 34 | 96 | 49 | 115 | 60 | 87 | 118 | 105 | 112 | 169 | 95 | 137 | 84 | 112 | 122 | 113 | 84 | 117 | 70 | 109 | 75 | 144 | 78 | 142 | 93 | 149 | 73 | 148 | 98 | 181 | 82 |
| Argentina | 1 | 1 | 3 | 1 | 4 | 1 | 4 | 2 | 4 | 2 | 8 | 3 | 5 | 6 | 9 | 8 | 4 | 10 | 13 | 5 | 15 | 10 | 5 | 11 | 4 | 12 | 13 | 9 | 13 | 5 | 9 | 11 | 7 | 6 | 8 | 9 | 9 | 11 | 5 | 17 | 10 | 7 |
| Brazil | 6 | 3 | 6 | 4 | 1 | 4 | 2 | 9 | 6 | 12 | 4 | 11 | 34 | 13 | 29 | 21 | 21 | 49 | 22 | 53 | 35 | 43 | 30 | 36 | 20 | 69 | 23 | 33 | 16 | 22 | 22 | 34 | 26 | 29 | 33 | 51 | 39 | 34 | 46 | 52 | 44 | 39 |
| All others | 25 | 6 | 28 | 27 | 23 | 20 | 17 | 23 | 26 | 31 | 36 | 21 | 57 | 31 | 77 | 31 | 62 | 59 | 70 | 53 | 120 | 42 | 102 | 37 | 88 | 41 | 77 | 42 | 89 | 43 | 78 | 30 | 111 | 42 | 101 | 33 | 101 | 28 | 97 | 29 | 127 | 36 |
| Europe | 1,034 | 1,612 | 1,002 | 2,281 | 1,100 | 2,239 | 1,245 | 2,404 | 1,880 | 2,365 | 2,195 | 2,758 | 1,976 | 2,933 | 2,172 | 5,620 | 2,966 | 5,820 | 3,112 | 6,208 | 3,295 | 7,517 | 3,227 | 8,448 | 2,951 | 9,504 | 2,872 | 8,629 | 2,692 | 8,756 | 2,868 | 9,151 | 2,913 | 9,587 | 3,265 | 10,399 | 3,562 | 11,394 | 3,424 | 11,873 | 3,679 | 12,139 |
| EU | 921 | 1,439 | 904 | 2,063 | 983 | 2,038 | 1,114 | 2,210 | 1,643 | 2,090 | 1,877 | 2,472 | 1,670 | 2,653 | 1,819 | 4,995 | 2,476 | 5,194 | 2,617 | 5,500 | 2,775 | 6,610 | 2,681 | 7,514 | 2,500 | 8,623 | 2,330 | 7,668 | 2,247 | 7,841 | 2,401 | 8,077 | 2,372 | 8,501 | 2,553 | 9,246 | 2,879 | 10,172 | 2,856 | 10,688 | 3,011 | 10,990 |
| Austria | 8 | 32 | 3 | 26 | 7 | 28 | 5 | 29 | 11 | 14 | 11 | 32 | 8 | 32 | 12 | 83 | 24 | 105 | 29 | 115 | 28 | 150 | 31 | 171 | 38 | 216 | 29 | 211 | 39 | 224 | 28 | 196 | 31 | 212 | 34 | 225 | 48 | 240 | 39 | 298 | 33 | 298 |
| Belgium | 13 | 30 | 24 | 73 | 11 | 70 | 25 | 53 | 26 | 49 | 40 | 35 | 16 | 71 | 27 | 118 | 45 | 126 | 62 | 150 | 75 | 164 | 58 | 183 | 59 | 234 | 41 | 169 | 43 | 191 | 53 | 216 | 44 | 245 | 38 | 269 | 58 | 248 | 52 | 257 | 63 | 310 |
| Denmark | 33 | 46 | 29 | 76 | 28 | 62 | 43 | 75 | 49 | 68 | 69 | 117 | 53 | 97 | 57 | 132 | 106 | 136 | 88 | 125 | 79 | 144 | 96 | 167 | 143 | 249 | 86 | 166 | 75 | 130 | 77 | 147 | 72 | 168 | 124 | 175 | 105 | 176 | 79 | 191 | 64 | 239 |
| Finland | 10 | 12 | 5 | 26 | 9 | 15 | 9 | 26 | 17 | 25 | 20 | 43 | 21 | 20 | 21 | 30 | 17 | 45 | 30 | 48 | 12 | 88 | 19 | 69 | 21 | 85 | 19 | 83 | 17 | 73 | 27 | 119 | 22 | 82 | 18 | 88 | 28 | 150 | 34 | 168 | 38 | 125 |
| France | 266 | 130 | 274 | 235 | 297 | 340 | 307 | 307 | 460 | 292 | 519 | 417 | 446 | 371 | 461 | 897 | 654 | 864 | 715 | 826 | 699 | 976 | 597 | 1,129 | 584 | 1,247 | 525 | 1,102 | 468 | 1,206 | 491 | 1,174 | 561 | 1,158 | 517 | 1,242 | 582 | 1,332 | 548 | 1,303 | 636 | 1,339 |
| Germany | 231 | 548 | 232 | 588 | 251 | 536 | 287 | 657 | 455 | 634 | 532 | 708 | 465 | 719 | 506 | 1,402 | 605 | 1,412 | 661 | 1,502 | 674 | 1,714 | 697 | 1,910 | 557 | 2,166 | 598 | 1,948 | 562 | 2,025 | 590 | 1,881 | 465 | 1,881 | 516 | 1,971 | 522 | 2,228 | 584 | 2,341 | 546 | 2,274 |
| Hungary | 3 | 2 | 3 | 7 | 0 | 0 | 0 | 5 | 1 | 6 | 0 | 1 | 1 | 1 | 6 | 7 | 9 | 28 | 5 | 19 | 9 | 20 | 5 | 44 | 8 | 52 | 5 | 47 | 8 | 43 | 13 | 50 | 8 | 59 | 7 | 70 | 4 | 76 | 6 | 84 | 11 | 77 |
| Ireland | 20 | 18 | 10 | 52 | 21 | 50 | 25 | 37 | 34 | 40 | 25 | 39 | 36 | 54 | 26 | 106 | 47 | 82 | 44 | 106 | 53 | 104 | 50 | 107 | 40 | 187 | 53 | 144 | 60 | 98 | 53 | 168 | 71 | 192 | 106 | 158 | 99 | 205 | 86 | 216 | 130 | 205 |
| Italy | 51 | 129 | 64 | 241 | 73 | 232 | 59 | 260 | 108 | 236 | 119 | 254 | 63 | 269 | 98 | 498 | 165 | 510 | 201 | 552 | 234 | 684 | 213 | 809 | 176 | 850 | 148 | 840 | 183 | 813 | 183 | 977 | 196 | 879 | 215 | 960 | 196 | 1,210 | 216 | 1,331 | 214 | 1,416 |
| Netherlands | 46 | 44 | 38 | 79 | 39 | 79 | 58 | 88 | 84 | 97 | 103 | 113 | 75 | 132 | 104 | 273 | 131 | 306 | 113 | 388 | 124 | 365 | 136 | 355 | 104 | 465 | 106 | 397 | 121 | 374 | 101 | 375 | 100 | 439 | 105 | 414 | 130 | 496 | 129 | 474 | 133 | 480 |
| Spain | 24 | 121 | 30 | 120 | 41 | 143 | 48 | 149 | 55 | 148 | 50 | 184 | 59 | 239 | 73 | 420 | 75 | 436 | 96 | 461 | 135 | 567 | 106 | 739 | 89 | 765 | 86 | 675 | 129 | 733 | 104 | 663 | 105 | 722 | 133 | 791 | 199 | 927 | 145 | 954 | 143 | 1,110 |
| Sweden | 34 | 27 | 27 | 87 | 29 | 79 | 52 | 93 | 81 | 92 | 75 | 115 | 69 | 109 | 70 | 154 | 118 | 162 | 83 | 192 | 105 | 258 | 109 | 202 | 163 | 255 | 86 | 216 | 68 | 252 | 90 | 206 | 90 | 254 | 98 | 345 | 137 | 267 | 124 | 328 | 97 | 322 |
| United Kingdom | 166 | 284 | 152 | 410 | 165 | 378 | 184 | 365 | 244 | 327 | 288 | 354 | 332 | 471 | 324 | 735 | 414 | 785 | 413 | 759 | 478 | 1,006 | 490 | 1,084 | 450 | 1,134 | 444 | 1,026 | 371 | 1,048 | 496 | 1,200 | 495 | 1,248 | 501 | 1,520 | 615 | 1,464 | 669 | 1,334 | 702 | 1,348 |
| All others | 17 | 16 | 12 | 42 | 11 | 29 | 10 | 67 | 18 | 62 | 26 | 60 | 26 | 69 | 32 | 139 | 66 | 197 | 78 | 257 | 67 | 368 | 73 | 545 | 68 | 718 | 103 | 645 | 104 | 630 | 94 | 706 | 114 | 962 | 140 | 1,018 | 155 | 1,153 | 146 | 1,407 | 201 | 1,448 |
| Other Europe | 113 | 173 | 98 | 218 | 117 | 201 | 131 | 194 | 237 | 274 | 318 | 286 | 306 | 279 | 352 | 625 | 491 | 627 | 494 | 707 | 520 | 908 | 546 | 935 | 451 | 881 | 542 | 961 | 445 | 915 | 467 | 1,074 | 540 | 1,086 | 713 | 1,153 | 683 | 1,221 | 567 | 1,186 | 668 | 1,149 |
| Former Soviet Union | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 3 | 0 | 2 | 4 | 4 | 1 | 7 | 3 | 3 | 8 | 6 | 8 | 4 | 6 | 7 | 12 | 3 | 10 | 15 | 15 | 36 | 22 |
| Norway | 7 | 5 | 9 | 9 | 3 | 4 | 4 | 11 | 7 | 5 | 9 | 7 | 12 | 15 | 9 | 19 | 15 | 7 | 13 | 15 | 15 | 19 | 19 | 25 | 38 | 22 | 26 | 30 | 15 | 24 | 26 | 39 | 18 | 36 | 21 | 32 | 14 | 39 | 21 | 47 | 38 | 64 |
| Russia | 0 | 0 | 0 | 1 | 1 | 1 | 3 | 2 | 1 | 2 | 3 | 3 | 3 | 0 | 8 | 2 | 16 | 8 | 10 | 5 | 19 | 14 | 16 | 10 | 14 | 10 | 22 | 29 | 32 | 17 | 20 | 28 | 45 | 30 | 29 | 21 | 28 | 51 | 20 | 36 | 18 | 86 |
| Switzerland | 89 | 160 | 76 | 186 | 100 | 176 | 106 | 174 | 211 | 250 | 287 | 254 | 267 | 244 | 306 | 544 | 406 | 542 | 429 | 628 | 442 | 747 | 469 | 744 | 359 | 735 | 448 | 808 | 363 | 747 | 348 | 866 | 428 | 805 | 596 | 846 | 589 | 980 | 463 | 948 | 522 | 803 |
| All others | 17 | 9 | 13 | 22 | 13 | 19 | 18 | 8 | 17 | 18 | 19 | 22 | 25 | 20 | 29 | 61 | 53 | 68 | 41 | 58 | 41 | 127 | 40 | 152 | 36 | 112 | 39 | 91 | 32 | 117 | 67 | 133 | 45 | 209 | 60 | 241 | 49 | 141 | 47 | 140 | 54 | 174 |
| Asia | 183 | 136 | 165 | 162 | 217 | 161 | 225 | 130 | 337 | 118 | 437 | 184 | 388 | 178 | 512 | 333 | 614 | 394 | 682 | 386 | 731 | 528 | 695 | 575 | 835 | 631 | 722 | 698 | 882 | 725 | 1,045 | 727 | 1,094 | 836 | 1,234 | 984 | 1,624 | 1,220 | 2,506 | 1,609 | 3,446 | 1,893 |

TABLE S8-53

## Number of registered USPTO and EUIPO trademarks in the business sector of health, by region, country, or economy: 1998–2018

(Number)

| Region, country, or economy | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO |
| China | 26 | 9 | 28 | 12 | 32 | 11 | 26 | 11 | 51 | 5 | 81 | 27 | 60 | 20 | 79 | 34 | 79 | 39 | 130 | 52 | 129 | 75 | 111 | 115 | 154 | 151 | 156 | 146 | 211 | 196 | 245 | 197 | 314 | 248 | 368 | 291 | 687 | 417 | 1,318 | 690 | 2,060 | 884 |
| India | 20 | 0 | 3 | 3 | 4 | 8 | 10 | 5 | 5 | 2 | 10 | 2 | 19 | 9 | 17 | 17 | 10 | 13 | 15 | 19 | 17 | 23 | 17 | 31 | 21 | 37 | 27 | 32 | 34 | 43 | 41 | 25 | 67 | 45 | 36 | 82 | 41 | 58 | 74 | 49 | 85 | 76 |
| Japan | 95 | 113 | 95 | 121 | 107 | 108 | 124 | 94 | 197 | 81 | 233 | 121 | 210 | 99 | 254 | 207 | 355 | 263 | 345 | 253 | 355 | 326 | 348 | 317 | 395 | 294 | 282 | 364 | 314 | 299 | 404 | 327 | 401 | 325 | 423 | 352 | 382 | 398 | 457 | 441 | 409 | 386 |
| Malaysia | 3 | 0 | 2 | 5 | 3 | 9 | 3 | 5 | 4 | 7 | 7 | 8 | 5 | 0 | 4 | 9 | 6 | 5 | 7 | 8 | 5 | 7 | 11 | 7 | 23 | 9 | 10 | 17 | 10 | 9 | 9 | 10 | 17 | 7 | 9 | 15 | 13 | 11 | 13 | 12 | 19 | 16 |
| Singapore | 3 | 6 | 0 | 8 | 7 | 11 | 8 | 4 | 7 | 6 | 9 | 7 | 9 | 16 | 15 | 11 | 21 | 21 | 18 | 12 | 29 | 16 | 20 | 23 | 26 | 37 | 23 | 27 | 43 | 34 | 55 | 52 | 37 | 31 | 45 | 51 | 57 | 59 | 78 | 52 | 81 | 56 |
| South Korea | 19 | 3 | 18 | 4 | 35 | 4 | 28 | 3 | 37 | 5 | 47 | 7 | 55 | 15 | 73 | 10 | 72 | 9 | 95 | 9 | 118 | 32 | 110 | 31 | 126 | 46 | 134 | 45 | 177 | 73 | 191 | 65 | 162 | 113 | 247 | 120 | 321 | 201 | 432 | 264 | 603 | 359 |
| Taiwan | 15 | 2 | 16 | 6 | 29 | 4 | 20 | 5 | 26 | 9 | 34 | 8 | 24 | 14 | 55 | 34 | 60 | 21 | 56 | 25 | 59 | 29 | 59 | 36 | 71 | 42 | 72 | 47 | 65 | 42 | 86 | 37 | 77 | 55 | 83 | 59 | 99 | 57 | 105 | 84 | 133 | 79 |
| All others | 2 | 2 | 4 | 2 | 0 | 5 | 6 | 2 | 10 | 2 | 17 | 4 | 7 | 5 | 16 | 12 | 11 | 22 | 16 | 8 | 20 | 19 | 18 | 14 | 19 | 16 | 17 | 20 | 27 | 29 | 12 | 15 | 20 | 13 | 22 | 14 | 24 | 19 | 30 | 18 | 56 | 37 |
| Middle East | 34 | 19 | 29 | 26 | 30 | 25 | 30 | 40 | 58 | 25 | 54 | 24 | 52 | 37 | 51 | 45 | 51 | 55 | 56 | 64 | 82 | 70 | 67 | 124 | 74 | 99 | 105 | 79 | 115 | 136 | 97 | 121 | 106 | 152 | 137 | 150 | 143 | 249 | 167 | 227 | 211 | 215 |
| Israel | 29 | 18 | 26 | 24 | 27 | 22 | 29 | 33 | 53 | 22 | 47 | 18 | 44 | 31 | 45 | 34 | 45 | 43 | 48 | 48 | 76 | 44 | 58 | 85 | 63 | 58 | 82 | 55 | 103 | 102 | 87 | 91 | 84 | 77 | 104 | 90 | 109 | 132 | 120 | 135 | 169 | 133 |
| All others | 5 | 1 | 3 | 2 | 3 | 3 | 2 | 7 | 5 | 4 | 7 | 6 | 8 | 6 | 5 | 10 | 7 | 12 | 7 | 16 | 6 | 25 | 9 | 39 | 11 | 41 | 24 | 24 | 13 | 33 | 10 | 30 | 22 | 74 | 33 | 60 | 34 | 117 | 46 | 92 | 42 | 82 |
| Africa | 6 | 2 | 6 | 6 | 7 | 13 | 6 | 5 | 3 | 6 | 18 | 9 | 13 | 11 | 15 | 28 | 9 | 22 | 11 | 22 | 25 | 27 | 20 | 28 | 26 | 43 | 23 | 90 | 36 | 36 | 34 | 37 | 21 | 44 | 37 | 57 | 29 | 47 | 32 | 43 | 42 | 48 |
| South Africa | 5 | 1 | 3 | 3 | 5 | 5 | 3 | 2 | 2 | 1 | 13 | 6 | 4 | 11 | 3 | 11 | 4 | 10 | 6 | 13 | 9 | 8 | 13 | 13 | 16 | 11 | 12 | 24 | 15 | 17 | 20 | 18 | 13 | 16 | 21 | 20 | 12 | 22 | 16 | 21 | 23 | 24 |
| All others | 1 | 1 | 3 | 3 | 2 | 8 | 3 | 3 | 2 | 5 | 6 | 3 | 9 | 0 | 12 | 17 | 5 | 12 | 5 | 9 | 16 | 18 | 7 | 15 | 11 | 32 | 11 | 66 | 21 | 19 | 14 | 18 | 8 | 28 | 17 | 37 | 17 | 25 | 16 | 21 | 19 | 25 |
| Australia and Oceania | 38 | 23 | 29 | 30 | 50 | 32 | 45 | 57 | 71 | 42 | 116 | 35 | 96 | 46 | 108 | 78 | 143 | 104 | 153 | 128 | 176 | 111 | 178 | 133 | 200 | 128 | 160 | 109 | 204 | 137 | 181 | 119 | 210 | 126 | 239 | 146 | 305 | 244 | 315 | 229 | 349 | 218 |
| Australia | 32 | 19 | 20 | 27 | 41 | 28 | 41 | 44 | 64 | 35 | 96 | 31 | 73 | 35 | 93 | 64 | 122 | 88 | 132 | 110 | 146 | 88 | 141 | 101 | 160 | 99 | 134 | 91 | 167 | 104 | 145 | 109 | 166 | 107 | 187 | 108 | 254 | 193 | 245 | 185 | 284 | 172 |
| New Zealand | 7 | 4 | 8 | 3 | 9 | 4 | 3 | 13 | 7 | 6 | 20 | 4 | 21 | 10 | 14 | 13 | 19 | 16 | 21 | 18 | 31 | 23 | 37 | 32 | 39 | 29 | 25 | 18 | 37 | 34 | 36 | 10 | 43 | 19 | 53 | 37 | 51 | 49 | 68 | 42 | 64 | 44 |
| All others | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 2 | 0 | 0 | 1 | 0 | 1 | 1 | 2 | 1 | 2 |
| Unclassified | 50 | 84 | 65 | 165 | 74 | 124 | 75 | 123 | 112 | 74 | 89 | 63 | 75 | 55 | 69 | 46 | 70 | 26 | 67 | 22 | 66 | 31 | 49 | 7 | 46 | 19 | 43 | 24 | 38 | 28 | 34 | 28 | 31 | 32 | 166 | 26 | 189 | 48 | 202 | 60 | 274 | 32 |

USPTO = U.S. Patent and Trademark Office; EUIPO = European Union Intellectual Property Office; EU = European Union.

**Note(s)**

Trademarks are allocated according to holder information. Trademarks are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named holders. The EU includes 28 member countries. China includes Hong Kong. Trademarks are classified under the 11th edition of the Nice classification of goods and services, which classifies trademarks under 34 categories of goods and 11 categories of services. Fractional counts of trademarks were assigned to each category to assign the proper weight of a trademark to the corresponding category under the classification. These counts are then grouped under 10 industry sectors following a mapping defined by Edital.

**Source(s)**

National Center for Science and Engineering Statistics, National Science Foundation; Science-Metrix; USPTO trademark data hosted by Reed Tech (LexisNexis), accessed April 2019; EUIPO trademark data, accessed April 2019.

*Science and Engineering Indicators*

TABLE S8-54

## Number of registered USPTO and EUIPO trademarks in the business sector of household equipment, by region, country, or economy: 1998–2018

(Number)

| Region, country, or economy | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO |
| World | 4,459 | 1,534 | 4,633 | 2,230 | 5,868 | 2,125 | 5,314 | 2,114 | 7,325 | 1,777 | 6,815 | 1,844 | 6,064 | 1,970 | 6,744 | 3,781 | 7,648 | 3,879 | 8,582 | 4,466 | 9,518 | 5,091 | 8,480 | 5,755 | 7,865 | 6,717 | 8,811 | 6,224 | 8,917 | 6,164 | 9,227 | 6,098 | 9,642 | 6,550 | 10,516 | 6,793 | 12,583 | 8,296 | 16,915 | 9,303 | 21,578 | 9,889 |
| North America | 3,895 | 333 | 4,130 | 425 | 5,081 | 430 | 4,563 | 400 | 6,135 | 331 | 5,644 | 368 | 4,992 | 326 | 5,546 | 573 | 6,179 | 547 | 6,878 | 638 | 7,495 | 665 | 6,677 | 713 | 6,198 | 691 | 6,951 | 728 | 6,981 | 686 | 7,244 | 700 | 7,470 | 688 | 8,047 | 715 | 8,495 | 901 | 9,603 | 828 | 10,508 | 832 |
| Canada | 186 | 8 | 150 | 21 | 198 | 23 | 175 | 21 | 254 | 12 | 209 | 18 | 216 | 16 | 250 | 26 | 287 | 29 | 253 | 29 | 295 | 31 | 265 | 45 | 273 | 48 | 328 | 49 | 248 | 37 | 259 | 42 | 264 | 44 | 290 | 46 | 310 | 43 | 358 | 55 | 395 | 70 |
| Mexico | 17 | 2 | 19 | 2 | 23 | 2 | 6 | 4 | 8 | 1 | 12 | 2 | 7 | 3 | 26 | 4 | 15 | 4 | 18 | 3 | 26 | 6 | 22 | 4 | 24 | 2 | 25 | 7 | 26 | 3 | 37 | 12 | 28 | 7 | 28 | 4 | 26 | 6 | 29 | 6 | 39 | 2 |
| Puerto Rico | 2 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 3 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 2 | 0 | 1 | 0 | 4 | 0 | 5 | 0 | 6 | 0 | 7 | 1 | 6 | 0 | 8 | 0 | 2 | 0 | 11 | 0 | 6 | 0 |
| United States | 3,689 | 323 | 3,960 | 402 | 4,859 | 404 | 4,382 | 375 | 5,873 | 318 | 5,420 | 348 | 4,767 | 307 | 5,270 | 542 | 5,877 | 515 | 6,602 | 605 | 7,172 | 628 | 6,388 | 664 | 5,897 | 641 | 6,592 | 673 | 6,701 | 645 | 6,940 | 645 | 7,173 | 637 | 7,721 | 664 | 8,157 | 852 | 9,205 | 767 | 10,068 | 760 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Central and South America | 11 | 5 | 10 | 6 | 20 | 7 | 25 | 6 | 30 | 9 | 27 | 11 | 48 | 12 | 47 | 29 | 62 | 35 | 47 | 18 | 44 | 17 | 31 | 25 | 33 | 19 | 43 | 10 | 33 | 13 | 23 | 17 | 32 | 15 | 36 | 21 | 41 | 13 | 70 | 19 | 49 | 29 |
| Argentina | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 3 | 0 | 2 | 0 | 5 | 1 | 2 | 2 | 5 | 5 | 3 | 2 | 3 | 2 | 2 | 2 | 3 | 1 | 3 | 1 | 3 | 2 | 0 | 2 | 1 | 0 | 2 | 1 | 3 | 2 | 3 | 0 | 7 | 0 |
| Brazil | 0 | 5 | 1 | 2 | 2 | 2 | 5 | 2 | 8 | 3 | 9 | 4 | 12 | 5 | 15 | 15 | 12 | 12 | 5 | 9 | 7 | 6 | 9 | 10 | 9 | 7 | 4 | 2 | 10 | 1 | 3 | 9 | 9 | 7 | 9 | 9 | 12 | 5 | 18 | 5 | 15 | 9 |
| All others | 11 | 0 | 9 | 4 | 17 | 5 | 19 | 4 | 19 | 6 | 16 | 7 | 32 | 6 | 30 | 12 | 45 | 18 | 40 | 8 | 33 | 10 | 19 | 12 | 21 | 10 | 36 | 7 | 20 | 10 | 20 | 6 | 21 | 7 | 25 | 11 | 26 | 5 | 49 | 14 | 27 | 19 |
| Europe | 381 | 1,068 | 334 | 1,604 | 505 | 1,505 | 479 | 1,529 | 807 | 1,288 | 752 | 1,340 | 649 | 1,461 | 740 | 2,916 | 906 | 3,015 | 1,028 | 3,442 | 1,260 | 3,971 | 1,133 | 4,464 | 1,024 | 5,392 | 1,076 | 4,811 | 1,064 | 4,776 | 1,070 | 4,718 | 1,154 | 5,070 | 1,129 | 5,205 | 1,337 | 5,796 | 1,328 | 6,093 | 1,544 | 6,009 |
| EU | 345 | 1,011 | 298 | 1,552 | 463 | 1,443 | 432 | 1,457 | 704 | 1,230 | 666 | 1,280 | 579 | 1,393 | 662 | 2,776 | 816 | 2,858 | 906 | 3,236 | 1,131 | 3,790 | 1,016 | 4,226 | 901 | 5,142 | 976 | 4,533 | 938 | 4,486 | 949 | 4,449 | 1,042 | 4,761 | 1,006 | 4,877 | 1,208 | 5,432 | 1,207 | 5,744 | 1,347 | 5,668 |
| Austria | 5 | 28 | 7 | 30 | 4 | 33 | 4 | 36 | 14 | 28 | 14 | 33 | 10 | 24 | 17 | 65 | 22 | 77 | 23 | 109 | 30 | 128 | 30 | 139 | 21 | 177 | 30 | 174 | 26 | 169 | 26 | 175 | 22 | 171 | 33 | 182 | 27 | 183 | 31 | 196 | 34 | 189 |
| Belgium | 2 | 19 | 4 | 26 | 5 | 44 | 6 | 35 | 12 | 24 | 6 | 32 | 14 | 27 | 5 | 75 | 22 | 87 | 25 | 88 | 21 | 88 | 25 | 130 | 18 | 131 | 10 | 111 | 20 | 104 | 19 | 124 | 21 | 123 | 19 | 124 | 26 | 140 | 26 | 157 | 31 | 183 |
| Denmark | 9 | 35 | 7 | 52 | 8 | 52 | 9 | 37 | 12 | 31 | 16 | 58 | 12 | 44 | 21 | 76 | 18 | 71 | 22 | 71 | 39 | 103 | 45 | 108 | 17 | 108 | 24 | 90 | 22 | 103 | 38 | 102 | 30 | 79 | 19 | 109 | 40 | 160 | 40 | 148 | 49 | 144 |
| Finland | 5 | 13 | 4 | 28 | 5 | 27 | 8 | 25 | 5 | 25 | 6 | 17 | 6 | 21 | 8 | 20 | 7 | 24 | 13 | 45 | 9 | 49 | 10 | 55 | 7 | 66 | 15 | 66 | 16 | 82 | 20 | 59 | 14 | 73 | 12 | 68 | 22 | 83 | 22 | 93 | 16 | 77 |
| France | 54 | 83 | 45 | 121 | 69 | 136 | 73 | 149 | 101 | 90 | 86 | 125 | 76 | 107 | 67 | 262 | 101 | 274 | 83 | 293 | 124 | 328 | 100 | 350 | 106 | 447 | 121 | 448 | 125 | 455 | 129 | 389 | 139 | 430 | 116 | 401 | 126 | 432 | 134 | 491 | 120 | 432 |
| Germany | 87 | 323 | 91 | 432 | 147 | 353 | 124 | 405 | 204 | 390 | 203 | 348 | 188 | 360 | 202 | 776 | 220 | 889 | 295 | 955 | 350 | 1,137 | 317 | 1,302 | 306 | 1,609 | 281 | 1,397 | 277 | 1,467 | 252 | 1,438 | 277 | 1,458 | 241 | 1,367 | 288 | 1,487 | 285 | 1,670 | 294 | 1,565 |
| Hungary | 0 | 1 | 0 | 0 | 2 | 0 | 1 | 0 | 1 | 1 | 2 | 0 | 0 | 2 | 1 | 5 | 1 | 6 | 0 | 5 | 2 | 11 | 2 | 15 | 4 | 18 | 1 | 14 | 2 | 14 | 3 | 19 | 2 | 29 | 2 | 23 | 0 | 27 | 0 | 31 | 2 | 26 |
| Ireland | 4 | 11 | 6 | 15 | 6 | 10 | 4 | 18 | 7 | 13 | 5 | 7 | 3 | 17 | 3 | 24 | 6 | 23 | 7 | 40 | 9 | 36 | 12 | 43 | 5 | 47 | 11 | 40 | 11 | 27 | 10 | 38 | 10 | 40 | 9 | 39 | 12 | 47 | 9 | 46 | 13 | 57 |
| Italy | 45 | 136 | 33 | 274 | 70 | 242 | 65 | 252 | 96 | 214 | 86 | 213 | 74 | 255 | 107 | 460 | 163 | 425 | 181 | 468 | 190 | 584 | 146 | 593 | 111 | 691 | 138 | 591 | 123 | 529 | 103 | 564 | 151 | 600 | 137 | 638 | 160 | 769 | 164 | 718 | 166 | 839 |
| Netherlands | 18 | 20 | 18 | 70 | 33 | 48 | 26 | 57 | 50 | 44 | 28 | 41 | 29 | 48 | 44 | 169 | 40 | 144 | 54 | 177 | 47 | 192 | 52 | 210 | 61 | 317 | 65 | 266 | 51 | 229 | 55 | 210 | 68 | 254 | 64 | 269 | 89 | 317 | 76 | 302 | 96 | 316 |
| Spain | 18 | 99 | 9 | 103 | 18 | 105 | 19 | 95 | 33 | 105 | 24 | 96 | 18 | 160 | 24 | 265 | 30 | 240 | 26 | 283 | 42 | 293 | 44 | 311 | 28 | 385 | 43 | 288 | 30 | 242 | 34 | 264 | 33 | 287 | 40 | 322 | 55 | 316 | 30 | 369 | 41 | 408 |
| Sweden | 12 | 33 | 18 | 97 | 21 | 74 | 27 | 63 | 45 | 43 | 39 | 63 | 32 | 53 | 25 | 104 | 33 | 73 | 22 | 111 | 46 | 134 | 29 | 136 | 30 | 173 | 42 | 157 | 40 | 149 | 40 | 148 | 40 | 187 | 46 | 188 | 53 | 180 | 55 | 243 | 46 | 193 |
| United Kingdom | 77 | 189 | 51 | 272 | 66 | 278 | 57 | 254 | 114 | 192 | 138 | 217 | 104 | 240 | 118 | 381 | 134 | 401 | 129 | 440 | 189 | 486 | 167 | 566 | 166 | 553 | 166 | 520 | 157 | 536 | 177 | 536 | 194 | 574 | 202 | 660 | 261 | 693 | 264 | 617 | 314 | 620 |
| All others | 9 | 24 | 5 | 33 | 9 | 43 | 7 | 30 | 11 | 29 | 14 | 29 | 13 | 34 | 21 | 94 | 20 | 124 | 27 | 152 | 34 | 221 | 37 | 269 | 23 | 418 | 27 | 372 | 37 | 380 | 43 | 382 | 41 | 455 | 67 | 486 | 48 | 596 | 70 | 661 | 127 | 619 |
| Other Europe | 36 | 56 | 36 | 52 | 42 | 62 | 47 | 72 | 103 | 58 | 86 | 61 | 70 | 68 | 78 | 140 | 90 | 157 | 122 | 206 | 129 | 182 | 117 | 238 | 123 | 250 | 100 | 278 | 126 | 290 | 121 | 269 | 112 | 309 | 124 | 328 | 129 | 364 | 122 | 349 | 197 | 340 |
| Former Soviet Union | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 2 | 0 | 0 | 3 | 2 | 2 | 3 | 2 | 0 | 1 | 6 | 2 | 4 | 12 | 7 | 49 | 13 |
| Norway | 2 | 4 | 6 | 6 | 7 | 9 | 5 | 9 | 15 | 4 | 7 | 3 | 4 | 14 | 13 | 18 | 8 | 17 | 12 | 14 | 10 | 16 | 17 | 23 | 7 | 21 | 12 | 10 | 6 | 16 | 9 | 19 | 7 | 16 | 13 | 19 | 13 | 26 | 8 | 27 | 13 | 32 |
| Russia | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 4 | 0 | 2 | 1 | 4 | 1 | 2 | 3 | 3 | 2 | 2 | 4 | 3 | 5 | 8 | 2 | 6 | 10 | 9 | 13 | 10 | 6 | 10 | 17 | 9 | 15 | 6 | 16 | 9 | 25 | 21 | 18 |
| Switzerland | 32 | 41 | 30 | 37 | 34 | 45 | 33 | 52 | 71 | 45 | 69 | 49 | 61 | 45 | 52 | 97 | 70 | 119 | 89 | 147 | 98 | 132 | 77 | 183 | 88 | 190 | 68 | 212 | 93 | 217 | 81 | 180 | 72 | 200 | 89 | 211 | 80 | 220 | 69 | 207 | 74 | 188 |
| All others | 1 | 11 | 1 | 9 | 1 | 8 | 9 | 11 | 16 | 9 | 6 | 9 | 2 | 9 | 9 | 24 | 9 | 17 | 18 | 44 | 20 | 29 | 19 | 27 | 18 | 34 | 14 | 44 | 15 | 43 | 19 | 61 | 21 | 77 | 12 | 77 | 28 | 98 | 24 | 83 | 40 | 91 |
| Asia | 114 | 67 | 104 | 79 | 155 | 81 | 166 | 70 | 234 | 76 | 258 | 76 | 259 | 104 | 315 | 189 | 373 | 225 | 500 | 280 | 570 | 339 | 519 | 445 | 490 | 518 | 602 | 572 | 708 | 597 | 765 | 563 | 804 | 639 | 1,145 | 751 | 2,507 | 1,411 | 5,693 | 2,186 | 8,977 | 2,855 |

TABLE S8-54

## Number of registered USPTO and EUIPO trademarks in the business sector of household equipment, by region, country, or economy: 1998–2018

(Number)

| Region, country, or economy | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO |
| China | 26 | 17 | 27 | 17 | 34 | 20 | 33 | 15 | 57 | 17 | 60 | 20 | 70 | 21 | 76 | 62 | 134 | 83 | 219 | 112 | 260 | 162 | 243 | 171 | 232 | 258 | 305 | 272 | 371 | 293 | 353 | 309 | 447 | 364 | 740 | 508 | 2,089 | 998 | 5,155 | 1,805 | 8,413 | 2,525 |
| India | 1 | 0 | 1 | 3 | 6 | 3 | 6 | 1 | 4 | 2 | 3 | 1 | 3 | 3 | 5 | 4 | 4 | 3 | 2 | 4 | 7 | 4 | 8 | 6 | 6 | 10 | 3 | 11 | 6 | 8 | 7 | 3 | 6 | 8 | 12 | 8 | 16 | 3 | 15 | 10 | 28 | 9 |
| Japan | 34 | 35 | 25 | 30 | 54 | 30 | 51 | 31 | 62 | 30 | 68 | 24 | 79 | 33 | 100 | 61 | 87 | 54 | 111 | 76 | 116 | 87 | 105 | 128 | 101 | 112 | 108 | 103 | 114 | 95 | 148 | 111 | 107 | 106 | 144 | 108 | 152 | 126 | 173 | 138 | 167 | 133 |
| Malaysia | 2 | 0 | 0 | 2 | 5 | 5 | 3 | 1 | 4 | 2 | 2 | 5 | 1 | 2 | 1 | 4 | 4 | 2 | 3 | 7 | 2 | 2 | 3 | 2 | 2 | 1 | 6 | 8 | 8 | 2 | 2 | 3 | 5 | 3 | 1 | 3 | 2 | 2 | 2 | 3 | 11 | 2 |
| Singapore | 0 | 2 | 1 | 3 | 3 | 2 | 1 | 3 | 3 | 3 | 1 | 2 | 5 | 2 | 3 | 3 | 8 | 4 | 7 | 5 | 6 | 8 | 10 | 9 | 9 | 4 | 7 | 8 | 5 | 4 | 8 | 8 | 11 | 13 | 18 | 6 | 24 | 17 | 28 | 10 | 27 | 12 |
| South Korea | 9 | 3 | 10 | 4 | 14 | 5 | 17 | 5 | 20 | 6 | 28 | 5 | 25 | 16 | 30 | 8 | 34 | 12 | 45 | 26 | 66 | 21 | 59 | 33 | 47 | 52 | 70 | 79 | 99 | 101 | 114 | 64 | 116 | 82 | 112 | 61 | 123 | 208 | 210 | 168 | 180 | 119 |
| Taiwan | 39 | 6 | 33 | 13 | 37 | 14 | 49 | 11 | 76 | 14 | 82 | 15 | 64 | 26 | 87 | 37 | 95 | 62 | 97 | 42 | 103 | 44 | 75 | 83 | 85 | 69 | 94 | 74 | 92 | 88 | 121 | 54 | 103 | 55 | 105 | 50 | 91 | 52 | 90 | 44 | 113 | 44 |
| All others | 3 | 5 | 7 | 7 | 2 | 3 | 6 | 3 | 8 | 3 | 14 | 5 | 12 | 3 | 13 | 11 | 8 | 3 | 16 | 7 | 11 | 11 | 16 | 13 | 8 | 11 | 11 | 15 | 12 | 6 | 11 | 10 | 9 | 8 | 13 | 7 | 10 | 5 | 21 | 8 | 39 | 10 |
| Middle East | 7 | 4 | 4 | 6 | 6 | 10 | 6 | 8 | 11 | 8 | 7 | 13 | 14 | 10 | 14 | 20 | 10 | 11 | 17 | 20 | 11 | 22 | 11 | 25 | 13 | 21 | 19 | 24 | 29 | 31 | 21 | 20 | 16 | 29 | 20 | 25 | 29 | 51 | 44 | 44 | 132 | 45 |
| Israel | 7 | 4 | 3 | 4 | 6 | 4 | 6 | 5 | 10 | 4 | 5 | 7 | 10 | 8 | 11 | 10 | 9 | 5 | 14 | 9 | 10 | 14 | 9 | 12 | 11 | 13 | 16 | 10 | 26 | 17 | 19 | 9 | 13 | 15 | 15 | 12 | 24 | 22 | 40 | 25 | 124 | 23 |
| All others | 0 | 0 | 1 | 3 | 0 | 6 | 0 | 3 | 1 | 4 | 2 | 6 | 5 | 2 | 3 | 10 | 1 | 6 | 3 | 11 | 1 | 7 | 2 | 13 | 2 | 8 | 3 | 13 | 3 | 14 | 2 | 11 | 3 | 14 | 5 | 14 | 5 | 29 | 4 | 19 | 8 | 21 |
| Africa | 4 | 5 | 2 | 2 | 6 | 1 | 5 | 3 | 2 | 3 | 17 | 4 | 2 | 6 | 6 | 3 | 7 | 3 | 7 | 6 | 10 | 8 | 7 | 11 | 8 | 11 | 3 | 7 | 9 | 8 | 11 | 12 | 9 | 14 | 10 | 7 | 11 | 8 | 10 | 13 | 22 | 11 |
| South Africa | 2 | 1 | 1 | 1 | 5 | 1 | 2 | 2 | 2 | 2 | 13 | 3 | 2 | 4 | 4 | 2 | 3 | 2 | 2 | 4 | 3 | 4 | 5 | 7 | 4 | 6 | 2 | 4 | 5 | 6 | 7 | 3 | 4 | 7 | 4 | 4 | 5 | 3 | 7 | 7 | 7 | 7 |
| All others | 2 | 4 | 1 | 1 | 1 | 1 | 3 | 1 | 0 | 1 | 4 | 1 | 1 | 2 | 2 | 1 | 4 | 1 | 5 | 3 | 7 | 4 | 2 | 3 | 4 | 5 | 1 | 3 | 4 | 2 | 4 | 8 | 5 | 6 | 6 | 4 | 7 | 5 | 3 | 6 | 15 | 4 |
| Australia and Oceania | 17 | 9 | 15 | 18 | 40 | 22 | 25 | 19 | 48 | 23 | 57 | 14 | 55 | 18 | 48 | 30 | 85 | 31 | 80 | 54 | 103 | 66 | 92 | 68 | 91 | 61 | 106 | 71 | 86 | 49 | 87 | 62 | 146 | 88 | 114 | 63 | 144 | 111 | 144 | 115 | 254 | 107 |
| Australia | 14 | 7 | 15 | 13 | 32 | 20 | 20 | 14 | 39 | 17 | 39 | 11 | 47 | 15 | 37 | 21 | 67 | 26 | 70 | 47 | 89 | 55 | 76 | 49 | 79 | 47 | 96 | 61 | 71 | 43 | 80 | 57 | 123 | 79 | 95 | 53 | 124 | 91 | 116 | 92 | 218 | 85 |
| New Zealand | 2 | 2 | 0 | 1 | 7 | 2 | 4 | 5 | 7 | 5 | 18 | 2 | 7 | 4 | 8 | 9 | 16 | 5 | 9 | 7 | 11 | 11 | 15 | 19 | 11 | 13 | 10 | 8 | 14 | 5 | 7 | 6 | 21 | 8 | 19 | 10 | 19 | 19 | 26 | 22 | 33 | 22 |
| All others | 1 | 0 | 0 | 4 | 2 | 0 | 1 | 0 | 2 | 1 | 0 | 0 | 1 | 0 | 3 | 0 | 2 | 0 | 1 | 0 | 3 | 1 | 2 | 0 | 1 | 1 | 0 | 2 | 2 | 1 | 1 | 0 | 2 | 1 | 1 | 1 | 2 | 1 | 2 | 1 | 4 | 0 |
| Unclassified | 31 | 44 | 36 | 89 | 54 | 69 | 46 | 80 | 58 | 40 | 54 | 19 | 43 | 32 | 28 | 21 | 27 | 13 | 24 | 8 | 24 | 3 | 10 | 4 | 9 | 4 | 11 | 2 | 7 | 4 | 6 | 6 | 12 | 7 | 14 | 6 | 18 | 6 | 23 | 5 | 90 | 2 |

USPTO = U.S. Patent and Trademark Office; EUIPO = European Union Intellectual Property Office; EU = European Union.

**Note(s)**

Trademarks are allocated according to holder information. Trademarks are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named holders. The EU includes 28 member countries. China includes Hong Kong. Trademarks are classified under the 11th edition of the Nice classification of goods and services, which classifies trademarks under 34 categories of goods and 11 categories of services. Fractional counts of trademarks were assigned to each category to assign the proper weight of a trademark to the corresponding category under the classification. These counts are then grouped under 10 industry sectors following a mapping defined by Edital.

**Source(s)**

National Center for Science and Engineering Statistics, National Science Foundation; Science-Metrix; USPTO trademark data hosted by Reed Tech (LexisNexis), accessed April 2019; EUIPO trademark data, accessed April 2019.

*Science and Engineering Indicators*

TABLE S8-55

## Number of registered USPTO and EUIPO trademarks in the business sector of leisure and education, by region, country, or economy: 1998–2018

(Number)

| | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Region, country, or economy | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO |
| World | 16,126 | 2,616 | 15,542 | 3,988 | 19,185 | 4,134 | 18,172 | 4,535 | 23,910 | 4,306 | 21,696 | 4,102 | 19,737 | 4,028 | 20,899 | 6,854 | 26,654 | 6,769 | 29,386 | 7,467 | 33,568 | 9,123 | 29,857 | 10,072 | 27,821 | 11,351 | 30,069 | 10,431 | 31,261 | 10,577 | 32,161 | 10,514 | 33,027 | 10,996 | 33,924 | 11,317 | 36,614 | 12,711 | 39,276 | 12,685 | 41,345 | 13,168 |
| North America | 15,004 | 921 | 14,467 | 1,193 | 17,845 | 1,246 | 16,718 | 1,216 | 21,826 | 1,067 | 19,476 | 953 | 17,680 | 1,075 | 18,894 | 1,684 | 24,111 | 1,500 | 26,488 | 1,496 | 30,317 | 1,792 | 26,886 | 1,753 | 24,934 | 1,677 | 27,212 | 1,660 | 28,076 | 1,732 | 28,798 | 1,661 | 29,537 | 1,659 | 30,044 | 1,757 | 31,831 | 2,003 | 33,050 | 2,033 | 33,150 | 1,973 |
| Canada | 328 | 27 | 279 | 45 | 327 | 48 | 287 | 46 | 398 | 41 | 407 | 57 | 404 | 52 | 410 | 98 | 467 | 71 | 479 | 66 | 538 | 82 | 516 | 120 | 543 | 115 | 570 | 126 | 537 | 174 | 547 | 124 | 536 | 135 | 546 | 151 | 570 | 165 | 737 | 147 | 692 | 164 |
| Mexico | 33 | 4 | 20 | 1 | 31 | 5 | 35 | 6 | 42 | 8 | 57 | 6 | 57 | 12 | 79 | 12 | 74 | 9 | 97 | 11 | 151 | 18 | 144 | 20 | 105 | 19 | 127 | 18 | 125 | 16 | 135 | 15 | 163 | 12 | 156 | 13 | 214 | 20 | 163 | 18 | 153 | 28 |
| Puerto Rico | 4 | 0 | 6 | 0 | 5 | 2 | 11 | 1 | 10 | 1 | 8 | 0 | 14 | 0 | 18 | 1 | 19 | 0 | 14 | 0 | 17 | 3 | 15 | 3 | 20 | 1 | 32 | 0 | 28 | 0 | 27 | 0 | 42 | 0 | 41 | 0 | 37 | 2 | 63 | 1 | 41 | 1 |
| United States | 14,639 | 889 | 14,162 | 1,147 | 17,482 | 1,190 | 16,385 | 1,164 | 21,376 | 1,017 | 19,004 | 890 | 17,206 | 1,010 | 18,388 | 1,573 | 23,552 | 1,420 | 25,897 | 1,419 | 29,610 | 1,689 | 26,211 | 1,610 | 24,266 | 1,543 | 26,482 | 1,517 | 27,386 | 1,542 | 28,089 | 1,523 | 28,796 | 1,511 | 29,301 | 1,593 | 31,011 | 1,816 | 32,087 | 1,867 | 32,265 | 1,780 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Central and South America | 36 | 17 | 37 | 11 | 35 | 24 | 41 | 22 | 92 | 23 | 110 | 24 | 95 | 27 | 103 | 58 | 118 | 61 | 136 | 50 | 139 | 64 | 125 | 72 | 108 | 81 | 133 | 70 | 131 | 56 | 125 | 59 | 95 | 69 | 139 | 74 | 125 | 65 | 152 | 55 | 184 | 77 |
| Argentina | 8 | 0 | 1 | 1 | 3 | 3 | 5 | 4 | 14 | 4 | 7 | 5 | 8 | 4 | 17 | 8 | 16 | 6 | 15 | 11 | 14 | 8 | 16 | 14 | 18 | 12 | 13 | 10 | 13 | 9 | 23 | 8 | 7 | 10 | 17 | 10 | 18 | 4 | 17 | 3 | 22 | 9 |
| Brazil | 7 | 10 | 9 | 6 | 14 | 4 | 4 | 3 | 12 | 6 | 21 | 10 | 11 | 5 | 17 | 24 | 27 | 14 | 15 | 18 | 31 | 21 | 24 | 20 | 20 | 34 | 27 | 22 | 19 | 18 | 21 | 21 | 26 | 23 | 34 | 24 | 30 | 18 | 40 | 27 | 53 | 33 |
| All others | 20 | 7 | 27 | 4 | 18 | 18 | 32 | 14 | 66 | 12 | 82 | 9 | 76 | 18 | 68 | 27 | 75 | 40 | 106 | 21 | 93 | 35 | 85 | 39 | 71 | 34 | 93 | 38 | 99 | 29 | 81 | 31 | 63 | 35 | 88 | 40 | 77 | 43 | 95 | 25 | 108 | 35 |
| Europe | 603 | 1,378 | 588 | 2,293 | 750 | 2,388 | 756 | 2,781 | 1,171 | 2,702 | 1,309 | 2,478 | 1,197 | 2,454 | 1,146 | 4,525 | 1,550 | 4,702 | 1,720 | 5,316 | 1,898 | 6,586 | 1,865 | 7,366 | 1,808 | 8,688 | 1,679 | 7,920 | 1,879 | 7,980 | 1,944 | 7,906 | 2,023 | 8,402 | 2,091 | 8,525 | 2,294 | 9,212 | 2,293 | 8,858 | 2,490 | 9,143 |
| EU | 545 | 1,317 | 537 | 2,193 | 663 | 2,314 | 690 | 2,692 | 1,074 | 2,621 | 1,181 | 2,380 | 1,103 | 2,367 | 1,039 | 4,364 | 1,387 | 4,504 | 1,558 | 5,069 | 1,694 | 6,286 | 1,693 | 6,994 | 1,634 | 8,321 | 1,504 | 7,516 | 1,661 | 7,577 | 1,731 | 7,454 | 1,802 | 7,936 | 1,863 | 8,095 | 2,031 | 8,694 | 2,054 | 8,394 | 2,211 | 8,689 |
| Austria | 15 | 40 | 22 | 61 | 27 | 51 | 16 | 64 | 37 | 62 | 52 | 45 | 23 | 51 | 19 | 110 | 38 | 181 | 39 | 219 | 55 | 296 | 38 | 313 | 27 | 418 | 39 | 372 | 37 | 424 | 46 | 378 | 48 | 374 | 48 | 358 | 61 | 348 | 79 | 371 | 39 | 395 |
| Belgium | 8 | 20 | 9 | 49 | 16 | 76 | 8 | 66 | 23 | 64 | 19 | 65 | 15 | 39 | 11 | 106 | 20 | 85 | 21 | 104 | 30 | 133 | 28 | 154 | 30 | 225 | 39 | 182 | 30 | 190 | 31 | 166 | 37 | 185 | 33 | 229 | 33 | 238 | 40 | 229 | 55 | 237 |
| Denmark | 8 | 27 | 12 | 46 | 5 | 51 | 8 | 47 | 13 | 39 | 14 | 54 | 16 | 34 | 11 | 56 | 24 | 76 | 25 | 87 | 28 | 82 | 33 | 96 | 41 | 93 | 21 | 125 | 24 | 141 | 34 | 129 | 33 | 127 | 29 | 151 | 45 | 136 | 37 | 132 | 35 | 115 |
| Finland | 12 | 12 | 2 | 31 | 7 | 54 | 12 | 47 | 21 | 53 | 38 | 57 | 30 | 46 | 29 | 51 | 26 | 72 | 41 | 72 | 25 | 97 | 18 | 95 | 27 | 140 | 35 | 117 | 34 | 122 | 35 | 124 | 37 | 121 | 45 | 161 | 41 | 158 | 40 | 194 | 54 | 165 |
| France | 71 | 111 | 66 | 176 | 83 | 227 | 79 | 249 | 123 | 274 | 147 | 238 | 131 | 225 | 104 | 465 | 139 | 479 | 156 | 482 | 163 | 582 | 198 | 649 | 177 | 843 | 192 | 744 | 188 | 692 | 191 | 697 | 188 | 736 | 180 | 714 | 197 | 794 | 193 | 721 | 193 | 773 |
| Germany | 114 | 323 | 109 | 556 | 153 | 486 | 144 | 741 | 240 | 696 | 268 | 588 | 274 | 559 | 254 | 1,007 | 372 | 1,030 | 328 | 1,248 | 380 | 1,505 | 410 | 1,610 | 350 | 1,975 | 303 | 1,806 | 308 | 1,897 | 318 | 1,797 | 298 | 1,773 | 285 | 1,756 | 332 | 1,764 | 331 | 1,807 | 340 | 1,839 |
| Hungary | 0 | 5 | 0 | 2 | 2 | 1 | 1 | 1 | 2 | 1 | 5 | 1 | 3 | 1 | 3 | 6 | 7 | 9 | 6 | 12 | 5 | 16 | 5 | 30 | 7 | 35 | 5 | 28 | 6 | 31 | 9 | 39 | 5 | 47 | 4 | 57 | 10 | 58 | 10 | 52 | 13 | 53 |
| Ireland | 8 | 14 | 4 | 31 | 8 | 50 | 16 | 52 | 25 | 38 | 13 | 28 | 16 | 39 | 16 | 60 | 19 | 55 | 31 | 72 | 38 | 93 | 35 | 93 | 31 | 106 | 22 | 86 | 33 | 76 | 31 | 101 | 29 | 120 | 37 | 120 | 37 | 106 | 26 | 124 | 39 | 96 |
| Italy | 27 | 97 | 45 | 204 | 53 | 213 | 38 | 244 | 57 | 269 | 74 | 211 | 57 | 251 | 60 | 510 | 94 | 443 | 117 | 458 | 136 | 631 | 106 | 716 | 107 | 776 | 98 | 754 | 122 | 668 | 105 | 639 | 123 | 704 | 116 | 749 | 136 | 869 | 113 | 751 | 145 | 920 |
| Netherlands | 27 | 62 | 36 | 128 | 33 | 107 | 37 | 99 | 48 | 84 | 61 | 70 | 60 | 72 | 54 | 190 | 72 | 177 | 99 | 237 | 88 | 309 | 75 | 305 | 81 | 422 | 75 | 350 | 93 | 381 | 83 | 335 | 80 | 344 | 77 | 329 | 91 | 386 | 80 | 392 | 124 | 407 |
| Spain | 22 | 203 | 12 | 164 | 16 | 197 | 21 | 230 | 57 | 248 | 51 | 242 | 36 | 323 | 43 | 520 | 66 | 535 | 81 | 580 | 71 | 670 | 65 | 747 | 70 | 880 | 69 | 805 | 86 | 699 | 81 | 720 | 87 | 745 | 93 | 766 | 99 | 813 | 119 | 823 | 96 | 795 |
| Sweden | 17 | 37 | 33 | 117 | 34 | 88 | 37 | 101 | 37 | 78 | 45 | 70 | 50 | 67 | 38 | 117 | 41 | 123 | 54 | 135 | 56 | 224 | 69 | 218 | 52 | 244 | 46 | 240 | 65 | 246 | 70 | 248 | 67 | 239 | 64 | 255 | 101 | 331 | 74 | 351 | 88 | 334 |
| United Kingdom | 208 | 324 | 178 | 574 | 215 | 649 | 256 | 687 | 360 | 647 | 363 | 637 | 371 | 600 | 366 | 1,016 | 420 | 1,028 | 494 | 1,088 | 534 | 1,270 | 516 | 1,433 | 551 | 1,458 | 489 | 1,327 | 524 | 1,380 | 563 | 1,344 | 618 | 1,580 | 680 | 1,485 | 669 | 1,628 | 734 | 1,352 | 762 | 1,333 |
| All others | 8 | 42 | 10 | 52 | 11 | 63 | 16 | 64 | 32 | 67 | 30 | 75 | 21 | 61 | 30 | 150 | 49 | 211 | 66 | 274 | 84 | 379 | 96 | 536 | 84 | 705 | 70 | 580 | 112 | 630 | 135 | 737 | 152 | 840 | 173 | 964 | 178 | 1,065 | 177 | 1,094 | 229 | 1,227 |
| Other Europe | 57 | 61 | 50 | 100 | 87 | 74 | 66 | 89 | 96 | 81 | 128 | 98 | 94 | 88 | 107 | 161 | 163 | 198 | 163 | 247 | 204 | 300 | 172 | 372 | 174 | 366 | 175 | 404 | 218 | 403 | 213 | 452 | 221 | 466 | 228 | 430 | 263 | 518 | 239 | 464 | 279 | 454 |
| Former Soviet Union | 0 | 2 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 5 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 5 | 1 | 4 | 1 | 3 | 4 | 6 | 3 | 5 | 3 | 5 | 5 | 13 | 8 | 11 | 11 | 31 | 14 |
| Norway | 1 | 2 | 5 | 11 | 6 | 6 | 5 | 4 | 13 | 7 | 11 | 8 | 3 | 7 | 7 | 10 | 7 | 8 | 16 | 20 | 13 | 21 | 14 | 23 | 22 | 35 | 13 | 30 | 17 | 36 | 13 | 21 | 27 | 40 | 12 | 30 | 25 | 45 | 24 | 45 | 22 | 40 |
| Russia | 3 | 0 | 2 | 1 | 4 | 1 | 6 | 1 | 3 | 2 | 6 | 1 | 6 | 2 | 6 | 3 | 12 | 6 | 15 | 5 | 15 | 8 | 15 | 14 | 12 | 9 | 24 | 11 | 30 | 13 | 19 | 14 | 27 | 23 | 32 | 24 | 31 | 26 | 36 | 29 | 46 | 44 |
| Switzerland | 47 | 55 | 38 | 77 | 73 | 57 | 52 | 72 | 76 | 62 | 96 | 75 | 75 | 70 | 85 | 125 | 119 | 156 | 107 | 182 | 147 | 230 | 119 | 273 | 110 | 283 | 117 | 318 | 140 | 313 | 146 | 350 | 134 | 341 | 135 | 304 | 159 | 352 | 133 | 314 | 133 | 271 |
| All others | 7 | 2 | 5 | 11 | 4 | 9 | 2 | 12 | 5 | 10 | 14 | 14 | 9 | 9 | 8 | 20 | 20 | 27 | 24 | 39 | 28 | 39 | 23 | 60 | 25 | 38 | 17 | 44 | 28 | 37 | 28 | 64 | 28 | 60 | 43 | 68 | 34 | 87 | 37 | 66 | 48 | 85 |
| Asia | 350 | 132 | 301 | 197 | 343 | 188 | 426 | 241 | 537 | 341 | 538 | 525 | 526 | 354 | 531 | 422 | 607 | 372 | 748 | 419 | 859 | 499 | 631 | 647 | 673 | 672 | 723 | 548 | 810 | 597 | 890 | 631 | 917 | 648 | 1,121 | 738 | 1,823 | 1,079 | 3,123 | 1,388 | 4,633 | 1,629 |

TABLE S8-55

## Number of registered USPTO and EUIPO trademarks in the business sector of leisure and education, by region, country, or economy: 1998–2018

(Number)

| Region, country, or economy | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO |
| China | 80 | 12 | 76 | 33 | 114 | 21 | 125 | 30 | 158 | 41 | 163 | 44 | 141 | 54 | 141 | 74 | 185 | 80 | 215 | 112 | 261 | 143 | 183 | 146 | 195 | 170 | 266 | 161 | 300 | 191 | 271 | 194 | 325 | 243 | 448 | 327 | 1,143 | 580 | 2,449 | 883 | 3,861 | 1,146 |
| India | 2 | 0 | 3 | 2 | 4 | 3 | 5 | 10 | 10 | 3 | 10 | 4 | 9 | 4 | 13 | 6 | 15 | 7 | 12 | 9 | 18 | 13 | 13 | 22 | 25 | 23 | 35 | 20 | 24 | 12 | 29 | 21 | 21 | 21 | 45 | 19 | 44 | 26 | 53 | 24 | 51 | 27 |
| Japan | 185 | 94 | 152 | 120 | 118 | 113 | 196 | 153 | 252 | 254 | 263 | 441 | 278 | 243 | 268 | 259 | 268 | 206 | 317 | 222 | 361 | 252 | 256 | 348 | 258 | 362 | 242 | 239 | 268 | 260 | 368 | 271 | 325 | 230 | 362 | 256 | 345 | 297 | 321 | 303 | 337 | 269 |
| Malaysia | 0 | 0 | 1 | 1 | 2 | 5 | 4 | 3 | 1 | 3 | 1 | 1 | 2 | 5 | 0 | 4 | 1 | 2 | 2 | 3 | 5 | 1 | 3 | 7 | 8 | 5 | 5 | 7 | 6 | 3 | 5 | 8 | 6 | 3 | 8 | 3 | 7 | 6 | 9 | 4 | 15 | 8 |
| Singapore | 4 | 7 | 5 | 15 | 7 | 7 | 8 | 8 | 12 | 6 | 4 | 6 | 9 | 8 | 15 | 21 | 14 | 12 | 31 | 20 | 23 | 20 | 19 | 22 | 41 | 18 | 37 | 16 | 47 | 40 | 46 | 21 | 33 | 23 | 42 | 18 | 43 | 45 | 54 | 28 | 58 | 35 |
| South Korea | 21 | 8 | 24 | 3 | 34 | 9 | 31 | 9 | 29 | 4 | 20 | 5 | 28 | 7 | 27 | 16 | 35 | 17 | 70 | 18 | 89 | 28 | 68 | 39 | 67 | 24 | 66 | 48 | 89 | 43 | 80 | 55 | 102 | 75 | 111 | 51 | 140 | 83 | 138 | 87 | 185 | 78 |
| Taiwan | 54 | 10 | 35 | 21 | 56 | 22 | 47 | 23 | 65 | 22 | 61 | 17 | 52 | 26 | 56 | 35 | 67 | 31 | 80 | 27 | 86 | 31 | 71 | 46 | 68 | 43 | 56 | 48 | 58 | 39 | 69 | 47 | 77 | 35 | 72 | 54 | 75 | 35 | 64 | 52 | 80 | 46 |
| All others | 2 | 1 | 3 | 1 | 7 | 8 | 9 | 5 | 10 | 8 | 16 | 6 | 6 | 6 | 11 | 7 | 22 | 17 | 20 | 7 | 17 | 11 | 18 | 18 | 11 | 26 | 17 | 8 | 17 | 11 | 22 | 14 | 29 | 17 | 33 | 12 | 27 | 7 | 35 | 6 | 46 | 21 |
| Middle East | 9 | 7 | 11 | 9 | 13 | 12 | 14 | 10 | 13 | 15 | 8 | 18 | 22 | 11 | 25 | 36 | 24 | 26 | 36 | 43 | 34 | 54 | 51 | 66 | 48 | 56 | 47 | 52 | 71 | 33 | 84 | 62 | 75 | 70 | 120 | 62 | 105 | 75 | 128 | 74 | 215 | 80 |
| Israel | 8 | 5 | 9 | 8 | 12 | 11 | 10 | 7 | 10 | 10 | 7 | 12 | 15 | 8 | 17 | 20 | 18 | 19 | 31 | 22 | 23 | 19 | 31 | 22 | 29 | 23 | 22 | 23 | 51 | 13 | 63 | 26 | 57 | 29 | 95 | 30 | 74 | 32 | 106 | 36 | 180 | 35 |
| All others | 2 | 2 | 2 | 1 | 1 | 1 | 4 | 2 | 3 | 5 | 2 | 6 | 7 | 4 | 8 | 16 | 6 | 7 | 5 | 21 | 11 | 35 | 21 | 44 | 19 | 34 | 24 | 29 | 20 | 20 | 21 | 36 | 19 | 41 | 26 | 32 | 32 | 43 | 22 | 39 | 35 | 45 |
| Africa | 7 | 5 | 3 | 5 | 12 | 4 | 23 | 8 | 14 | 5 | 15 | 11 | 18 | 8 | 9 | 21 | 20 | 15 | 8 | 10 | 22 | 22 | 28 | 21 | 21 | 26 | 40 | 29 | 23 | 30 | 25 | 39 | 43 | 23 | 46 | 25 | 32 | 22 | 41 | 30 | 39 | 22 |
| South Africa | 4 | 3 | 3 | 4 | 5 | 3 | 10 | 4 | 8 | 4 | 8 | 9 | 9 | 6 | 3 | 16 | 10 | 10 | 6 | 6 | 10 | 14 | 9 | 11 | 10 | 13 | 9 | 9 | 8 | 13 | 12 | 20 | 11 | 8 | 7 | 8 | 8 | 11 | 11 | 16 | 13 | 5 |
| All others | 3 | 2 | 0 | 1 | 7 | 1 | 13 | 4 | 6 | 1 | 6 | 2 | 9 | 2 | 5 | 5 | 10 | 5 | 3 | 4 | 12 | 9 | 19 | 10 | 11 | 14 | 31 | 19 | 15 | 17 | 13 | 19 | 32 | 15 | 39 | 18 | 24 | 10 | 31 | 14 | 26 | 17 |
| Australia and Oceania | 49 | 13 | 51 | 40 | 62 | 52 | 81 | 38 | 112 | 48 | 102 | 27 | 103 | 42 | 103 | 54 | 144 | 60 | 183 | 107 | 230 | 92 | 222 | 133 | 189 | 121 | 196 | 129 | 238 | 130 | 256 | 119 | 301 | 107 | 331 | 109 | 359 | 215 | 432 | 211 | 486 | 216 |
| Australia | 47 | 11 | 36 | 32 | 50 | 43 | 69 | 32 | 97 | 41 | 89 | 24 | 83 | 33 | 82 | 41 | 123 | 41 | 155 | 91 | 204 | 81 | 196 | 110 | 165 | 101 | 172 | 114 | 203 | 117 | 236 | 104 | 271 | 88 | 287 | 92 | 313 | 188 | 393 | 181 | 441 | 197 |
| New Zealand | 2 | 2 | 14 | 8 | 11 | 8 | 12 | 5 | 14 | 6 | 11 | 2 | 17 | 7 | 19 | 12 | 20 | 16 | 27 | 13 | 24 | 9 | 24 | 21 | 22 | 18 | 23 | 14 | 32 | 13 | 16 | 12 | 28 | 17 | 41 | 15 | 42 | 26 | 37 | 27 | 41 | 19 |
| All others | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 2 | 1 | 1 | 0 | 2 | 3 | 1 | 1 | 1 | 2 | 1 | 2 | 1 | 2 | 2 | 2 | 1 | 2 | 1 | 0 | 2 | 0 | 4 | 2 | 3 | 1 | 3 | 2 | 4 | 1 | 2 | 3 | 4 | 1 |
| Unclassified | 67 | 143 | 85 | 239 | 126 | 220 | 114 | 218 | 145 | 107 | 138 | 68 | 96 | 57 | 89 | 54 | 80 | 33 | 66 | 26 | 69 | 13 | 49 | 14 | 41 | 30 | 40 | 23 | 33 | 19 | 38 | 37 | 35 | 18 | 31 | 26 | 45 | 40 | 56 | 36 | 147 | 27 |

USPTO = U.S. Patent and Trademark Office; EUIPO = European Union Intellectual Property Office; EU = European Union.

**Note(s)**

Trademarks are allocated according to holder information. Trademarks are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named holders. The EU includes 28 member countries. China includes Hong Kong. Trademarks are classified under the 11th edition of the Nice classification of goods and services, which classifies trademarks under 34 categories of goods and 11 categories of services. Fractional counts of trademarks were assigned to each category to assign the proper weight of a trademark to the corresponding category under the classification. These counts are then grouped under 10 industry sectors following a mapping defined by Edital.

**Source(s)**

National Center for Science and Engineering Statistics, National Science Foundation; Science-Metrix; USPTO trademark data hosted by Reed Tech (LexisNexis), accessed April 2019; EUIPO trademark data, accessed April 2019.

*Science and Engineering Indicators*

TABLE S8-56

## Number of registered USPTO and EUIPO trademarks in the business sector of research and technology, by region, country, or economy: 1998–2018

(Number)

| | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Region, country, or economy | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO |
| World | 23,042 | 4,603 | 22,548 | 7,642 | 29,460 | 8,367 | 28,988 | 10,384 | 39,628 | 9,707 | 30,945 | 8,060 | 23,425 | 6,941 | 23,441 | 10,824 | 27,831 | 11,537 | 30,689 | 13,093 | 35,675 | 15,319 | 32,934 | 17,318 | 30,987 | 18,841 | 34,090 | 17,563 | 36,485 | 18,546 | 37,754 | 18,889 | 39,726 | 20,043 | 41,811 | 20,987 | 45,519 | 25,362 | 49,434 | 25,903 | 51,944 | 27,045 |
| North America | 20,831 | 1,612 | 20,246 | 2,453 | 26,291 | 2,547 | 25,782 | 3,000 | 34,514 | 2,696 | 25,533 | 2,260 | 19,047 | 1,868 | 19,245 | 2,838 | 22,576 | 2,794 | 24,995 | 3,002 | 28,950 | 3,339 | 26,417 | 3,508 | 24,878 | 3,303 | 27,453 | 3,151 | 29,447 | 3,501 | 30,105 | 3,552 | 31,634 | 3,668 | 32,157 | 3,758 | 32,579 | 4,564 | 33,073 | 4,200 | 32,398 | 4,227 |
| Canada | 570 | 60 | 556 | 107 | 661 | 115 | 654 | 126 | 940 | 147 | 917 | 129 | 824 | 103 | 731 | 160 | 828 | 159 | 808 | 161 | 976 | 174 | 862 | 216 | 800 | 230 | 846 | 190 | 868 | 219 | 919 | 232 | 997 | 266 | 984 | 242 | 929 | 296 | 1,072 | 264 | 1,035 | 306 |
| Mexico | 20 | 7 | 16 | 2 | 32 | 7 | 32 | 7 | 65 | 11 | 49 | 9 | 35 | 7 | 38 | 5 | 44 | 10 | 46 | 10 | 72 | 11 | 74 | 13 | 67 | 8 | 68 | 8 | 70 | 10 | 68 | 16 | 82 | 20 | 111 | 15 | 90 | 16 | 84 | 10 | 109 | 16 |
| Puerto Rico | 11 | 1 | 7 | 0 | 9 | 1 | 17 | 2 | 21 | 0 | 10 | 0 | 8 | 0 | 6 | 1 | 11 | 0 | 17 | 0 | 17 | 0 | 15 | 0 | 12 | 0 | 20 | 0 | 17 | 0 | 21 | 1 | 30 | 0 | 40 | 0 | 47 | 0 | 30 | 0 | 32 | 0 |
| United States | 20,230 | 1,544 | 19,667 | 2,344 | 25,588 | 2,424 | 25,079 | 2,865 | 33,488 | 2,538 | 24,557 | 2,122 | 18,180 | 1,758 | 18,469 | 2,672 | 21,693 | 2,624 | 24,123 | 2,831 | 27,884 | 3,154 | 25,465 | 3,278 | 23,998 | 3,065 | 26,519 | 2,953 | 28,491 | 3,273 | 29,098 | 3,304 | 30,525 | 3,382 | 31,022 | 3,501 | 31,514 | 4,252 | 31,887 | 3,926 | 31,221 | 3,906 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Central and South America | 46 | 14 | 38 | 25 | 46 | 40 | 54 | 39 | 128 | 48 | 104 | 38 | 84 | 33 | 73 | 80 | 91 | 66 | 103 | 58 | 104 | 80 | 105 | 105 | 113 | 103 | 109 | 81 | 155 | 68 | 180 | 82 | 166 | 76 | 165 | 102 | 158 | 76 | 179 | 77 | 173 | 93 |
| Argentina | 9 | 2 | 6 | 4 | 7 | 2 | 4 | 7 | 17 | 6 | 16 | 4 | 11 | 4 | 6 | 9 | 5 | 6 | 8 | 10 | 14 | 4 | 12 | 13 | 19 | 12 | 13 | 16 | 11 | 10 | 26 | 8 | 15 | 7 | 16 | 5 | 13 | 4 | 15 | 12 | 22 | 5 |
| Brazil | 2 | 3 | 8 | 3 | 5 | 9 | 10 | 9 | 23 | 15 | 18 | 12 | 13 | 9 | 16 | 32 | 13 | 13 | 20 | 15 | 15 | 30 | 28 | 55 | 32 | 41 | 25 | 22 | 46 | 27 | 54 | 27 | 39 | 28 | 28 | 45 | 39 | 27 | 64 | 22 | 53 | 35 |
| All others | 34 | 10 | 23 | 18 | 34 | 29 | 41 | 23 | 88 | 26 | 71 | 22 | 61 | 20 | 51 | 39 | 74 | 47 | 76 | 33 | 76 | 45 | 65 | 38 | 62 | 50 | 70 | 43 | 98 | 31 | 101 | 47 | 112 | 41 | 120 | 52 | 106 | 45 | 100 | 42 | 99 | 53 |
| Europe | 1,343 | 2,282 | 1,345 | 3,930 | 1,859 | 4,514 | 1,874 | 5,964 | 3,180 | 5,862 | 3,356 | 4,893 | 2,605 | 4,179 | 2,485 | 6,699 | 3,267 | 7,459 | 3,530 | 8,725 | 4,080 | 10,413 | 4,033 | 11,879 | 3,795 | 13,506 | 3,906 | 12,491 | 4,015 | 12,957 | 4,312 | 13,113 | 4,373 | 13,934 | 4,706 | 14,436 | 5,024 | 16,271 | 5,232 | 16,178 | 5,566 | 16,812 |
| EU | 1,235 | 2,178 | 1,214 | 3,774 | 1,679 | 4,344 | 1,706 | 5,755 | 2,868 | 5,635 | 3,029 | 4,696 | 2,377 | 4,017 | 2,265 | 6,398 | 2,972 | 7,077 | 3,127 | 8,220 | 3,622 | 9,900 | 3,658 | 11,257 | 3,392 | 12,894 | 3,507 | 11,819 | 3,586 | 12,252 | 3,824 | 12,380 | 3,866 | 13,084 | 4,195 | 13,565 | 4,472 | 15,253 | 4,702 | 15,191 | 4,914 | 15,782 |
| Austria | 7 | 43 | 15 | 89 | 31 | 90 | 22 | 107 | 43 | 131 | 68 | 101 | 47 | 92 | 52 | 137 | 63 | 238 | 79 | 274 | 85 | 323 | 84 | 363 | 69 | 487 | 83 | 439 | 90 | 473 | 107 | 465 | 115 | 507 | 121 | 479 | 135 | 532 | 127 | 580 | 101 | 562 |
| Belgium | 29 | 33 | 23 | 101 | 33 | 111 | 23 | 132 | 68 | 114 | 60 | 99 | 28 | 80 | 22 | 133 | 45 | 132 | 63 | 168 | 57 | 220 | 56 | 267 | 74 | 332 | 73 | 317 | 59 | 295 | 91 | 314 | 78 | 319 | 76 | 377 | 88 | 388 | 113 | 431 | 120 | 426 |
| Denmark | 33 | 60 | 22 | 88 | 44 | 118 | 30 | 125 | 58 | 83 | 66 | 144 | 43 | 81 | 52 | 121 | 65 | 108 | 75 | 154 | 92 | 175 | 85 | 213 | 62 | 188 | 71 | 196 | 90 | 183 | 76 | 208 | 91 | 238 | 95 | 271 | 111 | 310 | 97 | 334 | 102 | 309 |
| Finland | 22 | 41 | 25 | 87 | 32 | 104 | 33 | 120 | 77 | 102 | 70 | 112 | 41 | 85 | 45 | 91 | 49 | 83 | 75 | 148 | 83 | 190 | 75 | 179 | 80 | 253 | 68 | 188 | 66 | 210 | 63 | 218 | 78 | 234 | 100 | 274 | 119 | 338 | 108 | 437 | 144 | 407 |
| France | 173 | 183 | 143 | 355 | 223 | 438 | 245 | 622 | 392 | 614 | 397 | 506 | 267 | 411 | 232 | 786 | 327 | 857 | 356 | 833 | 410 | 955 | 422 | 1,142 | 428 | 1,286 | 476 | 1,237 | 426 | 1,218 | 506 | 1,223 | 441 | 1,215 | 462 | 1,292 | 480 | 1,440 | 523 | 1,456 | 542 | 1,480 |
| Germany | 315 | 655 | 326 | 1,066 | 520 | 1,110 | 491 | 1,706 | 825 | 1,716 | 919 | 1,394 | 758 | 1,154 | 750 | 1,864 | 1,064 | 2,084 | 963 | 2,429 | 1,134 | 2,998 | 1,075 | 3,245 | 917 | 3,703 | 907 | 3,462 | 927 | 3,763 | 941 | 3,592 | 931 | 3,456 | 906 | 3,357 | 950 | 3,698 | 1,040 | 3,683 | 1,091 | 3,931 |
| Hungary | 3 | 2 | 1 | 0 | 0 | 3 | 5 | 1 | 4 | 3 | 4 | 1 | 4 | 2 | 5 | 3 | 9 | 14 | 4 | 18 | 9 | 24 | 4 | 33 | 9 | 46 | 10 | 32 | 5 | 36 | 9 | 57 | 18 | 64 | 16 | 58 | 5 | 56 | 14 | 75 | 16 | 81 |
| Ireland | 32 | 30 | 25 | 55 | 23 | 78 | 37 | 133 | 46 | 115 | 50 | 70 | 45 | 52 | 42 | 81 | 38 | 78 | 55 | 120 | 67 | 119 | 66 | 153 | 43 | 188 | 69 | 114 | 56 | 132 | 59 | 154 | 60 | 181 | 94 | 181 | 83 | 179 | 97 | 178 | 104 | 162 |
| Italy | 67 | 163 | 66 | 333 | 95 | 382 | 81 | 543 | 132 | 557 | 140 | 411 | 106 | 402 | 107 | 593 | 180 | 632 | 196 | 662 | 190 | 852 | 223 | 1,002 | 186 | 1,027 | 215 | 967 | 205 | 899 | 223 | 992 | 197 | 1,048 | 233 | 1,091 | 243 | 1,408 | 241 | 1,214 | 258 | 1,392 |
| Netherlands | 77 | 46 | 93 | 186 | 105 | 209 | 124 | 218 | 187 | 208 | 189 | 159 | 134 | 135 | 149 | 312 | 175 | 405 | 208 | 461 | 226 | 530 | 223 | 610 | 196 | 751 | 220 | 662 | 223 | 648 | 196 | 644 | 200 | 645 | 232 | 701 | 271 | 790 | 241 | 816 | 246 | 807 |
| Spain | 22 | 170 | 50 | 182 | 30 | 261 | 32 | 409 | 74 | 420 | 78 | 372 | 63 | 361 | 47 | 628 | 82 | 601 | 85 | 778 | 131 | 908 | 124 | 1,012 | 136 | 1,130 | 124 | 1,055 | 146 | 1,015 | 137 | 968 | 147 | 1,059 | 157 | 1,086 | 180 | 1,260 | 155 | 1,237 | 165 | 1,195 |
| Sweden | 71 | 73 | 59 | 190 | 75 | 213 | 79 | 186 | 150 | 213 | 153 | 184 | 135 | 141 | 96 | 189 | 121 | 231 | 156 | 325 | 195 | 330 | 166 | 333 | 130 | 432 | 181 | 415 | 159 | 454 | 182 | 477 | 160 | 476 | 209 | 567 | 224 | 677 | 217 | 732 | 222 | 724 |
| United Kingdom | 368 | 639 | 349 | 978 | 438 | 1,108 | 479 | 1,334 | 753 | 1,252 | 796 | 1,034 | 662 | 937 | 625 | 1,266 | 674 | 1,323 | 714 | 1,458 | 832 | 1,740 | 897 | 1,939 | 887 | 1,999 | 829 | 1,822 | 899 | 1,937 | 949 | 1,971 | 1,057 | 2,288 | 1,160 | 2,360 | 1,221 | 2,518 | 1,341 | 2,211 | 1,320 | 2,218 |
| All others | 16 | 39 | 17 | 65 | 28 | 119 | 26 | 119 | 58 | 107 | 39 | 108 | 44 | 84 | 42 | 194 | 79 | 291 | 98 | 394 | 111 | 535 | 158 | 765 | 173 | 1,073 | 181 | 915 | 235 | 988 | 284 | 1,097 | 293 | 1,357 | 335 | 1,473 | 361 | 1,659 | 388 | 1,807 | 482 | 2,086 |
| Other Europe | 108 | 104 | 131 | 156 | 181 | 170 | 168 | 210 | 313 | 227 | 327 | 198 | 228 | 162 | 221 | 301 | 295 | 382 | 402 | 505 | 458 | 513 | 375 | 623 | 403 | 611 | 399 | 671 | 430 | 705 | 489 | 734 | 507 | 850 | 512 | 871 | 553 | 1,018 | 530 | 987 | 652 | 1,031 |
| Former Soviet Union | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 4 | 1 | 6 | 2 | 7 | 0 | 11 | 1 | 9 | 4 | 15 | 5 | 12 | 7 | 17 | 6 | 30 | 8 | 11 | 8 | 23 | 20 | 25 | 17 | 57 | 17 |
| Norway | 8 | 8 | 20 | 21 | 21 | 20 | 18 | 13 | 38 | 24 | 35 | 21 | 20 | 20 | 15 | 30 | 37 | 47 | 51 | 48 | 63 | 45 | 59 | 74 | 64 | 72 | 57 | 76 | 58 | 70 | 56 | 70 | 54 | 82 | 63 | 68 | 60 | 116 | 63 | 152 | 70 | 142 |
| Russia | 2 | 0 | 3 | 2 | 5 | 1 | 6 | 3 | 8 | 2 | 10 | 3 | 9 | 0 | 14 | 3 | 17 | 7 | 23 | 14 | 32 | 15 | 28 | 26 | 30 | 11 | 41 | 13 | 52 | 33 | 72 | 24 | 64 | 43 | 62 | 36 | 36 | 34 | 45 | 35 | 72 | 61 |
| Switzerland | 92 | 89 | 103 | 117 | 147 | 134 | 133 | 175 | 254 | 186 | 271 | 158 | 183 | 130 | 179 | 238 | 217 | 294 | 295 | 397 | 319 | 397 | 258 | 458 | 270 | 459 | 252 | 509 | 272 | 535 | 303 | 553 | 313 | 617 | 322 | 643 | 373 | 701 | 341 | 675 | 386 | 682 |
| All others | 6 | 6 | 5 | 16 | 7 | 15 | 10 | 18 | 11 | 14 | 9 | 16 | 16 | 12 | 13 | 29 | 19 | 33 | 28 | 43 | 38 | 56 | 20 | 63 | 29 | 66 | 34 | 67 | 36 | 60 | 41 | 81 | 47 | 101 | 53 | 117 | 61 | 147 | 56 | 108 | 66 | 128 |
| Asia | 510 | 352 | 599 | 542 | 771 | 566 | 794 | 597 | 1,055 | 562 | 1,261 | 573 | 1,230 | 633 | 1,189 | 949 | 1,376 | 981 | 1,525 | 993 | 1,828 | 1,171 | 1,709 | 1,470 | 1,598 | 1,544 | 1,918 | 1,511 | 2,198 | 1,701 | 2,474 | 1,763 | 2,793 | 1,988 | 3,969 | 2,281 | 6,780 | 3,775 | 9,987 | 4,848 | 12,620 | 5,247 |

TABLE S8-56

## Number of registered USPTO and EUIPO trademarks in the business sector of research and technology, by region, country, or economy: 1998–2018

(Number)

| Region, country, or economy | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO |
| China | 41 | 14 | 59 | 24 | 69 | 35 | 64 | 38 | 100 | 53 | 130 | 51 | 106 | 56 | 119 | 109 | 218 | 145 | 323 | 176 | 393 | 204 | 360 | 271 | 376 | 314 | 496 | 493 | 671 | 519 | 834 | 562 | 1,091 | 656 | 2,041 | 1,053 | 4,827 | 1,959 | 7,977 | 3,341 | 10,662 | 3,764 |
| India | 7 | 1 | 16 | 2 | 21 | 5 | 24 | 11 | 26 | 6 | 28 | 8 | 22 | 8 | 17 | 10 | 21 | 8 | 41 | 15 | 53 | 24 | 69 | 30 | 67 | 24 | 57 | 43 | 77 | 30 | 87 | 31 | 84 | 35 | 120 | 31 | 130 | 57 | 125 | 42 | 132 | 47 |
| Japan | 274 | 266 | 349 | 388 | 406 | 379 | 404 | 370 | 519 | 308 | 616 | 329 | 634 | 343 | 589 | 539 | 669 | 514 | 641 | 483 | 710 | 547 | 666 | 645 | 537 | 620 | 667 | 487 | 623 | 550 | 749 | 555 | 687 | 504 | 665 | 539 | 720 | 663 | 627 | 659 | 675 | 637 |
| Malaysia | 1 | 0 | 2 | 3 | 3 | 2 | 1 | 2 | 4 | 7 | 8 | 3 | 6 | 2 | 7 | 8 | 6 | 5 | 7 | 6 | 10 | 6 | 4 | 9 | 9 | 10 | 14 | 11 | 6 | 1 | 11 | 5 | 15 | 7 | 11 | 4 | 7 | 10 | 14 | 2 | 22 | 5 |
| Singapore | 24 | 28 | 12 | 40 | 24 | 31 | 27 | 25 | 42 | 29 | 51 | 21 | 47 | 27 | 33 | 27 | 35 | 35 | 43 | 33 | 54 | 23 | 46 | 49 | 84 | 37 | 72 | 34 | 70 | 48 | 85 | 47 | 88 | 50 | 97 | 56 | 113 | 110 | 115 | 72 | 108 | 108 |
| South Korea | 31 | 6 | 35 | 3 | 34 | 13 | 56 | 30 | 76 | 37 | 145 | 38 | 149 | 42 | 121 | 51 | 120 | 54 | 138 | 86 | 192 | 125 | 227 | 160 | 195 | 328 | 304 | 231 | 392 | 305 | 363 | 367 | 496 | 536 | 669 | 393 | 616 | 789 | 807 | 519 | 688 | 479 |
| Taiwan | 126 | 36 | 124 | 74 | 205 | 100 | 211 | 118 | 274 | 116 | 278 | 118 | 254 | 149 | 283 | 194 | 290 | 214 | 321 | 184 | 393 | 207 | 299 | 273 | 293 | 193 | 289 | 207 | 332 | 230 | 314 | 186 | 309 | 175 | 328 | 182 | 334 | 169 | 286 | 192 | 291 | 189 |
| All others | 7 | 1 | 3 | 9 | 9 | 2 | 6 | 3 | 14 | 7 | 6 | 4 | 11 | 4 | 19 | 10 | 17 | 6 | 12 | 10 | 24 | 35 | 39 | 32 | 37 | 18 | 18 | 5 | 28 | 18 | 31 | 10 | 24 | 25 | 39 | 23 | 31 | 17 | 37 | 21 | 42 | 18 |
| Middle East | 84 | 19 | 65 | 59 | 111 | 62 | 136 | 96 | 197 | 101 | 205 | 80 | 116 | 49 | 89 | 56 | 109 | 73 | 105 | 102 | 155 | 114 | 161 | 127 | 153 | 135 | 168 | 87 | 206 | 90 | 196 | 111 | 219 | 137 | 251 | 153 | 294 | 217 | 279 | 188 | 298 | 218 |
| Israel | 79 | 15 | 62 | 55 | 100 | 56 | 132 | 89 | 193 | 96 | 199 | 72 | 110 | 45 | 81 | 41 | 99 | 59 | 96 | 86 | 144 | 81 | 135 | 85 | 132 | 92 | 142 | 47 | 164 | 63 | 167 | 72 | 184 | 96 | 212 | 109 | 249 | 144 | 235 | 136 | 248 | 156 |
| All others | 5 | 4 | 3 | 4 | 11 | 5 | 5 | 7 | 4 | 5 | 6 | 8 | 6 | 3 | 8 | 14 | 9 | 15 | 9 | 17 | 11 | 32 | 26 | 43 | 21 | 43 | 26 | 40 | 42 | 28 | 29 | 39 | 35 | 41 | 38 | 44 | 45 | 74 | 45 | 52 | 51 | 62 |
| Africa | 11 | 8 | 9 | 10 | 17 | 18 | 10 | 19 | 18 | 22 | 20 | 19 | 17 | 15 | 20 | 26 | 20 | 18 | 26 | 20 | 30 | 32 | 34 | 27 | 27 | 37 | 26 | 29 | 27 | 31 | 34 | 32 | 46 | 44 | 49 | 29 | 46 | 42 | 43 | 38 | 48 | 47 |
| South Africa | 8 | 5 | 6 | 7 | 9 | 13 | 5 | 12 | 8 | 18 | 15 | 14 | 10 | 11 | 15 | 17 | 10 | 10 | 14 | 9 | 17 | 13 | 14 | 18 | 12 | 18 | 10 | 13 | 9 | 13 | 15 | 15 | 24 | 17 | 24 | 15 | 21 | 23 | 17 | 22 | 20 | 17 |
| All others | 4 | 4 | 3 | 3 | 8 | 5 | 5 | 6 | 10 | 4 | 5 | 5 | 8 | 4 | 5 | 8 | 10 | 8 | 12 | 11 | 13 | 19 | 19 | 9 | 16 | 19 | 16 | 16 | 17 | 18 | 19 | 17 | 23 | 27 | 25 | 14 | 26 | 19 | 26 | 17 | 28 | 30 |
| Australia and Oceania | 91 | 33 | 89 | 50 | 141 | 73 | 127 | 90 | 241 | 86 | 235 | 52 | 174 | 44 | 217 | 88 | 285 | 94 | 302 | 136 | 435 | 144 | 410 | 178 | 374 | 185 | 457 | 176 | 381 | 168 | 396 | 182 | 425 | 165 | 456 | 194 | 546 | 372 | 551 | 333 | 559 | 371 |
| Australia | 86 | 30 | 72 | 43 | 124 | 64 | 111 | 79 | 208 | 73 | 197 | 41 | 134 | 36 | 180 | 63 | 250 | 78 | 262 | 117 | 372 | 117 | 363 | 155 | 332 | 155 | 414 | 149 | 343 | 145 | 357 | 156 | 360 | 137 | 385 | 164 | 473 | 309 | 471 | 283 | 464 | 321 |
| New Zealand | 5 | 3 | 16 | 6 | 17 | 9 | 16 | 10 | 32 | 13 | 37 | 11 | 38 | 8 | 36 | 25 | 34 | 15 | 39 | 17 | 63 | 26 | 47 | 23 | 41 | 24 | 42 | 27 | 38 | 20 | 35 | 22 | 61 | 28 | 71 | 27 | 65 | 56 | 76 | 45 | 92 | 45 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 2 | 0 | 1 | 1 | 0 | 1 | 1 | 2 | 0 | 1 | 0 | 0 | 1 | 5 | 1 | 1 | 1 | 4 | 5 | 4 | 5 | 0 | 0 | 3 | 8 | 7 | 5 | 5 | 3 | 5 |
| Unclassified | 125 | 282 | 158 | 574 | 224 | 548 | 210 | 580 | 295 | 331 | 230 | 145 | 150 | 121 | 123 | 89 | 107 | 53 | 102 | 56 | 93 | 27 | 64 | 23 | 50 | 29 | 52 | 36 | 55 | 30 | 55 | 53 | 68 | 30 | 59 | 33 | 91 | 44 | 90 | 42 | 282 | 29 |

USPTO = U.S. Patent and Trademark Office; EUIPO = European Union Intellectual Property Office; EU = European Union.

**Note(s)**

Trademarks are allocated according to holder information. Trademarks are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named holders. The EU includes 28 member countries. China includes Hong Kong. Trademarks are classified under the 11th edition of the Nice classification of goods and services, which classifies trademarks under 34 categories of goods and 11 categories of services. Fractional counts of trademarks were assigned to each category to assign the proper weight of a trademark to the corresponding category under the classification. These counts are then grouped under 10 industry sectors following a mapping defined by Edital.

**Source(s)**

National Center for Science and Engineering Statistics, National Science Foundation; Science-Metrix; USPTO trademark data hosted by Reed Tech (LexisNexis), accessed April 2019; EUIPO trademark data, accessed April 2019.

*Science and Engineering Indicators*

TABLE S8-57

## Number of registered USPTO and EUIPO trademarks in the business sector of transportation, by region, country, or economy: 1998–2018

(Number)

| Region, country, or economy | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO |
| World | 4,144 | 1,947 | 4,476 | 3,097 | 5,771 | 2,721 | 5,438 | 2,679 | 7,465 | 2,382 | 6,271 | 2,380 | 5,433 | 2,530 | 5,637 | 4,352 | 7,087 | 4,412 | 7,987 | 4,719 | 8,835 | 5,603 | 8,056 | 6,103 | 7,088 | 6,723 | 7,607 | 6,043 | 7,558 | 6,333 | 7,895 | 6,218 | 8,062 | 6,374 | 8,181 | 6,591 | 9,315 | 7,609 | 10,138 | 7,791 | 10,841 | 8,113 |
| North America | 3,377 | 499 | 3,586 | 548 | 4,656 | 504 | 4,387 | 480 | 5,667 | 466 | 4,614 | 425 | 3,985 | 383 | 4,268 | 653 | 5,166 | 662 | 5,725 | 630 | 6,244 | 693 | 5,685 | 782 | 5,000 | 716 | 5,373 | 579 | 5,274 | 742 | 5,483 | 642 | 5,575 | 693 | 5,598 | 769 | 6,021 | 733 | 6,344 | 714 | 6,216 | 761 |
| Canada | 112 | 12 | 113 | 22 | 171 | 26 | 122 | 26 | 220 | 29 | 224 | 30 | 163 | 30 | 176 | 45 | 234 | 34 | 212 | 33 | 232 | 42 | 248 | 49 | 208 | 72 | 194 | 49 | 215 | 38 | 209 | 37 | 204 | 52 | 216 | 65 | 237 | 50 | 261 | 60 | 248 | 62 |
| Mexico | 16 | 5 | 6 | 3 | 20 | 1 | 15 | 12 | 9 | 3 | 24 | 5 | 13 | 2 | 14 | 3 | 13 | 3 | 20 | 2 | 29 | 7 | 26 | 12 | 27 | 3 | 26 | 4 | 29 | 4 | 38 | 6 | 29 | 7 | 39 | 9 | 18 | 5 | 31 | 7 | 30 | 9 |
| Puerto Rico | 0 | 0 | 2 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 1 | 0 | 3 | 0 | 11 | 0 | 4 | 0 | 2 | 0 | 6 | 0 | 3 | 0 | 6 | 0 | 3 | 0 | 4 | 0 | 4 | 0 | 5 | 0 | 4 | 0 | 3 | 0 |
| United States | 3,249 | 482 | 3,464 | 523 | 4,465 | 476 | 4,248 | 443 | 5,438 | 435 | 4,365 | 390 | 3,807 | 352 | 4,078 | 605 | 4,917 | 624 | 5,481 | 595 | 5,979 | 643 | 5,409 | 721 | 4,760 | 641 | 5,150 | 526 | 5,024 | 700 | 5,233 | 599 | 5,338 | 635 | 5,339 | 695 | 5,761 | 678 | 6,048 | 647 | 5,936 | 691 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Central and South America | 28 | 7 | 27 | 12 | 33 | 18 | 24 | 23 | 41 | 32 | 35 | 14 | 42 | 32 | 41 | 55 | 38 | 42 | 39 | 30 | 55 | 27 | 55 | 47 | 55 | 48 | 46 | 39 | 49 | 28 | 45 | 35 | 45 | 28 | 62 | 20 | 62 | 24 | 71 | 21 | 60 | 33 |
| Argentina | 2 | 0 | 3 | 1 | 1 | 3 | 1 | 6 | 2 | 1 | 4 | 3 | 1 | 5 | 2 | 4 | 3 | 11 | 1 | 6 | 10 | 2 | 3 | 6 | 5 | 5 | 8 | 7 | 3 | 2 | 2 | 0 | 7 | 5 | 5 | 1 | 7 | 3 | 5 | 2 | 5 | 13 |
| Brazil | 10 | 3 | 4 | 6 | 17 | 7 | 5 | 8 | 8 | 21 | 10 | 6 | 15 | 17 | 14 | 32 | 12 | 13 | 8 | 11 | 9 | 11 | 18 | 24 | 11 | 27 | 10 | 19 | 20 | 12 | 15 | 17 | 15 | 14 | 22 | 10 | 18 | 7 | 24 | 11 | 26 | 8 |
| All others | 16 | 4 | 20 | 6 | 16 | 7 | 18 | 9 | 31 | 9 | 20 | 5 | 25 | 10 | 26 | 18 | 23 | 18 | 30 | 13 | 36 | 14 | 34 | 17 | 38 | 16 | 28 | 14 | 25 | 14 | 28 | 18 | 23 | 9 | 35 | 9 | 37 | 13 | 42 | 8 | 30 | 11 |
| Europe | 480 | 1,176 | 583 | 2,134 | 692 | 1,813 | 673 | 1,835 | 1,154 | 1,614 | 1,082 | 1,674 | 887 | 1,785 | 839 | 3,222 | 1,216 | 3,218 | 1,381 | 3,521 | 1,560 | 4,207 | 1,463 | 4,556 | 1,257 | 5,162 | 1,296 | 4,722 | 1,335 | 4,714 | 1,353 | 4,636 | 1,341 | 4,669 | 1,372 | 4,821 | 1,624 | 5,490 | 1,529 | 5,548 | 1,685 | 5,715 |
| EU | 439 | 1,120 | 532 | 2,078 | 615 | 1,751 | 613 | 1,775 | 1,052 | 1,570 | 986 | 1,615 | 807 | 1,717 | 776 | 3,117 | 1,121 | 3,087 | 1,225 | 3,361 | 1,412 | 4,041 | 1,291 | 4,326 | 1,140 | 4,927 | 1,165 | 4,496 | 1,209 | 4,458 | 1,205 | 4,345 | 1,207 | 4,387 | 1,231 | 4,552 | 1,464 | 5,166 | 1,388 | 5,227 | 1,489 | 5,356 |
| Austria | 6 | 23 | 9 | 42 | 17 | 35 | 16 | 32 | 35 | 46 | 37 | 34 | 16 | 23 | 21 | 67 | 25 | 80 | 19 | 94 | 35 | 107 | 32 | 98 | 32 | 167 | 41 | 130 | 33 | 171 | 43 | 155 | 35 | 164 | 28 | 153 | 43 | 163 | 37 | 170 | 45 | 186 |
| Belgium | 6 | 17 | 7 | 33 | 7 | 37 | 4 | 40 | 20 | 36 | 11 | 24 | 7 | 21 | 10 | 44 | 22 | 40 | 10 | 61 | 18 | 52 | 15 | 75 | 17 | 80 | 8 | 74 | 18 | 55 | 19 | 94 | 18 | 74 | 15 | 82 | 22 | 90 | 18 | 100 | 23 | 99 |
| Denmark | 4 | 21 | 11 | 40 | 11 | 31 | 7 | 31 | 10 | 19 | 15 | 42 | 16 | 27 | 17 | 52 | 19 | 55 | 28 | 53 | 25 | 78 | 29 | 85 | 19 | 88 | 34 | 79 | 23 | 61 | 36 | 80 | 29 | 72 | 30 | 87 | 37 | 81 | 24 | 98 | 32 | 97 |
| Finland | 8 | 10 | 9 | 32 | 11 | 40 | 9 | 29 | 15 | 20 | 16 | 23 | 9 | 22 | 11 | 33 | 16 | 38 | 22 | 37 | 14 | 47 | 24 | 54 | 18 | 68 | 15 | 57 | 15 | 62 | 13 | 66 | 16 | 60 | 13 | 70 | 18 | 79 | 13 | 92 | 29 | 97 |
| France | 48 | 74 | 45 | 125 | 68 | 147 | 67 | 131 | 109 | 129 | 97 | 136 | 73 | 129 | 60 | 287 | 82 | 319 | 92 | 339 | 111 | 307 | 112 | 372 | 108 | 439 | 104 | 378 | 97 | 362 | 105 | 379 | 91 | 330 | 123 | 369 | 110 | 389 | 116 | 418 | 109 | 440 |
| Germany | 129 | 359 | 241 | 776 | 229 | 460 | 222 | 541 | 438 | 463 | 415 | 470 | 320 | 448 | 314 | 887 | 440 | 907 | 490 | 1,003 | 568 | 1,295 | 489 | 1,377 | 416 | 1,493 | 421 | 1,440 | 429 | 1,545 | 464 | 1,369 | 420 | 1,341 | 441 | 1,330 | 540 | 1,543 | 505 | 1,566 | 478 | 1,572 |
| Hungary | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 2 | 1 | 2 | 2 | 2 | 0 | 2 | 1 | 5 | 2 | 3 | 5 | 2 | 3 | 1 | 13 | 4 | 13 | 1 | 21 | 2 | 14 | 2 | 17 | 1 | 18 | 0 | 22 | 2 | 22 | 0 | 32 | 4 | 32 |
| Ireland | 1 | 6 | 3 | 12 | 4 | 14 | 8 | 13 | 6 | 12 | 5 | 13 | 6 | 14 | 6 | 20 | 6 | 19 | 6 | 21 | 8 | 21 | 7 | 34 | 5 | 33 | 7 | 22 | 7 | 28 | 16 | 17 | 9 | 27 | 8 | 39 | 9 | 27 | 10 | 28 | 16 | 27 |
| Italy | 67 | 136 | 74 | 276 | 83 | 253 | 86 | 250 | 130 | 223 | 99 | 189 | 102 | 237 | 101 | 370 | 184 | 378 | 181 | 444 | 203 | 536 | 196 | 527 | 152 | 525 | 131 | 486 | 174 | 486 | 177 | 482 | 152 | 474 | 159 | 535 | 177 | 692 | 173 | 669 | 228 | 759 |
| Netherlands | 17 | 24 | 18 | 97 | 35 | 63 | 24 | 58 | 51 | 51 | 44 | 49 | 25 | 60 | 38 | 152 | 44 | 137 | 51 | 134 | 43 | 160 | 61 | 222 | 48 | 292 | 46 | 258 | 66 | 233 | 47 | 221 | 60 | 210 | 51 | 231 | 70 | 274 | 73 | 257 | 63 | 275 |
| Spain | 17 | 195 | 7 | 172 | 21 | 266 | 19 | 251 | 31 | 245 | 32 | 258 | 26 | 386 | 26 | 635 | 48 | 535 | 46 | 515 | 60 | 599 | 36 | 564 | 53 | 687 | 53 | 580 | 59 | 509 | 41 | 496 | 42 | 484 | 55 | 515 | 39 | 530 | 47 | 473 | 47 | 481 |
| Sweden | 33 | 48 | 32 | 136 | 41 | 89 | 54 | 83 | 61 | 58 | 51 | 98 | 50 | 73 | 42 | 100 | 41 | 100 | 49 | 116 | 61 | 144 | 61 | 138 | 55 | 167 | 58 | 168 | 58 | 148 | 46 | 159 | 60 | 154 | 50 | 156 | 66 | 176 | 63 | 189 | 72 | 178 |
| United Kingdom | 85 | 186 | 68 | 297 | 78 | 275 | 84 | 269 | 132 | 239 | 142 | 234 | 136 | 229 | 109 | 352 | 147 | 341 | 188 | 367 | 194 | 411 | 180 | 440 | 172 | 474 | 195 | 440 | 173 | 418 | 144 | 426 | 215 | 509 | 196 | 482 | 248 | 531 | 244 | 488 | 260 | 488 |
| All others | 21 | 20 | 9 | 41 | 10 | 42 | 13 | 45 | 13 | 29 | 21 | 42 | 18 | 47 | 20 | 118 | 41 | 133 | 41 | 171 | 68 | 282 | 49 | 331 | 41 | 402 | 50 | 364 | 55 | 365 | 52 | 384 | 58 | 470 | 61 | 481 | 82 | 568 | 67 | 647 | 84 | 625 |
| Other Europe | 41 | 57 | 51 | 56 | 77 | 61 | 59 | 60 | 102 | 44 | 97 | 59 | 80 | 68 | 63 | 105 | 94 | 131 | 157 | 160 | 149 | 166 | 172 | 230 | 117 | 235 | 131 | 226 | 127 | 257 | 148 | 290 | 135 | 281 | 142 | 270 | 160 | 325 | 141 | 322 | 196 | 360 |
| Former Soviet Union | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 5 | 1 | 0 | 4 | 1 | 6 | 4 | 3 | 5 | 4 | 3 | 2 | 8 | 8 | 12 | 7 |
| Norway | 1 | 4 | 4 | 8 | 8 | 3 | 5 | 3 | 7 | 4 | 5 | 8 | 6 | 8 | 5 | 9 | 5 | 15 | 19 | 12 | 10 | 18 | 11 | 20 | 10 | 24 | 16 | 20 | 10 | 15 | 12 | 27 | 12 | 21 | 7 | 19 | 12 | 27 | 11 | 26 | 15 | 46 |
| Russia | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 2 | 3 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 5 | 2 | 5 | 1 | 3 | 2 | 15 | 5 | 9 | 4 | 9 | 5 | 10 | 10 | 12 | 11 | 11 | 10 | 7 | 5 | 8 | 11 | 8 | 23 | 19 | 18 |
| Switzerland | 38 | 45 | 42 | 37 | 64 | 50 | 48 | 46 | 87 | 33 | 83 | 46 | 68 | 50 | 51 | 81 | 73 | 99 | 109 | 112 | 110 | 126 | 126 | 175 | 75 | 175 | 80 | 162 | 82 | 174 | 88 | 173 | 84 | 173 | 104 | 170 | 89 | 183 | 75 | 182 | 107 | 190 |
| All others | 1 | 8 | 4 | 11 | 4 | 9 | 6 | 10 | 4 | 7 | 8 | 4 | 5 | 9 | 3 | 14 | 11 | 14 | 24 | 35 | 24 | 20 | 21 | 30 | 23 | 30 | 22 | 39 | 24 | 54 | 35 | 73 | 24 | 74 | 20 | 72 | 47 | 101 | 39 | 81 | 42 | 100 |
| Asia | 188 | 180 | 198 | 270 | 289 | 264 | 259 | 214 | 415 | 190 | 388 | 204 | 385 | 255 | 390 | 351 | 552 | 424 | 702 | 454 | 809 | 591 | 731 | 605 | 645 | 692 | 751 | 609 | 777 | 758 | 901 | 800 | 975 | 853 | 1,015 | 864 | 1,421 | 1,190 | 2,007 | 1,369 | 2,622 | 1,419 |

TABLE S8-57

## Number of registered USPTO and EUIPO trademarks in the business sector of transportation, by region, country, or economy: 1998–2018

(Number)

| Region, country, or economy | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO |
| China | 12 | 12 | 21 | 16 | 35 | 14 | 22 | 15 | 32 | 15 | 54 | 18 | 46 | 23 | 49 | 37 | 124 | 82 | 210 | 89 | 246 | 137 | 266 | 141 | 237 | 200 | 275 | 215 | 301 | 276 | 358 | 283 | 403 | 304 | 435 | 370 | 829 | 564 | 1,419 | 776 | 1,975 | 910 |
| India | 3 | 3 | 5 | 3 | 1 | 2 | 9 | 3 | 4 | 4 | 6 | 2 | 10 | 1 | 7 | 10 | 13 | 11 | 15 | 10 | 11 | 9 | 8 | 20 | 10 | 15 | 14 | 23 | 11 | 14 | 21 | 19 | 12 | 4 | 14 | 18 | 13 | 12 | 18 | 14 | 13 | 16 |
| Japan | 107 | 135 | 119 | 194 | 146 | 167 | 135 | 130 | 219 | 131 | 213 | 120 | 207 | 168 | 193 | 202 | 260 | 213 | 276 | 231 | 326 | 306 | 245 | 266 | 222 | 241 | 233 | 203 | 238 | 263 | 286 | 312 | 293 | 262 | 268 | 239 | 336 | 281 | 279 | 260 | 343 | 265 |
| Malaysia | 1 | 0 | 1 | 2 | 3 | 2 | 2 | 3 | 1 | 3 | 0 | 2 | 3 | 2 | 3 | 5 | 4 | 6 | 7 | 2 | 2 | 3 | 5 | 1 | 2 | 2 | 7 | 10 | 1 | 3 | 1 | 2 | 1 | 5 | 2 | 1 | 2 | 2 | 1 | 5 | 4 | 2 |
| Singapore | 5 | 4 | 4 | 4 | 7 | 7 | 3 | 5 | 12 | 4 | 7 | 2 | 10 | 5 | 7 | 6 | 4 | 10 | 12 | 13 | 17 | 11 | 14 | 16 | 11 | 9 | 6 | 12 | 11 | 7 | 14 | 12 | 18 | 16 | 19 | 19 | 20 | 27 | 14 | 34 | 29 | 11 |
| South Korea | 10 | 9 | 14 | 3 | 23 | 12 | 19 | 11 | 30 | 9 | 38 | 15 | 31 | 11 | 25 | 9 | 21 | 10 | 44 | 37 | 69 | 33 | 69 | 52 | 72 | 118 | 93 | 56 | 100 | 84 | 100 | 71 | 95 | 109 | 136 | 93 | 101 | 201 | 145 | 170 | 123 | 103 |
| Taiwan | 47 | 17 | 32 | 45 | 66 | 57 | 67 | 41 | 108 | 22 | 67 | 41 | 65 | 40 | 99 | 77 | 122 | 85 | 130 | 68 | 131 | 84 | 115 | 101 | 86 | 98 | 107 | 85 | 107 | 104 | 109 | 92 | 132 | 140 | 131 | 109 | 111 | 90 | 116 | 102 | 122 | 98 |
| All others | 3 | 1 | 1 | 1 | 8 | 2 | 1 | 5 | 10 | 3 | 3 | 3 | 13 | 5 | 7 | 5 | 3 | 6 | 7 | 3 | 7 | 8 | 9 | 8 | 4 | 10 | 16 | 4 | 7 | 8 | 12 | 11 | 20 | 13 | 10 | 14 | 9 | 13 | 15 | 7 | 13 | 13 |
| Middle East | 3 | 6 | 4 | 14 | 12 | 9 | 5 | 6 | 10 | 13 | 12 | 6 | 13 | 13 | 16 | 18 | 14 | 19 | 24 | 16 | 14 | 16 | 15 | 40 | 16 | 27 | 20 | 28 | 11 | 30 | 18 | 29 | 15 | 53 | 26 | 36 | 37 | 49 | 32 | 42 | 50 | 74 |
| Israel | 3 | 2 | 3 | 11 | 12 | 6 | 2 | 4 | 8 | 7 | 11 | 3 | 13 | 11 | 12 | 10 | 8 | 9 | 17 | 7 | 10 | 10 | 11 | 23 | 12 | 12 | 13 | 5 | 5 | 13 | 6 | 12 | 9 | 6 | 17 | 15 | 19 | 22 | 18 | 16 | 35 | 47 |
| All others | 0 | 4 | 2 | 3 | 1 | 4 | 3 | 2 | 3 | 6 | 1 | 3 | 0 | 2 | 4 | 8 | 6 | 11 | 7 | 10 | 3 | 6 | 4 | 16 | 4 | 15 | 6 | 23 | 6 | 17 | 12 | 17 | 6 | 47 | 9 | 21 | 17 | 27 | 14 | 26 | 15 | 27 |
| Africa | 7 | 1 | 7 | 6 | 13 | 4 | 8 | 8 | 14 | 4 | 14 | 8 | 18 | 7 | 7 | 9 | 5 | 6 | 9 | 14 | 22 | 13 | 16 | 12 | 22 | 14 | 12 | 17 | 14 | 13 | 12 | 10 | 13 | 16 | 15 | 16 | 19 | 6 | 9 | 15 | 8 | 15 |
| South Africa | 4 | 1 | 6 | 5 | 1 | 4 | 3 | 5 | 3 | 3 | 4 | 7 | 5 | 5 | 5 | 7 | 2 | 3 | 5 | 6 | 5 | 6 | 6 | 6 | 6 | 7 | 5 | 5 | 8 | 8 | 4 | 5 | 4 | 5 | 6 | 4 | 6 | 2 | 1 | 6 | 2 | 6 |
| All others | 3 | 0 | 2 | 1 | 11 | 0 | 5 | 3 | 11 | 1 | 9 | 1 | 13 | 2 | 2 | 2 | 3 | 3 | 3 | 9 | 18 | 7 | 10 | 6 | 16 | 7 | 7 | 13 | 6 | 5 | 7 | 5 | 10 | 11 | 9 | 11 | 13 | 4 | 8 | 9 | 6 | 9 |
| Australia and Oceania | 23 | 11 | 21 | 17 | 25 | 14 | 28 | 26 | 56 | 15 | 57 | 17 | 55 | 25 | 34 | 33 | 60 | 28 | 78 | 47 | 104 | 45 | 80 | 54 | 82 | 56 | 90 | 46 | 87 | 43 | 72 | 57 | 85 | 50 | 82 | 58 | 113 | 99 | 123 | 78 | 120 | 88 |
| Australia | 19 | 9 | 16 | 14 | 22 | 11 | 25 | 18 | 41 | 8 | 39 | 11 | 48 | 21 | 26 | 25 | 49 | 21 | 63 | 34 | 81 | 37 | 62 | 41 | 60 | 46 | 69 | 32 | 74 | 33 | 55 | 49 | 69 | 37 | 70 | 44 | 84 | 79 | 96 | 64 | 98 | 68 |
| New Zealand | 3 | 2 | 5 | 4 | 3 | 3 | 4 | 6 | 12 | 6 | 10 | 6 | 5 | 4 | 9 | 8 | 11 | 8 | 14 | 10 | 22 | 8 | 12 | 9 | 15 | 7 | 19 | 14 | 10 | 8 | 13 | 7 | 14 | 12 | 12 | 8 | 25 | 16 | 25 | 11 | 21 | 18 |
| All others | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 2 | 3 | 1 | 7 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 1 | 0 | 6 | 5 | 7 | 3 | 1 | 1 | 2 | 1 | 4 | 1 | 2 | 0 | 0 | 5 | 5 | 3 | 2 | 3 | 1 | 2 |
| Unclassified | 37 | 66 | 48 | 95 | 51 | 96 | 53 | 86 | 107 | 48 | 68 | 32 | 47 | 29 | 41 | 11 | 36 | 13 | 30 | 6 | 27 | 12 | 12 | 6 | 12 | 8 | 20 | 2 | 12 | 4 | 11 | 9 | 12 | 12 | 10 | 7 | 17 | 18 | 22 | 4 | 79 | 7 |

USPTO = U.S. Patent and Trademark Office; EUIPO = European Union Intellectual Property Office; EU = European Union.

**Note(s)**

Trademarks are allocated according to holder information. Trademarks are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named holders. The EU includes 28 member countries. China includes Hong Kong. Trademarks are classified under the 11th edition of the Nice classification of goods and services, which classifies trademarks under 34 categories of goods and 11 categories of services. Fractional counts of trademarks were assigned to each category to assign the proper weight of a trademark to the corresponding category under the classification. These counts are then grouped under 10 industry sectors following a mapping defined by Edital.

**Source(s)**

National Center for Science and Engineering Statistics, National Science Foundation; Science-Metrix; USPTO trademark data hosted by Reed Tech (LexisNexis), accessed April 2019; EUIPO trademark data, accessed April 2019.

*Science and Engineering Indicators*

TABLE S8-58

## Number of registered USPTO and EUIPO trademarks unassigned under the Nice classification, by region, country, or economy: 1998–2018

(Number)

| | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Region, country, or economy | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO |
| World | 975 | 0 | 1,414 | 0 | 1,270 | 0 | 782 | 0 | 958 | 0 | 635 | 0 | 754 | 0 | 462 | 0 | 592 | 0 | 637 | 0 | 593 | 0 | 600 | 0 | 526 | 1 | 492 | 0 | 504 | 0 | 471 | 1 | 508 | 1 | 462 | 0 | 458 | 1 | 501 | 0 | 387 | 0 |
| North America | 198 | 0 | 166 | 0 | 256 | 0 | 230 | 0 | 391 | 0 | 299 | 0 | 282 | 0 | 271 | 0 | 401 | 0 | 438 | 0 | 427 | 0 | 469 | 0 | 441 | 1 | 380 | 0 | 396 | 0 | 371 | 1 | 389 | 0 | 381 | 0 | 339 | 1 | 388 | 0 | 364 | 0 |
| Canada | 2 | 0 | 5 | 0 | 0 | 0 | 4 | 0 | 4 | 0 | 3 | 0 | 3 | 0 | 4 | 0 | 8 | 0 | 7 | 0 | 5 | 0 | 7 | 0 | 6 | 0 | 2 | 0 | 8 | 0 | 8 | 0 | 7 | 0 | 8 | 0 | 6 | 0 | 6 | 0 | 3 | 0 |
| Mexico | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| Puerto Rico | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| United States | 196 | 0 | 161 | 0 | 256 | 0 | 226 | 0 | 384 | 0 | 295 | 0 | 278 | 0 | 264 | 0 | 391 | 0 | 431 | 0 | 422 | 0 | 462 | 0 | 435 | 1 | 378 | 0 | 388 | 0 | 363 | 1 | 381 | 0 | 373 | 0 | 333 | 1 | 381 | 0 | 361 | 0 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Central and South America | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 4 | 0 | 4 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 2 | 0 | 4 | 0 | 0 | 0 |
| Argentina | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Brazil | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| All others | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 2 | 0 | 3 | 0 | 0 | 0 |
| Europe | 6 | 0 | 8 | 0 | 8 | 0 | 8 | 0 | 10 | 0 | 10 | 0 | 13 | 0 | 11 | 0 | 8 | 0 | 11 | 0 | 17 | 0 | 9 | 0 | 9 | 0 | 9 | 0 | 13 | 0 | 17 | 0 | 8 | 1 | 4 | 0 | 9 | 0 | 7 | 0 | 8 | 0 |
| EU | 5 | 0 | 7 | 0 | 7 | 0 | 6 | 0 | 8 | 0 | 9 | 0 | 13 | 0 | 7 | 0 | 5 | 0 | 10 | 0 | 16 | 0 | 9 | 0 | 6 | 0 | 8 | 0 | 10 | 0 | 11 | 0 | 7 | 1 | 4 | 0 | 9 | 0 | 7 | 0 | 6 | 0 |
| Austria | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Belgium | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Denmark | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Finland | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| France | 0 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 2 | 0 | 1 | 0 | 1 | 0 | 2 | 0 | 4 | 0 | 3 | 0 | 0 | 0 |
| Germany | 1 | 0 | 2 | 0 | 2 | 0 | 2 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| Hungary | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ireland | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Italy | 1 | 0 | 1 | 0 | 2 | 0 | 2 | 0 | 1 | 0 | 1 | 0 | 7 | 0 | 1 | 0 | 0 | 0 | 5 | 0 | 11 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 3 | 0 | 2 | 0 | 3 | 0 |
| Netherlands | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spain | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 |
| Sweden | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| United Kingdom | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 3 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 2 | 0 | 5 | 0 | 4 | 0 | 1 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| All others | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| Other Europe | 1 | 0 | 1 | 0 | 1 | 0 | 2 | 0 | 3 | 0 | 1 | 0 | 0 | 0 | 4 | 0 | 3 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 3 | 0 | 1 | 0 | 3 | 0 | 7 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 |
| Former Soviet Union | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Norway | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Russia | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Switzerland | 1 | 0 | 1 | 0 | 1 | 0 | 2 | 0 | 3 | 0 | 1 | 0 | 0 | 0 | 4 | 0 | 2 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 3 | 0 | 1 | 0 | 3 | 0 | 7 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Asia | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 2 | 0 | 1 | 0 | 2 | 0 | 2 | 0 | 1 | 0 | 7 | 0 | 1 | 0 | 1 | 0 | 8 | 0 | 1 | 0 | 7 | 0 | 4 | 0 | 2 | 0 | 7 | 0 | 0 | 0 |

TABLE S8-58

## Number of registered USPTO and EUIPO trademarks unassigned under the Nice classification, by region, country, or economy: 1998–2018

(Number)

| | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Region, country, or economy | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO | USPTO | EUIPO |
| China | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| India | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Japan | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| Malaysia | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Singapore | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| South Korea | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| Taiwan | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 3 | 0 | 0 | 0 | 6 | 0 | 0 | 0 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 6 | 0 | 1 | 0 | 1 | 0 | 8 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| Middle East | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 6 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| Israel | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 6 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Africa | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| South Africa | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| Australia and Oceania | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| Australia | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| New Zealand | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Unclassified | 771 | 0 | 1,238 | 0 | 1,004 | 0 | 544 | 0 | 556 | 0 | 322 | 0 | 455 | 0 | 178 | 0 | 181 | 0 | 182 | 0 | 143 | 0 | 111 | 0 | 75 | 0 | 95 | 0 | 73 | 0 | 79 | 0 | 97 | 0 | 74 | 0 | 104 | 0 | 94 | 0 | 14 | 0 |

USPTO = U.S. Patent and Trademark Office; EUIPO = European Union Intellectual Property Office; EU = European Union.

**Note(s)**

Trademarks are allocated according to holder information. Trademarks are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named holders. The EU includes 28 member countries. China includes Hong Kong. Trademarks are classified under the 11th edition of the Nice classification of goods and services, which classifies trademarks under 34 categories of goods and 11 categories of services. Fractional counts of trademarks were assigned to each category to assign the proper weight of a trademark to the corresponding category under the classification.

**Source(s)**

National Center for Science and Engineering Statistics, National Science Foundation; Science-Metrix; USPTO patent data hosted by Reed Tech (LexisNexis), accessed April 2019; EUIPO trademark data, accessed April 2019.

*Science and Engineering Indicators*

TABLE S8-59

## Number of plant variety protections issued across national offices and aggregated by UPOV, by region, country, or economy: 2008–17

(Number)

| Region, country, or economy | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|---|---|---|---|---|
| World | 10,495 | 10,799 | 11,234 | 10,270 | 9,876 | 10,083 | 11,660 | 12,504 | 12,648 | 15,066 |
| North America | 1,543 | 1,325 | 1,425 | 1,336 | 1,389 | 2,003 | 1,931 | 1,988 | 1,848 | 1,970 |
| Canada | 56 | 67 | 78 | 65 | 59 | 73 | 91 | 67 | 69 | 122 |
| Mexico | 17 | 16 | 18 | 32 | 79 | 83 | 59 | 44 | 66 | 111 |
| Puerto Rico | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| United States | 1,470 | 1,241 | 1,329 | 1,239 | 1,251 | 1,847 | 1,781 | 1,877 | 1,713 | 1,737 |
| All others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Central and South America | 325 | 391 | 327 | 361 | 298 | 350 | 375 | 374 | 464 | 438 |
| Argentina | 166 | 184 | 168 | 122 | 61 | 86 | 146 | 149 | 169 | 132 |
| Brazil | 100 | 120 | 122 | 113 | 184 | 191 | 156 | 146 | 229 | 195 |
| All others | 59 | 87 | 37 | 126 | 53 | 73 | 73 | 79 | 66 | 111 |
| Europe | 5,958 | 5,754 | 6,405 | 6,006 | 5,817 | 5,656 | 6,422 | 6,580 | 6,075 | 9,095 |
| EU | 4,558 | 4,776 | 4,813 | 4,884 | 4,787 | 4,616 | 5,005 | 5,405 | 5,108 | 7,910 |
| Austria | 25 | 12 | 18 | 27 | 37 | 33 | 60 | 22 | 23 | 83 |
| Belgium | 76 | 77 | 82 | 87 | 97 | 84 | 77 | 61 | 84 | 107 |
| Denmark | 220 | 228 | 194 | 162 | 116 | 210 | 230 | 195 | 200 | 283 |
| Finland | 8 | 10 | 17 | 9 | 3 | 14 | 7 | 15 | 56 | 23 |
| France | 507 | 553 | 579 | 635 | 595 | 579 | 746 | 1,052 | 760 | 1,347 |
| Germany | 938 | 1,002 | 1,061 | 973 | 885 | 800 | 829 | 815 | 771 | 1,181 |
| Hungary | 30 | 19 | 49 | 17 | 22 | 24 | 29 | 23 | 26 | 25 |
| Ireland | 11 | 22 | 13 | 11 | 15 | 22 | 8 | 24 | 12 | 20 |
| Italy | 201 | 173 | 105 | 91 | 132 | 111 | 164 | 117 | 130 | 251 |
| Netherlands | 1,751 | 2,037 | 1,967 | 2,255 | 2,220 | 2,036 | 2,154 | 2,348 | 2,442 | 3,692 |
| Spain | 109 | 158 | 137 | 126 | 107 | 191 | 101 | 203 | 117 | 196 |
| Sweden | 28 | 32 | 22 | 31 | 24 | 33 | 14 | 23 | 16 | 39 |
| United Kingdom | 271 | 232 | 230 | 159 | 189 | 174 | 236 | 190 | 218 | 294 |
| All others | 383 | 221 | 339 | 301 | 345 | 305 | 350 | 317 | 253 | 369 |
| Other Europe | 1,400 | 978 | 1,592 | 1,122 | 1,030 | 1,040 | 1,417 | 1,175 | 967 | 1,185 |
| Former Soviet Union | 560 | 202 | 453 | 310 | 266 | 220 | 447 | 333 | 58 | 348 |
| Norway | 13 | 21 | 5 | 10 | 14 | 0 | 9 | 12 | 9 | 10 |
| Russia | 598 | 520 | 637 | 489 | 421 | 406 | 361 | 461 | 509 | 452 |
| Switzerland | 203 | 209 | 318 | 258 | 249 | 346 | 493 | 252 | 326 | 269 |
| All others | 26 | 26 | 179 | 55 | 80 | 68 | 107 | 117 | 65 | 106 |
| Asia | 1,940 | 2,612 | 2,219 | 1,681 | 1,630 | 1,435 | 2,182 | 2,862 | 3,657 | 2,824 |
| China | 486 | 960 | 659 | 246 | 323 | 255 | 883 | 1,484 | 2,018 | 1,544 |
| India | 2 | 4 | 3 | 2 | 1 | 3 | 1 | 0 | 4 | 4 |

TABLE S8-59

## Number of plant variety protections issued across national offices and aggregated by UPOV, by region, country, or economy: 2008–17

(Number)

| Region, country, or economy | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|---|---|---|---|---|
| Japan | 1,141 | 1,282 | 1,144 | 991 | 832 | 703 | 777 | 767 | 739 | 605 |
| Malaysia | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Singapore | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 3 | 0 |
| South Korea | 280 | 335 | 377 | 399 | 392 | 409 | 447 | 558 | 770 | 495 |
| Taiwan | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| All others | 31 | 31 | 36 | 43 | 82 | 64 | 74 | 52 | 123 | 176 |
| Middle East | 113 | 125 | 134 | 222 | 197 | 114 | 154 | 133 | 140 | 168 |
| Israel | 102 | 109 | 128 | 194 | 183 | 95 | 119 | 127 | 103 | 146 |
| All others | 11 | 16 | 6 | 28 | 14 | 19 | 35 | 6 | 37 | 22 |
| Africa | 170 | 96 | 161 | 205 | 170 | 124 | 78 | 76 | 95 | 94 |
| South Africa | 169 | 87 | 109 | 124 | 125 | 104 | 71 | 56 | 88 | 35 |
| All others | 1 | 9 | 52 | 81 | 45 | 20 | 7 | 20 | 7 | 59 |
| Australia and Oceania | 412 | 358 | 346 | 311 | 299 | 325 | 386 | 342 | 284 | 341 |
| Australia | 285 | 226 | 204 | 192 | 182 | 210 | 243 | 219 | 195 | 238 |
| New Zealand | 127 | 132 | 141 | 118 | 117 | 115 | 143 | 123 | 89 | 103 |
| All others | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Unclassified | 34 | 138 | 217 | 148 | 76 | 76 | 132 | 149 | 85 | 136 |

UPOV = International Union for the Protection of New Varieties of Plants; EU = European Union.

**Note(s)**

Plant variety protections are allocated according to holder information. Data were extracted from a UPOV document reporting on plant variety protections published for the 52nd ordinary session of the Council (November 2018). These data include official statistics reported by 75 national offices to the UPOV (data are complete for 43 of these offices, 11 offices are missing data for a single year, 5 offices are missing data for 2 years, and the remaining 16 offices are missing more years). Data are not available before 2007 as the UPOV does not present subdivided data per resident countries for the office in charge of the European Union. The EU includes 28 member countries. China includes Hong Kong and might also include Taiwan as it does not appear as a standalone country in the UPOV reports.

**Source(s)**

National Center for Science and Engineering Statistics, National Science Foundation; Science-Metrix; UPOV plant variety protection data, accessed April 2019.

*Science and Engineering Indicators*

TABLE S8-60

## Citation of S&E articles in USPTO patents, including utility, design, and plant patents, by cited field and cited author address, by sector: 2013–18

(Number)

| Field, country, and sector | All patents | | | | | | Utility patents | | | | | | Design patents | | | | | | Plant patents | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
| All fields, all sectors | 630,385 | 693,022 | 683,934 | 663,339 | 676,983 | 640,330 | 629,274 | 692,794 | 683,362 | 662,457 | 676,359 | 639,660 | 1,083 | 214 | 542 | 849 | 530 | 644 | 28 | 14 | 30 | 33 | 94 | 26 |
| Foreign | 324,447 | 360,562 | 361,057 | 352,030 | 363,427 | 346,840 | 323,820 | 360,430 | 360,773 | 351,593 | 363,093 | 346,504 | 622 | 124 | 273 | 431 | 284 | 321 | 6 | 9 | 12 | 6 | 50 | 16 |
| Unknown country | 3,430 | 3,559 | 3,237 | 3,020 | 2,967 | 2,680 | 3,421 | 3,558 | 3,227 | 3,013 | 2,964 | 2,674 | 9 | 1 | 9 | 6 | 3 | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| United States | 302,508 | 328,901 | 319,640 | 308,289 | 310,589 | 290,809 | 302,034 | 328,806 | 319,362 | 307,851 | 310,303 | 290,483 | 452 | 90 | 260 | 412 | 242 | 317 | 22 | 5 | 18 | 27 | 44 | 10 |
| Academic | 196,677 | 213,693 | 211,001 | 206,038 | 207,680 | 196,235 | 196,407 | 213,626 | 210,845 | 205,725 | 207,492 | 196,003 | 261 | 63 | 139 | 289 | 148 | 223 | 9 | 5 | 16 | 25 | 41 | 10 |
| Business | 56,945 | 62,549 | 57,998 | 54,306 | 54,881 | 49,611 | 56,859 | 62,539 | 57,948 | 54,278 | 54,845 | 49,563 | 85 | 10 | 51 | 28 | 37 | 47 | 1 | 0 | 0 | 0 | 0 | 0 |
| Federal government | 12,047 | 12,724 | 12,451 | 11,964 | 11,876 | 11,536 | 12,019 | 12,723 | 12,443 | 11,943 | 11,864 | 11,531 | 17 | 0 | 6 | 19 | 9 | 5 | 10 | 0 | 2 | 2 | 3 | 0 |
| FFRDCs | 5,988 | 6,710 | 6,256 | 6,235 | 6,268 | 5,834 | 5,977 | 6,709 | 6,254 | 6,235 | 6,266 | 5,832 | 11 | 2 | 2 | 0 | 3 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| Nonprofit | 15,504 | 16,814 | 16,966 | 15,776 | 15,755 | 14,725 | 15,469 | 16,812 | 16,929 | 15,742 | 15,741 | 14,706 | 35 | 1 | 37 | 33 | 14 | 19 | 0 | 0 | 0 | 0 | 0 | 0 |
| State and local government | 298 | 318 | 272 | 315 | 243 | 242 | 298 | 317 | 272 | 314 | 243 | 242 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Joint and unknown sectors | 15,049 | 16,092 | 14,696 | 13,655 | 13,885 | 12,626 | 15,005 | 16,081 | 14,671 | 13,613 | 13,852 | 12,606 | 42 | 12 | 24 | 41 | 32 | 20 | 2 | 0 | 0 | 1 | 1 | 0 |
| Agricultural sciences | 3,307 | 3,587 | 3,336 | 3,186 | 3,287 | 3,244 | 3,295 | 3,577 | 3,328 | 3,161 | 3,251 | 3,220 | 8 | 0 | 0 | 11 | 0 | 7 | 4 | 10 | 8 | 14 | 36 | 17 |
| Foreign | 1,926 | 2,152 | 2,164 | 2,117 | 2,185 | 2,154 | 1,920 | 2,147 | 2,159 | 2,106 | 2,168 | 2,140 | 6 | 0 | 0 | 10 | 0 | 6 | 0 | 5 | 5 | 1 | 17 | 8 |
| Unknown country | 12 | 8 | 12 | 5 | 8 | 6 | 12 | 8 | 12 | 5 | 8 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| United States | 1,369 | 1,426 | 1,160 | 1,065 | 1,094 | 1,084 | 1,363 | 1,421 | 1,157 | 1,051 | 1,075 | 1,074 | 2 | 0 | 0 | 1 | 0 | 1 | 4 | 5 | 3 | 13 | 19 | 9 |
| Academic | 922 | 1,015 | 824 | 717 | 773 | 762 | 921 | 1,010 | 821 | 705 | 755 | 753 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 5 | 2 | 11 | 17 | 9 |
| Business | 151 | 131 | 111 | 110 | 102 | 114 | 151 | 131 | 111 | 109 | 102 | 114 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Federal government | 204 | 181 | 151 | 173 | 152 | 156 | 200 | 181 | 150 | 172 | 151 | 155 | 0 | 0 | 0 | 0 | 0 | 1 | 4 | 0 | 1 | 1 | 1 | 0 |
| FFRDCs | 3 | 4 | 7 | 9 | 11 | 5 | 3 | 4 | 7 | 9 | 11 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Nonprofit | 5 | 5 | 7 | 4 | 5 | 5 | 5 | 5 | 7 | 4 | 5 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| State and local government | 1 | 1 | 2 | 1 | 0 | 1 | 1 | 1 | 2 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Joint and unknown sectors | 83 | 89 | 59 | 51 | 51 | 41 | 83 | 89 | 59 | 50 | 50 | 40 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| Astronomy and astrophysics | 99 | 138 | 102 | 180 | 120 | 114 | 99 | 138 | 102 | 179 | 120 | 114 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Foreign | 62 | 85 | 61 | 115 | 77 | 62 | 62 | 85 | 61 | 114 | 77 | 62 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Unknown country | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| United States | 37 | 53 | 41 | 65 | 43 | 52 | 37 | 53 | 41 | 65 | 43 | 52 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Academic | 17 | 25 | 20 | 36 | 17 | 29 | 17 | 25 | 20 | 36 | 17 | 29 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Business | 7 | 13 | 7 | 11 | 2 | 5 | 7 | 13 | 7 | 11 | 2 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Federal government | 1 | 3 | 5 | 8 | 10 | 8 | 1 | 3 | 5 | 8 | 10 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| FFRDCs | 8 | 10 | 7 | 7 | 10 | 8 | 8 | 10 | 7 | 7 | 10 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Nonprofit | 2 | 3 | 0 | 0 | 2 | 1 | 2 | 3 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| State and local government | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Joint and unknown sectors | 1 | 0 | 2 | 3 | 3 | 0 | 1 | 0 | 2 | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Biological and biomedical sciences | 169,501 | 183,498 | 184,400 | 174,177 | 179,761 | 176,230 | 169,434 | 183,490 | 184,359 | 174,111 | 179,661 | 176,191 | 51 | 5 | 21 | 47 | 42 | 30 | 16 | 3 | 20 | 19 | 58 | 9 |

TABLE S8-60

## Citation of S&E articles in USPTO patents, including utility, design, and plant patents, by cited field and cited author address, by sector: 2013–18

(Number)

| Field, country, and sector | All patents | | | | | | Utility patents | | | | | | Design patents | | | | | | Plant patents | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
| Foreign | 82,968 | 90,911 | 90,782 | 85,418 | 88,424 | 87,135 | 82,923 | 90,904 | 90,766 | 85,383 | 88,369 | 87,113 | 39 | 4 | 9 | 30 | 22 | 14 | 6 | 3 | 7 | 5 | 33 | 8 |
| Unknown country | 762 | 758 | 712 | 665 | 644 | 638 | 762 | 758 | 712 | 665 | 643 | 638 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| United States | 85,772 | 91,829 | 92,906 | 88,094 | 90,693 | 88,457 | 85,749 | 91,828 | 92,881 | 88,064 | 90,648 | 88,440 | 12 | 1 | 12 | 17 | 19 | 16 | 10 | 0 | 13 | 14 | 25 | 1 |
| Academic | 54,878 | 58,391 | 59,383 | 56,674 | 58,472 | 57,647 | 54,862 | 58,390 | 59,363 | 56,648 | 58,438 | 57,638 | 9 | 1 | 8 | 13 | 10 | 8 | 8 | 0 | 13 | 13 | 23 | 1 |
| Business | 15,020 | 16,287 | 16,293 | 15,313 | 15,817 | 14,403 | 15,018 | 16,287 | 16,291 | 15,312 | 15,813 | 14,398 | 1 | 0 | 2 | 1 | 4 | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| Federal government | 5,404 | 5,786 | 5,800 | 5,458 | 5,426 | 5,315 | 5,402 | 5,786 | 5,800 | 5,457 | 5,422 | 5,315 | 2 | 0 | 0 | 1 | 2 | 0 | 1 | 0 | 0 | 1 | 2 | 0 |
| FFRDCs | 993 | 1,106 | 981 | 961 | 905 | 937 | 993 | 1,106 | 981 | 961 | 905 | 936 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Nonprofit | 5,553 | 6,075 | 6,367 | 6,085 | 6,461 | 6,611 | 5,553 | 6,075 | 6,367 | 6,084 | 6,461 | 6,610 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| State and local government | 97 | 111 | 101 | 102 | 81 | 99 | 96 | 111 | 101 | 102 | 81 | 99 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Joint and unknown sectors | 3,828 | 4,073 | 3,979 | 3,501 | 3,531 | 3,444 | 3,825 | 4,073 | 3,978 | 3,500 | 3,527 | 3,444 | 1 | 0 | 1 | 1 | 4 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| Chemistry | 53,600 | 55,987 | 56,548 | 54,901 | 55,425 | 52,826 | 53,579 | 55,986 | 56,514 | 54,866 | 55,382 | 52,784 | 21 | 1 | 34 | 35 | 43 | 42 | 0 | 0 | 0 | 0 | 0 | 0 |
| Foreign | 30,781 | 32,672 | 33,419 | 32,151 | 32,818 | 31,679 | 30,776 | 32,671 | 33,405 | 32,136 | 32,802 | 31,666 | 5 | 1 | 14 | 16 | 16 | 12 | 0 | 0 | 0 | 0 | 0 | 0 |
| Unknown country | 86 | 66 | 42 | 43 | 44 | 46 | 86 | 66 | 42 | 43 | 44 | 46 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| United States | 22,733 | 23,249 | 23,087 | 22,707 | 22,563 | 21,102 | 22,717 | 23,249 | 23,067 | 22,688 | 22,536 | 21,072 | 16 | 0 | 20 | 19 | 27 | 30 | 0 | 0 | 0 | 0 | 0 | 0 |
| Academic | 16,962 | 17,272 | 17,085 | 16,985 | 16,855 | 16,022 | 16,953 | 17,272 | 17,072 | 16,969 | 16,833 | 15,997 | 9 | 0 | 13 | 16 | 22 | 25 | 0 | 0 | 0 | 0 | 0 | 0 |
| Business | 3,250 | 3,418 | 3,340 | 3,243 | 3,030 | 2,537 | 3,250 | 3,418 | 3,336 | 3,240 | 3,027 | 2,533 | 0 | 0 | 4 | 3 | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| Federal government | 527 | 517 | 510 | 499 | 518 | 530 | 527 | 517 | 510 | 499 | 517 | 530 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| FFRDCs | 788 | 804 | 773 | 754 | 796 | 791 | 783 | 804 | 771 | 754 | 794 | 791 | 5 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Nonprofit | 662 | 719 | 857 | 679 | 810 | 696 | 662 | 719 | 857 | 679 | 810 | 696 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| State and local government | 6 | 7 | 5 | 14 | 6 | 6 | 6 | 7 | 5 | 14 | 6 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Joint and unknown sectors | 538 | 512 | 516 | 533 | 549 | 520 | 538 | 512 | 515 | 533 | 548 | 519 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Computer and information sciences | 82,048 | 91,608 | 88,616 | 88,723 | 90,931 | 93,006 | 81,788 | 91,557 | 88,497 | 88,607 | 90,844 | 92,939 | 260 | 51 | 119 | 116 | 87 | 67 | 0 | 0 | 0 | 0 | 0 | 0 |
| Foreign | 39,482 | 44,112 | 43,895 | 44,961 | 48,931 | 50,702 | 39,343 | 44,082 | 43,845 | 44,881 | 48,877 | 50,669 | 139 | 30 | 50 | 79 | 54 | 33 | 0 | 0 | 0 | 0 | 0 | 0 |
| Unknown country | 651 | 754 | 636 | 608 | 499 | 413 | 651 | 753 | 636 | 607 | 499 | 413 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| United States | 41,915 | 46,743 | 44,085 | 43,154 | 41,501 | 41,891 | 41,794 | 46,722 | 44,016 | 43,118 | 41,468 | 41,857 | 121 | 21 | 69 | 35 | 33 | 34 | 0 | 0 | 0 | 0 | 0 | 0 |
| Academic | 27,085 | 31,008 | 29,823 | 29,073 | 28,400 | 28,826 | 27,041 | 30,991 | 29,792 | 29,050 | 28,376 | 28,799 | 45 | 17 | 31 | 23 | 24 | 27 | 0 | 0 | 0 | 0 | 0 | 0 |
| Business | 11,451 | 12,261 | 11,146 | 11,006 | 10,288 | 10,218 | 11,386 | 12,259 | 11,111 | 10,998 | 10,281 | 10,211 | 65 | 3 | 35 | 9 | 7 | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| Federal government | 301 | 312 | 305 | 323 | 328 | 419 | 301 | 312 | 305 | 323 | 328 | 419 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| FFRDCs | 433 | 467 | 478 | 493 | 427 | 428 | 433 | 467 | 478 | 493 | 426 | 428 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Nonprofit | 958 | 983 | 798 | 698 | 518 | 384 | 947 | 982 | 795 | 695 | 517 | 384 | 11 | 1 | 3 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| State and local government | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Joint and unknown sectors | 1,686 | 1,712 | 1,534 | 1,559 | 1,540 | 1,615 | 1,686 | 1,711 | 1,534 | 1,558 | 1,539 | 1,615 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Engineering | 69,985 | 78,021 | 75,221 | 74,650 | 77,458 | 71,439 | 69,812 | 77,992 | 75,142 | 74,539 | 77,356 | 71,273 | 173 | 28 | 78 | 111 | 102 | 166 | 0 | 1 | 1 | 0 | 0 | 0 |
| Foreign | 36,045 | 39,932 | 39,743 | 39,655 | 41,607 | 39,004 | 35,932 | 39,908 | 39,689 | 39,611 | 41,556 | 38,928 | 112 | 23 | 54 | 44 | 51 | 76 | 0 | 1 | 0 | 0 | 0 | 0 |
| Unknown country | 382 | 418 | 341 | 340 | 343 | 295 | 382 | 418 | 341 | 339 | 343 | 295 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

TABLE S8-60

## Citation of S&E articles in USPTO patents, including utility, design, and plant patents, by cited field and cited author address, by sector: 2013–18

(Number)

| | All patents | | | | | | Utility patents | | | | | | Design patents | | | | | | Plant patents | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Field, country, and sector | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
| United States | 33,559 | 37,672 | 35,137 | 34,655 | 35,507 | 32,140 | 33,498 | 37,666 | 35,112 | 34,589 | 35,457 | 32,051 | 61 | 6 | 24 | 66 | 51 | 90 | 0 | 0 | 1 | 0 | 0 | 0 |
| Academic | 21,402 | 24,359 | 23,777 | 23,892 | 24,424 | 22,208 | 21,362 | 24,355 | 23,761 | 23,843 | 24,395 | 22,142 | 40 | 4 | 15 | 49 | 29 | 66 | 0 | 0 | 1 | 0 | 0 | 0 |
| Business | 7,990 | 8,671 | 7,138 | 6,515 | 6,810 | 5,988 | 7,984 | 8,669 | 7,131 | 6,508 | 6,795 | 5,968 | 7 | 2 | 7 | 7 | 15 | 20 | 0 | 0 | 0 | 0 | 0 | 0 |
| Federal government | 791 | 870 | 865 | 793 | 871 | 838 | 787 | 870 | 865 | 792 | 871 | 837 | 4 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| FFRDCs | 1,247 | 1,398 | 1,227 | 1,373 | 1,357 | 1,321 | 1,242 | 1,398 | 1,227 | 1,373 | 1,357 | 1,320 | 5 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Nonprofit | 792 | 890 | 754 | 669 | 599 | 457 | 789 | 890 | 753 | 663 | 594 | 455 | 3 | 0 | 1 | 6 | 6 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| State and local government | 17 | 26 | 21 | 30 | 17 | 13 | 17 | 26 | 21 | 30 | 17 | 13 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Joint and unknown sectors | 1,320 | 1,458 | 1,355 | 1,382 | 1,429 | 1,316 | 1,318 | 1,458 | 1,354 | 1,380 | 1,429 | 1,316 | 2 | 0 | 1 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Geosciences, atmospheric, and ocean sciences | 2,993 | 3,566 | 3,241 | 2,938 | 3,638 | 3,226 | 2,977 | 3,564 | 3,241 | 2,937 | 3,632 | 3,219 | 16 | 2 | 0 | 1 | 6 | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| Foreign | 1,422 | 1,744 | 1,539 | 1,428 | 1,815 | 1,592 | 1,406 | 1,744 | 1,539 | 1,428 | 1,811 | 1,586 | 16 | 0 | 0 | 0 | 4 | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| Unknown country | 101 | 104 | 83 | 87 | 87 | 59 | 101 | 104 | 83 | 87 | 87 | 59 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| United States | 1,470 | 1,718 | 1,620 | 1,424 | 1,736 | 1,575 | 1,470 | 1,716 | 1,620 | 1,423 | 1,734 | 1,574 | 0 | 2 | 0 | 1 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Academic | 665 | 745 | 767 | 622 | 752 | 623 | 665 | 745 | 767 | 621 | 751 | 623 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Business | 442 | 559 | 492 | 396 | 558 | 597 | 442 | 559 | 492 | 396 | 558 | 597 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Federal government | 89 | 88 | 68 | 101 | 87 | 64 | 89 | 88 | 68 | 101 | 87 | 64 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| FFRDCs | 66 | 78 | 61 | 77 | 72 | 46 | 66 | 78 | 61 | 77 | 72 | 46 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Nonprofit | 49 | 54 | 64 | 40 | 69 | 80 | 49 | 54 | 64 | 40 | 69 | 80 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| State and local government | 2 | 0 | 2 | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Joint and unknown sectors | 156 | 193 | 165 | 187 | 198 | 165 | 156 | 191 | 165 | 187 | 197 | 164 | 0 | 2 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Health sciences | 160,412 | 174,212 | 171,304 | 166,134 | 170,686 | 157,400 | 159,970 | 174,111 | 171,043 | 165,670 | 170,503 | 157,195 | 442 | 101 | 261 | 464 | 183 | 205 | 0 | 0 | 0 | 0 | 0 | 0 |
| Foreign | 79,991 | 86,447 | 85,304 | 83,268 | 85,706 | 80,944 | 79,766 | 86,396 | 85,172 | 83,045 | 85,621 | 80,831 | 225 | 51 | 131 | 223 | 86 | 113 | 0 | 0 | 0 | 0 | 0 | 0 |
| Unknown country | 1,289 | 1,298 | 1,274 | 1,134 | 1,198 | 1,116 | 1,280 | 1,298 | 1,265 | 1,130 | 1,196 | 1,110 | 8 | 0 | 9 | 4 | 2 | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| United States | 79,132 | 86,467 | 84,726 | 81,733 | 83,782 | 75,340 | 78,923 | 86,417 | 84,606 | 81,495 | 83,687 | 75,254 | 209 | 50 | 120 | 237 | 95 | 85 | 0 | 0 | 0 | 0 | 0 | 0 |
| Academic | 51,965 | 56,239 | 55,945 | 54,849 | 55,983 | 50,744 | 51,835 | 56,202 | 55,884 | 54,695 | 55,931 | 50,696 | 130 | 38 | 61 | 154 | 52 | 48 | 0 | 0 | 0 | 0 | 0 | 0 |
| Business | 10,005 | 11,837 | 11,118 | 10,301 | 11,344 | 10,097 | 9,995 | 11,835 | 11,117 | 10,294 | 11,341 | 10,091 | 10 | 2 | 1 | 7 | 3 | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| Federal government | 3,581 | 3,783 | 3,669 | 3,573 | 3,434 | 3,240 | 3,570 | 3,783 | 3,663 | 3,557 | 3,427 | 3,238 | 11 | 0 | 6 | 17 | 7 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| FFRDCs | 253 | 223 | 263 | 242 | 265 | 198 | 253 | 223 | 263 | 242 | 264 | 197 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Nonprofit | 7,054 | 7,636 | 7,726 | 7,248 | 6,999 | 6,217 | 7,033 | 7,635 | 7,693 | 7,225 | 6,991 | 6,204 | 22 | 1 | 33 | 23 | 8 | 13 | 0 | 0 | 0 | 0 | 0 | 0 |
| State and local government | 169 | 168 | 137 | 162 | 136 | 119 | 169 | 167 | 137 | 161 | 136 | 119 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Joint and unknown sectors | 6,104 | 6,581 | 5,867 | 5,357 | 5,621 | 4,724 | 6,068 | 6,573 | 5,848 | 5,322 | 5,597 | 4,709 | 36 | 8 | 19 | 35 | 25 | 15 | 0 | 0 | 0 | 0 | 0 | 0 |
| Materials science | 9,503 | 10,684 | 11,007 | 10,174 | 10,871 | 10,058 | 9,502 | 10,679 | 11,006 | 10,174 | 10,870 | 10,054 | 1 | 5 | 1 | 0 | 1 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| Foreign | 5,926 | 6,839 | 7,310 | 6,930 | 7,328 | 6,918 | 5,925 | 6,834 | 7,309 | 6,930 | 7,328 | 6,918 | 1 | 5 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Unknown country | 11 | 12 | 13 | 17 | 14 | 14 | 11 | 12 | 13 | 17 | 14 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| United States | 3,566 | 3,833 | 3,684 | 3,226 | 3,530 | 3,126 | 3,566 | 3,833 | 3,684 | 3,226 | 3,529 | 3,122 | 0 | 0 | 0 | 0 | 1 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| Academic | 2,269 | 2,437 | 2,450 | 2,196 | 2,442 | 2,147 | 2,269 | 2,437 | 2,450 | 2,196 | 2,442 | 2,145 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |

TABLE S8-60

## Citation of S&E articles in USPTO patents, including utility, design, and plant patents, by cited field and cited author address, by sector: 2013–18

(Number)

| | All patents | | | | | | Utility patents | | | | | | Design patents | | | | | | Plant patents | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Field, country, and sector | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
| Business | 626 | 614 | 535 | 417 | 454 | 365 | 626 | 614 | 535 | 417 | 453 | 364 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Federal government | 181 | 209 | 212 | 176 | 160 | 149 | 181 | 209 | 212 | 176 | 160 | 148 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| FFRDCs | 266 | 372 | 338 | 310 | 348 | 322 | 266 | 372 | 338 | 310 | 348 | 321 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Nonprofit | 67 | 55 | 48 | 43 | 42 | 33 | 67 | 55 | 48 | 43 | 42 | 33 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| State and local government | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Joint and unknown sectors | 156 | 146 | 101 | 84 | 84 | 110 | 156 | 146 | 101 | 84 | 84 | 110 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mathematics and statistics | 1,096 | 1,122 | 1,008 | 973 | 1,024 | 1,292 | 1,087 | 1,122 | 1,008 | 973 | 1,024 | 1,292 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Foreign | 521 | 567 | 479 | 486 | 560 | 679 | 512 | 567 | 479 | 486 | 560 | 679 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Unknown country | 4 | 3 | 2 | 2 | 9 | 0 | 4 | 3 | 2 | 2 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| United States | 571 | 552 | 527 | 484 | 455 | 613 | 571 | 552 | 527 | 484 | 455 | 613 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Academic | 435 | 425 | 419 | 381 | 369 | 494 | 435 | 425 | 419 | 381 | 369 | 494 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Business | 62 | 54 | 39 | 26 | 24 | 34 | 62 | 54 | 39 | 26 | 24 | 34 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Federal government | 14 | 15 | 11 | 19 | 14 | 15 | 14 | 15 | 11 | 19 | 14 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| FFRDCs | 27 | 24 | 12 | 14 | 21 | 37 | 27 | 24 | 12 | 14 | 21 | 37 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Nonprofit | 11 | 11 | 13 | 12 | 8 | 19 | 11 | 11 | 13 | 12 | 8 | 19 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| State and local government | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Joint and unknown sectors | 21 | 23 | 34 | 33 | 20 | 15 | 21 | 23 | 34 | 33 | 20 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Natural resources and conservation | 1,186 | 1,302 | 1,222 | 1,304 | 1,358 | 1,344 | 1,170 | 1,302 | 1,221 | 1,302 | 1,347 | 1,338 | 8 | 0 | 0 | 2 | 11 | 6 | 8 | 0 | 1 | 0 | 0 | 0 |
| Foreign | 688 | 767 | 752 | 850 | 861 | 842 | 683 | 767 | 752 | 849 | 850 | 838 | 5 | 0 | 0 | 1 | 11 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| Unknown country | 4 | 7 | 4 | 3 | 3 | 1 | 4 | 7 | 4 | 3 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| United States | 494 | 528 | 466 | 451 | 494 | 501 | 483 | 528 | 465 | 450 | 494 | 499 | 4 | 0 | 0 | 1 | 0 | 2 | 8 | 0 | 1 | 0 | 0 | 0 |
| Academic | 298 | 338 | 317 | 310 | 341 | 308 | 295 | 338 | 316 | 309 | 341 | 307 | 3 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 |
| Business | 79 | 69 | 53 | 50 | 53 | 52 | 77 | 69 | 53 | 50 | 53 | 52 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| Federal government | 56 | 62 | 44 | 41 | 53 | 51 | 51 | 62 | 44 | 41 | 53 | 51 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 |
| FFRDCs | 19 | 20 | 18 | 17 | 14 | 52 | 19 | 20 | 18 | 17 | 14 | 52 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Nonprofit | 8 | 1 | 5 | 4 | 4 | 8 | 8 | 1 | 5 | 4 | 4 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| State and local government | 2 | 4 | 2 | 3 | 2 | 2 | 2 | 4 | 2 | 3 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Joint and unknown sectors | 32 | 33 | 27 | 27 | 27 | 27 | 31 | 33 | 27 | 27 | 27 | 26 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Physics | 71,292 | 83,303 | 82,195 | 79,863 | 76,107 | 63,878 | 71,256 | 83,289 | 82,174 | 79,829 | 76,086 | 63,821 | 36 | 14 | 21 | 34 | 21 | 57 | 0 | 0 | 0 | 0 | 0 | 0 |
| Foreign | 42,438 | 51,991 | 53,227 | 52,112 | 50,499 | 42,498 | 42,417 | 51,985 | 53,220 | 52,098 | 50,486 | 42,465 | 21 | 5 | 7 | 14 | 14 | 33 | 0 | 0 | 0 | 0 | 0 | 0 |
| Unknown country | 112 | 114 | 104 | 92 | 92 | 72 | 112 | 114 | 104 | 92 | 92 | 72 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| United States | 28,742 | 31,199 | 28,864 | 27,659 | 25,515 | 21,308 | 28,726 | 31,190 | 28,850 | 27,639 | 25,508 | 21,284 | 15 | 9 | 14 | 20 | 7 | 24 | 0 | 0 | 0 | 0 | 0 | 0 |
| Academic | 17,741 | 19,199 | 18,133 | 17,951 | 16,405 | 13,869 | 17,729 | 19,196 | 18,122 | 17,933 | 16,400 | 13,850 | 12 | 3 | 11 | 18 | 5 | 19 | 0 | 0 | 0 | 0 | 0 | 0 |
| Business | 7,030 | 7,590 | 6,689 | 5,959 | 5,361 | 4,335 | 7,029 | 7,587 | 6,689 | 5,958 | 5,358 | 4,331 | 1 | 3 | 1 | 1 | 2 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| Federal government | 851 | 861 | 779 | 753 | 791 | 712 | 851 | 861 | 779 | 753 | 791 | 712 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

TABLE S8-60

## Citation of S&E articles in USPTO patents, including utility, design, and plant patents, by cited field and cited author address, by sector: 2013–18

(Number)

| | All patents | | | | | | Utility patents | | | | | | Design patents | | | | | | Plant patents | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Field, country, and sector | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
| FFRDCs | 1,882 | 2,206 | 2,086 | 1,975 | 2,037 | 1,685 | 1,881 | 2,204 | 2,086 | 1,975 | 2,037 | 1,685 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Nonprofit | 290 | 300 | 303 | 267 | 211 | 177 | 290 | 300 | 303 | 267 | 211 | 177 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| State and local government | 2 | 1 | 1 | 2 | 0 | 1 | 2 | 1 | 1 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Joint and unknown sectors | 947 | 1,042 | 873 | 752 | 710 | 529 | 946 | 1,042 | 870 | 750 | 710 | 528 | 1 | 1 | 2 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Psychology | 4,680 | 5,351 | 5,236 | 5,557 | 5,675 | 5,666 | 4,622 | 5,344 | 5,229 | 5,534 | 5,655 | 5,623 | 58 | 7 | 7 | 23 | 20 | 43 | 0 | 0 | 0 | 0 | 0 | 0 |
| Foreign | 1,934 | 2,086 | 2,168 | 2,317 | 2,346 | 2,363 | 1,889 | 2,082 | 2,162 | 2,304 | 2,331 | 2,348 | 45 | 5 | 6 | 13 | 14 | 15 | 0 | 0 | 0 | 0 | 0 | 0 |
| Unknown country | 11 | 13 | 14 | 24 | 24 | 20 | 11 | 13 | 14 | 23 | 24 | 20 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| United States | 2,736 | 3,252 | 3,055 | 3,216 | 3,305 | 3,283 | 2,723 | 3,249 | 3,054 | 3,207 | 3,299 | 3,255 | 13 | 2 | 1 | 10 | 6 | 28 | 0 | 0 | 0 | 0 | 0 | 0 |
| Academic | 1,712 | 1,955 | 1,842 | 2,075 | 2,159 | 2,280 | 1,699 | 1,954 | 1,842 | 2,065 | 2,155 | 2,254 | 13 | 1 | 0 | 9 | 5 | 26 | 0 | 0 | 0 | 0 | 0 | 0 |
| Business | 809 | 1,014 | 1,008 | 924 | 994 | 845 | 809 | 1,014 | 1,008 | 924 | 993 | 844 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Federal government | 33 | 27 | 26 | 39 | 28 | 29 | 33 | 27 | 26 | 39 | 28 | 29 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| FFRDCs | 2 | 0 | 2 | 1 | 4 | 4 | 2 | 0 | 2 | 1 | 4 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Nonprofit | 33 | 52 | 13 | 21 | 20 | 28 | 33 | 52 | 13 | 21 | 20 | 25 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| State and local government | 2 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Joint and unknown sectors | 145 | 203 | 163 | 157 | 99 | 97 | 145 | 202 | 163 | 157 | 99 | 97 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Social sciences | 683 | 643 | 498 | 579 | 642 | 607 | 683 | 643 | 498 | 575 | 628 | 597 | 0 | 0 | 0 | 4 | 14 | 10 | 0 | 0 | 0 | 0 | 0 | 0 |
| Foreign | 265 | 258 | 216 | 223 | 271 | 268 | 265 | 258 | 216 | 222 | 258 | 260 | 0 | 0 | 0 | 1 | 13 | 8 | 0 | 0 | 0 | 0 | 0 | 0 |
| Unknown country | 5 | 4 | 0 | 1 | 1 | 0 | 5 | 4 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| United States | 413 | 382 | 282 | 355 | 370 | 339 | 413 | 382 | 282 | 352 | 369 | 337 | 0 | 0 | 0 | 3 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| Academic | 325 | 287 | 214 | 276 | 290 | 276 | 325 | 287 | 214 | 273 | 289 | 275 | 0 | 0 | 0 | 3 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Business | 24 | 28 | 29 | 35 | 44 | 21 | 24 | 28 | 29 | 35 | 44 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Federal government | 11 | 10 | 3 | 7 | 5 | 10 | 11 | 10 | 3 | 7 | 5 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| FFRDCs | 1 | 1 | 4 | 2 | 2 | 1 | 1 | 1 | 4 | 2 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Nonprofit | 21 | 29 | 12 | 5 | 7 | 8 | 21 | 29 | 12 | 5 | 7 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| State and local government | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Joint and unknown sectors | 31 | 27 | 21 | 30 | 23 | 23 | 31 | 27 | 21 | 30 | 23 | 23 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |

USPTO = U.S. Patent and Trademark Office; FFRDC = federally funded research and development center.

**Source(s)**

National Center for Science and Engineering Statistics, National Science Foundation; Science-Metrix; PatentsView, USPTO, accessed April 2019; Elsevier, Scopus abstract and citation database, accessed June 2019.

*Science and Engineering Indicators*

TABLE 08-07

**Federal policies and programs supporting early-stage technology development and innovation**

Glossary of programs and policies for selected federal agencies

| Agency | Office | Program | Science and technology development | | | | | | | Enterprise development | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Tech. dev. | Tech. scouting | Gov. need | Financial support | Talent dev. | Standard setting | IP rights / tech. transfer | Business training | Business networks | Business mentors and peers | Business services | Talent dev. | Liability prob. | Financial support |
| Department of Agriculture | | | | | | | | | | | | | | | | |
| Under Secretary for Natural Resources and Environment | U.S. Forest Service | Forest Products Laboratory (FPL) Business Incubator<br>Forest Products Laboratory (FPL) Industrial Materials (CORRIM) | ✓ | | | | | | ✓ | | | | | | | |
| Under Secretary for Research, Education, and Economics | Agricultural Research Service (ARS) | ARS Innovation Desk (Cross ARS)<br>Agricultural Research Partnerships (ARP) Network | | ✓ | | | | | ✓ | | ✓ | ✓ | ✓ | | | |
| | National Institute of Food and Agriculture (NIFA) | Agriculture Innovation Competitiveness Initiative<br>Innovations in Food and Agricultural Science and Technology (IFAST) Prize Competition | | ✓ | | | | | ✓ | ✓ | ✓ | | ✓ | | | |
| Program descriptions | | Program goals: To expedite the discovery and application of new science, the FPL is the initial stages of developing a business incubator for emerging or fledgling advanced wood technology business ventures. | | | | | | | | | | | | | | |
| | FPL Business Incubator | Program activities: Private sector large or other entities seeking expanded production resources can rent space and equipment at the FPL to pilot test new products or process innovations. By developing prototype without excessive overhead costs, business incubator associates can sell these products in limited quantities. These companies will conduct research in partnership with FPL scientists and technical staff in existing FPL laboratories. When appropriate, companies can also enter into joint venture agreements for collaborative research. | | | | | | | | | | | | | | |
| | | Website: https://www.fpl.fs.fed.us/documnts/pdf2009/fpl_2009_ellis001.pdf | | | | | | | | | | | | | | |
| | CORRIM | Program goals: The CORRIM research plan develops a scientific base of information relating to the environmental performance of wood-based building products. The research plan provides (1) a consistent life-cycle inventory database for evaluating the environmental performance of wood and alternative materials from resource regeneration or extraction to end use and disposal; (2) a framework for evaluating life-cycle environmental and economic impacts; (3) source data for many users, including resource managers, manufacturers, architects, engineers, environmental protection and energy analysts, and policy specialists; and (4) continuously updated wood products life-cycle assessment (LCA) underlying data for making LCA-based environmental product declaration (EPD) eco-labels. | | | | | | | | | | | | | | |
| | | Program activities: CORRIM is a consortium of universities and other entities seeking to develop a credible database of information for quantifying environmental impacts and economic costs of wood-building materials through the stages of tree planting, growing, harvest, manufacturing, building construction, and its possible reuse and demolition. Current research provides a compassionate life-cycle assessment of environmental impacts to assist in making building design changes that can improve performance along with development of North American-wide EPDs. CORRIM participants, policies, and building design coverage are expanded in order to identify more opportunities for improved performance. As part of the six-year product LCA and EPD updates, CORRIM addresses pressing research issues including carbon sequestration, temporal and spatial aspects of forest harvesting, land use and land use changes (direct and indirect), and the impact of changes in forest carbon inventories. | | | | | | | | | | | | | | |
| | | Website: http://www.corrim.org/ | | | | | | | | | | | | | | |
| | I-Corps ARS | Program goals: The I-Corps ARS pilot was a part of activities and programs that prepared ARS scientists to extend their focus beyond the laboratory and broadened the impact of select ARS research projects. | | | | | | | | | | | | | | |
| | | Program activities: The I-Corps ARS curriculum, based on the National Science Foundation (NSF) I-Corps, taught research teams to identify the problems facing stakeholders and develop valuable products and or technologies that can emerge from their core research. In addition, I-Corps ARS offered entrepreneurship training, which helped the participants to be more innovative in their research programs. I-Corps ARS was the first program in a government-owned, government-operated environment (GOGO) that has an intrapreneur focus with the goal of creating an entrepreneurial scientific enterprise. | | | | | | | | | | | | | | |
| | | Website: N/A | | | | | | | | | | | | | | |
| | ARP Network | Program goals: The ARS Funded the ARP Network to expand the impact of ARS research and provide resources to help ARS commercial partners grow. | | | | | | | | | | | | | | |
| | | Program activities: The ARP Network provides ARS scientists with opportunities to leverage their capabilities and provides business assistance services to help companies and startups solve agricultural problems, develop products, and create new jobs. The ARP Network assists ARS in creating new partnerships and in supporting existing partnerships to advance ARS field efforts and subsequent utilization, including commercialization. Some of the ARP Network activities include matching industry needs with ARS patents and researchers for partnering, providing access to ARS research expertise, facilities, and equipment, and assisting in identifying sources of funding. The ARP Network is composed of organizations interested in agriculture-based economic development. | | | | | | | | | | | | | | |
| | | Website: https://www.ars.usda.gov/office-of-technology-transfer/administration-partnerships/ | | | | | | | | | | | | | | |
| | eTOP | Program goals: eTOP is a national network of Department of Agriculture (USDA) federal partnership intermediaries that facilitates the transfer of USDA technologies to U.S. businesses to meet their business development, and production needs to meet agriculture requirements, as well as to foster commercial applications and support U.S. economic competitiveness. | | | | | | | | | | | | | | |
| | | Program activities: eTOP provides technical assistance to U.S. businesses and entrepreneurs to enhance USDA's ability to transfer technology. eTOP helps USDA labs and research organizations successfully partner with the private sector to the purpose of collaborating on technology innovation and innovation. The program created USDA technologies and capabilities and facilitates communications with the private sector. eTOP also conducts market research to establish the value of licensable technologies and helps ensure the licensee applications and commercialization plans received certain appropriate information for a decision on licensing or partnering regarding further development of a technology. | | | | | | | | | | | | | | |
| | | Website: http://nbaonline.com/ | | | | | | | | | | | | | | |
| | I-FIST Prize Competition | Program goals: The I-FIST Prize Competition pilot program provides entrepreneurship training to USDA ARS grantees. The competition aims to identify valuable product opportunities that can emerge from ARS-supported academic research, to spur transition of that research to the market place, to encourage collaboration between academia and industry, and to train ARS-funded faculty, students, and other researchers to understand innovation and entrepreneurship. | | | | | | | | | | | | | | |
| | | Program activities: The I-FIST Prize Competition provides a cash prize to the winner of a competitive process that includes a pitch competition and business plan development. The I-FIST Prize Competition is a 5-month entrepreneurial immersion course provided by the NCIP I-Corps program. Leveraging experience and guidance from established entrepreneurs and the NCIP I-Corps curriculum, I-FIST teams learn to identify valuable product opportunities that can emerge from USDA ARS-supported academic research. The final goal of the I-FIST Prize Competition is to facilitate technology transfer of innovations that can make an impact in the marketplace and the global economy. | | | | | | | | | | | | | | |
| | | Website: https://nifa.usda.gov/program/innovations-food-and-agricultural-science-and-technology-ifast-prize-competition | | | | | | | | | | | | | | |
| Department of Commerce | | | | | | | | | | | | | | | | |
| National Institutes of Standards and Technology (NIST) | Associate Director for Innovation and Industry Services | Manufacturing USA | ✓ | | | ✓ | | ✓ | | | ✓ | | ✓ | | | ✓ |
| | | Designated User Facilities<br>Hollings Manufacturing Extension Partnership (MEP) Program | ✓ | | ✓ | | | | | | | | | | | |
| | | Hollings Manufacturing Extension Partnership (MEP)<br>NIST Center for Neuroscience Technology | | ✓ | | | | | | ✓ | | ✓ | ✓ | ✓ | | |
| | | NIST Science and Technology Entrepreneurship Program (N-STEP) | | | | | | | | ✓ | | ✓ | ✓ | ✓ | | |
| Economic Development Administration (EDA) | Office of Innovation and Entrepreneurship | i6 Challenge | | | | ✓ | | | | | | ✓ | | ✓ | | ✓ |
| | | Start-Fund Start-Support (SFS) Grant | | | | | | | | | | | | | | ✓ |

TABLE 3A-1

**Federal policies and programs supporting early-stage technology development and innovation**

Summary of programs and policies for selected federal agencies

| Agency | Office | Science and technology development: Financial support: Tech. dev. | Tech. scouting | Cont. need | Talent dev. | Standard setting | IP rights / tech. transfer | Business training | Business networks | Business mentors and peers | Enterprise development: Business services: Talent dev. | Liability protn. | Financial support |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Program descriptions | Manufacturing USA | Program goals: Manufacturing USA aims to (1) increase the competitiveness of U.S. manufacturing, (2) facilitate the transition of innovative technologies into scalable, cost-effective, and high-performing domestic manufacturing capabilities, (3) accelerate the development of an advanced manufacturing workforce, and (4) support business models that help institutions become stable and sustainable.<br>Program activities: The program currently consists of 14 public-private partnership institutes, which are established through competitive proposals requiring matching funds from the proposing partner organizations. Manufacturing USA Institutes focus on a specific technology area; examples include advanced fabrics, biopharmaceuticals, and integrated photonics. | | | | | | | | | | | |
| | Designated User Facilities | Program goals: Designated User Facilities aim to support U.S. industry, academic institutions, NGO, and other government laboratories to operate at the cutting edge of research.<br>Program activities: NIST operates two unique laboratory facilities available for use by approved users from industry, academic institutions, NGO, and other government laboratories: (1) NIST Center for Neutron Research (NCNR), and (2) Center for Nanoscale Science and Technology (CNST). NCNR is a national user facility that provides cold and thermal neutron measurement capabilities. CNST supports the development of nanotechnology from discovery to production. | | | | | | | | | | | |
| | SBIR Program | Program goals: The SBIR Program provides access to NIST facilities and equipment to nongovernment scientists to work with NIST staff on projects of mutual interest.<br>Program activities: The program provides access for technically qualified U.S. citizens to NIST facilities and equipment while working with NIST staff on projects of mutual interest. Research results are available to the public because the SOR Agreement does not provide for confidentiality of research results. | | | | | | | | | | | |
| | MEP | Program goals: The MEP Program's overarching mission is to strengthen and expand U.S. manufacturers. The program works primarily with small- and medium-sized U.S. manufacturers to help them create and retain jobs, increase profits, and increase sales.<br>Program activities: The MEP Program's activities include providing technical services, business services, and workforce services to U.S. manufacturers. The public-private partnership that is the MEP National Network™ is composed of nonprofit, university-based and state economic development-based organizations, in partnership with the federal government. Each MEP center provides a variety of services to their local manufacturers, including product design and prototyping, design for manufacture assembly, machine and equipment design, lean process improvements, and other services. Center services are fee-based and designed to be flexible and responsive.<br>Website: https://www.nist.gov/mep | | | | | | | | | | | |
| | NIST Ventures | Program goals: The Technology Innovation and Partnerships Development Corporation (TIDCO), NIST Ventures, was selected to provide advice and consulting to NIST scientists and tech transfer staff regarding commercialization and entrepreneurship.<br>Program activities: NIST Ventures seeks promising ideas and entrepreneurship and commercialization, and raises seed or pre-seed capital from venture capitalists and angel investors. They also provide information about the potential commercial viability of new NIST inventions to assist in the patenting and licensing process.<br>Website: N/A | | | | | | | | | | | |
| | NIST Gitlab | Program goals: NIST GitHub aims to provide opportunities for minoritized researchers to build upon the experience gained while working at NIST as they explore entrepreneurial careers.<br>Program activities: NIST GitHub provides opportunities for minoritized researchers to build upon the experience gained while working at NIST as they explore entrepreneurial careers.<br>Website: https://www.nist.gov/gitlab | | | | | | | | | | | |
| | NIST-STEP | Program goals: NIST-STEP aims to promote opportunities for minoritized researchers to build upon the experience gained while working at NIST as they explore entrepreneurial careers.<br>Program activities: Research TIDCO administers the NIST-STEP program, which will offer grants to current and former NIST researchers for technology development and commercialization of NIST technologies. The NIST Technology Partnerships Office identifies inventions available for licensing from our in-house and commercialization NIST's inventions. In addition to the licensing NIST and TIDCO will make available a variety of resources, including entrepreneurship training, mentoring, and other resources.<br>Website: https://www.nist.gov/step-1-step | | | | | | | | | | | |
| | In Challenge | Program goals: The In Challenge is a test of the innovation, entrepreneurship, innovation regional economic development, and commercialization of research. Supported projects must focus on one or more of these aims.<br>Program activities: The In Challenge is one of the two competitions supported by the Regional Innovation Strategies (RIS) Program. The In Challenge provides grants to support the creation of centers for innovation and entrepreneurship that increase the rate at which innovations, ideas, intellectual property, and research are translated into products, services, viable companies, and, ultimately, jobs. The .8 grantees offer a range of services to client companies, including events, networking, and referrals, mentoring, coaching, and technical assistance; access to facilities and equipment; technology development support; and financing support.<br>Website: https://www.eda.gov/ris/in/ | | | | | | | | | | | |
| | OFS Grant | Program goals: The Out Challenge aims to increase the availability of early-stage risk capital, in the form of seed funds, in regions around the country by providing funding for technical assistance to support the creation, launch, or expansion of equity-based, quasi-equity-based, or debt-based venture capital firms that invest regionally managed risk capital in regionally based startups with a potential for high growth.<br>Program activities: The OFS Grant is one of the two competitions supported by the RIS Program. The initiative provides funding for new and existing equity-based seed fund projects (e.g., technical assistance, feasibility studies, or marketing related to the operation) that (1) provide early-stage capital support for new businesses (generally less than three years old), (2) have a sustainability plan based on taking equity stakes in the businesses in which the program invests, and (3) demonstrate ecosystem and downstream funding support. OFS Grants provide a maximum of $250,000 in funding and require a minimum of 1:1 matching funds.<br>Website: https://www.eda.gov/ris/ofs/ | | | | | | | | | | | |
| Department of Defense (DOD) | | | | | | | | | | | | | |
| Department wide | Manufacturing Technology (ManTech) Program<br>Commercialization Readiness Program (CRP)<br>Small Business Innovation Research | 0<br>0 | 0 | 0<br>0 | 0 | 0 | 0 | 0<br>0 | 0<br>0 | 0<br>0 | 0<br>0 | 0 | 0 |
| Department of the Army | Army Research Lab (ARL) | Open Campus initiative<br>Small Business Innovation Research (SBIR) / Small Business Technology Transfer (STTR) Transition Program (STP) | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | | | |
| Department of the Navy | Naval Surface Warfare Center, Crane Division (NSWC Crane) | Innovation Discovery Process | | | | 0 | | 0 | | 0 | | | |
| Department of the Air Force | New York Kaiserslautern Technology Transfer Accelerator (NY-Forward) | Open Innovation Prototyping | | | | 0 | | 0 | | 0 | | | |
| Office of the Secretary of Defense | Office of the Under Secretary of Defense for Acquisition, Technology and Logistics | Joint Capability Technology Demonstration (JCTD)<br>Rapid Innovation Fund | 0<br>0 | | 0<br>0 | | | | | | | | |

TABLE 8A-41

**Federal policies and programs supporting early-stage technology development and innovation**

Summary of programs and policies for selected federal agencies

| Agency | Office | Program | Science and technology development | | | | | | | Enterprise development | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Tech. dev. | Tech. scouting | Cust. need | Financial support | Talent dev. | Standard setting | IP rights / tech. transfer | Business training | Business networks | Business mentors and peers | Business services | Talent dev. | Liability protn. | Financial support |
| Program descriptions | Office of the Assistant Secretary of Defense for Research & Engineering | J-Corps @ DOD | | | | | | | | | | | | | | |
| | Defense Advanced Research Projects Agency (DARPA) | DARPA DTTA Transition & Commercialization Support Program (TCSP) | | | | | | | | X | X | X | X | | | X |
| | | Defense Innovation Unit (DIU) Commercial Solutions | X | X | X | X | | | | X | X | X | X | X | | |
| | | National Security Innovation Network (NSIN) | | | X | | | | | X | X | X | | | | |
| | MacTech Program | Program goals: The Defense Wide Manufacturing Science & Technology (DWMT) MacTech Program was established to address crosscutting, game-changing initiatives that are beyond the scope of any one Military Department or Defense Agency. | | | | | | | | | | | | | | |
| | | Program activities: Focus areas include advanced defense manufacturing needs, transition manufacturing R&D processes into production applications, which manufacturing issues, and explore new opportunities. | | | | | | | | | | | | | | |
| | | Website: https://www.dwmtmactech.com/ | | | | | | | | | | | | | | |
| | CIRP | Program goals: Part of the DOD SBIR/ STTR program, the purpose of the CIRP is to accelerate the transition of SBIR and STTR funded technologies to Phase III, especially those that lead to programs of record and fielded systems. | | | | | | | | | | | | | | |
| | | Program activities: Provides a mechanism for Program Managers to identify and prioritize technologies that are ready for transition and to leverage the SBIR/STTR programs to fund the maturation of identified technology to DOD, directly or as a subcontractor. | | | | | | | | | | | | | | |
| | | Website: https://www.afwerx.af.mil/Program-CIRP-Research.html | | | | | | | | | | | | | | |
| | AVID | Program goals: The Air Force Venture Innovation Development (AVID) office focuses cybersecurity and computing capabilities through partnerships in various fields to develop and field AVID-enabled capabilities of significant interest to the warfighter that are traditionally beyond the reach of the DOD. | | | | | | | | | | | | | | |
| | | Program activities: AVID is the venture activity of the U.S. Army and DOD that strategically invests in cutting-edge technologies. The model helps build sustainable solutions and is powered by investing along with venture capital firms. AVID focuses on technologies addressing the needs of the commercial market that will also meet priority warfighter needs. For each dollar AVID invests in a company, the venture community, on average, invests more than $20. AVID's model offers a complement to traditional acquisition and uses a proven commercial investment methodology that results in faster solution identification, product development, continuous enhancements, and in other accompanied by lower costs to the DOD. | | | | | | | | | | | | | | |
| | | Website: https://www.afwerx.com/avid/ | | | | | | | | | | | | | | |
| | AFL Open Campus Initiative | Program goals: AFL's Open Campus Initiative is a collaboration endeavor, with the goal of building a science and technology ecosystem that will encourage groundbreaking advances in basic and applied research areas of relevance to the Army. | | | | | | | | | | | | | | |
| | | Program activities: Through the Open Campus Framework, AFL scientists and engineers work collaboratively and side by side with visiting scientists in AFL's facilities and via visiting researchers at collaborator institutions. Central to the research collaborations is mutual scientific interest and investment by all partners. AFL's Open Campus is not a funding opportunity. | | | | | | | | | | | | | | |
| | | Website: https://www.arlfl.com/open-campus/ | | | | | | | | | | | | | | |
| | Navy STP | Program goals: The Navy STP provides commercialization, transition, and professional business assistance through a structured program so that participating small businesses are in the best position to obtain Phase III funding. | | | | | | | | | | | | | | |
| | | Program activities: The program takes a holistic approach to assisting selected small businesses to identify and plan a path to obtain Phase III funding for commercialization of their SBIR/ STTR-developed technology/ies and transition their technology/ies through business mentoring, training, marketing material creation, and business development activities and promotion. STP provides a range of support for selected companies, including providing relevant market research appropriate to the small business's technology and transition targets, identifying leads for potential transition opportunities, and promoting their technology(ies) on the Virtual Transition Marketplace (VTM) — an online, searchable showcase accessible to government and private sectors), and others. | | | | | | | | | | | | | | |
| | | Website: https://navysbir.com/ | | | | | | | | | | | | | | |
| | NSWC Crane Innovation Discovery Process | Program goals: The primary goal of the NSWC Crane Innovation Discovery Process is to help researchers identify potential intellectual property. | | | | | | | | | | | | | | |
| | | Program activities: The NSWC Crane Innovation Discovery Process (Institute: Innovation Mining) starts where Inventive Discovery Week (research projects in front of business and engineering faculty, entrepreneurs, and industry and technology transfer experts who help identify potential invention disclosures and commercialization ideas concurrently. | | | | | | | | | | | | | | |
| | | Website: N/A | | | | | | | | | | | | | | |
| | VF Furnace | Program goals: The aim of VF Furnace is to form, fund, and launch startups that will license and successfully commercialize one or more Air Force technologies. | | | | | | | | | | | | | | |
| | | Program activities: VF Furnace is a program that provides a pathway to entrepreneurs through state-wide competitions. Those entrepreneurial teams selected then participated in a fulltime-or startup acceleration program called VF Furnace. DOD partnered with Arizona State University's (ASU's) Pacesetters Center of Excellence in Technology Transfer (PCE). The developers of the furnace system, to support the transfer and commercialization of discoveries from the country's top research laboratories. | | | | | | | | | | | | | | |
| | | Website:https://www.asu.edu/the-startup-foundation/ | | | | | | | | | | | | | | |
| | JCTD | Program goals: The mission of the JCTD Program is to execute pre-engineering and manufacturing development (pre-EMD) and fielded prototypes through operational demonstrations of game-changing technologies to meet DOD strategic needs while addressing Joint Force and Combatant Commands capability gaps. | | | | | | | | | | | | | | |
| | | Program activities: The JCTD Program is a process that leverages the Department's investments in government, industry, and academia and providing a bridge from science and technology to operational use and acquisition. (1) reducing technical risk through the use of experimentation and prototyping and reducing operational risk by conducting operational demonstrations with the warfighter; (2) creating affordability by providing open architecture to enhance interoperability and minimizing design changes and surprises during the EMD phase of acquisition; and (3) accelerating the acquisition process. | | | | | | | | | | | | | | |
| | | Website: https://www.rowan.edu/Economic-Science-and-Technology/Office-of-Science-and-Technology-Integration.html | | | | | | | | | | | | | | |
| | Rapid Innovation Fund | Program goals: To accelerate fielding of innovative technologies into military systems. | | | | | | | | | | | | | | |
| | | Program activities: Provides a mechanism for Program Managers (PM) preferences to small business proposals. | | | | | | | | | | | | | | |
| | | Website: https://business.defense.gov/Programs/RIF/ | | | | | | | | | | | | | | |
| | I-Corps @ DOD | Program goals: I-Corps @ DOD aims to commercialize the outputs of basic research funded by DOD, develop a more entrepreneurial mindset among DOD-funded researchers, and better align DOD basic research efforts with the needs of the defense community and commercial markets. | | | | | | | | | | | | | | |
| | | Program activities: The I-Corps @ DOD Pilot Program partners with NSF's I-Corps program to provide entrepreneurial education to DOD-funded researchers. Funded researchers conduct 100 interviews with potential customers using four startup methodolo in order to learn more about problems that commercial stakeholders want to have solved. The training is directed by experienced entrepreneurs who teach researchers about value propositions, business plans, and other concepts essential to commercialization. | | | | | | | | | | | | | | |

TABLE 8A-41

**Federal policies and programs supporting early-stage technology development and innovation**

Summary of programs and policies for selected federal agencies

| Agency | Office | Program | Science and technology development: Tech. dev. | Tech. scouting | Cont. need | Financial support | Talent dev. | Standard setting | IP mgmt./tech. transfer | Business training | Business networks | Business mentors and peers | Enterprise development: Business services | Talent dev. | Liability protn. | Financial support |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Website: http://sbirresearch.defense.gov/ | | | | | | | | | | | | | | |
| | SBIR/STTR "C2P" | Program goals: The DoD's SBIR/ STTR C2P aims to maximize the potential for SBIR/ STTR companies to move their technology beyond Phase II, and into other R&D programs for further maturity, or into solutions or products for DOD acquisition programs, other federal programs, and, or the commercial market. | | | | | | | | | | | | | | |
| | | Website: https://www.dla.mil/Small-Business/Innovation/Commercialization/ Program goals: Provide a continuous transition path for commercialization. For Phase I activities, the program reviews and provides feedback to the company on its transition and commercialization plan, identifies potential sources of funding and collaborators, experiment and demonstration opportunities, thought leadership opportunities, and media and publication sources; facilitates introductions to potential funders, collaborators, and partners; and provides business planning and assessment tools. In addition to providing other resources. | | | | | | | | | | | | | | |
| | DLA | Website: https://www.dla.mil/Small-Business/Innovation/Commercialization/ | | | | | | | | | | | | | | |
| | | Program goals: Offer aim to accelerate commercial innovation for national defense by building relationships between the high technology commercial sector and DOD customers. | | | | | | | | | | | | | | |
| | | Website: https://www.darpa.mil/ Program goals: Leverage non-dilutive capital to companies to work on new technologies to solve DOD problems. Elicit operators, nationwide, with headquarters in Silicon Valley and offices in Boston, Austin, and the Pentagon. | | | | | | | | | | | | | | |
| | DARPA | Website: https://dian.mil/ | | | | | | | | | | | | | | |
| | | Program goals: NSW seeks to (1) accelerate capability development leveraging nontraditional collaborators and "Science-up" approaches, (2) augment the defense industry through the creation of startup businesses responsive to national security problems, and (3) enhance the DOD workforce through critical innovation skills development. | | | | | | | | | | | | | | |
| | NSWC | Website: https://www.navsea.navy.mil/Home/Warfare-Centers/Naval-Surface-Warfare-Center-Indian-Head-Division/Innovation-Technology-Office/ Program goals: Grow the portfolio of effort. Education provides workforce development, prototyping innovation, and infrastructure needs DOD (including the Defense Joint Professional Military Education, Innovation Tech camp, and Industry Fellowships). Collaboration contests, communities of innovators around problems and technologies relevant to national security to enable formation of new ventures (Hackathons, Innovation Challenges, Startup Showcases, and Pitch Tents), and Acceleration grows and matures civil-military technology ventures by ensuring that innovators can access critical resources, including DOD R&D infrastructure, to build, test, and enhance various concepts (Proof-of-Concept Centers, Futurum, Hard Tech Studio; Innovator-in-Residence, and Defense Innovation Proving Ground). | | | | | | | | | | | | | | |
| Department of Energy | | Website: https://www.osti.gov/ | | | | | | | | | | | | | | |
| Advanced Research Projects Agency-Energy (ARPA-E) | | Tech to Market (T2M) Program | | | | | | | | | | | | | | |
| | | Technology Assistance Program | | | | | | | | | | | | | | |
| | | Cleantech University Prize (Cleantech UP) | | | | | | | | | | | | | | |
| | | National Incubator Initiative for Clean Energy (NIICE) | | | | | | | | | | | | | | |
| | | Entrepreneurial Leadership Training for Cleantech Entrepreneurs (BuildWhyLab) | | | | | | | | | | | | | | |
| | Office of Energy Efficiency and Renewable Energy (EERE) | Energy Crisis Call Forum | | | | | | | | | | | | | | |
| | | Incubatoring Network | | | | | | | | | | | | | | |
| | | Small Business Vouchers Program | | | | | | | | | | | | | | |
| | | Technological to Residence (T2R) Program | | | | | | | | | | | | | | |
| Office of the Under Secretary for Science and Energy | | SunShot Incubator | | | | | | | | | | | | | | |
| | | Energy Innovation Hub Market (T2M) initiative | | | | | | | | | | | | | | |
| | | Argonne National Laboratory Energy Works (AERE) | | | | | | | | | | | | | | |
| | | Argonne Collaborative Center for Energy Storage Science (ACCESS) | | | | | | | | | | | | | | |
| | Office of Science | Argonne Leadership Computing Facility Innovation (LCF) | | | | | | | | | | | | | | |
| | | Innovation Crossroads | | | | | | | | | | | | | | |
| | | Lawrence Berkeley National Laboratory Cyclotron Road | | | | | | | | | | | | | | |
| | | Office of Science Tech Transfer | | | | | | | | | | | | | | |
| | Office of Nuclear Energy | Gateway for Accelerated Innovation in Nuclear (GAIN) | | | | | | | | | | | | | | |
| | Office of Technology Transitions | Technology Commercialization Fund (TCF) | | | | | | | | | | | | | | |
| | | Center for Collaboration and Commercialization (C3) | | | | | | | | | | | | | | |
| Office of the Under Secretary for Nuclear Security and National Nuclear Security Administration | National Nuclear Security Administration | Technology Transfer Program | | | | | | | | | | | | | | |
| | | Website: https://www.energy.gov/nnsa/tech-transfer-program | | | | | | | | | | | | | | |
| Program descriptions | T2M Program | Program goals: The ARPA-E T2M Program aids ARPA-E in transitioning energy technologies from the laboratory towards real-world application. The T2M Program team helps create impact opportunities for funded projects across all ARPA-E program areas. | | | | | | | | | | | | | | |
| | | Program activities: Since a project team has crafted a tech-to-market (T2M) plan, the ARPA-E T2M team works to align its resources and efforts towards the wants and needs of potential technology transition partners. The ARPA-E T2M team does this through a range of activities, including providing awardees with market knowledge, providing resources on commercialization best practices, identifying and connecting awardees to strategic opportunities and resources, maintaining and cultivating a strong network across the market, industry, presenting and highlighting ARPA-E projects and technologies to stakeholders across the ecosystem, and identifying and working to mitigate shared obstacles for fielding new energy technologies (regulatory, ecosystem, standards, etc.). | | | | | | | | | | | | | | |
| | | Website: https://www.energy.gov/ta/tech-transfer-program | | | | | | | | | | | | | | |

**Federal policies and programs supporting early-stage technology development and innovation**

Summary of programs and policies for selected federal agencies

| Agency | Office | Program | Tech. dev. Financial support | Tech. scouting | Qual. need | Talent dev. | Standard setting | IP mgmt./ tech. transfer | Business training | Business networks | Business mentors and peers | Business services | Talent dev. | Liability protn. | Financial support |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Science and technology development | | | | | | | | | Enterprise development | | | |
| | SBIR/ | Program goals: SBIR's help small businesses overcome challenges with prototyping, materials characterization, high-performance computations, modeling and simulations, and validation of technology performance by providing their access to national labs. At the same time, the program increases national lab awareness of the challenges small businesses face in the energy sector. | | | | | | | | | | | | | |
| | | Program activities: Through the SBIR program, eligible small businesses can tap into the reserve of national laboratory intellectual and technical assets to overcome critical technology challenges, including prototyping, materials characterization, high-performance computations, modeling and simulations, intermediate scaling to generate samples for potential customers, validation of technology performance, and designing new ways to satisfy regulatory compliance. The SunShot Initiative funds vouchers for solar projects under the SBI program, which are valued between $50,000 and $300,000 each. | | | | | | | | | | | | | |
| | Cleantech LP | Program name: Cleantech LP | | | | | | | | | | | | | |
| | | Program goals: Cleantech LP inspires and equips the next generation of clean energy entrepreneurs and innovators by providing them with competitive funding for business development and commercialization training and other educational opportunities. | | | | | | | | | | | | | |
| | | Program activities: Eight institutions across the country host annual Cleantech LP Collegiate Competitions, where students receive entrepreneurial support and compete for cash prizes and services to further support the commercialization of their clean energy technologies. The Collegiate Competitions establish team development and training that will aid students in developing the skills to move clean energy technologies from the discovery phase to the marketplace. Winners of the Collegiate Competitions are eligible to compete in the Cleantech LP National Competition run by the Hub. The National Competition, which is the culmination of the Collegiate Competitions, awards an additional $100,000 in prizes. | | | | | | | | | | | | | |
| | Energy Frontier Research Centers | Program name: EFRCs | | | | | | | | | | | | | |
| | | Program goals: NNSA aims to increase coordination and collaboration among institutions across the country and develop best practices to raise research performance standards. This effort enables students to provide more efficient and effective services to early-stage U.S. companies. | | | | | | | | | | | | | |
| | | Program activities: Through NNSA, EERE holds the first nationwide support organization to connect and build a community of cleantech-focused entrepreneurs and investors. This network is a community of U.S. clean energy-focused business incubators nationwide that have supported almost 500 companies to date. NNSA also funds several regional cleantech incubators to run programs with commercialization services for startups including mentorship, business development, capital access, and testing and demonstration. These incubators work with the national organization to develop best practices for their clean energy incubators that can be replicated nationwide. | | | | | | | | | | | | | |
| | Bioinformatics | Program name: Bioinformatics | | | | | | | | | | | | | |
| | | Program goals: Bioinformatics provides entrepreneurs with the tools they need to identify and address manufacturing challenges early in the process. The development of the Bioinformatics training was informed by the Manufacturing 101: An Education and Training Curriculum for Hardware Entrepreneurs' report developed by MP Leverage. | | | | | | | | | | | | | |
| | | Program activities: Bioinformatics provides entrepreneurs with the tools they need to identify and address manufacturing challenges early in the process. The development of the Bioinformatics training was informed by the Manufacturing 101: An Education and Training Curriculum for Hardware Entrepreneurs' report developed by MP Leverage. | | | | | | | | | | | | | |
| | Lab-Embedded Entrepreneurship Program | Program name: Lab-Embedded Entrepreneurship Program | | | | | | | | | | | | | |
| | | Website: https://energy.gov/articles/energy-innovation-portal-lab-embedded-entrepreneurship-program | | | | | | | | | | | | | |
| | | Program goals: The Lab-Embedded Entrepreneurship Program (LEEP) is a multisectoral team for researchers to build their research into products and train to be entrepreneurs. | | | | | | | | | | | | | |
| | | Program activities: The Lab-Embedded Entrepreneurship Program (LEEP) is a multisectoral team for researchers to build their research into products and train to be entrepreneurs. In addition to technological access and support, the program trains innovators to develop entrepreneurial acumen and skills, while introducing them to the ecosystem partners needed to facilitate commercial and investment opportunities. The SunShot Initiative and entrepreneurial developer providers innovators with the platform they need to better refine their ideas and to develop their business plans. | | | | | | | | | | | | | |
| | | Website: https://energy.gov/articles/energy-innovation-portal-lab-embedded-entrepreneurship-program | | | | | | | | | | | | | |
| | TIA Program | Program name: TIA Program | | | | | | | | | | | | | |
| | | Program goals: The TIA program is designed to streamline engagement and increase collaboration R&D between national labs and private sector companies. The program competitively selects "technological pairs" — a prime technical staff member from a manufacturing company or consortium of companies — that focus on building strong new R&D relationships between the respective companies and national labs. These partnerships focus on identifying the challenges of interest, and applicable resources and capabilities within the national labs, proposing collaborative R&D solutions, and developing an agreement and scope of work that would address one or more identified challenges. | | | | | | | | | | | | | |
| | | Website: https://energy.gov/articles/technology-transfer-partnerships | | | | | | | | | | | | | |
| | SunShot Incubator | Program name: SunShot Incubator | | | | | | | | | | | | | |
| | | Program goals: The SunShot Incubator program provides early-stage businesses in the solar energy companies cross-technological barriers to commercialization and accelerate promising technologies from lab to market. By taking innovations and putting them through a rigorous de-risking process, SunShot Incubator aims to increase critical technical data and information that the investment community is unable to address. Once these key risks are addressed, the startup businesses are ideally positioned for private follow-on funding and success. | | | | | | | | | | | | | |
| | | Website: https://energy.gov/articles/sunshot-incubator-program | | | | | | | | | | | | | |
| | SunShot TIAN Initiative | Program name: SunShot TIAN Initiative | | | | | | | | | | | | | |
| | | Program goals: The SunShot TIAN Initiative aims to accelerate the continued development of the U.S. solar market and the continued expansion of U.S. manufacturing of solar products in order to achieve the 2020 SunShot goals. The TIAN Initiative targets two funding gaps for energy technologies: those that occur at the prototype commercialization stage and those at the commercial scale-up stage. | | | | | | | | | | | | | |
| | | Program activities: There are four main funding programs under the SunShot TIAN Initiative, each of which addresses innovations in technology development, supply chain, and in manufacturing. The SunShot Incubator program provides technical assistance to companies, SBIR and STTR program provides grants to U.S. based small businesses to engage in R&D, (3) the Solar Manufacturing Technology program, which funds the development of manufacturing technologies, and (4) the SunShot Photovoltaic Manufacturing Initiative, which focuses on manufacturing R&D projects. | | | | | | | | | | | | | |
| | | Website: https://energy.gov/articles/sunshot-tian | | | | | | | | | | | | | |
| | ARPA-E | Program name: ARPA-E | | | | | | | | | | | | | |
| | | Program goals: ARPA-E's mission is to identify and support the acceleration of discoveries to market, helping the United States remain a leader in global technology. | | | | | | | | | | | | | |
| | | Program activities: ARPA provides a starting point of contact for companies — ranging from large industrial entities to smaller businesses and startups as well as government agencies — to benefit from Argonne National Laboratory's world-class expertise, assets, and facilities in the fields of nanotechnology. Argonne National Laboratory has the capacity to fully comprehend the function of materials in three-key areas: (1) fabrication and synthesis, (2) characterization of nanoscale materials, and (3) predictive understanding through modeling and simulation. | | | | | | | | | | | | | |
| | | Website: https://www.anl.gov/partnerships | | | | | | | | | | | | | |
| | ATCOSS | Program name: ATCOSS | | | | | | | | | | | | | |
| | | Program goals: ATCOSS helps public and private sector customers solve energy storage problems through multidisciplinary research. | | | | | | | | | | | | | |
| | | Program activities: ATCOSS provides a central point of contact for companies to benefit from Argonne National Laboratory's world-class expertise, scientific tools, and facilities in the field of energy storage. ATCOSS assemblies collaborative teams drawn from Argonne National Laboratory's 400 scientists and engineers, who represent dozens of disciplines, to help clients in several key areas related to energy storage, including discovery of new materials and properties, materials characterization, process scale-up, process and systems modeling, cell fabrication, and performance testing. | | | | | | | | | | | | | |
| | | Website: https://www.anl.gov/atcoss | | | | | | | | | | | | | |
| | Argonne National Laboratory CRI | Program name: Argonne National Laboratory CRI | | | | | | | | | | | | | |
| | | Program goals: Argonne National Laboratory CRI identifies innovations with ideas for energy- and science-based technologies that can have a significant impact on the lives of billions of people. | | | | | | | | | | | | | |
| | | Program activities: CRI is a 5-year program for innovators focusing on energy and science technologies. Program participants receive the financial and technical support needed to mature nascent technologies that have long development cycles to the proof-of-concept level. CRI gives teams of innovators a 2-year runway to develop and scale their technologies while being supported through following funding that covers salary, benefits, and use of laboratory equipment and office space. Through partnerships with mentor organizations, CRI participants get assistance developing business strategies, conducting market research, and finding long-term financing and potential commercial partners. CRI is one of the Lab-Embedded Entrepreneurship Programs. | | | | | | | | | | | | | |

TABLE 8A-1

**Federal policies and programs supporting early-stage technology development and innovation**

Summary of programs and policies for selected federal agencies[1]

| Agency | Office | Program | Science and technology development: Tech. dev. | Tech. scouting | Cont. need | Talent dev. | Standard setting | IP rights / tech. transfer | Business training | Business networks | Business mentors and peers | Enterprise development: Business services | Talent dev. | Liability protn. | Financial support |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Website: https://internetworkx.net/ gov/ | | | | | | | | | | | | | |
| | Innovation Crossroads | Program goals: Through Innovation Crossroads, DRN, matches aspiring energy entrepreneurs with technology leaders, experienced mentors, and business and investment networks in technology-related fields that can help accelerate the transition of their world-changing ideas to the marketplace. | | | | | | | | | | | | | |
| | | Financial support: Through Innovation Crossroads (program) awards up to five entrepreneurs to help transition their ideas into energy and advanced manufacturing companies with financial support from the DOE-EERE. Innovation Crossroads is a Bellwether that connects finding, study, benefits, and a travel stipend for up to 3 years (up to an $250,000 to use on collaborative research and development at ORNL. Each innovator is also paired with a doctoral student from the University of Tennessee's Bredesen Center for Interdisciplinary Research and Graduate Education for assistance with market research and customer discovery. | | | | | | | | | | | | | |
| | | Website: https://innovationcrossroads.ornl.gov/ | | | | | | | | | | | | | |
| | Lawrence Berkeley National Laboratory Cyclotron Road | Program goals: Cyclotron Road aims to empower scientists to advance hard technologies from concept to viable first product, positioning them for broad societal impact in the long term. | | | | | | | | | | | | | |
| | | Financial support: Cyclotron Road is a 24-month Fellowship Program in a 2-year Fellowship that supports scientists developing energy technologies that have potential for broad impact in the national, economic, and energy security of the United States. Cohort innovators spend 2 years embedded at Lawrence Berkeley National Laboratory with an explicit mandate to bring their ideas to the point of commercial viability. Cyclotron Road participants receive access to facilities, equipment, and expertise at Lawrence Berkeley National Laboratory, as well as a small amount of initial research funding to facilitate access and collaboration with the lab's staff scientists. Innovators fully own or jointly own all intellectual property developed during the program. Cyclotron Road is one of the Lab-Embedded Entrepreneurship Programs. | | | | | | | | | | | | | |
| | | Website: http://www.cyclotronroad.org/ | | | | | | | | | | | | | |
| | ORNL Partnerships | Program goals: Through industry and technology transfer partnerships, ORNL seeks to increase the lab's economic impact, accelerate development of ORNL developed technologies, and strengthen innovation ecosystems regionally and nationally. | | | | | | | | | | | | | |
| | | Website: https://www.ornl.gov/partnerships | | | | | | | | | | | | | |
| | GAIN | Program goals: GAIN provides the nuclear energy community with access to the technical, regulatory, and financial support necessary to bring new or enhanced nuclear energy-based commercialization while ensuring the continued safe, reliable, and economic operation of the existing nuclear fleet. | | | | | | | | | | | | | |
| | | Program activities: GAIN provides the nuclear community with a single point of access to the broad range of capabilities – people, facilities, materials, and data – across the DOE complex and its national laboratory capabilities. Focused research opportunities and dedicated industry engagement are also important components of GAIN, ensuring that DOE-sponsored activities are impactful to companies working to realize the full potential of nuclear energy. The capabilities accessible through GAIN include experimental capabilities, with primary emphasis on nuclear and radiological facilities, computational capabilities, information and data, and land use and site information for demonstration facilities. | | | | | | | | | | | | | |
| | | Website: https://gain.inl.gov/SitePages/Home.aspx | | | | | | | | | | | | | |
| | LPO | Program goals: TCF aims to (1) increase the number of energy technologies developed at DOE's mission-scale that potential to commercial development and achieve commercial impact, and (2) enhance DOE's technology transitions system with a forward-looking and competitive approach to deal-making partnerships. | | | | | | | | | | | | | |
| | | Program activities: The TCF is a nearly $50 million funding opportunity that leverages the R&D funding in applied energy programs to mature promising energy technologies with the potential for high impact. These funds are matched with funds from private partners to promote promising energy technologies for commercial purposes. There are three key areas within DOE where the TCF enhances technology transitions efforts: (1) national lab technology maturation, (2) strategic CRADA (Cooperative Research and Development Agreement) approach to increase commercial impact, and (3) focused industry engagement to identify high-quality partners. | | | | | | | | | | | | | |
| | CI | Program goals: The proposed CI will serve as a public face for Sandia National Laboratories, facilitating access to the data and building linkages with the community. | | | | | | | | | | | | | |
| | | Program activities: Located in the Sandia Science & Technology Park, CI will be a multistaff facility dedicated to increasing Sandia's collaboration and commercialization activities. CI will offer space for lease along with programs and services for tenants and partners, all designed to facilitate successful partnerships. CI will offer many programs and services, including Entrepreneur Training, Small Business Assistance, Intersector Intellectual Property Library, Tech Maturation, Investor Access, Scientific and Technical Consulting, Technology Showcase, and Mentors. | | | | | | | | | | | | | |
| | | Website: https://ci.sandia.gov/ | | | | | | | | | | | | | |
| | CNSE | Program goals: CNSE's mission is to create a secure venue for collaboration between experts from universe Lawrence National Laboratory and Sandia National Laboratories, industry, academia, and other partners, and other people, outside the lab. | | | | | | | | | | | | | |
| | | Program activities: CNSE's an innovation hub along the boundaries of Lawrence Livermore National Laboratory and Sandia National Laboratories. LVSC is an open, unclassified R&D space intended to foster research on current and future national security challenges in areas such as high-performance computing, energy and environmental security, cybersecurity, economic security, and nonproliferation. Modeled in part after research and development campuses found at major industrial research parks and other DOE laboratories, LVSC has a set of business and operating rules devised to enhance and accelerate international scientific collaboration and partnerships with U.S. government agencies, industry, and academia. | | | | | | | | | | | | | |
| | | Website: https://lvsc.org/ | | | | | | | | | | | | | |
| Department of Health and Human Services | | | | | | | | | | | | | | | |
| | Office of the Director | Commercialization Acceleration Program (CAP) | | | | | | | | 1 | 1 | 1 | 1 | | |
| | | Entrepreneur-in-Residence | | | | | | | | | | | | | |
| | | Niche Assessment Program | | | | | | | | | | | | | |
| National Institutes of Health (NIH) | | Neuro Startup Challenge | | | | | | 1 | | | | | 1 | | |
| | National Heart Lung and Blood Institute (NHLBI) | Research Evaluation and Commercialization (REACH) | 1 | 1 | | | | | | 1 | | 1 | | | |
| | | Research Evaluation and Commercialization Hubs (REACH) | | | | | | | | 1 | | | | | |
| | | Small Business Innovation Research | 1 | | | | | | | 1 | | | | | |
| | | SBIR Phase IIB Match Award | 1 | | | | | | | 1 | | | | | |
| | | SBIR Phase IIB Bridge Award | | | | | | | | 1 | | | | | |
| | National Cancer Institute (NCI) | SBIR Online Resources for Accelerating Commercialization (ORAC) Workshop | | | | | | | | | 1 | | | | 1 |
| | | Breast Cancer Startup Challenge | | 1 | | | | | | | | | | | 1 |
| | | Nanotechnology Startup Challenge in Cancer | | 1 | | | | | | | | | | | 1 |

TABLE 8A-41

**Federal policies and programs supporting early-stage technology development and innovation**

Summary of programs and policies for selected federal agencies

| Agency | Office | Program | Science and technology development: Financial support | | | | | | | | Enterprise development | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Tech. dev. | Tech. scouting | Cust. need | Talent dev. | Standard setting | IP mgmt./ tech. transfer | Business training | Business networks | Business mentors and peers | Business services | Talent dev. | Liability protn. | Financial support |
| Program descriptions | Inventor Development Program | Inventor Development Program | ✓ | ✓ | | | | | | | | | | | |
| | National Center for Advancing Translational Sciences (NCATS) | Therapeutics for Rare and Neglected Diseases (TRND) | ✓ | | | | | | | | | | | | |
| | | Discovery Therapeutics Laboratory (DTL) (NIDDK) | ✓ | | | | | | | | | | | | |
| Centers for Disease Control and Prevention (CDC) | Office of the Director | Innovation Fund (Fund) | | | | | | | ✓ | | | | | | |
| | | Mentor Connect (Connect) | | | | | | | | | ✓ | | ✓ | | |
| | | Mentor Connect (Connect) connectors and assists the agency's most promising small life science and health care SBIR/ STTR Phase II awardees in developing commercial businesses and transitioning SBIR/ STTR-funded technologies into the marketplace. | | | | | | | | | | | | | |
| | CIAP | Program activities: Offered annually, CIAP provides selected participants with informational assistance toward accomplishing key commercialization goals. The program assists participants in evaluating commercialization options based on their specific technologies (including the need and prospect for investment, strategic partnerships, or licensing) and in developing an 18-month market-entry plan. This is achieved through individual mentoring and consulting sessions, training workshops, access to domain experts, and focus on outcomes that will enhance the commercialization profile and readiness of participating ventures. The program is customized to meet the needs of participating companies in three distinct tracks: (1) Commercialization Transition Track for emerging companies, (2) Advanced Commercialization Track, and (3) Regulatory Reimbursement Training Track for "seasoned" companies. | | | | | | | | | | | | | |
| | | Website: https://cdc.gov/cancer/ | | | | | | | | | | | | | |
| | I-Corps at NIH | Program guide: The NIH I-Corps program, I-Corps at NIH provides participants with real-world, hands-on entrepreneurship training in the life sciences and technology sectors in order to accelerate the transition of innovations from the lab to clinical practice. | | | | | | | | | | | | | |
| | | Program activities: I-Corps at NIH is offered to SBIR/ STTR funded academic researchers and small businesses from across 17 NIH and CDC institutes and centers. Project teams include (1) a Lead Corporate Officer with decision-making authority, (2) an individual with a business development background in the target industry, and (3) the assigned principal investigator or the SBIR/ STTR Phase I awardee. Selected teams receive funding through grant supplement awards to support entrepreneurial training, mentorship, and collaboration opportunities that will enhance their commercialization efforts. At the beginning of the training program, the project teams attend an evening reception and intensive, 3-day "Entrepreneurial Immersion" course. Project teams then participate in an 8-week I-Corps training curriculum administered via online instruction. At the end of the course, each team attends a 2-day report-out session. | | | | | | | | | | | | | |
| | | Website: https://www.niehs.nih.gov/research/supported/translation/icorps/index.htm | | | | | | | | | | | | | |
| | TechIn Assessment Program | Program guide: The TechIn Assessment Program provides small businesses with market insight and data to help them strategically position their technology in the marketplace. | | | | | | | | | | | | | |
| | | Program activities: TechIn Assessments offer business owners potential application for a technology and flow for one viable application. It provides an assessment of the (1) needs and concerns of end users, (2) competing technologies and competing products, (3) competitive advantage of the SBIR/ STTR-developed technology, (4) market size and potential market share (may include national and/or global markets), (5) barriers to market entry (may include but is not limited to pricing, competition, government regulations, manufacturing challenges, capital requirements, etc.), (6) market drivers, (7) status of market and industry trends, (8) potential customers, licensees, investors, or other commercialization partners, and (9) the price customers are likely to pay. | | | | | | | | | | | | | |
| | | Website: https://cdc.gov/cancer/ | | | | | | | | | | | | | |
| | Neuro Startup Challenge | Program guide: The Neuro Startup Challenge was a multiphase business plan competition that leveraged NIH's significant portfolio of inventions available for licensing. | | | | | | | | | | | | | |
| | | Program activities: Neuro Startup Challenge (US) evaluated NIH's portfolio to identify tissue inventions with the strongest commercial viability. These inventions were eligible for use in the Neuro Startup Challenge. The Neuro Startup Challenge involved four phases. In Phase I, teams outlined their intent to participate in the Neuro Startup Challenge by providing information regarding the inventors' and their business plan, details and backgrounds of the members of their team, and how team members met eligibility requirements. In Phase II, Business Plan, which totaled approximately 15 page business plan with a detailed financial plan and presented a 30-minute "live" pitch to the challenge judges. Winners of this phase moved on to Phase III. In Phase III, Business Plan, which totaled approximately 15 page business plan with a detailed financial plan and presented a 30-minute "live" pitch to the challenge judges. Winners of this phase moved on to Phase IV. In Phase IV, Startup, the Neuro teams launched their startups, including incorporation, applying for licenses, and executing other regulatory or developmental needs. | | | | | | | | | | | | | |
| | | Website: https://www.neurostartupchallenge.org/ | | | | | | | | | | | | | |
| | NCIA | Program guide: NCIA address the gap in the commercialization pipeline between scientific discovery and company formation in order to more rapidly and effectively move breakthrough innovations to available products with health, economic, and societal impact. | | | | | | | | | | | | | |
| | | Program activities: NCIA's mission is to accelerate private partnerships leveraging institutes and resources from the federal government, academia, and the private sector that change life only discoveries with scientific and commercial potential are identified and developed. NCIA's support pool of concept studies, educate academics on the technology development process, and provide early access to the scientific and business expertise needed for commercialization. NCIA's provide early mentoring to innovators to develop key business elements (begin business development, regulatory, reimbursement, access to partners and capital). NCIA addresses the knowledge and funding gaps for the early steps needed to translate novel discoveries and technologies into new diagnostics, devices, therapeutics, and tools for patient care by providing pilot funding, based upon a review process for scientific merit and commercial potential, resources and expertise, including business plan development, market research, and IP protection, and educational and networking activities and linkages to local ecosystem resources. | | | | | | | | | | | | | |
| | | Website: https://ncia.nih.gov/about | | | | | | | | | | | | | |
| | REACH | Program guide: REACH accelerates the translation of scientific discovery into commercial products that improve health for patients. | | | | | | | | | | | | | |
| | | Program activities: REACH accelerates the translation of scientific discovery into commercial products that improve health for patients. | | | | | | | | | | | | | |
| | | Website: https://ncia.nih.gov/reach | | | | | | | | | | | | | |
| | NHLBI SBIR Phase IIB Bridge Award | Program guide: NHLBI SBIR Phase IIB Bridge Awards facilitate and accelerate the capital-intensive steps that are required to transition SBIR/ STTR Phase II projects to the commercialization stage by promoting partnership between SBIR/ STTR Phase II awardees and third-party investors and/or strategic partners. | | | | | | | | | | | | | |
| | | Program activities: The NHLBI SBIR Phase IIB Bridge Award provides a mechanism for small business concerns and SBIR/ STTR grantees to attract investors or strategic partners who can provide substantial financing to fully validate the commercial potential of the technology. | | | | | | | | | | | | | |
| | | Website: www.nhlbi.nih.gov/research/funding/sbir/bridge-award-program | | | | | | | | | | | | | |
| | NHLBI SBIR Phase IIB Small Market Award | Program guide: The NHLBI SBIR Phase IIB Small Market Award provides support to Phase II SBIR/ STTR awardees developing NHLBI mission-related technologies that address a rare disease or young pediatric population. | | | | | | | | | | | | | |
| | | Program activities: The NHLBI SBIR Phase IIB Small Market Award provides a mechanism for small business concerns and SBIR/ STTR grantees to attract investors or strategic partners who can provide substantial financing to fully validate the commercial potential of the technology. The applicant's ability to secure independent third-party investor funds that equal or exceed one-third of the NHLBI funds being requested over the entire project period is essential to the projects solicited under this program. Projects supported by this award must require eventual federal regulatory approval or clearance and be focused on commercializing biomedical technologies for rare diseases and/ or young pediatric populations, and may address preclinical and/ or clinical stages of technology development. | | | | | | | | | | | | | |
| | | Website: www.nhlbi.nih.gov/research/funding/sbir/small-market-awards | | | | | | | | | | | | | |
| | NCI SBIR Phase IIB Bridge Award | Program guide: The National Cancer Institute (NCI) Small Business Innovation Research (SBIR) Phase IIB Bridge Award facilitates the transition of promising new products for the technical scientific areas of cancer therapeutics, cancer imaging technologies, interventional devices, and in vivo diagnostics, and/ or in vitro and ex vivo cancer diagnostics and prognostics. To achieve this goal, the funding opportunity incentivized partnerships between federally funded SBIR Phase II awardees and third-party investors and/ or strategic partners. Preference is given to applications deemed likely to result in a commercial product, as indicated by the applicant's ability to secure substantial independent third-party investor funds. Applicants must provide a commercialization plan that describes the long-term commercialization strategy and details on any independent third-party investor funding that has already been secured or will be provided during the Bridge Award project period. | | | | | | | | | | | | | |
| | | Program activities: This award addresses the "valley of death" funding gap between the end of the SBIR Phase II award and the subsequent round of financing needed to advance a product or service beyond commercialization for projects in the technical scientific areas of cancer therapeutics, cancer imaging technologies, interventional devices, and in vivo diagnostics, and/ or in vitro and ex vivo cancer diagnostics and prognostics. To achieve this goal, the funding opportunity incentivized partnerships between federally funded SBIR Phase II awardees and third-party investors and/ or strategic partners. Preference is given to applications deemed likely to result in a commercial product, as indicated by the applicant's ability to secure substantial independent third-party investor funds. Applicants must provide a commercialization plan that describes the long-term commercialization strategy and details on any independent third-party investor funding that has already been secured or will be provided during the Bridge Award project period. | | | | | | | | | | | | | |
| | | Website: https://cancer.gov/research/funding/sbir/bridge-award | | | | | | | | | | | | | |
| | SBIR FAN2 Workshop | Program guide: The SBIR FAN2 Workshop provides academics an opportunity to learn how to utilize federal and local resources in order to advance commercialization. | | | | | | | | | | | | | |
| | | Program activities: The NCI SBIR Development Center FAN2 Workshop is a 2-day event open to current NCI SBIR/ STTR awardees. The workshop brings together representatives from federal agencies including the Food and Drug Administration (FDA), Centers for Medicare & Medicaid Services, and Biomedical Advanced Research and Development Authority, as well as experts from local and private organizations to share their expertise with attending companies. Attendees also have a chance to engage in one-on-one meetings with their respective Program Directors, as well as with speakers at the event. | | | | | | | | | | | | | |
| | | Website: https://dtp.cancer.gov/sbir/27 | | | | | | | | | | | | | |

TABLE 06-01

## Federal policies and programs supporting early-stage technology development and innovation

Summary of programs and policies for selected federal agencies

| Agency | Office | Program | Science and technology development: Tech. dev. | Tech. scouting | Cont. need | Talent dev. | Standard setting | IP rights / tech. transfer | Business training | Business networks | Enterprise development: Business mentors and peers | Business services | Talent dev. | Liability protn. | Financial support |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Broad Cancer Startup Challenge | Program goals: The Broad Cancer Startup Challenge was a business plan and startup competition to accelerate the commercialization of inventions conceived and developed by NCI scientists and Ivan Foundation grantees. | | | | | | | | | | | | | |
| | | Program activities: The Broad Cancer Startup Challenge leveraged 10 research technologies that were judged to show great promise to advance toward cancer research. These inventions included therapeutics, diagnostics, proprietary, one device, one vaccine, and delivery system, and one health IT invention. Teams of business, legal, medical or scientific, engineering and computer science students and seasoned entrepreneurs evaluated these technologies to create business plans and start new companies to develop and commercialize them. Winners and finalists in the Broad Cancer Startup Challenge were not only recognized for creating a business plan and pitch but were also invited to launch a startup, negotiate licensing agreements, and raise seed funding to further develop the inventions. | | | | | | | | | | | | | |
| | Nanotechnology Startup Challenge in Cancer | Program goals: The Nanotechnology Startup Challenge in Cancer is a business plan and startup competition that leverages inventions available for licensing from NCI to accelerate the translation and development of nanotechnology solutions for the early detection, diagnosis, and treatment of cancer. | | | | | | | | | | | | | |
| | | Program activities: 130 evaluated NCI's portfolio to identify three inventions with the strongest commercial viability. These inventions were eligible for use in the Nanotechnology Startup Challenge in Cancer. The Nanotechnology Startup Challenge in Cancer includes four phases. In Phase 0, teams outline their intent to participate in the Nanotechnology Startup Challenge in Cancer by providing information regarding the inventions they will develop their business plan around, details and backgrounds of the members of their team, and how team members meet eligibility requirements. In Phase 1 Elevator Speech, teams develop a 2-minute elevator speech via recorded video, a 250-word executive summary outlining potential commercial product(s), and a company vision. Winners of Phase 1 move on to Phase 2. Business Plan, in which teams develop a 10-page business plan with a detailed financial plan and present a 20-minute "live" pitch to the challenge judges. Winners of this phase receive a $10,000 award as well as move on to Phase 3: Startup. In Phase 3, teams launch their startups, including incorporation, applying for licenses, and executing other regulatory or developmental needs. | | | | | | | | | | | | | |
| | | Program goals: The Investors Development Program accelerates the development of selected technologies through the early stages of validation to inform critical decision points in the planning process. | | | | | | | | | | | | | |
| | | Program activities: The Investors Development Program accelerates development of NCI's inventions by providing funding for studies conducted by Leidos Biomedical Research to demonstrate proof of principle. NCI identified 21 inventions from its portfolio that were in need of specific data to attract commercial interest. The inventions were evaluated based on uniqueness, patent status, public health benefit, stage of research, patent filing date, and cost. A review committee composed of NCI scientists with experience in drug development and practical validation reviewed the 21 inventions and selected eight inventions as top candidates for the program. | | | | | | | | | | | | | |
| | SBIR | Program goals: The SBIR program supports preclinical development of therapeutic candidates intended to treat rare or neglected disorders, with the goal of enabling an investigational New Drug (IND) application to FDA. | | | | | | | | | | | | | |
| | | Program activities: The SBIR program supports small business concerns (SBCs) in the development of innovations that show promise for making a substantial impact on public health and meet the DTP accomplishes its mission. | | | | | | | | | | | | | |
| | BRDIs | Program goals: The Biomedical Research Development Investments (BRDIs) program supports the development of medical countermeasures for high consequence and rare disease through grants and contracts to small business concerns, academic institutions, nonprofit organizations, and pharmaceutical and biotechnology companies working on rare and neglected diseases. The program provides BRI's rare and neglected disease drug development capabilities, expertise, clinical resources, and regulatory expertise to research partners to optimize promising therapeutics and move them through preclinical testing, with the goal to generate sufficient quality data to support successful IND applications and first-in-human studies in limited circumstances. | | | | | | | | | | | | | |
| | | Program activities: Investigators do not receive grant funds through this program. Instead, selected researchers partner with BRI/TS experts to generate preclinical data and clinical grade material through government contracts for use in IND applications to a regulatory authority such as the FDA. BRDIs provides synthesis, formulation, pharmacokinetics, and toxicology expertise and resources to its collaborators. | | | | | | | | | | | | | |
| | | Website: https://www.dtp.gov/brdis | | | | | | | | | | | | | |
| | P-CAP | Program goals: The Pediatric Cancer Acceleration Program (P-CAP) supports the development of innovations that show promise for making a substantial impact on public health and how the DTP accomplishes its mission. | | | | | | | | | | | | | |
| | | Program activities: The P-CAP seeks to promote the maintenance and creativity of the DCC community in the design and development of new medications which show promise for making a substantial impact on public health and how it accomplishes its mission. The P-CAP provides intramural funding and support to DCC staff to develop initial proof of concept "prototypes" and pilot projects or scale up more mature projects that have been proven effective through pilot or replication studies. | | | | | | | | | | | | | |
| | | Website: https://www.cbiit.gov/ncia/science/technology/innovation/innovationofficer.html | | | | | | | | | | | | | |
| | I-Catalyst | Program goals: I-Catalyst is an internal innovation training program intended to help DCC teams transform ideas into solutions. I-Catalyst is designed to help teams get their ideas out of the starting blocks and down the track through a discovery, ideation, and prototyping process. I-Catalyst is based on NSF's successful I-Corps program. | | | | | | | | | | | | | |
| | | Website: NA | | | | | | | | | | | | | |
| Department of Homeland Security (DHS) | | | | | | | | | | | | | | | |
| | Office of Research and Development Commercialization (ORD) | Support Act Overview by Fostering Effective Technologies Act (SAFETY Act) | | | | | | | | | | | | | |
| | | Technology Scouting and Horizon Scanning | | | | | | | | | | | | | |
| | | Centers of Excellence (COEs) | | | | | | | | | | | | | |
| | | VIBRANT | | | | | | | | | | | | | |
| | Homeland Security Advanced Research Projects Agency (HSARPA) | Transition to Practice Program (TRL) | | | | | | | | | | | | | |
| | | Small Business Innovation Research Program (SBIR) | | | | | | | | | | | | | |
| | | Silicon Valley Office (SVO) | | | | | | | | | | | | | |
| | Support to the Homeland Security Enterprise and First Responders Group (FRG) | Technology Scouting | | | | | | | | | | | | | |
| | | Program goals: The SAFETY Act aims to designate antiterrorism technologies that qualify for protection under the system of risk management. The program incentivizes the private sector to commit additional resources to significantly improve antiterrorism preparedness and readiness by reducing private-sector risk and liability for developing antiterrorism technologies. | | | | | | | | | | | | | |
| | SAFETY Act | Program activities: The SAFETY Act provides a liability cap for claims resulting from an act of terrorism and provides legal liability protection for providers of qualified antiterrorism technologies. The SAFETY Act provides two levels of liability protection: (1) designation, where the seller's liability for products or services is limited to the amount of liability insurance the DHS determines the seller must maintain, and (2) certification, which allows a seller of antiterrorism technology to assert the Government Contractor Defense for claims arising from acts of terrorism. | | | | | | | | | | | | | |
| | | Website: https://www.safetyact.gov/SAFETYWebsite/Home.aspx | | | | | | | | | | | | | |
| Program descriptions | Technology Scouting and Horizon Scanning | Program goals: Technology scouting aims to provide DHS S&T with a foundation for program decisions and help shape program priorities. Technology scouting shapes the way DHS S&T discovers, monitors, and assesses new and emerging technologies critical to homeland security. The program goals are to improve the availability of technology alternatives, increase the speed of project execution, and reduce costs for projects. | | | | | | | | | | | | | |
| | | Program activities: The technology scouting program provides program managers with a better understanding of the state of technology, including new and emerging technology, market analysis, and private-sector innovation landscapes. The program does this in two ways: (1) technology scouting, which maps potential landscapes, finds federal laboratory technology, analyzes venture capital firms, and looks across relevant markets for a technology that will meet S&T needs, and (2) horizon scanning, which maintains constant awareness of the technology spaces to inform program managers of impactful breakthroughs or alternatives. | | | | | | | | | | | | | |

TABLE 06-41

**Federal policies and programs supporting early-stage technology development and innovation**

Summary of programs and policies for selected federal agencies[1]

| Agency | Office | Program | Science and technology development: Financial support | Talent dev. | Standard setting | IP rights / tech. transfer | Business training | Business networks | Enterprise development: Business mentors and peers | Business services | Talent dev. | Liability protn. | Financial support |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Website: https://www.dhs.gov/publication/technology-scouting-and-horizon-scanning | | | | | | | | | | | |
| | CIQs | Program goals: CIQs establish a coordinated, university-based system to enhance the nation's homeland security. | | | | | | | | | | | |
| | | Program: Homeland Security Centers of Excellence (COEs) develop new tools and technologies to arm our homeland homeland security challenges and help train the next generation of homeland security experts. COEs assist the homeland security community with specialized research, expertise, and facilities. Each COE focuses on a specific set of DHS-relevant challenges and addresses these challenges with multidisciplinary, customer-driven research and technology development. COEs also provide their knowledge and technology to assist in rapid response and emergency operations. | | | | | | | | | | | |
| | | Website: https://www.dhs.gov/science-and-technology/centers-excellence | | | | | | | | | | | |
| | HSARPA | Program goals: HSARPA seeks competitive, merit-reviewed grants, cooperative agreements, or contracts to public or private entities, including businesses, federally funded research and development centers, and universities that support basic and applied homeland security research that promotes revolutionary changes in technologies. | | | | | | | | | | | |
| | | Program: HSARPA's Innovation Pipeline, Innovation Teams, quasi-contracts, and prizes and Other-Transaction Authority (OTA) are flexible, quick, and agile business practices that leverage commercial capabilities to DHS components and other homeland security enterprise partners. HSARPA also advises partners on science, technology, and industry developments with respect to mission, threats, and opportunities. | | | | | | | | | | | |
| | | Website: https://www.dhs.gov/science-and-technology/hsarpa | | | | | | | | | | | |
| | SAVI | Program goals: TPP aims to (1) identify mission technologies that address or widening or imminent cybersecurity gap in public or private systems that impacts national security; (2) increase rate through partnerships, product development efforts, and marketing strategies; and (3) improve the long-term ability for federal government research labs to transition technology more efficiently. | | | | | | | | | | | |
| | | Program: TPP seeks to identify technologies that address or widening or imminent cybersecurity gap in public or private systems that impacts national security. Technologies are introduced to potential partners, investors, and integrators, and showcased at a national series of Technology Demonstration Days. TPP supports multiple paths to transition, including open source, licensing, startups, adaptors by cyber operations, and government use. | | | | | | | | | | | |
| | | Website: https://www.dhs.gov/science-and-technology/savi | | | | | | | | | | | |
| | VIDP | Program goals: VIDP's goal is to identify and develop cyber security solutions and the world's cyber/IT/OT challenges. The program seeks to use leading-edge private sector capabilities to shorten the process, and speed of discovery, delivery and other innovative investments, research, and development. | | | | | | | | | | | |
| | | Program activities: VIDP uses Innovation Other Transaction Solicitations (OTSs) to work with transformational performers. These Innovation OTSs are open to all innovation ecosystems and offer up to $600k in funding over 24 months. The Innovation OTS program offers several advantages to performers, including the government as an early adopter, no dilution of ownership, and jobs and operator feedback. The VIDP regional programs help companies better understand DHS, S&T, DHS components, the homeland security mission, and how innovation contractors can help the government solve problems across the Homeland Security Enterprise. | | | | | | | | | | | |
| | | Website: https://www.dhs.gov/science-and-technology/vidp | | | | | | | | | | | |
| | SVIP | Program goals: SVIP DHS's efforts to partnership with the private sector to solve some of the most challenging homeland security problems. | | | | | | | | | | | |
| | | Program activities: SVIP DHS's efforts to partnership with the private sector to solve some of the most challenging homeland security problems. SVIP DHS collaborates with the private sector, academia, and other government agencies to develop solutions for the toughest homeland security challenges. | | | | | | | | | | | |
| | | Program: SVIP DHS's efforts to partnership with the private sector to solve some of the most challenging homeland security problems. SVIP DHS collaborates relationships with technology companies from small startups to large firms, incubators, and accelerators, to help them better understand DHS's operational mission. SVIP also connects in promoting technologies to accelerate transition to market, demonstrate and pilot new-term technologies that could better protect the homeland, fund new research and development using forward-leaning acquisition methods (such as accelerators and prize competitions), and transition emerging innovative technology into DHS programs and the Homeland Security Enterprise. | | | | | | | | | | | |
| | | Website: https://www.dhs.gov/science-and-technology/svip | | | | | | | | | | | |
| | DARPA Accelerator | Program goals: DARPA Accelerator is a pilot for entrepreneurs designed to accelerate the development of technologies that address the unique needs of first responders by promoting early market validation, test and evaluation opportunities, and paths to introduce these technologies to a variety of leading, leading partners in the public sector. | | | | | | | | | | | |
| | | Program activities: DARPA Accelerator provides a pilot for entrepreneurs designed to accelerate the development of technologies that address the unique needs of first responders by promoting early market validation, test and evaluation opportunities, and paths to introduce these technologies to a variety of leading, leading partners in the public sector. | | | | | | | | | | | |
| | | Website: https://www.dhs.gov/publication/darpa-accelerator-program | | | | | | | | | | | |
| Department of Transportation | | | | | | | | | | | | | |
| Federal Highway Administration (FHWA) | Office of Innovative Program Delivery | State Transportation Innovation Council (STIC) Incentive Program | ✓ | ✓ | | | | ✓ | | | | | |
| | | Program: The STIC Incentive Program offers technical assistance and resources to support the standardization of innovative practices among state transportation agencies and other public-sector stakeholders. | | | | | | | | | | | |
| | | Accelerated Innovation Deployment (AID) Demonstration Program | ✓ | ✓ | | | | | | | | | ✓ |
| | | Program goals: The STIC Incentive Program offers technical assistance and resources to support the standardization of innovative practices among state transportation agencies and other public-sector stakeholders. | | | | | | | | | | | |
| | STIC Incentive Program | Program: The STIC Incentive Program provides up to $150,000 per state per Federal fiscal year (in FY21) to support or offset the costs of standardizing innovative practices in state transportation agency or other public-sector STIC stakeholder. STIC Incentive Program funding may be used to conduct internal assessments, build capacity, develop guidance, standards, and specifications, implement system process changes, organize peer exchanges, offset implementation costs, or conduct other activities STIC identifies to address Technology and Innovation Deployment Program goals. | | | | | | | | | | | |
| | | Website: https://www.fhwa.dot.gov/innovation/stic/ | | | | | | | | | | | |
| Program descriptions | STIC Program | Program goals: The STIC Program is a state-based model for the identification and rapid deployment of proven but underutilized innovations to shorten the project delivery process, enhance roadway safety, reduce congestion, and improve environmental sustainability. | | | | | | | | | | | |
| | | Program: The STIC Program is a state-based model for the identification and rapid deployment of proven but underutilized innovations to shorten the project delivery process, enhance roadway safety, reduce congestion, and improve environmental sustainability. | | | | | | | | | | | |
| | | Website: https://www.fhwa.dot.gov/innovation/stic/pdf/stic_fact_sheet.pdf | | | | | | | | | | | |
| | AID Demonstration Program | Program goals: The AID Demonstration Program provides funding to state departments of transportation, federal land management agencies, and tribal governments that covers the cost of implementation and adaption of an innovation being deployed in a highway transportation project. AID Demonstration projects may involve any phase of a highway transportation project between project planning and project delivery including planning, financing, operation, structures, materials, pavements, environment, and construction and must include an innovation proven as a real-world highway transportation application but not routinely used by the applicant. | | | | | | | | | | | |
| | | Website: https://www.fhwa.dot.gov/innovation/aid/ | | | | | | | | | | | |
| Environmental Protection Agency (EPA) | | | | | | | | | | | | | |
| Office of Water | | WaterSense | ✓ | | | ✓ | | | | | | | |
| Office of Air and Radiation | | SmartWay | ✓ | | | | | ✓ | | ✓ | | | |

TABLE 06-01

**Federal policies and programs supporting early-stage technology development and innovation**

Summary of programs and policies for selected federal agencies[1]

| Agency | Office | Program | Science and technology development: Tech. dev. | Tech. scouting | Cont. need | Financial support | Talent dev. | Standard setting | IP mgmt./tech. transfer | Business training | Business networks | Business mentors and peers | Enterprise development: Business services | Talent dev. | Liability protn. | Financial support |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Office of Research and Development | | ENERGY STAR® | | | | | | | | | | | | | | |
| | | Continuous Emissions Monitoring Performance Specifications | ✓ | | | | | | | | | | | | | |
| | | Federal Energy Management Program | ✓ | ✓ | | | ✓ | | ✓ | | | | | | | |
| | | Program goals: WaterSense aims to transform the marketplace for products and services that use water and promote a nationwide ethic of water efficiency to conserve water resources for future generations and reduce water and wastewater infrastructure costs. The program encourages water efficiency in the United States through the use of a special label on consumer products. | | | | | | | | | | | | | | |
| | WaterSense | Program activities: The EPA provides and maintains the WaterSense brand and develops national specifications for water-efficient products and programs through agreement and partnerships with interested stakeholders, such as product manufacturers, retailers, and water utilities. EPA requires all products bearing the WaterSense label to be assessed for conformance to the relevant WaterSense product specification by an accredited third-party product certifying body. Accredited product certifying bodies are licensed by EPA to certify that products conform to applicable specifications and to authorize the use of the WaterSense label in conjunction with the certified product. | | | | | | | | | | | | | | |
| | | Website: https://www.epa.gov/watersense | | | | | | | | | | | | | | |
| | | Program goals: SmartWay is a partnership with the private sector to achieve better environmental outcomes, save money, and drive technical innovation through improved efficiency in moving goods across commercial supply chains. | | | | | | | | | | | | | | |
| | SmartWay | Program activities: SmartWay helps U.S. businesses (freight shippers, carriers, logistics companies) innovate with tools, methods, and technical advice that businesses rely upon to make transportation decisions. SmartWay provides technical assistance and guidance on technology assessment, and improves efficiency across freight supply chains. SmartWay technology verification and branding works with manufacturers and suppliers to accelerate the availability, adoption, and market penetration of cleaner, fuel-saving technologies and operational practices. SmartWay also advances technical capacity for U.S. companies with overseas supply chains, by working to harmonize global sustainability accounting methods. More than 3,000 companies and over 400 trade associations and other organizations participate in SmartWay, along with dozens of manufacturers and suppliers. | | | | | | | | | | | | | | |
| | | Website: https://www.epa.gov/smartway | | | | | | | | | | | | | | |
| Program descriptions | | Program goals: ENERGY STAR® is the government-backed symbol for energy efficiency, providing simple, credible, and unbiased information that consumers and businesses rely on to make well-informed decisions. It is a voluntary program that aims to identify and promote energy-efficient products and buildings that offer the highest energy efficiency benefits. | | | | | | | | | | | | | | |
| | ENERGY STAR® | Program activities: ENERGY STAR® is a partnership between the EPA and the U.S. Department of Energy (DOE) to help businesses and individuals save money and protect our climate through the use of energy-efficient products and practices. The ENERGY STAR® brand is backed by rigorous specifications and independent third-party verification and testing to ensure that products and buildings that earn the ENERGY STAR® deliver the promised energy efficiency and performance benefits. The ENERGY STAR® brand also delivered energy performance rating systems for commercial and institutional building stocks and the manufacturing sector. The ENERGY STAR® brand also delivered energy performance rating systems for commercial and institutional building stocks and the manufacturing sector. | | | | | | | | | | | | | | |
| | | Website: https://www.energystar.gov/ | | | | | | | | | | | | | | |
| | | Program goals: The Continuous Emissions Monitoring Performance Specifications provide a standard for continuous emissions monitoring systems (CEMS) to be used for long-term compliance monitoring at stationary sources. | | | | | | | | | | | | | | |
| | Continuous Emissions Monitoring Performance Specifications | Program activities: EPA's CEMS performance specifications and quality assurance procedures currently address (1) flow for six criteria pollutants (including particulate matter, sulfur dioxide, nitrogen oxides, carbon monoxide, and total reduced sulfur); (2) flow for six criteria pollutants (including mercury, hydrogen chloride, hydrogen sulfide, and gaseous total organic compounds); (3) hydrogen chloride; and (4) flow for mercury. The specifications also contain quality assurance procedures for Cluster Rule facilities subject to the National Emission Standards for Hazardous Air Pollutants (NESHAP) for the combustion of municipal solid waste and hazardous waste. | | | | | | | | | | | | | | |
| | | Website: https://www.epa.gov/emc/performance-specifications-and-other-monitoring-information | | | | | | | | | | | | | | |
| | Roadmap for Next Generation Air Monitoring | Program goals: The Roadmap program research and other activities is part of three areas: (1) technology development, testing, and integration, (2) technology demonstration, outreach, and communication strategies, and (3) IT infrastructure and new data streams. | | | | | | | | | | | | | | |
| | | Program activities: The Roadmap program research and other activities is part of three areas: (1) technology development, testing, and integration, (2) technology demonstration, outreach, and communication strategies, and (3) IT infrastructure and new data streams. | | | | | | | | | | | | | | |
| | | Website: https://www.epa.gov/sites/production/files/2014-06/documents/roadmap-2014036.pdf | | | | | | | | | | | | | | |
| National Aeronautics and Space Administration (NASA) | | | | | | | | | | | | | | | | |
| Private Business: From multi-federal agency initiative, including NASA | | LaunchX | ✓ | | | | | | | | ✓ | ✓ | | | | |
| NASA Initiated Public-Private Partnership | | Space Race | | ✓ | | | | | ✓ | | | ✓ | | ✓ | | ✓ |
| Human Exploration and Operations Mission Directorate | Advanced Exploration Systems Division | Next Space Technologies for Exploration Partnerships (NextSTEP) | | | ✓ | | ✓ | | | | ✓ | | | | | |
| | | Technology Demonstration Missions | ✓ | ✓ | | | | | | | | | | | | |
| | | Human Landing System | ✓ | ✓ | | | | | | | | | | | | |
| | | Centennial Challenges | ✓ | ✓ | | | | | | | | | | | ✓ | |
| Space Technology Mission Directorate | | Regional Economic Development (RED) | ✓ | ✓ | | | | | | | | | ✓ | | | |
| | | Prizes and Challenges | ✓ | ✓ | | | | ✓ | | | | | | | | |
| | | Game Changer | ✓ | ✓ | | | | ✓ | | | | | | | | ✓ |
| | Technology Transfer Program | NASA Software Catalog | | ✓ | | | | | | | | | | | | |
| | | Small Business Innovation Research (SBIR) | | | | | | | | ✓ | | | | ✓ | | |
| Program descriptions | | Program goals: LlaunchX aims to build and nurture a community of innovators, thought leaders, and decision makers across value chains to collectively understand, articulate, and scale solutions for positive systems-change leading to a more sustainable society. | | | | | | | | | | | | | | |
| | LAUNCH | Program activities: LAUNCH is a network-centered innovation platform that connects and curates networks of individuals and organizations. LAUNCH coordinates system-wide collaborations to address complex challenges through its curated network of innovators and thought leaders. LAUNCH network maintains help shape LAUNCH's challenge statements, recruit and select innovators, provide pro bono innovator support and mentorship, and join a coalition of the committed to actively shepherd change. | | | | | | | | | | | | | | |
| | | Website: https://www.launch.org/ | | | | | | | | | | | | | | |

TABLE 8A-41

## Federal policies and programs supporting early-stage technology development and innovation

Summary of programs and policies for selected federal agencies

| Agency | Office | Program | Science and technology development: Tech. dem | Tech. scouting | Cont. need | Financial support | Talent dev | Standard setting | IP rights / tech. transfer | Business training | Business networks | Enterprise development: Business mentors and peers | Business services | Talent dev. | Liability protn. | Financial support |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| National Science Foundation | Space Race | Program goals: Space Race fostered new startup companies and encouraged adoption of NASA technologies, by learning x86-32bit to run a multiplatform business plan competition in 2014. The competition leveraged NASA's new program — "Startup NASA" — to create space technology spin-offs. | | | | | | | | | | | | | | |
| | | Program activities: Did reviewed NASA's portfolio of technologies and identified those that have near-term commercialization potential. Did held a challenge for teams to explore the market potential of the technologies and write business plans. The winners of the competition were awarded a cash prize, provided by third-party venture capital investors, and encouraged to incorporate and pursue licensing the technologies from NASA, using their winnings as seed funding for the new business. The challenge was supported by a startup accelerator designed to provide training and expert mentorship to all participants. | | | | | | | | | | | | | | |
| | | Website: https://www.nasa.gov/spacerace/spacerace-overview/ | | | | | | | | | | | | | | |
| | NextSTEP | Program goals: The NextSTEP program is a public-private partnership model that leverages commercial development of deep space exploration capabilities to support more extensive human spaceflight missions in the Proving Ground around and beyond cislunar space — the space near Earth that extends just beyond the moon. | | | | | | | | | | | | | | |
| | | Program activities: NextSTEP stimulates the commercial space industry to help NASA achieve its strategic goals and objectives for expanding the frontiers of knowledge, capability, and opportunities in space. The NextSTEP partnership model provides an opportunity for NASA and industry to partner to develop capabilities that meet NASA human space exploration objectives while also supporting industry commercialization plans. Through these public-private partnerships, NextSTEP partners provide advance concept studies and technology development projects in the areas of advanced propulsion, habitation systems, and small satellites. | | | | | | | | | | | | | | |
| | | Website: https://www.nasa.gov/nextstep/about | | | | | | | | | | | | | | |
| | Technology Demonstration Missions | Program goals: Technology Demonstration Missions seek to mature innovating, laboratory-proven technologies — ones that could radically advance NASA's mission in space and may unlock benefits for science and industry here on Earth — to flight-ready status. | | | | | | | | | | | | | | |
| | | Program activities: The Technology Demonstration Mission program focuses on crosscutting technologies with strong customer interest that meet the needs of NASA and industry by enabling new missions or greatly enhancing existing ones. Chosen technologies are thoroughly ground- and flight-tested in relevant operating environments — reducing risks to future flight missions, gaining operational heritage, and continuing NASA's long history as a technological leader. | | | | | | | | | | | | | | |
| | | Website: https://www.nasa.gov/mission_pages/tdm/index.html#.Xq4Ldm4zZPY | | | | | | | | | | | | | | |
| | Flight Opportunities | Program goals: The Flight Opportunities program advances innovation space technologies of interest to NASA while also stimulating the growth and use of the U.S. commercial spaceflight industry as well as supporting capability development in the suborbital and orbital small satellite launch vehicle market. | | | | | | | | | | | | | | |
| | | Program activities: Flight Opportunities provides a cost-effective, commercial spaceflight platform for the testing and development of technologies in relevant environments, including suborbital, orbital, and parabolic aircraft flights. The program entails two activities. Through Suborbital Flight Testing and Capability Development, NASA selects promising technologies from industry, academia, and government, and tests them on commercial suborbital platforms. This approach takes technologies from a laboratory environment and grows them flight-heritage, increasing their Technology Readiness Level, while also nurturing the development of U.S. commercial spaceflight capabilities, services, and skills. Through Small Launch Vehicle Technology Development, NASA uses public-private partnerships to accelerate the development of commercial capabilities that enable the frequent launch of small satellites to low Earth orbit at a cost per kilogram of payload much lower than currently available. | | | | | | | | | | | | | | |
| | | Website: https://www.nasa.gov/directorates/spaceflight/flightopportunities/index.html | | | | | | | | | | | | | | |
| | Centennial Challenges | Program goals: Centennial Challenges seek to stimulate innovation and advanced technology development by offering monetary prizes to generate breakthrough solutions to challenges and to spur private sector investment in prizes to NASA and the nation. | | | | | | | | | | | | | | |
| | | Program activities: The program seeks innovations from diverse and nontraditional sources. Competitions are not supported by government funding and awards are only made to successful teams when the challenges are met. The Centennial Challenges prizes are offered to independent inventors including small businesses, student groups, and individuals. These independent inventors are sought to generate innovative solutions for technical problems of interest to NASA and the nation and to provide them with the opportunity to contribute or create new business ventures. | | | | | | | | | | | | | | |
| | | Website: https://www.nasa.gov/directorates/spaceflight/centennial_challenges/index.html | | | | | | | | | | | | | | |
| | SBIR | Program goals: The SBIR program is designed to stimulate technological innovation in private innovative ecosystems across the country through strategic regional partnerships with external public- and private-sector organizations to increase access of critical importance to the region of interest. | | | | | | | | | | | | | | |
| | | Program activities: The SBIR process is different in every regional focus area but follows four general steps in order to be successful: 1. Step Zero: "Local Listening," an inventory of the regional and federal assets is conducted. 2. Step Two: "Market Analysis and Vision Gathering," an industry and market analysis is conducted to understand what opportunities both provide. 3. Step Three: "Demonstration Projects," the regional players are brought together to determine common goals and alignment between industry and NASA, as well as what assets can be utilized and how they are linked. Demonstration projects include technology showcases, technology interchange forums, technology roadshows, technology incubing, and NASA Executive in Residence programs. 4. Step Four: "Ecosystem Sustainability," the motivation is expected to come from the ecosystem and its customers. | | | | | | | | | | | | | | |
| | | Website: https://www.nasa.gov/directorates/spaceflight/regional_economic_development/success-stories | | | | | | | | | | | | | | |
| | | Program activities: Regional Economic Development offices are located in strategic locations to provide regional partnerships to the biomes | | | | | | | | | | | | | | |
| | QuickLaunch | Program activities: NASA offers a specially selected portfolio of technologies available for commercial licensing. QuickLaunch purposes have a set initial fee, annual royalty, and standard terms. For many technologies, licensees may request an evaluation license for a short term prior to requesting a commercial license. | | | | | | | | | | | | | | |
| | | Website: https://technology.nasa.gov/licenses | | | | | | | | | | | | | | |
| | Startup NASA | Program goals: Startup NASA partnerships with top gun3 coach for commercial use of NASA's patented technologies. | | | | | | | | | | | | | | |
| | | Program activities: Startup NASA licenses space-ready technology there and begins to minimize fees for the first 3 years. Once a company starts selling products, NASA collects a standard royalty fee. This allows companies to hold onto their cash while securing the intellectual property needed to carve out competitive market space. Startup NASA licenses are only available for U.S. companies formed with the express intent of commercializing the licensed NASA technology. The startup agreement applies only to nonexclusive licenses, which means other companies may apply for similar rights to use the same technology. | | | | | | | | | | | | | | |
| | | Website: https://technology.nasa.gov/startup | | | | | | | | | | | | | | |
| | NASA Software Catalog | Program goals: The NASA Software Catalog offers an extensive portfolio of software products for a wide variety of technical applications, all free of charge to the public, without any royalty or copyright fees. | | | | | | | | | | | | | | |
| | | Program activities: The catalog has contributions from all of NASA's centers in data processing or storage, business systems, operations, propulsion, and aeronautics. It includes many of the tools NASA uses to explore space and broaden our understanding of the universe. Each catalog entry is accompanied with a plain language description of what it does. The NASA Software Catalog was the first comprehensive listing of publicly available software to be compiled by a federal government agency — the largest creator of custom code. While access restrictions apply to some codes, NASA has automated and updated its software release process to ensure that it is quick, easy, and straightforward as possible. | | | | | | | | | | | | | | |
| | | Website: https://software.nasa.gov/ | | | | | | | | | | | | | | |
| | TOU | Program goals: Through TOU, NASA grants technologies into the classroom so that business students can practice creating market assessments and business plans for high-tech patents. | | | | | | | | | | | | | | |
| | | Program activities: In this program, business students have access to the NASA scientists and innovators, giving them a unique look into the fine-grained details of the technology they are working on. Through the TOU program, NASA field centers across the country engage business schools and hundreds of students each year. TOU educates young entrepreneurs about the benefits of using federal government research and development assets in commercial applications. | | | | | | | | | | | | | | |
| | | Website: https://technology.nasa.gov/TOU | | | | | | | | | | | | | | |
| National Science Foundation | | | | | | | | | | | | | | | | |
| Directorate for Engineering | Division of Industrial Innovation and Partnerships (IIP) | Program goals: | | | | | | | | | | | | | | |
| | | Industry-University Cooperative Research Centers Program (IUCRC) | | 0 | | | | | | | | 0 | | | | |
| | | Partnerships for Innovation: Building Innovation Capacity (PFI:BIC) | | 0 | | 0 | | 0 | | | | 0 | | 0 | | |
| | | Partnerships for Innovation: Accelerating Innovation Research Technical Translation (PFI:AIR-TT) | | | | 0 | | | | | | | | | | |

TABLE 8A-1

**Federal policies and programs supporting early-stage technology development and innovation**

Summary of programs and policies for selected federal agencies[1]

| Agency | Office | Program | Tech. dev. | Tech. scouting | Gov. need | Science and technology development: Financial support | Talent dev. | Standard setting | IP rights / tech. transfer | Business training | Business networks | Enterprise development: Business mentors and peers | Business services | Talent dev. | Liability protn. | Financial support |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Program descriptions | Division of Engineering Education and Centers (EEC) | Engineering Research Centers (ERC)<br>Website: https://www.nsf.gov/news/special_reports/erc/ | X | | | X | X | | X | | | | | | | |
| | eCorps[2] | Program activities: There are three distinct components of eCorps: Twenty Hubs, and Cities. eCorps Twenty include NSF funded researchers who will receive additional support in the form of mentoring and funding. In academic innovation that can attract subsequent third-party funding. Hubs serve as hubs for education, infrastructure, and research that engage academic scientists and engineers in innovation. They also deliver the Corps Curriculum to eCorps Teams. Cities Alliance Cities are academic institutions that catalyze the engagement of multiple, local teams in technology transaction and strengthen local innovation.<br>Website: https://www.nsf.gov/news/special_reports/ecorps/ | | | | | | | | | | | | | | |
| | SCERC | Program activities: The SCERC program seeks to promote a strong, pre-competitive research ecosystem that supports multidisciplinary, sustained partnerships among industry, academia, and government. NSF invests in these partnerships to promote research programs of mutual interest to industry members and SCERC faculty, to contribute to the nation's research infrastructure base, to enhance the intellectual capacity of the engineering or science workforce through the integration of research and education, and to facilitate technology transfer.<br>Program activities: The SCERC program seeks to achieve its goals by: (1) contributing to the nation's research enterprise by developing long-term partnerships among industry, academia, and government; (2) leveraging NSF funds with industry to support graduate students performing industrially relevant pre-competitive research; (3) expanding the innovation capacity of our nation's competitive workforce through partnerships between industries and universities; and (4) encouraging the nation's research enterprise to remain competitive through active engagement with academic and industrial leaders throughout the world.<br>Website: https://www.nsf.gov/news/special_reports/scerc/ | | | | | | | | | | | | | | |
| | PFI:BIC | Program activities: PFI:BIC focuses on academic-industry partnerships that carry out research to advance, adapt, and integrate technologies into specified, human-centered smart service systems with the potential to achieve transformational change in an existing service system or to spur an entirely new service system. These partnerships are led by an interdisciplinary academic research team with at least one industry partner. The PFI:BIC program places a heavy emphasis on the quality, composition, and participation of the partners, including their appropriate contributions.<br>Website: https://www.nsf.gov/news/special_reports/pfi/ | | | | | | | | | | | | | | |
| | PFI:AIR-TT | Program activities: PFI:AIR-Translational partnerships working on projects that operate in the proof/potential/ and translational space that require additional effort to integrate the technology into a real service system, one that can identify, learn, adapt, and make decisions. The research tracks in turn can spawn additional discoveries inspired by the interaction of humans with the technology. The research components included in these projects are engineered system design and integration, computing, sensing, and information technologies, and human factors, behavioral sciences, and cognitive engineering.<br>Website: https://www.nsf.gov/news/special_reports/pfi/ | | | | | | | | | | | | | | |
| | I-Corps | Program goals: The I-Corps™ program supports research to overcome technology barriers or knowledge gaps in the transformation of fundamental science and engineering discoveries into market-valued solutions.<br>Program goals: The PFI:AIR-TT program supports research to overcome technology barriers or knowledge gaps in the transformation of fundamental science and engineering discoveries into market-valued solutions.<br>Website: https://www.nsf.gov/news/special_reports/i-corps/ | | | | | | | | | | | | | | |
| | EDSILI | Program goals: EDSILI promotes university-industry collaboration by making partner Hubs or fellowships or internships available to support an eclectic mix of industry-university linkages across NSF. By increasing the number of industrial partnerships and collaborations, NSF aims to improve the nation's capacity for intellectual and economic growth. By serving as a catalyst for industry-university partnerships, NSF helps ensure that intellectual capital and emerging technologies are brought together in ways that promote economic growth and an improved quality of life.<br>Program activities: EDSILI is a pilot program that relies on Hubs or Hub-like organizations (HOs) funding other in conjunction with a regular proposal submitted by a standing NSF program or as a supplemental funding request to an existing NSF funded award. NSF funding can be used for university research or education activities and may support activities of faculty and their students and research assistants in the industrial setting. NSF funds are not permitted to be used to support the industrial research partner. (HOs) projects focus on research that addresses shared interests by academic researchers and industrial partners. The research furthers scientific and engineering foundations to enable future breakthrough technologies with the potential to address critical industry needs.<br>Website: https://www.nsf.gov/news/special_reports/ | | | | | | | | | | | | | | |
| | ERC | Program goals: ERCs support basic and translational research on national priorities such as water, clean energy, biotechnology and health care, advanced manufacturing, and critical civil infrastructure. The program aims to integrate engineering research and education with technological innovation to transform national prosperity, health, and security. ERCs create an innovative, inclusive culture in engineering to cultivate new ideas and pursue engineering discovery that achieves a significant science, technology, and societal outcome within the 10 year time frame of NSF support.<br>Program activities: ERCs are long-term (ten-three-five-three) awards, (1) cross-disciplinary and systems-oriented research, (2) education and outreach, and (3) industrial collaboration and technology transfer. Each ERC is established as a three-way partnership involving academia, industry, and NSF (in some cases with the participation of states, local, and or other federal government agencies). Total annual funding for each ERC ranges from $1.5 to $2.5 million, with NSF's contribution ranging from $1.0 to $1.5 million per year, averaging $1.5 million per year. | | | | | | | | | | | | | | |

Source: research + government needs, IP rights / tech. transfer + intellectual property management+ technology transfer, Liability protn. = liability protection, NA = not available, Talent dev. = talent development, Tech. dev. = technology development, Tech. scouting = technology scouting.

**Notes:**

[1] The table summarizes policy and program information collected during the spring and fall of 2017. Point-of-contact staff for a selected set of U.S. agencies with major R&D and technology development activities. The table reflects agency responses and is not intended to be exhaustive.

**Sources:**

National Center for Science and Engineering Statistics, National Science Foundation, 8th International, special tabulations of federal program information (2017).

Science and Engineering Indicators

TABLE S8-62

## Global venture capital investment, by selected region, country, or economy: 1999–2018

(Millions of U.S. dollars)

| Region, country, or economy | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Global total | 24,548 | 57,139 | 29,457 | 22,964 | 22,857 | 25,967 | 29,308 | 36,787 | 45,615 | 53,237 | 37,561 | 52,980 | 65,667 | 63,584 | 69,795 | 111,224 | 152,809 | 151,470 | 171,887 | 271,369 |
| North America | | | | | | | | | | | | | | | | | | | | |
| Canada | 244 | 968 | 869 | 621 | 386 | 639 | 1,064 | 769 | 1,239 | 1,076 | 853 | 930 | 1,467 | 1,835 | 2,074 | 1,773 | 2,006 | 2,172 | 2,509 | 5,748 |
| Mexico | 0 | 4 | 0 | 10 | 0 | 0 | 0 | 10 | 0 | 24 | 10 | 89 | 37 | 274 | 143 | 168 | 195 | 159 | 142 | 191 |
| United States | 22,545 | 50,812 | 24,771 | 19,209 | 18,179 | 21,659 | 23,413 | 29,350 | 35,562 | 40,610 | 27,821 | 32,034 | 44,490 | 41,611 | 47,541 | 70,275 | 81,955 | 75,285 | 83,886 | 118,658 |
| Europe | | | | | | | | | | | | | | | | | | | | |
| EU | 1,221 | 4,090 | 2,946 | 2,402 | 1,812 | 2,539 | 2,905 | 3,682 | 5,428 | 6,558 | 4,679 | 7,622 | 7,680 | 8,916 | 9,120 | 12,392 | 17,791 | 16,621 | 18,192 | 21,699 |
| Belgium | 81 | 114 | 116 | 93 | 43 | 75 | 55 | 238 | 237 | 146 | 172 | 197 | 768 | 174 | 636 | 379 | 354 | 359 | 374 | 581 |
| France | 98 | 448 | 406 | 219 | 161 | 490 | 409 | 723 | 891 | 884 | 785 | 996 | 897 | 1,079 | 1,058 | 1,267 | 1,772 | 2,048 | 2,219 | 3,552 |
| Germany | 135 | 534 | 261 | 176 | 186 | 430 | 448 | 310 | 629 | 1,122 | 590 | 785 | 1,490 | 1,480 | 1,566 | 2,701 | 3,277 | 3,170 | 2,871 | 3,726 |
| Italy | 15 | 27 | 42 | 22 | 25 | 103 | 4 | 68 | 25 | 74 | 78 | 80 | 260 | 252 | 151 | 65 | 141 | 254 | 131 | 335 |
| Ireland | 9 | 137 | 152 | 73 | 99 | 145 | 181 | 370 | 251 | 245 | 215 | 344 | 360 | 232 | 243 | 450 | 518 | 683 | 513 | 753 |
| Netherlands | 137 | 134 | 95 | 46 | 36 | 77 | 63 | 101 | 163 | 174 | 158 | 147 | 240 | 152 | 363 | 894 | 952 | 447 | 721 | 555 |
| Spain | 38 | 47 | 9 | 30 | 282 | 22 | 46 | 146 | 260 | 212 | 166 | 370 | 420 | 333 | 290 | 337 | 466 | 646 | 655 | 810 |
| Sweden | 265 | 559 | 244 | 157 | 159 | 105 | 181 | 245 | 368 | 406 | 418 | 329 | 688 | 360 | 521 | 624 | 1,090 | 1,633 | 1,218 | 899 |
| United Kingdom | 349 | 1,930 | 1,510 | 612 | 736 | 847 | 1,172 | 1,177 | 2,069 | 2,205 | 1,405 | 3,934 | 1,990 | 4,385 | 3,431 | 4,790 | 6,836 | 6,023 | 8,210 | 8,847 |
| All others | 94 | 161 | 110 | 973 | 85 | 245 | 347 | 305 | 535 | 1,089 | 694 | 440 | 568 | 470 | 862 | 886 | 2,385 | 1,358 | 1,281 | 1,641 |
| Other Europe | | | | | | | | | | | | | | | | | | | | |
| Norway | 13 | 0 | 15 | 12 | 65 | 38 | 88 | 33 | 152 | 88 | 151 | 195 | 74 | 132 | 167 | 169 | 144 | 182 | 180 | 319 |
| Russia | 0 | 6 | 5 | 3 | 0 | 88 | 12 | 14 | 28 | 253 | 454 | 5,608 | 1,591 | 1,776 | 913 | 508 | 202 | 89 | 172 | 126 |
| Switzerland | 105 | 123 | 72 | 100 | 44 | 156 | 284 | 203 | 445 | 254 | 432 | 306 | 141 | 353 | 495 | 451 | 652 | 841 | 716 | 1,185 |
| Asia | | | | | | | | | | | | | | | | | | | | |
| China | 129 | 182 | 81 | 98 | 747 | 271 | 700 | 1,153 | 1,313 | 2,087 | 1,582 | 3,118 | 6,436 | 3,738 | 3,062 | 13,659 | 33,221 | 44,610 | 45,750 | 96,863 |
| India | 31 | 86 | 67 | 37 | 84 | 31 | 201 | 513 | 441 | 593 | 498 | 780 | 1,252 | 1,585 | 1,499 | 5,273 | 8,038 | 3,382 | 10,477 | 5,834 |
| Indonesia | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 5 | 15 | 122 | 10 | 9 | 127 | 82 | 870 | 158 | 4,080 |
| Japan | 0 | 61 | 19 | 128 | 34 | 30 | 34 | 20 | 28 | 84 | 91 | 213 | 210 | 535 | 852 | 602 | 892 | 839 | 924 | 1,185 |
| Philippines | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 3 | 63 | 12 | 6 | 15 | 41 | 29 |
| Singapore | 0 | 83 | 25 | 14 | 7 | 18 | 6 | 44 | 118 | 128 | 82 | 158 | 109 | 329 | 819 | 1,066 | 1,050 | 1,460 | 1,579 | 3,873 |
| South Korea | 0 | 25 | 24 | 7 | 14 | 5 | 21 | 42 | 27 | 41 | 50 | 72 | 95 | 85 | 413 | 800 | 2,099 | 554 | 528 | 3,356 |
| Taiwan | 0 | 37 | 37 | 39 | 4 | 56 | 38 | 35 | 45 | 52 | 154 | 38 | 65 | 77 | 59 | 104 | 259 | 443 | 467 | 189 |
| Thailand | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 2 | 2 | 9 | 43 | 37 | 79 | 309 | 33 |
| Vietnam | 0 | 0 | 0 | 2 | 0 | 0 | 1 | 37 | 0 | 3 | 2 | 0 | 60 | 0 | 9 | 20 | 70 | 51 | 6 | 114 |
| Other countries | | | | | | | | | | | | | | | | | | | | |
| Australia | 8 | 21 | 42 | 35 | 9 | 14 | 151 | 58 | 93 | 82 | 47 | 346 | 311 | 132 | 268 | 732 | 478 | 547 | 696 | 950 |
| Brazil | 1 | 6 | 2 | 2 | 0 | 3 | 1 | 1 | 16 | 48 | 46 | 154 | 141 | 689 | 432 | 737 | 507 | 398 | 833 | 1,382 |
| Israel | 154 | 497 | 418 | 224 | 190 | 378 | 344 | 624 | 520 | 836 | 478 | 1,004 | 983 | 1,067 | 893 | 1,264 | 1,327 | 1,652 | 2,187 | 2,932 |

TABLE S8-62

## Global venture capital investment, by selected region, country, or economy: 1999–2018

(Millions of U.S. dollars)

| Region, country, or economy | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South Africa | 0 | 0 | 0 | 1 | 34 | 37 | 5 | 19 | 27 | 8 | 8 | 19 | 43 | 36 | 4 | 235 | 40 | 63 | 737 | 499 |
| ROW | 87 | 138 | 65 | 23 | 1,248 | 5 | 40 | 181 | 130 | 404 | 117 | 280 | 358 | 400 | 951 | 813 | 1,757 | 1,158 | 1,400 | 2,125 |

EU = European Union; ROW = rest of the world.

**Note(s)**

The EU includes 28 member countries. China includes Hong Kong.

**Source(s)**

PitchBook, venture capital and private equity database, accessed 21 September 2019.

*Science and Engineering Indicators*

TABLE S8-63

## PitchBook venture capital industry verticals and technologies

(List of industries or technologies and definitions)

| Industry or technology | Definition |
|---|---|
| 3D printing | Three-dimensional (3D) printing is also known as additive manufacturing and refers to the manufacturing process and all technology related to printing a 3D object. 3D printing encompasses the actual printer as well as software, including 3D versions of computer-aided design, which utilizes multiple data points to create cross-sectional patterns of the object to be formed. |
| Advanced manufacturing | Advanced manufacturing refers to companies utilizing innovative and novel technologies to improve products or processes related to manufacturing. This encompasses technologies such as 3D printing, sensors and Internet of Things platforms, automation and robotics, artificial intelligence/ machine learning and big data applications, wearable devices and exoskeletons, augmented and virtual reality applications, as well as software relating to enterprise resource planning and warehouse management systems. |
| Advertising technology | Advertising technology consists of all technologies, software, and services used for delivering, controlling, and targeting online advertising. This includes an extensive range of products and services (e.g., ad exchanges, contextual advertising, personalized advertising, adware, and retargeting). |
| Agricultural technology | Agricultural technology includes companies that provide services, engage in scientific research, or develop technology with the express purpose of enhancing the sustainability of agriculture. This includes wireless sensors to monitor soil, air, and animal health; hydroponic and aquaponic systems; remote-controlled irrigation systems; aerial photo technology to analyze field conditions; biotechnology platforms for crop yields; data analysis software to augment planting, herd, poultry, and livestock management; automation software to manage farm task workflows; and accounting software to track and manage facility and task expenses. |
| Artificial intelligence and machine learning | Companies in artificial intelligence (AI) and machine learning develop technologies that enable computers to autonomously learn, deduce, and act through utilization of large data sets. The technology enables development of systems that collect and store massive amounts of data and analyze that content to make decisions based on probability and statistical analysis. Applications for AI and machine learning include speech recognition, computer vision, robotic control, and accelerating processes in the empirical sciences where large data sets are essential, such as gene-sequencing in life sciences. |
| Audio technology | Audio technology (or developers of software and hardware technology for the music industry) includes providers of on-demand music services, such as Spotify and Apple Music, that connect products from music artists with the public. This also includes developers of audio technology for the professional and consumer sound markets, including earphones, transmitters, automobile sound systems, and home and studio systems. NOTE: Audio technology does NOT include retailers of physical audio products, such as electronics stores or installers of home audio equipment. |
| Augmented reality | Augmented reality (AR) is a technology which overlays superimposed computer-generated images over a user's view of the real world, thus altering and/ or enhancing one's current perception of reality. Companies in this space are involved with hardware and software development, content creation, and distribution related to AR products. |
| Autonomous cars | Autonomous cars are street-legal vehicles that can sense their environments and navigate without human interaction. Companies in this field include related technology, which is based on radar, lidar, global positioning system (GPS), odometry, software, and computer vision. |
| B2B payments | Business-to-business (B2B) payment companies develop software intended to facilitate transactions between businesses. This technology is primarily intended to improve the speed, security, and affordability of existing B2B payment solutions. This includes companies involved in accounts receivable and accounts payable software, electronic invoicing, international payments networks, blockchain B2B solutions, payments analytics, virtual payment cards, and supply chain and procurement software. |
| Beauty | This vertical encompasses beauty companies that are incorporating digital technologies into their products or services, providing bespoke products that target a niche group of users, or are manufacturing and marketing their products as natural, clean, and organic. |
| Big data | Big data companies provide a product or service whose core technology handles data that are too large for traditional database systems, usually due to data volume, data velocity, or data variety. |
| Blockchain/ cryptocurrency | Blockchain refers to a distributed public database which keeps a permanent and incorruptible record of digital transactions. Blockchains are unique in that they cannot be controlled by a single entity and have no single point of failure. Furthermore, blockchains can be programmed to store more than just financial information. This space includes companies involved in developing blockchain applications related to smart contracts, crowd funding, supply chain auditing, cryptocurrency, identity management, intellectual property, and file storage.<br><br>Cryptocurrency refers to a virtual medium of exchange, created and stored electronically in the blockchain, distinguishable from other currencies in that it uses cryptographic technology to decentralize the creation of monetary units and securely verify transactions. This space includes companies providing services or developing technology related to the exchange of cryptocurrency, the storage of cryptocurrency, the facilitation of payments using cryptocurrency, and securing cryptocurrency ledgers via mining activities. |

TABLE S8-63

## PitchBook venture capital industry verticals and technologies

(List of industries or technologies and definitions)

| Industry or technology | Definition |
|---|---|
| Cannabis | Cannabis companies are involved in the production, retail distribution, digital media, therapeutics, business solutions, or development of consumer products related to cannabis. This includes marijuana dispensaries, laboratory testing equipment and services, medical marijuana, cannabinoid-based pharmaceuticals, vaporizers and accessories, cannabis cultivation, and online content and networking related to cannabis. |
| Car-sharing | Car-sharing is a model of car rental whereby users rent cars for short periods of time, often by the hour. The act of renting usually takes place via a mobile application. |
| Clean technology | The primary purpose of clean technology companies is developing new technologies related to clean energy production, transmission, storage, or use; water treatment and management; and/ or efficiency in energy or resource management and use. |
| Construction technology | Construction technology companies build hardware and software solutions intended to increase the efficiency and productivity of operations related to construction, building, and infrastructure. This includes project management software, construction robots, job site survey drones, building information modeling, augmented and virtual reality applications for construction, modular and prefabrication solutions, equipment marketplaces, and risk management tools. |
| Cybersecurity | Cybersecurity consists of information technology companies that provide their software using client-server architectures that host the application in a centralized, off-site location. |
| Digital health | Digital health companies engage in building hardware and software solutions to empower individuals to more easily keep track of their health and offer health care providers better tools to communicate with and treat patients. This space includes a host of mobile applications designed to track fitness activity, sleep, nutrition, weight, and medication intake, as well as telemedicine programs to make it easier to connect with health professionals, electronic health record and clinical workflow software, digital wearable devices, remote monitoring and diagnostics software, artificial intelligence platforms, and genomics testing technology. |
| E-commerce | Examples of e-commerce companies include (1) a retailer who specifically sells online consumer products and services; (2) a company that provides logistics services for online retailers; or (3) a company that provides technology and web-design services for creating e-commerce websites. |
| Educational technology | Educational technology is software and hardware created to enhance teaching practices and improve learning outcomes. This includes online academic courses, online educational games, and audio-visual technology, such as smart boards and online grading/ administrative systems. |
| Ephemeral content | Ephemeral content companies provide online platforms for the sharing and temporary display of photos, videos, messages, documents, and other content. The key aspect is that the content vanishes from the Web after a certain time frame (usually minutes or hours). |
| eSports | Competitive gaming at a professional level, or eSports, is played in an organized format such as a tournament or league and with a specific goal such as winning a championship and/ or receiving prize money. This vertical includes eSports teams, streaming and broadcasting platforms, communication and social applications used for gaming, marketing tools, analytics and training services for eSports athletes, fantasy and virtual gambling, gaming hardware manufacturers, tournament and event hosts, and developers and publishers of eSports titles. |
| Female technology | Female technology refers to the development and application of technologies, products, and services intended to improve outcomes related to women's health. Companies in this space service the following use cases: period care, aging and menopause, sexual health, pregnancy and childbirth, pre- and postnatal solutions, fertility management, and pelvic health. |
| Financial technology | Financial technology companies use new technologies including the Internet, blockchain, software, and algorithms to offer or facilitate financial services usually provided by traditional banks including loans, payments, wealth or investment management. Financial technology companies are also software providers automating financial processes or addressing core business needs of financial firms. This includes makers of automatic teller machines (ATMs), electronic trading portals, and point-of-sale software. |
| Food technology | Food technology companies develop technology intended to improve consumer experiences around food selection, purchasing, and consumption. This space includes all of the Restaurant Technology vertical in addition to food ordering and delivery applications, food waste recyclers, meal kits and recipe boxes, cooking and chef communities, novel foods, and online grocery retail. |
| Gaming | This vertical collects all companies existing within the video game ecosystem. This includes companies developing and publishing titles, building tools and services for video game studios and players, and providing accessories and peripherals intended for gaming. Online poker and casino games are excluded from this space, while gambling related to eSports is included. |
| Health technology | Health technology companies provide mobile and other information technologies to improve health care delivery while decreasing costs. Health technology entails the use of technology and services — including cloud computing, Internet services, and digital records and image management — to optimize patient-centric health care. |
| Human resources technology | Human resources technology companies develop software designed to improve human resource management operations and hiring processes. This includes applications used for recruiting, applicant tracking, applicant screening, performance management, benefits administration, employee engagement, and employee analytics. |

TABLE S8-63

## PitchBook venture capital industry verticals and technologies

(List of industries or technologies and definitions)

| Industry or technology | Definition |
|---|---|
| Impact investing | Impact investing companies only include those that have received investment from funds and/or investors with an investment preference of "seeks impact investment." For a fund to qualify as an impact fund, it must invest for financial returns as well as to create a positive social or environmental impact and be actively measuring the impact that is created, or it must self-identify as an impact fund. The category also includes companies that have received investment from "not-for-profit venture capital" investors. |
| Industrials | This vertical serves as an industry aggregate intended to capture companies engaged in providing industrial and commercial supplies and services, diversified trading, distribution operations, and transportation services. Industrials comprise the infrastructure vertical combined with the following industries: Aerospace & Defense, Building Products, Construction & Engineering, Electrical Equipment, Machinery, Distributors & Wholesale, Printing Services, Environmental Services, Office Services, Security Services, Consulting Services, Human Capital Services, B2B Transportation, and B2C (business-to-consumer) Transportation. |
| Infrastructure | Infrastructure companies own physical assets necessary for the movement of goods, multimodal commerce, or power generation. This includes toll roads and bridges, airports, railroad networks, bus terminals, ports, and power plants. |
| InsurTech | InsurTech companies utilize technology to increase the speed, efficiency, accuracy, and convenience of processes across the insurance value chain. This includes quote comparison websites, insurance telematics, insurance domotics (home automation), peer-to-peer insurance, corporate platforms, online brokers, cyber insurance, underwriting software, claims software, and digital sales enabling. |
| Internet of Things | An Internet of Things company provides a product that is enabled with sensors and actuators embedded in physical objects, and/ or software that uses this sensor data to improve the user experience or allows for sharing this data with a network of other devices, often using the same Internet Protocol that connects the Internet. This includes Radio Frequency Identification technology, as well as codes that can be scanned with a smartphone; appliances and thermostats that can be regulated remotely by a smartphone or other monitoring device; and other remotely controlled, embedded devices. |
| Life sciences | Life sciences companies are involved in sciences dealing with living organisms and life processes, including biology, pharmaceuticals, biomedical technology, and nutraceuticals. |
| LOHAS | LOHAS (Lifestyles of Health and Sustainability) companies provide consumer products or services focused on health, the environment, green technology, social justice, personal development, and sustainable living. This includes providers of nutritional supplements, fitness products, organic foods and textiles, ecotourism, electric vehicles, socially conscious investing and financing, ecologically conscious furnishings, housewares, and cleaning supplies. |
| Manufacturing | Manufacturing companies produce products that require the heavy use of capital equipment and raw materials. |
| Marketing technology | Marketing technology is digital technology that automates and simplifies tasks for marketers, reducing the need for information technology involvement. This vertical includes search engine optimization (SEO) tools for evaluating and ranking site pages, writing SEO-friendly copy, and performing real-time keyword research; technology that supports marketing, online ads, and sponsorship; applications that aid content creation, landing page optimization, merchandising, usability, and analytics; and retention and growth tools that focus on personalization, loyalty programs, e-mail marketing, and customer relationship management. |
| Micromobility | Micromobility includes transportation solutions that target the "last mile" problem, whereby users have difficulty getting from their starting destination to a major transportation hub such as a bus or railway station. Distances covered by these solutions typically average less than 6 miles, with bicycles and scooters being the most prevalent form of transportation. |
| Mobile | Mobile companies are those whose primary revenue source comes from providing services for mobile devices or enabling mobile communications. |
| Mobile commerce | Mobile commerce companies build mobile applications to assist in the buying and selling of goods and services through a wireless Internet-connected device such as a phone or tablet. This includes bill payments, mobile retail, mobile baking services, peer-to-peer payment transferring applications, and mobile point-of-sale applications. |
| Mortgage technology | Mortgage technology companies leverage digital technologies to improve efficiency and speed in phases of the mortgage life cycle, such as mortgage origination, underwriting, servicing, and closing. This includes mortgage processing and workflow software providers, technology-based mortgage lenders, mortgage data and analytics, and digital mortgage brokers. |
| Nanotechnology | Nanotechnology companies engage in creating products that are dependent upon the ability to manipulate materials at an atomic level, usually due to the materials exhibiting novel properties at the subatomic level. |
| Oil and gas | Oil and gas companies are involved in the extraction, production, refining, transportation, and/or processing of oil and natural gas resources, as well as related products. This vertical encompasses all of the upstream (exploration, extraction, operating of wells), midstream (transportation via pipeline, oil tanker, rail, or truck of refined and unrefined goods), and downstream (refining and processing of crude oil, as well as purifying of raw natural gas) sectors of the oil and gas industry. |
| Oncology | Oncology companies are involved in the diagnosis or treatment of cancer without regard to whether they do so through the production of pharmaceuticals, devices, or services-based models. |

TABLE S8-63

## PitchBook venture capital industry verticals and technologies

(List of industries or technologies and definitions)

| Industry or technology | Definition |
|---|---|
| Pet technology | Pet technology companies enhance pet ownership and pet quality of life through the creation of digital devices, novel services, and pet-related applications. This includes pet health and monitoring devices, pet genetics services, social media applications designed for pets, pet care and dog walking applications, pet food delivery services, and assorted digital devices intended for pet care.B51 |
| Real estate technology | Real estate technology companies develop and leverage technology intended to help facilitate the purchase, management, maintenance, and investment into both residential and commercial real estate. This includes subsectors such as property management software, Internet of Things home devices, property listing and rental services, mortgage and lending applications, data analysis tools, virtual reality modeling software, augmented reality design applications, marketplaces, mortgage technology, and crowdfunding websites. |
| Restaurant technology | Restaurant technology companies develop hardware and software intended to help restaurants increase profitability, efficiency, and customer engagement. This includes the provision of guest Wi-Fi and phone charging stations, customer acquisition and retention programs, order kiosks, point-of-sale systems, tabletop devices, restaurant management software, 3D food printing, and mobile applications related to online ordering, booking and reservations, payment, and restaurant reviews and discovery. |
| Ridesharing | Ridesharing is the hailing of a ride via application or platform, usually met by a private vehicle and sometimes a taxi. Though "sharing" is in the name, this definition isn't restricted to pool rides or lines where passengers from different parties ride together. The term also encompasses private rides, which consist of a driver and one-trip party only. |
| Robotics and drones | Robotics and drones companies provide automated or remote-controlled mechanical devices and technology. This includes machinery programmed to perform repetitive tasks such as manufacturing and loading; precision tasks such as surgery or semiconductor production; and remote-operated movement or travel, such as that provided by unmanned aerial vehicles, subsea vehicles, and land vehicles. |
| Software as a service | Software as a service (SaaS) refers to information technology companies that provide software that is available for login through the Internet and that sell that software to customers through an ongoing subscription. A SaaS company sells software for online use that a person or company has to purchase. Companies like Zenefits, PitchBook, Workday, and Salesforce are all SaaS companies that offer online software for which a user pays through an ongoing subscription. |
| Space technology | Space technology companies provide services, engage in scientific research, or develop technology related to space flight, satellites, or space exploration. This includes microsatellites, nanosatellites, ground station networks, rocket technology, payload systems, spacecraft development, satellite imagery, satellite telecommunications, space-based data, space materials, space tourism, and asteroid mining. |
| Technology, media, and telecommunications | Technology, media, and telecommunications (TMT) serves as an industry aggregate intended to capture companies that exist within the TMT value chain. This includes companies providing network infrastructure, companies developing technologies utilizing those networks, and companies leveraging those technologies to distribute digital content. TMT comprises all technology-related verticals combined with the following industries: Business-to-Consumer (B2C) Electronics, Healthcare Technology Systems, and the entire Information Technology sector. |
| Virtual reality | Virtual reality refers to technology, including hardware and software, that provides an immersive, three-dimensional user experience in a virtual world. Virtual reality environments are provided through a computer screen augmented with wearable devices, such as head-mounted stereoptical displays or sensor-embedded gloves. Virtual reality also includes remote communication environments, where users interact with each other through computer-generated avatars. |
| Wearables and quantified self | Wearables and quantified self refers to a consumer health care sector entailing sensor-based tracking of aspects of a user's life, including moods, nutrition, and activities. This category entails the use of wireless sensors that can be attached to a person through clothing, attached to the body, or ingested into the body. The data are used for self-tracking for better understanding of individual health and behavioral capacities. Common uses for this technology include fitness assessment, stress analysis, sleep monitoring, biofeedback applications, and monitoring of behavioral changes. |

**Source(s)**

PitchBook, venture capital and private equity database, accessed 2 July 2019.

*Science and Engineering Indicators*

TABLE S8-64

## Venture capital investment in China and the United States, by industry: 2013–18

(Millions of U.S. dollars)

| Industry | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|
| China | | | | | | |
| Total | 3,062.13 | 13,642.96 | 33,231.20 | 44,613.34 | 45,676.51 | 96,795.57 |
| Agriculture | 16.21 | 0.00 | 12.08 | 1.37 | 27.07 | 0.00 |
| Apparel and accessories | 1.00 | 397.31 | 35.70 | 165.29 | 45.39 | 165.56 |
| Capital markets/ institutions | 0.00 | 11.00 | 60.00 | 29.93 | 22.00 | 52.21 |
| Chemicals and gases | 0.00 | 1.65 | 4.84 | 9.12 | 0.00 | 0.00 |
| Commercial banks | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Commercial products | 41.88 | 139.58 | 607.44 | 761.53 | 889.07 | 1,447.89 |
| Commercial services | 220.94 | 1,015.92 | 2,140.02 | 2,688.66 | 3,057.03 | 5,936.16 |
| Commercial transportation | 0.00 | 0.00 | 587.09 | 2.99 | 1,734.26 | 233.19 |
| Communications and networking | 17.15 | 140.73 | 44.81 | 10.15 | 66.29 | 3,039.20 |
| Computer hardware | 1.90 | 44.55 | 130.00 | 356.54 | 241.49 | 984.48 |
| Construction (non-wood) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Consumer durables | 54.74 | 1,375.49 | 798.92 | 501.09 | 1,490.80 | 2,050.04 |
| Consumer nondurables | 30.89 | 188.31 | 419.69 | 279.93 | 216.26 | 1,201.09 |
| Containers and packaging | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Energy equipment | 35.73 | 22.00 | 21.80 | 26.00 | 3.63 | 236.00 |
| Energy services | 0.41 | 23.97 | 130.67 | 1.62 | 0.15 | 165.43 |
| Exploration, production, and refining | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Forestry | 0.00 | 0.00 | 0.00 | 0.39 | 0.59 | 0.00 |
| Health care devices and supplies | 107.57 | 114.15 | 121.13 | 150.49 | 357.55 | 738.40 |
| Health care services | 100.00 | 353.70 | 125.22 | 349.62 | 588.40 | 705.34 |
| Health care technology systems | 11.33 | 18.73 | 296.48 | 612.81 | 2,325.99 | 1,529.51 |
| Insurance | 21.40 | 0.70 | 18.60 | 87.28 | 61.98 | 43.43 |
| Information technology services | 41.56 | 86.10 | 279.73 | 167.76 | 175.29 | 372.42 |
| Media | 217.55 | 1,059.97 | 2,619.12 | 1,452.10 | 4,581.52 | 4,436.26 |
| Metals, minerals, and mining | 0.00 | 0.00 | 0.00 | 0.00 | 2.19 | 6.33 |
| Other business products and services | 0.00 | 16.77 | 34.30 | 85.92 | 554.61 | 899.69 |
| Other consumer products and services | 60.00 | 0.00 | 8.78 | 0.00 | 314.52 | 0.00 |
| Other energy | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Other financial services | 45.10 | 619.96 | 1,408.17 | 2,821.67 | 956.05 | 2,371.12 |
| Other health care | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 4.76 |
| Other information technology | 0.00 | 1.50 | 4.00 | 0.15 | 0.00 | 145.00 |
| Other materials | 0.00 | 0.00 | 3.81 | 6.55 | 157.76 | 0.00 |
| Pharmaceuticals and biotechnology | 70.75 | 119.42 | 405.79 | 1,331.30 | 1,951.28 | 3,205.70 |
| Restaurants, hotels, and leisure | 56.81 | 216.43 | 626.71 | 295.39 | 649.43 | 692.20 |

TABLE S8-64

## Venture capital investment in China and the United States, by industry: 2013–18

(Millions of U.S. dollars)

| Industry | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|
| Retail | 803.61 | 1,871.35 | 2,652.96 | 1,836.42 | 1,173.03 | 4,824.02 |
| Semiconductors | 3.41 | 235.21 | 26.89 | 19.38 | 185.43 | 154.50 |
| Services (nonfinancial) | 106.66 | 403.16 | 1,122.87 | 2,043.80 | 975.30 | 2,128.17 |
| Software | 851.42 | 3,972.88 | 13,621.23 | 17,667.42 | 13,529.00 | 45,511.85 |
| Textiles | 0.00 | 0.00 | 35.33 | 0.00 | 0.00 | 10.00 |
| Transportation | 144.11 | 1,192.42 | 4,827.02 | 10,850.67 | 9,343.15 | 13,505.62 |
| Utilities | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| United States | | | | | | |
| Total | 47,541.84 | 70,276.90 | 81,953.76 | 75,034.99 | 83,873.25 | 118,699.22 |
| Agriculture | 70.39 | 112.41 | 137.63 | 217.84 | 456.79 | 518.99 |
| Apparel and accessories | 284.06 | 283.01 | 546.72 | 371.65 | 450.37 | 616.26 |
| Capital markets/ institutions | 417.24 | 369.80 | 237.95 | 294.79 | 250.15 | 998.11 |
| Chemicals and gases | 300.96 | 347.89 | 176.02 | 179.54 | 230.10 | 298.51 |
| Commercial banks | 13.20 | 26.23 | 44.49 | 54.23 | 42.92 | 28.72 |
| Commercial products | 1,161.68 | 1,143.28 | 2,454.45 | 1,790.65 | 3,360.39 | 3,670.36 |
| Commercial services | 3,892.36 | 4,715.27 | 5,404.54 | 4,503.43 | 4,961.12 | 5,819.62 |
| Commercial transportation | 87.50 | 154.66 | 252.02 | 241.03 | 865.56 | 749.16 |
| Communications and networking | 1,021.11 | 617.93 | 1,482.84 | 847.81 | 950.88 | 750.07 |
| Computer hardware | 1,054.40 | 905.14 | 985.53 | 718.11 | 1,416.38 | 1,334.07 |
| Construction (nonwood) | 0.02 | 0.03 | 0.04 | 0.00 | 0.10 | 0.14 |
| Consumer durables | 897.95 | 2,594.50 | 1,481.61 | 2,622.46 | 2,947.67 | 4,555.17 |
| Consumer nondurables | 556.50 | 1,377.48 | 1,729.85 | 1,221.69 | 1,794.38 | 2,634.67 |
| Containers and packaging | 6.26 | 31.72 | 13.85 | 17.07 | 30.75 | 54.70 |
| Energy equipment | 948.62 | 949.91 | 582.85 | 450.99 | 718.35 | 625.27 |
| Energy services | 542.85 | 916.12 | 436.89 | 507.11 | 636.98 | 1,122.02 |
| Exploration, production, and refining | 495.81 | 436.17 | 456.43 | 663.53 | 51.33 | 97.84 |
| Forestry | 0.00 | 0.00 | 0.40 | 2.32 | 5.07 | 3.70 |
| Health care devices and supplies | 4,917.16 | 4,730.86 | 4,232.71 | 3,585.56 | 4,926.43 | 5,723.19 |
| Health care services | 1,136.80 | 1,203.90 | 1,597.63 | 1,682.67 | 1,627.45 | 2,509.64 |
| Health care technology systems | 1,239.30 | 2,299.21 | 2,039.91 | 2,754.19 | 2,869.29 | 4,855.16 |
| Insurance | 169.50 | 333.36 | 260.16 | 814.80 | 489.10 | 1,537.34 |
| Information technology services | 568.12 | 939.06 | 1,041.99 | 570.62 | 647.58 | 799.74 |
| Media | 1,495.48 | 2,475.93 | 1,906.66 | 1,346.35 | 1,519.94 | 2,197.59 |
| Metals, minerals, and mining | 31.85 | 15.33 | 53.24 | 92.84 | 37.78 | 11.41 |
| Other business products and services | 89.86 | 227.82 | 205.00 | 184.12 | 249.30 | 618.67 |
| Other consumer products and services | 12.46 | 50.70 | 29.72 | 21.55 | 66.70 | 94.68 |

TABLE S8-64

## Venture capital investment in China and the United States, by industry: 2013–18

(Millions of U.S. dollars)

| Industry | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|
| Other energy | 33.60 | 57.47 | 35.17 | 13.18 | 11.18 | 7.61 |
| Other financial services | 462.31 | 1,231.69 | 3,924.34 | 2,139.71 | 2,096.14 | 1,713.58 |
| Other health care | 24.69 | 59.66 | 304.69 | 15.37 | 28.97 | 35.24 |
| Other information technology | 8.65 | 61.35 | 5.06 | 53.63 | 102.96 | 133.26 |
| Other materials | 37.28 | 8.38 | 5.73 | 11.46 | 71.37 | 20.78 |
| Pharmaceuticals and biotechnology | 5,953.03 | 7,471.10 | 10,922.03 | 9,096.43 | 12,564.77 | 18,662.21 |
| Restaurants, hotels, and leisure | 175.94 | 709.87 | 1,987.83 | 471.47 | 1,388.45 | 1,983.69 |
| Retail | 1,166.66 | 1,861.08 | 2,233.24 | 1,454.65 | 3,551.76 | 3,532.34 |
| Semiconductors | 473.15 | 670.37 | 667.81 | 465.78 | 681.71 | 718.93 |
| Services (nonfinancial) | 959.46 | 1,190.26 | 1,523.16 | 1,214.01 | 2,197.81 | 3,103.11 |
| Software | 16,081.93 | 26,215.09 | 28,434.39 | 27,039.07 | 27,598.82 | 39,763.74 |
| Textiles | 33.59 | 0.14 | 32.30 | 59.61 | 36.77 | 131.12 |
| Transportation | 648.49 | 3,247.67 | 4,019.42 | 7,174.35 | 1,914.56 | 6,644.85 |
| Utilities | 71.62 | 235.05 | 67.46 | 69.32 | 25.12 | 23.96 |

**Note(s)**

Industries classified by PitchBook on the basis of the firm's primary industry.

**Source(s)**

PitchBook, venture capital and private equity database, accessed 21 September 2019.

*Science and Engineering Indicators*

TABLE S8-65

## Venture capital investment in China and the United States, by industry vertical or technology area: 2013–18

(Millions of U.S. dollars)

| Industry vertical or technology area | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|
| China | | | | | | |
| 3D printing | 0 | 0 | 19 | 14 | 23 | 82 |
| Advanced manufacturing | 12 | 27 | 34 | 25 | 262 | 181 |
| Advertising technology | 157 | 348 | 807 | 31 | 724 | 3,128 |
| Agricultural technology | 0 | 106 | 21 | 30 | 69 | 73 |
| Artificial intelligence and machine learning | 76 | 351 | 1,354 | 1,728 | 8,935 | 15,571 |
| Audio technology | 0 | 12 | 65 | 101 | 140 | 1,286 |
| Augmented reality | 0 | 13 | 75 | 59 | 175 | 63 |
| Autonomous cars | 0 | 0 | 516 | 659 | 2,286 | 2,647 |
| B2B payments | 0 | 0 | 2 | 9 | 17 | 34 |
| Beauty | 2 | 16 | 63 | 3 | 88 | 64 |
| Big data | 119 | 397 | 918 | 2,308 | 7,362 | 14,131 |
| Blockchain/ cryptocurrency | 15 | 28 | 16 | 55 | 181 | 3,081 |
| Car-sharing | 0 | 148 | 195 | 30 | 192 | 70 |
| Clean technology | 47 | 108 | 302 | 1,313 | 3,494 | 7,449 |
| Construction technology | 3 | 6 | 1 | 6 | 36 | 57 |
| Cybersecurity | 97 | 68 | 148 | 405 | 363 | 869 |
| Digital health | 2 | 293 | 141 | 565 | 149 | 1,638 |
| E-commerce | 986 | 2,781 | 6,671 | 8,167 | 4,728 | 20,837 |
| Educational technology | 89 | 491 | 1,346 | 626 | 1,450 | 4,730 |
| Ephemeral content | 0 | 0 | 0 | 0 | 15 | 11 |
| eSports | 11 | 21 | 75 | 389 | 340 | 583 |
| Female technology | 5 | 33 | 24 | 0 | 0 | 0 |
| Financial technology | 122 | 1,189 | 4,833 | 9,381 | 5,540 | 20,248 |
| Food technology | 50 | 93 | 1,559 | 445 | 948 | 4,761 |
| Gaming | 102 | 297 | 235 | 481 | 458 | 658 |
| Health technology | 24 | 270 | 473 | 1,027 | 3,402 | 4,094 |
| Human resources technology | 6 | 93 | 89 | 285 | 21 | 115 |
| Impact investing | 0 | 0 | 0 | 225 | 212 | 0 |
| Industrials | 208 | 2,065 | 7,647 | 14,007 | 14,487 | 19,073 |
| Infrastructure | 0 | 20 | 2 | 432 | 195 | 0 |
| InsurTech | 21 | 5 | 134 | 605 | 2,406 | 210 |
| Internet of things | 40 | 1,309 | 500 | 280 | 1,970 | 3,890 |
| Life sciences | 185 | 144 | 478 | 1,370 | 1,887 | 3,584 |
| LOHAS | 42 | 141 | 843 | 125 | 996 | 2,497 |
| Manufacturing | 85 | 488 | 790 | 2,478 | 4,757 | 8,957 |

TABLE S8-65

## Venture capital investment in China and the United States, by industry vertical or technology area: 2013–18

(Millions of U.S. dollars)

| Industry vertical or technology area | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|
| Marketing technology | 53 | 165 | 302 | 215 | 898 | 2,823 |
| Micromobility | 0 | 25 | 130 | 172 | 967 | 47 |
| Mobile | 722 | 5,677 | 13,639 | 19,996 | 16,546 | 35,813 |
| Mobile commerce | 22 | 360 | 2,649 | 5,043 | 640 | 18,916 |
| Mortgage technology | 0 | 165 | 24 | 159 | 0 | 0 |
| Nanotechnology | 0 | 30 | 97 | 17 | 196 | 15 |
| Oil and Gas | 0 | 22 | 7 | 40 | 56 | 210 |
| Oncology | 136 | 97 | 219 | 574 | 1,324 | 2,741 |
| Pet technology | 0 | 25 | 0 | 0 | 0 | 16 |
| Real estate technology | 14 | 190 | 386 | 1,571 | 349 | 1,230 |
| Restaurant technology | 42 | 106 | 1,137 | 3,389 | 55 | 9,512 |
| Ridesharing | 15 | 810 | 4,140 | 9,336 | 6,873 | 5,900 |
| Robotics and drones | 12 | 131 | 369 | 332 | 811 | 1,818 |
| Software as a service | 383 | 1,962 | 5,918 | 6,780 | 3,140 | 20,258 |
| Space technology | 0 | 0 | 0 | 22 | 216 | 199 |
| Technology, media, and telecommunications | 2,368 | 11,548 | 27,887 | 35,686 | 30,079 | 73,040 |
| Virtual reality | 0 | 25 | 115 | 61 | 156 | 88 |
| Wearables and quantified self | 0 | 103 | 202 | 54 | 368 | 33 |
| United States | | | | | | |
| 3D printing | 94 | 119 | 224 | 655 | 300 | 768 |
| Advanced manufacturing | 107 | 142 | 364 | 696 | 964 | 1,529 |
| Advertising technology | 1,309 | 1,649 | 1,654 | 864 | 916 | 1,057 |
| Agricultural technology | 182 | 499 | 494 | 815 | 1,520 | 1,675 |
| Artificial intelligence and machine learning | 2,355 | 6,473 | 7,610 | 12,263 | 8,279 | 15,995 |
| Audio technology | 192 | 351 | 320 | 135 | 345 | 259 |
| Augmented reality | 232 | 801 | 414 | 1,516 | 1,196 | 2,883 |
| Autonomous cars | 59 | 91 | 227 | 527 | 868 | 1,710 |
| B2B payments | 235 | 452 | 769 | 582 | 700 | 1,109 |
| Beauty | 263 | 383 | 443 | 418 | 582 | 823 |
| Big data | 3,472 | 6,570 | 6,728 | 6,927 | 8,142 | 13,131 |
| Blockchain/ cryptocurrency | 189 | 306 | 380 | 405 | 664 | 2,577 |
| Cannabis | 2 | 53 | 240 | 151 | 314 | 1,198 |
| Car-sharing | 19 | 59 | 75 | 35 | 108 | 932 |
| Clean technology | 2,959 | 3,454 | 2,420 | 2,952 | 2,679 | 4,459 |
| Construction technology | 93 | 76 | 353 | 300 | 520 | 1,329 |
| Cybersecurity | 1,828 | 2,549 | 3,654 | 2,998 | 3,576 | 4,434 |

TABLE S8-65

## Venture capital investment in China and the United States, by industry vertical or technology area: 2013–18

(Millions of U.S. dollars)

| Industry vertical or technology area | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|
| Digital health | 939 | 1,505 | 1,694 | 2,893 | 3,351 | 3,513 |
| E-commerce | 2,879 | 4,265 | 5,401 | 3,557 | 6,404 | 6,077 |
| Educational technology | 1,007 | 1,262 | 1,699 | 1,154 | 1,256 | 1,371 |
| Ephemeral content | 86 | 582 | 243 | 1,814 | 14 | 25 |
| eSports | 107 | 269 | 955 | 315 | 598 | 2,077 |
| Female technology | 55 | 158 | 242 | 183 | 307 | 457 |
| Financial technology | 2,078 | 4,791 | 7,112 | 6,497 | 6,743 | 11,331 |
| Food technology | 583 | 3,282 | 3,597 | 7,131 | 1,527 | 4,992 |
| Gaming | 428 | 890 | 1,182 | 992 | 1,440 | 2,420 |
| Health technology | 2,077 | 3,147 | 4,358 | 4,547 | 5,427 | 6,767 |
| Human resources technology | 373 | 645 | 1,512 | 945 | 708 | 1,339 |
| Impact investing | 761 | 1,107 | 1,108 | 878 | 1,426 | 1,388 |
| Industrials | 3,315 | 4,762 | 7,817 | 6,171 | 7,831 | 12,010 |
| Infrastructure | 136 | 144 | 136 | 243 | 307 | 362 |
| InsurTech | 196 | 353 | 696 | 1,386 | 1,075 | 2,432 |
| Internet of things | 947 | 1,387 | 1,520 | 1,765 | 2,662 | 2,503 |
| Life sciences | 7,281 | 9,817 | 12,583 | 11,132 | 14,680 | 21,353 |
| LOHAS | 1,480 | 1,522 | 2,139 | 2,403 | 3,183 | 5,809 |
| Manufacturing | 3,290 | 3,595 | 4,162 | 2,811 | 4,637 | 7,088 |
| Marketing technology | 1,855 | 2,737 | 3,219 | 2,158 | 1,936 | 2,535 |
| Micromobility | 76 | 255 | 689 | 1,010 | 676 | 3,109 |
| Mobile | 7,533 | 13,979 | 15,688 | 19,051 | 12,921 | 22,651 |
| Mobile commerce | 334 | 1,059 | 650 | 579 | 767 | 1,613 |
| Mortgage technology | 13 | 188 | 1,332 | 246 | 706 | 250 |
| Nanotechnology | 510 | 378 | 553 | 426 | 443 | 719 |
| Oil and gas | 655 | 761 | 609 | 419 | 511 | 497 |
| Oncology | 2,569 | 3,849 | 5,061 | 5,108 | 6,446 | 9,895 |
| Pet technology | 37 | 75 | 57 | 159 | 188 | 585 |
| Real estate technology | 391 | 1,494 | 2,825 | 2,159 | 4,646 | 3,688 |
| Restaurant technology | 301 | 496 | 610 | 957 | 738 | 1,911 |
| Ridesharing | 349 | 2,698 | 3,388 | 6,840 | 969 | 4,154 |
| Robotics and drones | 296 | 409 | 806 | 892 | 2,035 | 2,208 |
| Software as a service | 12,306 | 19,223 | 21,164 | 17,371 | 19,275 | 25,326 |
| Space technology | 164 | 75 | 1,351 | 299 | 1,360 | 944 |
| Technology, media, and telecommunications | 32,034 | 50,729 | 58,563 | 55,232 | 55,176 | 76,073 |
| Virtual reality | 252 | 846 | 551 | 1,736 | 1,132 | 3,076 |

TABLE S8-65

## Venture capital investment in China and the United States, by industry vertical or technology area: 2013–18

(Millions of U.S. dollars)

| Industry vertical or technology area | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|
| Wearables and quantified self | 394 | 1,477 | 588 | 1,821 | 582 | 1,988 |

3D = three-dimensional; B2B = business to business; LOHAS = Lifestyles of Health and Sustainability.

**Note(s)**

Industry verticals or technology areas are venture-backed firms that operate in technology areas. Venture-backed firms are classified by PitchBook in multiple industries according to their activities and goods and services. The sum of venture capital investment in industry verticals exceeds total investment because of double counting of companies that are classified in multiple industries.

**Source(s)**

PitchBook, venture capital and private equity database, accessed 21 September 2019.

*Science and Engineering Indicators*