

TABLE 48

**Worldwide, domestic, and foreign R&D paid for by the company and others and performed by the company, R&D employment, and R&D cost per R&D employee, by industry and company size: 2020**

(Millions of U.S. dollars, number of employees in thousands, and cost per employee in thousands of U.S. dollars)

Industry and company size	NAICS code	Company-performed R&D (US\$millions)			R&D employment (thousands)			Company-performed R&D per R&D employee (US\$thousands per employee)		
		Worldwide	Domestic	Foreign	Worldwide	Domestic	Foreign	Worldwide	Domestic	Foreign
All industries	21-23, 31-33, 42-81	647,324	537,619	109,705	2,847	1,936	910	227.4	277.6	120.5
Manufacturing industries	31-33	374,688	308,445	66,243	1,457	985	472	257.2	313.3	140.3
Food	311	6,392 - 6,399	5,239	1,153 - 1,161	44	28	17	D	188.6	D
Beverage and tobacco products	312	1,935	1,177	759	7	5	3	259.1	259.9	258.0
Textile, apparel, and leather products	313-16	973	822	152	8	6	1	122.5	127.4	101.4
Wood products	321	195	187	8	3	3	*	56.9	56.3	75.5
Paper	322	1,021	928	93	8	6	2	132.8	159.1	50.2
Printing and related support activities	323	294	283	10	5	4	*	65.1	67.6	32.6
Petroleum and coal products	324	1,476 - 1,490	1,311 - 1,324	165	8	6	2	D	D	70.3
Chemicals	325	120,440	101,079	19,362	266	193	73	453.4	524.8	265.1
Basic chemicals	3251	3,540	2,694	846	19	12	7	185.9	221.1	123.4
Resin, synthetic rubber, and artificial synthetic fibers and filaments	3252	1,745	1,234	512	10	6	4	175.5	196.4	139.8
Pesticide, fertilizer, and other agricultural chemicals	3253	1,157 - 1,172	1,060 - 1,066	92 - 108	5	5	1	D	D	D
Pharmaceuticals and medicines	3254	108,537	91,776	16,761	193	146	47	561.3	627.9	355.2
Soap, cleaning compound, and toilet preparation	3256	3,432	2,665	767	17	11	6	202.8	241.4	130.3
Paint, coating, adhesive, and other chemicals	3255, 3259	2,013 - 2,028	1,643 - 1,649	370 - 385	21	12	9	D	D	D
Plastics and rubber products	326	3,162	2,634	529	32	27	5	98.8	97.1	108.9
Nonmetallic mineral products	327	1,924	1,717	206	7	6	1	269.5	273.9	237.7
Primary metals	331	847	815	32	8	8	*	106.3	105.9	119.8
Fabricated metal products	332	3,746	3,396	349	42	40	2	89.0	85.3	152.4
Machinery	333	20,508	16,223	4,285	153	101	52	134.1	160.8	82.4
Agricultural implement	33311	2,450	1,769 - 1,811	639 - 681	18	11	7	137.9	D	D
Semiconductor machinery	333242	5,834	4,807	1,027	22	13	9	268.1	376.2	114.4
Engine, turbine, and power transmission equipment	3336	2,203	1,645	558	12	7	4	191.0	227.3	129.8
Other machinery	other 333	10,022	7,959 - 8,001	2,021 - 2,062	102	70	32	98.4	D	D
Computer and electronic products	334	126,102	99,535	26,567	459	264	195	275.0	377.4	136.3
Communications equipment	3342	15,491	12,103	3,388	75	41	34	206.2	291.8	100.7
Semiconductor and other electronic components	3344	56,204	43,181	13,023	177	91	86	317.9	473.2	152.2
Navigational, measuring, electromedical, and control instruments	3345	21,651	18,505	3,146	96	67	29	225.5	277.9	107.0

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Electromedical, electrotherapeutic, and irradiation apparatus	334510, 334517	3,356	2,858	498	10	8	3	327.9	378.2	186.0
Search, detection, navigation, guidance, aeronautical, and nautical system and instrument	334511	11,270	10,586	684	40	35	5	280.8	301.3	136.7
Other measuring and controlling device	other 3345	7,025	5,061	1,964	46	24	22	154.0	211.8	90.4
Other computer and electronic products	other 334	32,756	25,747	7,010	111	64	46	296.0	399.7	151.6
Electrical equipment, appliances, and components	335	6,792	4,998	1,794	51	27	24	134.1	187.4	74.8
Transportation equipment	336	55,311	48,796	6,515	234	174	60	236.5	280.9	108.3
Motor vehicles, bodies, trailers, and parts	3361-63	28,910 - 28,922	23,121	5,789 - 5,801	151	101	50	D	229.3	D
Aerospace products and parts	3364	23,424	22,914	509	69	62	7	340.3	372.3	70.0
Aircraft, aircraft engine, and aircraft parts	336411-13	21,791	21,291	500	61	54	7	356.1	393.8	70.1
Guided missile, space vehicle, and related parts	336414-15, 336419	1,633	1,623	10	8	7	*	214.0	216.7	68.2
Military armored vehicle, tank, and tank component	336992	11	11	0	*	*	0	141.1	141.1	NA
Other transportation	other 336	2,955 - 2,966	2,750	206 - 216	14	11	3	D	244.4	D
Furniture and related products	337	535	496	39	5	4	*	113.0	116.0	85.4
Miscellaneous	339	23,013 - 23,027	18,791 - 18,809	4,217 - 4,224	117	84	34	D	D	D
Medical equipment and supplies	3391	19,938	16,116	3,822	94	65	29	212.4	247.9	132.4
Other miscellaneous manufacturing	3399	3,075 - 3,088	2,674 - 2,692	396 - 403	23	19	5	D	D	D
Nonmanufacturing industries	21-23, 42-81	272,637	229,174	43,462	1,390	952	438	196.1	240.8	99.2
Mining, quarrying, oil and gas extraction, and support activities	21	1,285 - 1,292	1,165	120 - 127	9	8	1	D	147.9	D
Utilities	22	271	264	6	0 - 20	0 - 20	*	D	D	66.7
Wholesale trade	42	1,104	1,058	45	13	13	*	83.5	82.7	106.0
Electronic shopping and electronic auctions	454111-12	3,937 - 24,262	3,840 - 19,390	97 - 4,884	58 - 147	58 - 80	0 - 70	D	D	D
Transportation and warehousing	48-49	4,994	4,957	37	13	13	*	376.5	384.5	100.0
Information	51	152,363	129,463	22,900	626	422	204	243.2	306.8	112.0
Publishing	511	42,708	35,025	7,683	188	113	74	227.7	309.1	103.5
Newspaper, periodical, book, and directory publishers	5111	60	60	0	1	1	0	102.0	102.0	NA
Software publishers	5112	42,648	34,965	7,683	187	113	74	228.1	310.2	103.5
Telecommunications	517	3,519 - 3,532	3,425 - 3,437	94	23	21	2	D	D	60.1

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Data processing, hosting, and related services	518	49,697	41,551	8,147	271	171	100	183.6	243.3	81.5
Other information	other 51	56,425 - 56,440	49,449 - 49,463	6,976	146	117	29	D	D	243.1
Finance and insurance	52	13,837	12,296	1,541	88	66	22	157.3	185.7	70.9
Real estate and rental and leasing	53	3,412	3,249	163	6	5	*	617.1	634.9	396.3
Lessors of nonfinancial intangible assets (except copyrighted works)	533	6 - 21	7	0 - 15	*	*	*	D	128.5	D
Other real estate and rental and leasing	other 53	3,390 - 3,406	3,242	148 - 164	5	5	*	D	640.3	D
Professional, scientific, and technical services	54	68,112	54,367	13,744	i 443	300	144	153.6	181.4	95.7
Architectural, engineering, and related services	5413	4,235	4,214	20	56	55	*	75.7	76.0	44.8
Computer systems design and related services	5415	21,259	17,935	3,324	136	94	42	156.4	191.7	78.5
Scientific research and development services	5417	35,670	25,600	10,070	i 203	107	95	i 176.0	238.3	105.7
Research and development in nanotechnology	541713	179 - 182	i 179	i 0 - 3	1	i 1	i *	i D	193.7	D
Research and development in biotechnology (except nanobiotechnology)	541714	9,120	6,191	2,929	62	30	32	146.8	205.9	91.4
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	25,674	i 18,539	i 7,135	i 133	i 70	63	i 193.3	266.1	112.9
Research and development in the social sciences and humanities	541720	692 - 698	691	1 - 7	7	7	*	D	101.9	D
Other professional, scientific, and technical services	other 54	6,948	6,618	330	49	43	6	142.4	153.3	58.9
Health care services	621-23	1,495 - 1,498	1,477	18 - 22	i 8	8	*	D	185.4	D
Other nonmanufacturing	23, 44-45 (excluding 454111-12), 55-56, 624, 71-72, 81	1,504 - 21,828	1,491 - 17,041	1 - 4,789	i 39 - 110	40	0 - 70	D	D	D
All companies (number of domestic employees)	-	647,324	537,619	109,705	2,847	1,936	910	227.4	277.6	120.5
Small companies										
10-19 <sup>a</sup>	-	5,338	5,047	290	36	32	4	147.9	157.3	72.4
20-49	-	13,600	12,994	606	102	94	8	132.8	138.2	72.1
Medium companies										
50-99	-	13,791	12,993	798	102	89	13	135.3	146.3	60.8
100-249	-	27,483	25,411	2,072	165	145	20	166.9	175.2	105.2
Large companies										
250-499	-	23,743	20,878	2,866	135	112	23	175.7	186.5	123.5
500-999	-	24,451	21,264	3,187	135	96	39	180.7	220.6	81.9

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1,000–4,999	–	106,758	88,238	18,520	484	327	157	220.6	269.8	118.1
5,000–9,999	–	60,241	48,397	11,845	265	169	96	227.3	285.8	123.7
10,000–24,999	–	111,753	88,567	23,186	494	277	217	226.3	320.1	106.8
25,000 or more	–	260,165	213,829	46,336	928	595	333	280.3	359.3	139.1

\* = amount < 500 employees; D = data withheld to avoid disclosing operations of individual companies; i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse; NA = not available.

NAICS = 2017 North American Industry Classification System.

<sup>a</sup> The Business Enterprise Research and Development Survey does not include companies with fewer than 10 domestic employees.

**Note(s):**

Detail may not add to total because of rounding. Ratios were calculated using unrounded data. Industry classification is based on the dominant business code for domestic R&D performance, where available. For companies that did not report business codes, the classification used for sampling was assigned. Statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D and are not comparable with estimates published for years prior to 2018. An estimate range may be displayed in place of a single estimate to avoid disclosing operations of individual companies.

**Source(s):**

National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2020.