

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: 2021

(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	737,911	602,499	135,412	3,161	2,132	1,029	233.4	282.6	131.6
Manufacturing industries	31–33	404,449	326,060	78,389	1,524	1,015	510	265.3	321.3	153.8
Food	311	6,456	5,266	1,190	40	27	13	160.7	194.7	90.6
Beverage and tobacco products	312	2,139	1,247	893	8	5	3	259.8	257.8	262.8
Textile, apparel, and leather products	313–16	997	829	169	9	7	2	114.6	126.6	78.2
Wood products	321	447	444	4	6	6	*	73.4	73.6	59.0
Paper	322	1,206	1,139	67	8	6	2	149.5	182.7	36.7
Printing and related support activities	323	231	204	27	3	3	*	76.0	75.1	83.4
Petroleum and coal products	324	1,131	957	175	7	5	2	163.8	187.9	96.4
Chemicals	325	133,231	109,490	23,741	278	201	77	479.5	546.0	307.1
Basic chemicals	3251	3,710	2,713	997	19	12	8	190.3	231.6	128.2
Resin, synthetic rubber, and artificial synthetic fibers and filaments	3252	1,969	1,389	580	10	6	4	191.9	214.4	153.3
Pesticide, fertilizer, and other agricultural chemicals	3253	1,279	1,157	123	5	5	1	247.0	255.7	186.8
Pharmaceuticals and medicines	3254	121,157	100,220	20,936	211	157	54	573.3	637.9	386.1
Soap, cleaning compound, and toilet preparations	3256	3,611	2,740	871	18	11	6	202.6	241.0	134.9
Paint, coating, adhesive, and other chemicals	3255, 3259	1,505	1,271	234	14	9	4	109.4	136.0	53.1
Plastics and rubber products	326	3,752	3,144	607	29	23	6	129.4	135.6	104.9
Nonmetallic mineral products	327	1,731	1,533	198	9	8	1	182.8	186.0	161.7
Primary metals	331	963	912	50	10	9	1	95.7	96.5	82.5
Fabricated metal products	332	4,669	4,291	378	52	50	2	90.0	86.4	170.8
Machinery	333	23,073	17,730	5,343	159	100	59	145.3	176.9	91.1
Agricultural implement	33311	2,774	1,867	907	17	10	7	167.3	191.6	132.5
Semiconductor machinery	333242	6,648	5,349	1,299	27	14	13	242.9	373.1	99.7
Engine, turbine, and power transmission equipment	3336	1,920	1,374	546	11	8	3	173.5	176.9	165.5
Other machinery	other 333	11,731	9,140	2,591	104	68	35	113.0	133.7	73.1
Computer and electronic products	334	132,597	101,063	31,535	464	256	208	285.9	394.7	151.9
Communications equipment	3342	15,968	12,557	3,411	81	49	32	198.0	258.3	106.5
Semiconductor and other electronic components	3344	63,917	47,396	16,521	188	93	95	339.2	509.0	173.3
Navigational, measuring, electromedical, and control instruments	3345	17,220	13,644	3,576	86	54	31	201.2	251.3	114.3
Electromedical, electrotherapeutic, and irradiation apparatus	334510, 334517	3,554	3,087	467	10	8	3	344.9	400.4	180.0
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments	334511	5,895	5,301	594	25	21	3	238.2	246.9	180.9
Other measuring and controlling devices	other 3345	7,771	5,256	2,516	51	25	25	153.8	209.3	99.0
Other computer and electronic products	other 334	35,492	27,465	8,027	109	60	49	325.4	457.5	163.7

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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
Electrical equipment, appliances, and components	335	7,374	5,494	1,880	47	26	21	155.7	208.0	89.7
Transportation equipment	336	58,423	50,760	7,663	272	196	77	214.5	259.6	99.7
Motor vehicles, bodies, trailers, and parts	3361-63	33,111	26,391	6,720	168	108	60	196.9	244.8	111.3
Aerospace products and parts	3364	22,180	21,468	711	86	75	11	258.7	285.6	67.4
Aircraft, aircraft engine, and aircraft parts	336411-13	20,538	19,845	693	79	69	10	259.9	289.0	66.9
Guided missile, space vehicle, and related parts	336414-15, 336419	1,642	1,623	18	7	7	*	244.7	249.5	91.2
Military armored vehicle, tank, and tank components	336992	24	21-25	0-3	*	*	0	95.5	D	NA
Other transportation	other 336	3,109	2,875-2,880	228-233	18	12	6	170.8	D	D
Furniture and related products	337	464	426	37	4	4	*	104.3	107.0	81.0
Miscellaneous	339	25,564	21,133	4,431	118	83	35	216.2	254.8	125.6
Medical equipment and supplies	3391	22,444	18,438	4,007	96	65	31	233.7	283.3	129.4
Other miscellaneous manufacturing	3399	3,120	2,695	424	22	18	4	140.7	150.9	98.2
Nonmanufacturing industries	21-23, 42-81	333,462	276,439	57,024	1,637	1,117	520	203.7	247.4	109.8
Mining, quarrying, oil and gas extraction, and support activities	21	1,339	1,260-1,334	5-79	9-91	9	0-82	D	D	D
Utilities	22	168-19,125	168-17,997	0-1,129	3-33	3-24	0-10	D	D	D
Wholesale trade	42	1,855	1,745-1,855	0-109	23-127	24	0-103	D	D	D
Electronic shopping and electronic auctions	454111-12	10,538-29,503	5,936-24,040	4,330-6,357	98-221	98-120	0-103	D	D	D
Transportation and warehousing	48-49	7,282	7,208	73	21-125	22	0-103	D	332.8	D
Information	51	177,113	147,855	29,258	692	449	242	256.1	329.2	120.7
Publishing	511	49,085	39,152	9,933	216	127	90	227.2	309.3	111.0
Newspaper, periodical, book, and directory publishers	5111	103	103	*	1	1	0	89.7	89.7	NA
Software publishers	5112	48,981	39,049	9,933	215	125	90	227.9	311.3	111.0
Telecommunications	517	3,912	3,835	77	23	22	1	172.9	177.4	76.1
Data processing, hosting, and related services	518	55,072	45,192	9,881	282	168	114	195.1	269.3	86.4
Other information	other 51	69,044	59,676	9,367	171	133	38	404.6	448.4	249.2
Finance and insurance	52	23,409	20,947	2,461	113	87	26	207.2	241.3	94.1
Real estate and rental and leasing	53	2,199	2,096	103	4-22	4	0-17	D	472.0	D
Lessors of nonfinancial intangible assets (except copyrighted works)	533	7	5-8	0-2	*	*	0	26.2	D	NA

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		Worldwide	Domestic	Foreign	Worldwide	Domestic	Foreign	Worldwide	Domestic	Foreign		
		Other real estate and rental and leasing	other 53	2,192	2,088 - 2,091	100 - 104	4 - 22	4	0 - 17	D	D	D
Professional, scientific, and technical services	54	85,259	66,496	18,763	i	494	343	150	172.7	193.7	124.9	
Architectural, engineering, and related services	5413	4,598	4,560	39	r	68	65	3	r	68.0	70.4	13.3
Computer systems design and related services	5415	25,041	20,409	4,632		145	102	44	172.6	200.9	106.5	
Scientific research and development services	5417	47,772	34,142	13,630	i	229	130	99	i	209.0	262.8	138.1
Research and development in nanotechnology	541713	244	228	16		1	1	*	i	181.5	175.3	364.7
Research and development in biotechnology (except nanobiotechnology)	541714	13,441	9,039	4,402		79	36	43		170.8	253.7	102.2
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	33,519	24,312	9,207	i	139	84	55	i	240.6	289.7	166.2
Research and development in the social sciences and humanities	541720	568	563	5		9	9	*		61.7	62.2	31.9
Other professional, scientific, and technical services	other 54	7,847	7,385	463		52	47	5		150.3	156.9	89.9
Health care services	621-23	2,140	2,060 - 2,138	2 - 81		8 - 22	9	0 - 13		D	D	D
Other nonmanufacturing	23, 44-45 (excluding 454111-12), 55-56, 624, 71-72, 81	3,200	2,564 - 3,199	1 - 637		49 - 153	50	0 - 103		D	D	D
All companies (number of domestic employees)	-	737,911	602,499	135,412		3,161	2,132	1,029		233.4	282.6	131.6
Small companies												
10-19 ^a	-	5,836	5,477	359		40	36	5		144.6	153.1	78.4
20-49	-	15,969	15,061	909		110	99	12		144.6	152.8	76.8
Medium companies												
50-99	-	15,406	14,540	866		102	92	9		151.6	157.5	92.9
100-249	-	26,406	24,023	2,382		178	157	21		148.3	152.7	115.2
Large companies												
250-499	-	27,592	23,932	3,660		148	110	38		186.2	217.0	96.7
500-999	-	31,961	27,432	4,528		154	110	43		208.2	248.3	105.3
1,000-4,999	-	115,278	94,615	20,663		507	340	168		227.2	278.6	123.2
5,000-9,999	-	78,388	62,817	15,571		315	211	103		249.2	297.3	150.9
10,000-24,999	-	133,088	104,607	28,481		541	309	232		246.0	338.9	122.6
25,000 or more	-	287,987	229,995	57,992		1,066	668	399		270.1	344.5	145.5

* = amount < \$500,000 or < 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; r = relative standard error is more than 50%; NA = not available.

NAICS = 2017 North American Industry Classification System.

^a 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, 2021.