

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: 2022

(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	841,131	691,547	149,584	3,186	2,110	1,076	264.0	327.8	139.0
Manufacturing industries	31-33	456,879	372,459	84,419	1,527	1,008	518	299.3	369.4	162.9
Food	311	8,605	7,143	1,463	46	30	16	185.8	235.4	91.6
Beverage and tobacco products	312	1,397	767	630	7	5	2	203.1	167.4	274.5
Textile, apparel, and leather products	313-16	748	635	113	6	5	2	116.2	130.3	72.2
Wood products	321	263	259	4	4	4	*	72.4	72.1	91.7
Paper	322	1,086	1,005	81	8	7	1	130.6	146.6	55.8
Printing and related support activities	323	167	165	2	2	2	*	86.8	88.5	32.6
Petroleum and coal products	324	1,107	860	247	6	4	2	189.6	219.5	128.5
Chemicals	325	150,790	125,728	25,061	302	217	85	499.4	578.4	296.4
Basic chemicals	3251	3,816	2,860	956	21	13	8	181.3	217.0	121.4
Resin, synthetic rubber, and artificial synthetic fibers and filaments	3252	2,032	1,493	539	11	7	4	184.5	214.6	133.0
Pesticide, fertilizer, and other agricultural chemicals	3253	1,344	1,193	151	5	4	1	265.8	270.1	236.3
Pharmaceuticals and medicines	3254	138,339	116,073	22,266	233	172	61	593.2	676.0	362.1
Soap, cleaning compound, and toilet preparations	3256	3,803	2,886	917	19	12	7	196.0	234.1	129.7
Paint, coating, adhesive, and other chemicals	3255, 3259	1,456	1,223	232	12	9	3	119.2	139.2	67.9
Plastics and rubber products	326	4,151	3,470	682	30	22	8	137.4	155.8	85.7
Nonmetallic mineral products	327	1,623	1,464	159	7	6	1	222.1	239.3	133.5
Primary metals	331	1,139	1,120	19	8	8	1	140.1	147.8	35.0
Fabricated metal products	332	3,757	3,526	231	40	38	2	94.6	92.7	136.1
Machinery	333	25,378	19,464	5,914	167	105	62	151.9	185.6	95.1
Agricultural implement	33311	3,277	2,287	990	18	10	8	180.5	222.0	126.0
Semiconductor machinery	333242	7,074	5,438	1,636	28	14	14	248.9	386.2	114.1
Engine, turbine, and power transmission equipment	3336	4,097	3,026	1,071	26	15	10	159.0	196.0	103.7
Other machinery	other 333	10,930	8,713	2,217	95	65	30	115.4	134.0	74.8
Computer and electronic products	334	140,254	104,718	35,536	460	245	215	305.1	427.2	165.5
Communications equipment	3342	15,174	11,665	3,509	69	36	32	221.4	321.7	108.8
Semiconductor and other electronic components	3344	71,114	49,330	21,784	204	93	111	348.0	531.0	195.4
Navigational, measuring, electromedical, and control instruments	3345	15,445	12,777	2,668	77	53	24	200.9	242.9	109.9
Electromedical, electrotherapeutic, and irradiation apparatus	334510, 334517	5,007	4,578	429	20	16	4	249.0	277.8	118.3
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments	334511	4,473	4,146	327	20	16	4	229.4	262.0	89.0
Other measuring and controlling devices	other 3345	5,965	4,053	1,912	37	20	17	160.0	199.6	112.6
Other computer and electronic products	other 334	38,521	30,946	7,575	110	63	47	350.3	488.6	162.4
Electrical equipment, appliances, and components	335	8,661	7,086	1,575	42	27	14	208.1	260.3	109.3

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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
Transportation equipment	336	79,294	71,259	8,035	265	195	70	299.2	366.2	114.0
Motor vehicles, bodies, trailers, and parts	3361-63	38,916	32,881	6,035	164	110	54	236.9	297.6	112.2
Aerospace products and parts	3364	37,175	35,356	1,819	86	71	14	434.4	495.7	127.7
Aircraft, aircraft engine, and aircraft parts	336411-13	25,224	24,571	653	58	50	8	433.3	490.8	80.1
Guided missile, space vehicle, and related parts	336414-15, 336419	11,951	10,785	1,166	27	21	6	436.9	507.3	191.3
Military armored vehicle, tank, and tank components	336992	31	30	1	*	*	0	102.4	99.6	NA
Other transportation	other 336	3,172	2,992	181	15	12	2	213.1	240.0	74.7
Furniture and related products	337	445	410	36	5	4	*	97.4	97.1	100.9
Miscellaneous	339	28,014	23,382	4,631	122	85	37	229.8	275.4	125.3
Medical equipment and supplies	3391	24,628	20,394	4,234	102	69	33	240.5	294.8	127.5
Other miscellaneous manufacturing	3399	3,385	2,989	397	19	16	4	173.7	189.9	105.9
Nonmanufacturing industries	21-23, 42-81	384,253	319,088	65,165	1,660	1,102	558	231.5	289.7	116.8
Mining, quarrying, oil and gas extraction, and support activities	21	1,008	D	D	10	9	1	102.2	D	D
Utilities	22	D	D	D	5	5	*	D	D	D
Wholesale trade	42	1,861	D	D	22	21	1	84.9	D	D
Electronic shopping and electronic auctions	454111-12	D	D	D	D	77	D	D	D	D
Transportation and warehousing	48-49	9,516	9,395	121	19	18	1	511.0	527.0	152.0
Information	51	219,288	182,340	36,948	781	489	292	280.8	372.5	126.7
Publishing	511	62,697	50,367	12,330	258	145	114	242.6	347.8	108.5
Newspaper, periodical, book, and directory publishers	5111	72	72	*	1	1	0	118.0	118.0	NA
Software publishers	5112	62,625	50,295	12,330	258	144	114	242.9	348.8	108.5
Telecommunications	517	3,891	3,690	201	13	11	2	311.2	347.8	106.1
Data processing, hosting, and related services	518	61,649	49,407	12,242	302	177	125	203.9	278.6	97.9
Other information	other 51	91,051	78,876	12,176	208	157	51	438.4	503.3	238.8
Finance and insurance	52	19,834	17,222	2,612	88	52	35	225.8	328.6	73.8
Real estate and rental and leasing	53	2,500	2,398	102	6	6	*	392.9	408.6	206.2
Lessors of nonfinancial intangible assets (except copyrighted works)	533	5	5	1	*	*	*	85.4	124.9	28.6
Other real estate and rental and leasing	other 53	2,494	2,393	101	6	6	*	396.0	410.5	216.1
Professional, scientific, and technical services	54	93,801	74,773	19,028	549	376	173	170.8	198.6	110.1
Architectural, engineering, and related services	5413	3,919	3,883	36	70	69	1	56.3	56.5	42.6
Computer systems design and related services	5415	27,108	22,534	4,575	164	111	53	165.0	203.3	85.5
Scientific research and development services	5417	53,196	39,625	13,571	259	149	110	205.6	265.7	123.9
Research and development in nanotechnology	541713	311	282	30	2	1	*	198.8	202.0	172.4
Research and development in biotechnology (except nanobiotechnology)	541714	14,299	10,226	4,073	74	35	39	193.8	291.9	105.1

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Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	37,886	28,420	9,466	173	103	70	218.7	276.5	134.4
Research and development in the social sciences and humanities	541720	700	698	2	10	10	*	69.3	70.2	10.9
Other professional, scientific, and technical services	other 54	9,577	8,730	847	57	48	9	169.2	183.1	94.7
Health care services	621-23	2,948	2,855	93	11	11	1	258.6	263.1	168.2
Other nonmanufacturing	23, 44-45 (excluding 454111-12), 55-56, 624, 71-72, 81	3,539	3,394	146	D	36	D	D	94.6	D
All companies (number of domestic employees)	-	841,131	691,547	149,584	3,186	2,110	1,076	264.0	327.8	139.0
Small companies										
10-19 ^a	-	5,537	5,277	260	37	34	3	148.3	155.7	75.6
20-49	-	15,636	14,695	941	98	89	9	159.5	165.1	104.1
Medium companies										
50-99	-	16,227	15,265	962	101	87	13	161.4	174.7	72.9
100-249	-	29,864	27,847	2,017	164	143	21	181.8	194.9	94.5
Large companies										
250-499	-	33,789	29,549	4,240	160	123	37	211.7	240.8	114.8
500-999	-	36,458	31,802	4,657	175	131	44	208.1	242.1	106.3
1,000-4,999	-	128,912	104,505	24,407	552	348	205	233.4	300.7	119.2
5,000-9,999	-	72,325	58,709	13,616	277	181	96	261.3	324.6	142.0
10,000-24,999	-	153,179	121,142	32,036	565	338	227	271.1	358.6	141.0
25,000 or more	-	349,204	282,756	66,448	1,057	636	421	330.4	444.4	158.0

* = 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.

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.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2022.