

Table 47. 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: 2023

(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	873,593	721,792	151,801	3,262	2,126	1,136	267.8	339.4	133.6
Manufacturing industries	31-33	479,261	393,648	85,613	1,619	1,047	572	296.0	376.1	149.6
Food	311	7,129	5,827	1,302	41	27	14	171.9	213.9	91.4
Beverage and tobacco products	312	1,838	974	864	8	5	3	230.6	199.3	280.1
Textile, apparel, and leather products	313-16	876	747	129	7	5	2	134.6	149.6	85.4
Wood products	321	261	258	3	4	4	*	60.0	59.6	201.2
Paper	322	1,308	1,235	73	8	6	2	165.4	196.1	45.5
Printing and related support activities	323	341	333	8	3	3	*	102.9	104.4	63.7
Petroleum and coal products	324	1,123	961	162	6	4	2	198.4	237.9	99.7
Chemicals	325	162,246	136,867	25,379	323	231	92	502.5	593.4	275.2
Basic chemicals	3251	4,131	3,200	931	20	13	8	202.7	255.3	118.7
Resin, synthetic rubber, and artificial synthetic fibers and filaments	3252	1,949	1,413	536	10	7	4	193.7	216.0	152.3
Pesticide, fertilizer, and other agricultural chemicals	3253	2,652	2,054	598	10	7	3	256.1	283.7	191.9
Pharmaceuticals and medicines	3254	148,160	125,986	22,174	251	185	66	591.3	682.6	336.0
Soap, cleaning compound, and toilet preparations	3256	3,887	2,992	895	19	11	8	210.1	273.9	118.2
Paint, coating, adhesive, and other chemicals	3255, 3259	1,468	1,224	245	13	9	4	112.7	138.0	58.7
Plastics and rubber products	326	3,622	3,178	443	23	19	4	158.9	170.1	107.9
Nonmetallic mineral products	327	1,564	1,360	203	6 i	5 i	1 i	248.7	268.3	166.9
Primary metals	331	680	616	64	8	8	1	81.0	80.1	90.9
Fabricated metal products	332	3,442	3,132	310	35	32	3	99.3	98.0	115.3
Machinery	333	29,139	22,682	6,457	182	115	67	159.9	197.8	95.7
Agricultural implement	33311	3,612	2,500	1,111	19	11	8	185.4	224.4	133.2
Semiconductor machinery	333242	8,294	6,517	1,777	32	17	15	259.9	379.9	120.5
Engine, turbine, and power transmission equipment	3336	5,696	4,423	1,273	32	20	12	178.5	224.0	104.7
Other machinery	other 333	11,537	9,241	2,295	99	67	32	116.7	138.7	71.2
Computer and electronic products	334	145,860	110,658	35,203	517	270	247	281.9	409.1	142.6
Communications equipment	3342	16,477	12,918	3,559	68	36	32	242.4	358.7	111.4
Semiconductor and other electronic components	3344	70,928	50,079	20,850	257	113	144	276.2	443.9	144.8
Navigational, measuring, electromedical, and control instruments	3345	16,897	13,984	2,913	85	59	26	199.6	238.8	111.6
Electromedical, electrotherapeutic, and irradiation apparatus	334510, 334517	5,357	4,860	498	23	18	4	236.9	267.6	111.6
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments	334511	5,192	4,789	404	24	20	4	215.3	243.5	90.8
Other measuring and controlling devices	other 3345	6,347	4,335	2,012	38	21	17	167.4	209.2	117.0
Other computer and electronic products	other 334	41,558	33,677	7,881	108	63	45	384.8	533.7	175.6
Electrical equipment, appliances, and components	335	8,980	7,170	1,809 i	42	28	14	213.0	258.0	126.0
Transportation equipment	336	82,280	73,928	8,352	279	198	81	295.2	373.8	103.1

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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
Motor vehicles, bodies, trailers, and parts	3361-63	38,824	32,574	6,249	170	108	62	228.9	301.8	101.4
Aerospace products and parts	3364	39,515	37,643	1,873	92	i 76	16	429.0	497.0	114.4
Aircraft, aircraft engine, and aircraft parts	336411-13	27,724	27,056	i 669	63	53	10	438.9	507.1	68.1
Guided missile, space vehicle, and related parts	336414-15, 336419	11,791	10,587	1,204	29	i 22	i 7	i 407.4	472.9	183.8
Military armored vehicle, tank, and tank components	336992	25	25	0	*	*	0	70.0	70.0	NA
Other transportation	other 336	3,915	3,685	i 230	17	14	3	234.3	268.6	76.9
Furniture and related products	337	501	470	32	5	4	*	108.6	109.3	99.7
Miscellaneous	339	28,071	23,252	4,819	122	83	39	230.7	281.1	123.8
Medical equipment and supplies	3391	24,900	20,445	4,455	104	69	35	238.4	294.7	127.0
Other miscellaneous manufacturing	3399	3,171	2,807	364	17	13	4	184.2	210.2	94.3
Nonmanufacturing industries	21-23, 42-81	394,332	328,144	66,188	1,643	1,080	564	239.9	303.9	117.4
Mining, quarrying, oil and gas extraction, and support activities	21	1,120	1,031	89	4	4	1	263.5	284.8	141.2
Utilities	22	602	587	15	6	6	*	96.1	97.6	61.1
Wholesale trade	42	2,501	i 2,328	i 172	i 23	i 22	i 2	i 107.0	106.9	107.9
Electronic shopping and electronic auctions	454111-12	9,572	i 8,026	i 1,546	i 38	i 31	i 7	i 250.4	260.4	208.7
Transportation and warehousing	48-49	12,515	12,256	258	28	27	2	442.6	458.0	171.1
Information	51	235,649	195,439	40,210	808	497	311	291.6	393.4	129.1
Publishing	511	66,176	52,003	14,173	284	149	135	232.8	349.2	104.7
Newspaper, periodical, book, and directory publishers	5111	13	13	0	*	*	0	96.0	96.0	NA
Software publishers	5112	66,163	51,990	14,173	284	149	135	232.9	349.4	104.7
Telecommunications	517	3,473	3,359	114	12	11	i 1	298.6	316.9	110.5
Data processing, hosting, and related services	518	66,559	53,115	13,445	309	184	125	215.5	288.6	107.8
Other information	other 51	99,441	86,962	12,478	203	153	50	488.9	567.9	248.4
Finance and insurance	52	29,899	26,183	3,715	138	90	48	216.6	291.7	77.0
Real estate and rental and leasing	53	2,348	2,255	93	6	5	1	391.3	415.8	161.5
Lessors of nonfinancial intangible assets (except copyrighted works)	533	16	i 15	i *	i *	r *	r 0	76.6	74.3	NA
Other real estate and rental and leasing	other 53	2,332	2,239	93	6	5	1	402.5	429.3	160.7
Professional, scientific, and technical services	54	93,111	73,317	19,794	533	348	185	i 174.6	210.8	106.8
Architectural, engineering, and related services	5413	4,136	4,089	48	60	59	1	69.4	69.5	59.5
Computer systems design and related services	5415	30,830	25,430	5,400	168	107	61	184.0	237.8	89.1
Scientific research and development services	5417	47,372	34,245	13,127	i 247	i 133	i 113	i 192.0	257.0	115.7
Research and development in nanotechnology	541713	412	386	26	2	2	*	177.2	189.2	91.7
Research and development in biotechnology (except nanobiotechnology)	541714	12,765	9,077	3,688	78	i 36	42	i 163.8	252.4	87.9
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	33,632	i 24,220	i 9,412	i 159	i 88	i 71	i 211.5	275.7	132.3
Research and development in the social sciences and humanities	541720	563	561	1	8	7	*	74.8	75.5	16.1

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		Worldwide	Domestic	Foreign	Worldwide	Domestic	Foreign	Worldwide	Domestic	Foreign
Other professional, scientific, and technical services	other 54	10,773	9,554	1,219	59	49	10	182.0	195.7	117.4
Health care services	621-23	2,831	2,696	135	11	10	1	254.4	259.3	185.1
Other nonmanufacturing	23, 44-45 (excluding 454111-12), 55-56, 624, 71-72, 81	4,185	4,026	159	47	40	6	89.8	99.6	25.7
All companies (number of domestic employees)	-	873,593	721,792	151,801	3,262	2,126	1,136	267.8	339.4	133.6
Small companies										
10-19 ^a	-	6,227	5,808	419	37	34	3	166.9	171.6	120.9
20-49	-	15,796	14,520	1,276	101	86	15	156.6	169.4	84.1
Medium companies										
50-99	-	16,692	15,626	1,066	97	87	10	171.7	179.8	103.7
100-249	-	33,187	30,641	2,546	161	141	20	205.8	216.8	127.9
Large companies										
250-499	-	33,834	29,635	4,199	163	122	42	207.1	243.6	100.6
500-999	-	39,133	33,973	5,160	173	124	49	226.1	273.8	105.3
1,000-4,999	-	150,367	124,027	26,340	600	377	223	250.8	328.9	118.4
5,000-9,999	-	73,756	60,151	13,605	312	202	110	236.3	297.1	124.0
10,000-24,999	-	160,509	126,138	34,371	556	307	249	288.5	410.5	138.0
25,000 or more	-	344,092	281,273	62,819	1,061	646	415	324.2	435.4	151.3

* = amount < \$500,000 or < 500 employees; 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.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2023.