

미국 기업의 R&D 투자액과 특허수와의 관계^a

	R&D 투자액(\$ Millions)			Patent수(개)		
	1991	1990	1991 R&D spending as % of sales	1991	1982	Total 1982~91
Chemical companies						
Du Pont	\$ 1298	\$ 1428	3.4 %	651 ^b	331 ^b	4,466 ^b
Dow Chemical	1159	1136	6.2	332	277	3,611
Monsanto	627	612	8.0	129	131	1,083
American Cyanamid	492	460	9.9	106	129	1,139
Union Carbide	190	191	3.2	131 ^c	202 ^c	1,755 ^c
Rohm & Haas	183	178	6.6	49	49	358
W. R. Grace	150	148	2.5	121	49	688
Hercules	86	92	2.9	63	30	417
Air Products	80	72	2.7	119	54	795
Lubrizol	80	74	5.4	—	—	—
Ethyl	69	65	2.7	118	31	745
International Flavors	62	57	6.1	38	87	620
Morton International	59	48	3.1	—	—	—
Nalco	47	45	3.8	—	—	—
Olin	41	66	1.8	105	80	853
Petrolite	11	12	3.5	—	—	—
Ciba-Geigy	—	—	—	414	281	3,100
Dow Corning	—	—	—	135	35	749
PPG Industries	—	—	—	93	177	1,244
GAF Chemicals	—	—	—	40	32	277
Drug companies						
Merck & Co.	\$ 998	\$ 854	11.6 %	152	135	1,300
Briston-Myers Squibb	993	881	8.9	—	—	—
Eli Lilly	767	703	13.4	66	104	814
Pfizer	757	640	10.9	91	72	748
Upjohn	\$ 491	\$ 427	14.4 %	23	123	557
Schering-Plough	426	380	11.8	—	—	—
Warner-Lambert	—	—	—	120	25	858
Abbott-Laboratories	—	—	—	79	50	430
Hoffmann-LaRoche	—	—	—	78	118	838
American Home Products	—	—	—	46	43	491
Smithkline Beckman	—	—	—	13	66	478

a : U. S. Chemical Patents

b : Includes Patents issued to Conoco. acquired in 1981, for all years.

c : Includes Patents issue to Union Carbide Chemicals & Plastics.

Union Carbide Chemicals & Plastics Technology, and Union Carbide Industrial Gases Technology.

〈C&E News, Aug. 17, 1992〉

특허수로 본 세계주요화학기업의 기술경쟁력

Company	Number of patents			Current impact index			Technological strength			Technology cycle time		
	1991	% change		1991	% change		1991	% change		1991	% change	
		Avg. 1987~91	1987~91		Avg. 1987~91	1987~91		Avg. 1987~91	1987~91		Avg. 1987~91	1987~91
Group composite	6299	5792	6	0.82	0.83	1	5167	4809	7	10.0	10.0	0
1. Du Pont	631	523	9	1.06	1.03	3	669	539	11	9.7	9.7	0
2. Minnesota Mining & Mfg.	374	333	9	1.39	1.33	2	519	442	11	10.9	10.3	-3
3. Hoechst	575	536	7	0.88	0.78	8	507	442	15	8.6	9.4	4
4. Bayer	706	657	7	0.66	0.72	0	463	474	8	9.5	9.1	-1
5. Dow Chemical	439	480	-3	0.80	0.83	-3	353	397	-6	10.6	10.6	-2
6. Ciba-Geigy	430	384	7	0.79	0.78	3	342	300	10	9.2	9.5	1
7. BASF	464	406	10	0.66	0.68	-2	308	275	8	9.6	9.7	2
8. Monsanto	196	148	10	0.90	0.73	7	176	110	20	11.6	10.9	-1
9. Imperial Chemical Industries	278	239	13	0.63	0.84	-10	176	196	2	10.0	9.5	-4
10. Olin	121	87	18	1.44	1.17	32	174	105	54	9.5	10.2	3
11. Air Products & Chemicals	123	102	14	1.27	1.13	10	156	115	16	8.7	9.7	5
12. W. R. Grace	135	111	17	1.07	1.15	-1	145	127	17	10.5	10.6	3
13. Shin-Etsu Chemical	143	85	30	0.99	1.09	-5	141	91	28	7.2	8.2	2
14. Union Carbide	152	151	-1	0.89	1.06	-4	135	160	-6	9.5	10.2	2
15. Rhône-Poulenc	210	231	-5	0.59	0.57	2	123	132	-3	9.1	10.0	4
16. Sumitomo Chemical	161	144	12	0.62	0.80	-4	100	116	9	10.3	8.6	-8
17. American Cyanamid	114	119	2	0.79	0.71	11	90	85	14	8.6	9.5	3
18. PPG Industries	108	119	-3	0.82	0.84	1	89	100	-2	11.6	11.3	-3
19. Akzo	104	90	8	0.76	0.79	-2	79	71	8	10.9	10.9	-3
20. Ethyl	133	97	28	0.58	0.72	8	77	71	43	11.2	10.6	0

Glossary

Number of patents : The number of patents granted by the U.S. Patent Office. The number excludes design patents and other special cases.

Current impact index : A measure of how important a company's patents are based on how often they're cited in other patents, which shows how frequently they're used as the foundation for other inventions. For example, a company's 1991 index is computed by first calculating the average number of times the patents it was granted in each of the previous five years were cited in new patents granted in 1991. Those figures are divided by the average number of 1991 citations for all U.S. patents in each of the previous five years. That yields a citation ratio for each year. A ratio of 1.0 means that the company's patents were cited as often as the overall average. A ratio of 1.2 means that the company's patents were cited 20% more often than average. Finally, the citation ratio for each of the five years is averaged to get the 1991 rating.

Technological strength : The number of patents times the current impact index.

Technology cycle time : The median age of the U.S. patent references cited in the company's new patents. The lower the number, the more quickly the company is replacing one generation of inventions with another.

〈Chemtech, February 1993〉

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