

EMPLOYMENT: ANOTHER DECLINE

Data show continued contraction as companies seek to lower costs, become more efficient

PRICE INCREASES WERE NOT THE only factor that boosted the bottom line for chemical companies in 2004; there was also cost cutting. And an important element of the lowering of costs was the continuing reduction of jobs at chemical-producing companies.

Looking at U.S. government statistics and at figures from individual companies around the world, it is evident that the trend continues to be global.

In the U.S., statistics from the Labor Department show an average of 887,000 chemical employees in 2004, down 2.1% from the previous year. In comparison, total employment for all manufacturing, while continuing to decline, fell only 1.2% last year to 14,329,000.

Despite improvements in the fortunes of the two important sectors—basic chemicals and resins, synthetic rubber, and fibers—employment in these product categories still declined. Total employment for basic chemicals fell 3.8% to 156,100, while that for the polymers sector declined 2.7% to 108,800. Only the soaps and toiletries sector showed a larger contraction, falling 4.2% to 114,400.

Last year's drop marks the sixth straight year of lower chemical employment, according to the government data. But because the Labor Department does not count

all workers within an industry—assigning employees such as accountants, lawyers, and even chemists to other categories—a clearer picture might be gleaned from looking at company data for the U.S., Canada, Europe, and Japan, even though they measure worldwide employment of these firms rather than domestic employment.

In the U.S., total employment at a group of 20 chemical companies fell 1.6% in 2004 to 215,500. This is just the third year of decline rather than the six years shown by the government figures.

Total employment for four major chemical companies in Canada declined just 0.7% to 14,500. In Europe, employment at 18 companies fell 3.9% to 602,400. But in Japan, 12 companies increased combined employment 1.4% to 216,400.

While production was increasing in the U.S., the number of hourly production workers was declining slightly. According to the Labor Department data, the average number of production workers was 520,000 in 2004, down 0.9% from 2003. This is slightly less than the 1.1% decline

seen for all manufacturing. These data are more reliable than those for employees because the industry classification system used by the government is production based, thus providing a fairly indicative count.

As they did for total employees, the basic chemicals and polymers segments

showed large declines in production workers. The basic chemicals sector's average of 95,000 workers was down 4.9% from 2003, whereas that for the resins, synthetic rubber, and fibers sector was down 4.6% to 73,900.

Increasing production combined with fewer production workers raised the level of chemical productivity, or output per hour, in 2004. Based on employment and workhour data from the Labor Department and output indexes from the Federal Reserve Board, C&EN estimates that productivity in the U.S. chemical industry increased 2.9% in 2004, quite a bit less than the 4.9% increase for all manufacturing.

As one might expect, given the decline in production workers in basic chemicals and polymers, productivity in these two sectors showed unusually large growth. Basic chemicals showed a 10.1% improvement, and the index for polymers rose 6.0%. Soaps and toiletries increased 4.3% and agricultural chemicals rose 0.2%. In contrast, productivity for pharmaceuticals declined 1.0%; for paints, coatings, and adhesives, it fell 8.4%.

Increasing wages in the chemical industry drove unit labor costs higher, which ideally should decline, however. Unit labor costs for all chemicals increased only 0.7%, against a 2.2% decline for all manufacturing. Within the broad chemicals category, only three sectors showed declines in unit labor costs and, again, basic chemicals and polymers performed very well. Unit labor costs for polymers were down 3.7%, while the index for basic chemicals fell 5.0%. The index for soaps and toiletries declined by 0.3%.

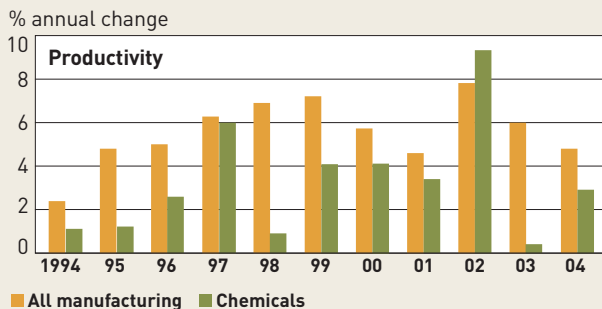
On the other hand, the labor cost index for agricultural chemicals increased 2.7%; that for pharmaceuticals rose 6.7%; and the index for paints, coatings, and adhesives jumped 10.9%.



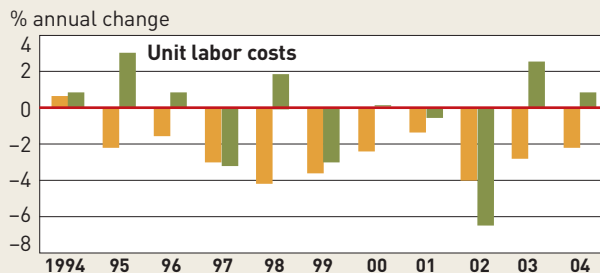
FACTS & FIGURES

U.S. METRICS

Measures improved as chemical productivity increased and growth of unit labor costs slowed



SOURCES: Federal Reserve Board, Bureau of Labor Statistics, C&EN estimates



OVERALL U.S. EMPLOYMENT

U.S. chemical employment has declined for six straight years

THOUSANDS	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	ANNUAL CHANGE	
												2003-04	1994-04
Manufacturing	17,021	17,241	17,237	17,419	17,560	17,322	17,263	16,441	15,259	14,510	14,329	-1.2%	-1.7%
Chemicals	1,005	988	985	987	993	983	980	959	928	906	887	-2.1	-1.2
Basic chemicals	235	228	224	219	213	195	188	181	170	162	156	-3.8	-4.0
Resins, synthetic rubber & fibers	142	140	141	141	140	137	136	126	115	112	109	-2.7	-2.6
Agricultural chemicals	51	50	47	49	50	51	48	46	45	42	41	-1.2	-2.1
Pharmaceuticals	231	228	229	236	247	261	274	283	291	292	291	-0.3	2.4
Paints, coatings & adhesives	80	79	76	77	78	78	80	75	72	69	68	-0.9	-1.6
Soaps & toiletries	126	126	127	128	131	131	13	127	121	119	114	-4.2	-1.0
Other chemicals	141	137	137	137	135	128	127	120	114	111	108	-2.7	-2.6

NOTE: Average annual domestic employment. SOURCE: Department of Labor

U.S. CHEMICAL EMPLOYMENT

Employment at major companies contracted again

THOUSANDS	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Air Products & Chemicals	13.3	14.8	15.2	16.4	16.7	17.4	17.5	17.8	17.2	18.5	19.9
Albemarle	3.7	3.0	2.8	2.7	2.7	2.6	2.5	3.0	3.0	3.0	3.7
Cabot	5.4	4.1	4.7	4.8	4.8	4.5	4.5	4.3	4.5	4.4	4.3
Cambrex	1.3	1.3	1.3	1.8	1.8	1.9	1.9	2.1	2.2	1.9	1.9
Crompton	2.5	2.8	5.7	5.6	5.4	8.6	8.3	7.3	6.8	5.5	4.8
Cytec Industries	5.0	5.0	5.0	5.2	5.1	4.9	4.8	4.5	4.3	4.5	4.5
Dow Chemical ^a	53.7	39.5	40.3	42.9	39.0	39.2	41.9	52.7	50.0	46.4	43.2
Eastman Chemical	17.5	17.7	17.5	16.1	15.9	14.7	14.6	15.8	15.7	15.0	12.0
H.B. Fuller	6.4	6.4	5.9	6.0	6.0	5.4	5.2	4.9	4.6	4.5	4.5
Georgia Gulf	1.1	1.1	1.0	1.1	1.1	1.4	1.3	1.2	1.2	1.2	1.2
W.R. Grace	37.9	21.2	17.4	6.3	6.6	6.3	6.3	6.4	6.4	6.3	6.4
Hercules	12.0	7.9	7.1	6.2	12.4	11.4	9.8	9.7	5.1	5.1	5.0
Lubrizol ^b	4.5	4.6	4.4	4.3	4.3	4.1	4.4	4.5	5.2	5.0	7.8
Monsanto	29.4	28.5	28.0	21.9	31.8	29.9	14.7	14.6	13.7	13.2	12.6
NewMarket Corp. ^c	1.5	1.8	1.8	1.5	1.5	1.5	1.5	1.1	1.1	1.1	1.1
PPG Industries	30.8	31.2	31.3	31.9	32.5	33.8	35.6	34.9	34.1	32.9	31.8
Praxair	17.8	18.2	25.3	25.4	24.8	24.1	23.4	24.3	25.0	25.4	27.0
Rohm and Haas	12.2	11.7	11.6	11.6	11.3	21.5	18.5	18.2	17.6	17.3	16.7
Solutia ^d	—	—	—	8.8	8.7	10.6	10.2	9.2	7.3	6.3	5.7
Stepan	1.3	1.3	1.3	1.3	1.4	1.4	1.4	1.5	1.5	1.4	1.4
TOTAL EMPLOYEES^e	257.3	222.1	227.6	221.8	233.8	245.2	228.25	238.0	226.5	219.0	215.5

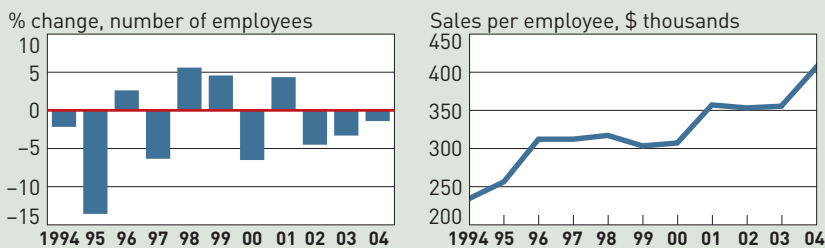
NOTE: Data are not restated for acquisitions, divestitures, or similar developments. ^a Merged with Union Carbide in 2001. ^b Acquired Noveon in 2004. ^c Formerly Ethyl Corp. ^d Spun off from Monsanto in 1997. ^e For companies reporting.

GOT A THING FOR DATA?

If you're itching to do your own calculations with all these numbers, let yourself go ... to www.cen-online.org, that is, where you can access downloadable versions of these tables.

COMPANY CHANGE

Smaller number of jobs helped drive sales per employee upward



SOURCE: C&EN calculations based on data from 20 companies listed above

CANADA EMPLOYMENT

Total workforce at four companies dropped slightly in 2004

THOUSANDS	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Agrium	na	3.5	4.4	4.4	4.5	4.5	4.0	4.0	4.8	4.7	4.6
Methanex	na	0.9	0.9	0.8	0.9	0.8	0.8	0.8	0.8	0.7	0.9
Nova Chemicals ^a	—	5.7	3.4	3.4	3.3	4.7	4.7	4.6	4.3	4.3	4.1
Potash Corp. ^b	1.7	4.6	4.5	5.7	5.7	5.5	5.3	5.0	5.2	4.9	4.9
TOTAL EMPLOYEES^c	1.7	14.7	13.2	14.3	14.4	15.5	14.8	14.4	15.1	14.6	14.5

a Spun off from Nova. Corp. in 1995. b Acquired Texas Gulf in 1995. c For companies reporting. na = not available.

EUROPE EMPLOYMENT

Employment continued to fall at major European chemical firms

THOUSANDS	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Air Liquide (France)	24.6	26.1	27.8	27.6	28.6	29.0	30.3	30.8	30.8	31.9	35.9
Akzo Nobel (Netherlands)	66.3	68.4	68.0	85.9	68.9	70.7	69.8	70.4	60.7	64.6	61.5
BASF (Germany)	106.3	106.6	105.6	105.0	105.9	104.6	103.3	92.5	89.4	87.2	82.0
Bayer (Germany)	146.7	142.9	142.2	144.6	145.1	120.4	122.1	116.9	122.6	94.9	93.3
BOC International (U.K.)	39.4	40.1	40.9	41.4	37.1	33.4	42.7	43.2	46.3	44.5	43.4
Ciba Specialty Chemicals ^a (Switzerland)	—	—	—	21.4	24.5	20.1	20.3	19.7	19.0	18.7	19.3
Clariant ^b (Switzerland)	—	8.4	32.5	30.9	29.3	29.0	31.5	28.9	27.8	27.0	24.8
Degussa (Germany)	27.3	27.1	26.0	25.7	na	62.5	62.9	53.4	47.6	46.6	44.6
DSM (Netherlands)	19.4	17.0	18.4	17.5	23.0	21.8	21.8	21.5	18.5	26.1	24.5
Givaudan ^c (Switzerland)	—	—	—	—	—	4.9	5.1	5.3	5.8	6.0	5.9
ICI (U.K.)	67.5	64.8	64.0	69.5	60.6	53.6	45.9	39.8	38.0	36.2	33.8
Kemira (Finland)	11.2	10.5	10.6	10.4	10.8	10.7	9.6	10.2	10.4	10.5	9.7
Lanxess ^d (Germany)	—	—	—	—	—	—	—	—	—	20.5	19.7
Lonza ^e (Switzerland)	—	—	—	—	5.7	5.7	4.6	6.2	6.2	5.7	5.7
Merck ^f (Germany)	26.0	27.8	28.7	28.9	28.9	32.7	33.5	34.3	34.5	34.2	28.9
Rhodia ^g (France)	—	31.7	29.1	25.1	24.5	24.8	29.4	26.9	24.5	23.0	20.6
Solvay (Belgium)	39.9	38.6	35.4	34.4	33.1	32.8	32.3	29.4	30.3	30.1	29.3
Syngenta ^h (Switzerland)	—	—	—	—	—	23.5	21.0	20.5	20.0	19.1	19.5
TOTAL EMPLOYEESⁱ	574.6	610.0	629.2	668.3	626.0	680.2	686.1	649.9	632.4	626.8	602.4

a Spun off from Novartis in 1997. b Spun off from Sandoz in 1995, merged with Hoechst Specialty Chemicals in 1997. c Spun off from Roche in 2001; prior figures are pro forma. d Spun off from Bayer in January 2005; figures are pro forma. e Became an independently listed company in 1999; prior figures are pro forma. f Privately held until 1996. g Spun off from Rhône-Poulenc in 1998; prior figures are pro forma. h Became an independent company in 2000; prior figures are pro forma. i For companies reporting.

JAPAN EMPLOYMENT

Sumitomo, Shin-Etsu, and others resumed hiring

THOUSANDS	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Asahi Kasei	28.6	28.2	26.7	27.8	29.3	26.6	26.7	26.2	25.7	25.0	23.8
Dainippon Ink & Chemicals	24.8	25.6	25.9	24.9	25.7	31.0	30.3	28.4	27.0	26.5	26.8
JSR Corp. ^a	—	—	—	—	—	4.4	4.4	4.4	4.3	4.3	4.4
Kaneka	—	—	—	—	7.2	6.6	7.0	6.7	6.7	6.6	6.6
Mitsubishi Chemical ^b	—	na	na	na	na	33.5	33.0	38.6	37.6	33.5	33.3
Mitsui Chemicals ^c	—	—	—	13.6	12.6	11.7	12.8	13.2	12.7	12.3	12.2
Shin-Etsu	16.1	17.1	18.9	19.2	18.4	18.8	19.4	16.5	16.6	17.4	18.2
Showa Denko	6.1	9.0	8.9	13.6	13.5	12.5	13.2	12.0	10.9	10.6	11.2
Sumitomo Chemical	17.2	16.8	16.3	15.9	15.8	17.5	17.4	17.0	17.9	19.0	20.2
Taiyo Nippon Sanso ^d	2.0	2.0	1.8	1.7	na	7.0	6.3	5.5	4.8	4.6	7.1
Teijin	15.9	16.2	17.3	17.6	17.2	22.0	22.3	24.0	23.3	20.6	19.0
Toray	31.9	32.9	33.8	32.9	34.3	35.5	35.7	34.9	33.8	32.9	33.7
TOTAL EMPLOYEES^e	142.6	147.6	149.6	167.2	173.9	226.9	228.5	227.4	221.3	213.4	216.4

NOTE: Fiscal year ends March 31 at all companies, except for Showa Denko, where it ends Dec. 31. a JSR initiated a consolidated head count in 1999. b Formed in 1994 from the merger of Mitsubishi Kasei and Mitsubishi Petrochemical. c Formed in 1997 from the merger of Mitsui Toatsu and Mitsui Petrochemical. d Nippon Sanso became Taiyo Nippon Sanso in 2004 when it acquired Taiyo Toyo Sanso. Prior figures are for Nippon Sanso. e For companies reporting. na = not available.

EMPLOYMENT

U.S. PRODUCTION WORKERS

Decline in plant workers in 2004 was lowest in five years

THOUSANDS	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	ANNUAL CHANGE	
												2003-04	1994-04
Manufacturing	12,361.0	12,566.0	12,532.0	12,673.0	12,729.0	12,524.0	12,428.0	11,677.0	10,768.0	10,190.0	10,083.0	-1.1%	-2.0%
Chemicals	595.6	598.4	595.1	593.3	600.6	595.2	587.7	562.2	531.9	524.9	520.0	-0.9	-1.3
Basic chemicals	138.8	139.4	138.8	137.4	136.3	126.2	121.8	114.9	104.4	99.9	95.0	-4.9	-3.7
Resins, synthetic rubber & fibers	101.2	99.2	98.0	98.7	97.6	96.4	96.0	88.6	80.7	77.5	73.9	-4.6	-3.1
Agricultural chemicals	33.1	32.8	32.8	32.8	33.8	34.0	31.8	30.0	29.7	29.0	28.9	-0.3	-1.3
Pharmaceuticals	114.6	119.0	118.0	115.7	122.6	129.3	132.3	132.1	127.9	133.3	138.8	4.1	1.9
Paints, coatings & adhesives	41.2	40.8	39.6	40.1	40.3	41.2	41.9	39.0	38.2	36.9	40.5	9.8	-0.2
Soaps & toiletries	80.0	79.7	80.4	81.0	83.6	84.7	81.5	80.4	76.4	76.7	73.8	-3.8	-0.8
Other chemicals	86.9	86.6	87.6	87.8	86.5	83.4	82.4	77.2	74.6	71.6	69.0	-3.6	-2.3

NOTE: Average annual domestic employment. SOURCE: Department of Labor

U.S. PAY

Hourly and weekly wages increased for all chemical sectors

	HOURLY EARNINGS				WEEKLY EARNINGS			
	2001	2002	2003	2004	2001	2002	2003	2004
Manufacturing	\$14.76	\$15.29	\$15.74	\$16.14	\$595.19	\$618.75	\$635.99	\$658.53
Chemicals	17.57	17.97	18.50	19.16	735.54	759.53	783.95	819.59
Basic chemicals	21.43	21.84	22.12	23.13	959.90	980.58	988.97	1,034.38
Resins, synthetic rubber & fibers	17.45	17.78	17.87	18.23	722.48	738.79	747.84	800.22
Agricultural chemicals	17.39	18.96	18.41	18.93	799.96	848.10	837.14	865.44
Pharmaceuticals	17.77	18.12	19.77	20.90	729.44	776.67	850.39	891.92
Paints, coatings & adhesives	14.78	15.64	16.01	16.26	609.76	644.01	656.44	684.69
Soaps & toiletries	14.11	14.26	14.16	14.72	560.43	566.43	564.19	588.09
Other chemicals	16.02	16.41	17.02	17.16	647.79	665.84	694.18	708.40

NOTE: For production workers in domestic employment. SOURCE: Department of Labor

U.S. PRODUCTIVITY

Overall chemical output per hour improved, as it has for more than a decade ...

PRODUCTIVITY ^a , 1997 = 100	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	ANNUAL CHANGE
												2003-04
Manufacturing	85.4	89.4	94.1	100.0	106.9	114.5	121.1	126.6	136.6	144.7	151.7	4.9%
Chemicals	90.7	91.9	94.3	100.0	100.9	105.1	109.3	113.0	123.5	124.0	127.6	2.9
Basic chemicals	93.3	92.9	92.3	100.0	99.4	116.9	118.5	113.8	129.4	134.3	147.8	10.1
Resins, synthetic rubber & fibers	91.9	94.5	94.0	100.0	105.7	109.0	109.2	109.3	125.4	126.4	134.0	6.0
Agricultural chemicals	93.1	94.6	95.8	100.0	98.8	89.1	93.4	94.1	99.1	99.7	99.8	0.2
Pharmaceuticals	87.3	85.9	93.4	100.0	101.4	98.7	99.5	104.6	110.0	103.9	102.9	-1.0
Paints, coatings & adhesives	95.3	94.5	100.1	100.0	99.9	97.7	97.3	104.9	102.3	110.4	101.1	-8.4
Soaps & toiletries	87.8	94.0	96.4	100.0	95.2	90.5	99.4	102.8	116.1	116.3	121.3	4.3

... while unit labor costs increased only slightly and are still below prerecession levels

UNIT LABOR COSTS ^b , 1997 = 100	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	ANNUAL CHANGE
												2003-04
Manufacturing	107.3	104.9	103.1	100.0	95.8	92.1	90.0	88.8	85.2	82.8	81.0	-2.2%
Chemicals	99.4	102.4	103.3	100.0	101.9	98.9	99.1	98.5	92.2	94.5	95.1	0.7
Basic chemicals	96.6	101.8	105.4	100.0	103.3	86.6	88.5	93.8	84.1	82.0	77.9	-5.0
Resins, synthetic rubber & fibers	96.1	97.6	103.2	100.0	97.1	96.6	99.7	101.7	90.3	90.0	86.7	-3.7
Agricultural chemicals	98.8	100.2	101.7	100.0	104.3	119.9	120.6	128.7	133.3	128.6	132.1	2.7
Pharmaceuticals	97.2	101.7	97.2	100.0	96.5	100.6	104.2	102.0	98.9	114.3	122.0	6.7
Paints, coatings & adhesives	97.6	98.9	96.6	100.0	102.1	107.1	110.6	107.6	116.7	110.8	122.9	10.9
Soaps & toiletries	108.0	102.2	101.2	100.0	109.9	122.6	120.1	118.8	106.3	105.4	105.1	-0.3

a Productivity is output per workhour, calculated by dividing indexes for production by indexes for workhours of production workers. b Unit labor costs are calculated by dividing indexes for hourly wages by indexes for output per hour. SOURCES: Federal Reserve Board, Department of Labor, C&EN estimates