

EMPLOYMENT: STILL FALLING IN MOST REGIONS

The chemical industry continues to shed employees in its cost-cutting efforts

IN MOST AREAS OF THE WORLD, THE chemical industry is still reducing employment as it tries to cope with rising costs especially of raw materials and energy.

Only chemical companies in Japan employed more people in 2005 than in the year before. In other regions surveyed by C&EN, the downward slope in employment continued. In the U.S., the total number of chemical workers fell by 7,800 from 2004 to 879,200. This, however, is the smallest number of jobs cut since 1999, when the U.S. industry lost only 2,100 employees.

Since 1998, when U.S. chemical employment reached its highest point in the past 10 years, the industry has lost 103,300 workers, most of whom have been hourly production workers. Labor Department data show that 86,000 fewer production workers were employed in 2005 than in 1998.

Most sectors saw a decline in total employment between 2004 and 2005. In basic chemicals, employment was off by 4,500 to 151,200. Agricultural chemicals had a 900-employee decline to 40,600. In the pharmaceutical sector, employment fell 1,900 to 288,500, and in the "other chemicals" category, the number of workers declined 1,500 to 105,100. Only the resins, synthetic rubber, and fibers; paints, coatings, and adhesives; and soaps and toiletries sectors made modest gains in employment.

The decline in the number of U.S. production workers over the years has driven labor productivity higher, and 2005 was no exception. Productivity, or output per

workhour, rose 2.4% in 2005, according to C&EN calculations using government data. Productivity increased in the basic chemicals, agricultural chemicals, and soaps and toiletries sectors, while falling in the resins, synthetic rubber, and fibers sector and in the paints, coatings, and adhesives sector.

Despite a 9% drop in the number of production workers, the basic chemicals sector only managed a 1.9% increase in productivity in 2005. This pales in comparison with the productivity increase of 10.1% achieved in 2004, the largest gain that year for all the sectors. The decline in productivity growth is in large part the result of interruptions in production caused by the hurricanes on the Gulf Coast.

The largest productivity gain in 2005 was in the agricultural chemicals sector, where output per hour jumped 6.0%.

While overall productivity was rising, unit labor costs, which ideally should decline, were also increasing. Unit labor costs are calculated by dividing the index for hourly wages, which rose 2.6% last year, by the productivity index. These costs increased 0.3% in 2005 for the overall chemical industry. Higher unit labor costs were widespread among the chemical sectors, with increases ranging from 0.5% for basic chemicals to 6.4% for resins, synthetic rubber, and fibers. Only in the paints, coatings, and adhesives sector did unit labor costs decline, by 2.6%.

Unit labor costs for the chemical indus-

try, in fact, have declined in just four of the past 10 years.

Although total employment declined among 19 U.S.-headquartered chemical companies, worldwide employment actually increased by 1,900, or almost 1%, to 204,800. Two companies, however, that made large acquisitions in 2005, Chemtura and Cytec Industries, accounted for 35% of the worldwide increase.

Canadian companies also reduced employment. Total employment among the four major firms there fell by 500 to 14,000 last year. Agrium increased its workforce by 100 to 4,700, while Methanex reduced employment by 100 to 800. Nova Chemicals lost 500 employees, bringing its workforce down to 3,600. Potash Corp. of Saskatchewan held steady at 4,900 employees.

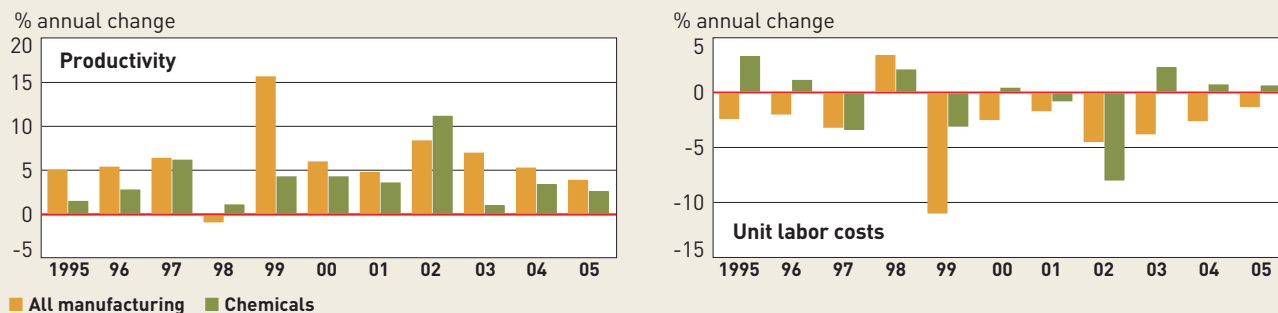
In Europe, which is still struggling with economic recovery, employment at 19 chemical companies fell by 23,400 to 597,600. Although a majority of the companies had fewer workers last year than in 2004, much of the drop can be laid at the doorstep of BOC International, which shed 12,800 workers, or more than half the total decline. BOC's 2005 employment was 30,600. The only European companies to have more employees in 2005 than in the year before were Bayer, up 400 to 93,700; Degussa, up 100 to 45,600; Lonza, up 300 to 6,000; and Merck, up 200 to 29,100.

Overall, Japanese companies added employees in 2005. Among the 12 large Japanese chemical companies surveyed, employment increased in seven and decreased in five. For the group, employment increased by 4,500 to 220,900.

Sumitomo Chemical had the largest gain, with the number of employees rising by 4,000, about 20%, to 24,200. The increase in employment at the company came as it started up new electronic materials plants in South Korea.

U.S. EFFICIENCY

U.S. chemical productivity declined slightly, as did unit labor costs



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

OVERALL U.S. EMPLOYMENT

U.S. chemical employment continued to decrease

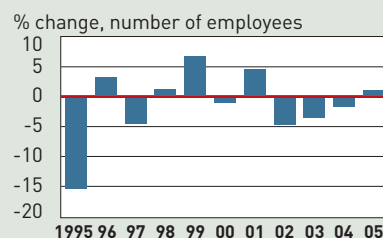
THOUSANDS	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	ANNUAL CHANGE	
												2004-05	1995-05
Manufacturing	17,241	17,237	17,419	17,560	17,322	17,263	16,441	15,259	14,510	14,315	14,232	-0.6%	-1.9%
Chemicals	988	985	987	993	983	980	959	928	906	887	879	-0.9	-1.2
Basic chemicals	228	224	219	213	195	188	181	170	162	156	151	-2.9	-4.0
Resins, synthetic rubber & fibers	140	141	141	140	137	136	126	115	112	110	110	0.6	-2.3
Agricultural chemicals	50	47	49	50	51	48	46	45	42	42	41	-2.2	-2.0
Pharmaceuticals	228	229	236	247	261	274	283	291	292	290	289	-0.7	2.4
Paints, coatings & adhesives	79	76	77	78	78	80	75	72	69	68	68	0.4	-1.5
Soaps & toiletries	126	127	128	131	131	13	127	121	119	115	116	0.1	-0.9
Other chemicals	137	137	137	135	128	127	120	114	111	107	105	-1.4	-2.6

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

U.S. COMPANY EMPLOYMENT

Number of employees began to climb

THOUSANDS	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Air Products & Chemicals	14.8	15.2	16.4	16.7	17.4	17.5	17.8	17.2	18.5	19.9	20.2
Albemarle	3.0	2.8	2.7	2.7	2.6	2.5	3.0	3.0	3.0	3.7	3.7
Cabot	4.1	4.7	4.8	4.8	4.5	4.5	4.3	4.5	4.4	4.3	4.4
Cambrex	1.3	1.3	1.8	1.8	1.9	1.9	2.1	2.2	1.9	1.9	1.9
Chemtura ^a	2.8	5.7	5.6	5.4	8.6	8.3	7.3	6.8	5.5	4.8	6.6
Cytec Industries ^b	5.0	5.0	5.2	5.1	4.9	4.8	4.5	4.3	4.5	4.5	7.3
Dow Chemical ^c	39.5	40.3	42.9	39.0	39.2	41.9	52.7	50.0	46.4	43.2	42.4
Eastman Chemical	17.7	17.5	16.1	15.9	14.7	14.6	15.8	15.7	15.0	12.0	12.0
H.B. Fuller	6.4	5.9	6.0	6.0	5.4	5.2	4.9	4.6	4.5	4.5	4.0
Georgia Gulf	1.1	1.0	1.1	1.1	1.4	1.3	1.2	1.2	1.2	1.2	1.1
W.R. Grace	21.2	17.4	6.3	6.6	6.3	6.3	6.4	6.4	6.3	6.4	6.4
Hercules	7.9	7.1	6.2	12.4	11.4	9.8	9.7	5.1	5.1	5.0	4.7
Lubrizol ^d	4.6	4.4	4.3	4.3	4.1	4.4	4.5	5.2	5.0	7.8	7.5
NewMarket Corp. ^e	1.8	1.8	1.5	1.5	1.5	1.5	1.1	1.1	1.1	1.1	1.1
PPG Industries	31.2	31.3	31.9	32.5	33.8	35.6	34.9	34.1	32.9	31.8	30.8
Praxair	18.2	25.3	25.4	24.8	24.1	23.4	24.3	25.0	25.4	27.0	27.3
Rohm and Haas	11.7	11.6	11.6	11.3	21.5	18.5	18.2	17.6	17.3	16.7	16.5
Solutia ^f	—	—	8.8	8.7	10.6	10.2	9.2	7.3	6.3	5.7	5.4
Stepan	1.3	1.3	1.3	1.4	1.4	1.4	1.5	1.5	1.4	1.4	1.5
TOTAL EMPLOYEES^g	193.6	199.6	199.9	202.0	215.3	213.6	223.4	212.8	205.8	202.9	204.8

NOTE: Data are not restated for acquisitions, divestitures, or similar developments. **a** Crompton and Great Lakes Chemical merged in 2005 to form Chemtura. **b** Acquired Service Specialties in 2005. **c** Merged in 2001 with Union Carbide. **d** Acquired Noveon in 2004. **e** Formerly Ethyl Corp. **f** Spun off from Monsanto in 1997. **g** For companies reporting. SOURCE: Company dataCOMPANY CHANGE
Employment at major chemical firms increased after three down years

NOTE: Percentage change is calculated from total of U.S. companies listed above reporting in prior year.

CANADA EMPLOYMENT

Employment dropped in 2005

THOUSANDS	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Agrium	3.5	4.4	4.4	4.5	4.5	4.0	4.0	4.8	4.7	4.6	4.7
Methanex	0.9	0.9	0.8	0.9	0.8	0.8	0.8	0.8	0.7	0.9	0.8
Nova Chemicals	5.7	3.4	3.4	3.3	4.7	4.7	4.6	4.3	4.3	4.1	3.6
Potash Corp.	4.6	4.5	5.7	5.7	5.5	5.3	5.0	5.2	4.9	4.9	4.9
TOTAL EMPLOYEES^a	14.7	13.2	14.3	14.4	15.5	14.8	14.4	15.1	14.6	14.5	14.0

a For companies reporting.

EUROPE EMPLOYMENT

Total employment continued to fall at major European chemical firms

THOUSANDS	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Air Liquide (France)	26.1	27.8	27.6	28.6	29.0	30.3	30.8	30.8	31.9	35.9	35.9
Akzo Nobel (Netherlands)	68.4	68.0	85.9	68.9	70.7	69.8	70.4	60.7	64.6	61.5	61.3
Arkema ^a (France)	—	—	—	—	—	—	—	—	—	18.6	17.7
BASF (Germany)	106.6	105.6	105.0	105.9	104.6	103.3	92.5	89.4	87.2	82.0	80.9
Bayer (Germany)	142.9	142.2	144.6	145.1	120.4	122.1	116.9	122.6	94.9	93.3	93.7
BOC International (U.K.)	40.1	40.9	41.4	37.1	33.4	42.7	43.2	46.3	44.5	43.4	30.6
Ciba Specialty Chemicals ^b (Switzerland)	—	—	21.4	24.5	20.1	20.3	19.7	19.0	18.7	19.3	19.1
Clariant ^c (Switzerland)	8.4	32.5	30.9	29.3	29.0	31.5	28.9	27.8	27.0	24.8	23.4
Degussa (Germany)	27.1	26.0	25.7	na	62.5	62.9	53.4	47.6	46.6	44.6	45.6
DSM (Netherlands)	17.0	18.4	17.5	23.0	21.8	21.8	21.5	18.5	26.1	24.5	22.8
Givaudan ^d (Switzerland)	—	—	—	—	4.9	5.1	5.3	5.8	6.0	5.9	5.9
ICI (U.K.)	64.8	64.0	69.5	60.6	53.6	45.9	39.8	38.0	36.2	33.8	32.5
Kemira (Finland)	10.5	10.6	10.4	10.8	10.7	9.6	10.2	10.4	10.5	9.7	7.7
Lanxess ^e (Germany)	—	—	—	—	—	—	—	—	20.5	19.7	18.3
Lonza ^f (Switzerland)	—	—	—	5.7	5.7	4.6	6.2	6.2	5.7	5.7	6.0
Merck ^g (Germany)	27.8	28.7	28.9	28.9	32.7	33.5	34.3	34.5	34.2	28.9	29.1
Rhodia ^h (France)	31.7	29.1	25.1	24.5	24.8	29.4	26.9	24.5	23.0	20.6	19.4
Solvay (Belgium)	38.6	35.4	34.4	33.1	32.8	32.3	29.4	30.3	30.1	29.3	28.7
Syngenta ⁱ (Switzerland)	—	—	—	—	23.5	21.0	20.5	20.0	19.1	19.5	19.0
TOTAL EMPLOYEES^j	610.0	629.2	668.3	626.0	680.2	686.1	649.9	632.4	626.8	602.4	597.6

a Spun off from Total in 2006; figures are pro forma. b Spun off from Novartis in 1997. c Spun off from Sandoz in 1995; merged with Hoechst Specialty Chemicals in 1997. d Spun off from Roche in 2000; prior figures are pro forma. e Spun off from Bayer in January 2005; prior figures are pro forma. f Became an independent, listed company in 1999; prior figures are pro forma. g Privately held until 1996. h Spun off from Rhône-Poulenc in 1998; prior figures are pro forma. i Formed from agrochemicals businesses of Zeneca and Novartis; became an independent company in 2000; prior figures are pro forma. j For companies reporting.

JAPAN EMPLOYMENT

Sumitomo accounted for most of the rise in headcount in Japan

THOUSANDS	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Asahi Kasei	28.2	26.7	27.8	29.3	26.6	26.7	26.2	25.7	25.0	23.8	23.0
Dainippon Ink & Chemicals	25.6	25.9	24.9	25.7	31.0	30.3	28.4	27.0	26.5	26.8	25.6
JSR Corp. ^a	na	na	na	na	4.4	4.4	4.4	4.3	4.3	4.4	4.6
Kaneka	na	na	na	7.2	6.6	7.0	6.7	6.7	6.6	6.6	7.3
Mitsubishi Chemical	na	na	na	na	33.5	33.0	38.6	37.6	33.5	33.3	33.0
Mitsui Chemicals ^b	—	—	13.6	12.6	11.7	12.8	13.2	12.7	12.3	12.2	12.5
Shin-Etsu Chemical	17.1	18.9	19.2	18.4	18.8	19.4	16.5	16.6	17.4	18.2	18.9
Showa Denko	9.0	8.9	13.6	13.5	12.5	13.2	12.0	10.9	10.6	11.2	11.1
Sumitomo Chemical	16.8	16.3	15.9	15.8	17.5	17.4	17.0	17.9	19.0	20.2	24.2
Taiyo Nippon Sanso ^c	2.0	1.8	1.7	na	7.0	6.3	5.5	4.8	4.6	7.1	7.3
Teijin	16.2	17.3	17.6	17.2	22.0	22.3	24.0	23.3	20.6	19.0	18.8
Toray	32.9	33.8	32.9	34.3	35.5	35.7	34.9	33.8	32.9	33.7	34.7
TOTAL EMPLOYEES^d	147.6	149.6	167.2	173.9	218.9	227.2	225.7	219.7	211.7	216.4	220.9

NOTE: Fiscal year ends March 31 for all companies except Showa Denko's, where it ends Dec. 31. a JSR initiated a consolidated headcount in 1999. b Formed in 1997 from the merger of Mitsui Toatsu and Mitsui Petrochemical. c Nippon Sanso became Taiyo Nippon Sanso in 2004 when it acquired Taiyo Toyo Sanso. d For companies reporting. na = not available.

EMPLOYMENT

U.S. PRODUCTION WORKERS

Decline in number of plant workers slowed

THOUSANDS	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	ANNUAL CHANGE	
												2004-05	1995-05
Manufacturing	12,566	12,532	12,673	12,729	12,524	12,428	11,677	10,768	10,190	10,072	10,062	-0.1%	-2.2%
Chemicals	598	595	593	600	595	587	562	531	524	520	514	-1.1	-1.5
Basic chemicals	139	138	137	136	126	121	114	104	99	94	86	-9.0	-4.7
Resins, synthetic rubber & fibers	99	98	98	97	96	96	88	80	77	74	72	-2.8	-3.1
Agricultural chemicals	32	32	32	33	34	31	30	29	29	29	29	1.0	-1.1
Pharmaceuticals	119	118	115	122	129	132	132	127	133	138	144	4.2	1.9
Paints, coatings & adhesives	40	39	40	40	41	41	39	38	36	40	41	1.7	0.0
Soaps & toiletries	79	80	81	83	84	81	80	76	76	74	73	-0.7	-0.8
Other chemicals	86	87	87	86	83	82	77	74	71	68	67	-2.0	-2.5

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

U.S. PAY

Wages increased for all sectors except 'other chemicals'

	HOURLY EARNINGS				WEEKLY EARNINGS			
	2002	2003	2004	2005	2002	2003	2004	2005
Manufacturing	\$15.29	\$15.74	\$16.15	\$16.56	\$618.75	\$635.99	\$658.59	\$673.61
Chemicals	17.97	18.50	19.17	19.67	759.53	783.95	819.73	831.40
Basic chemicals	21.84	22.12	23.15	23.83	980.58	988.97	1,036.01	1,040.01
Resins, synthetic rubber & fibers	17.78	17.87	18.24	19.03	738.79	747.84	800.73	843.43
Agricultural chemicals	18.96	18.41	18.93	20.87	848.10	837.14	865.68	947.68
Pharmaceuticals	18.12	19.77	20.90	21.31	776.67	850.39	891.99	894.48
Paints, coatings & adhesives	15.64	16.01	16.26	16.31	644.01	656.44	684.66	676.20
Soaps & toiletries	14.26	14.16	14.73	15.37	566.43	564.19	588.27	610.33
Other chemicals	16.41	17.02	17.16	17.15	665.84	694.18	708.42	702.41

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

U.S. PRODUCTIVITY

Output per workhour was mixed among chemical industry sectors ...

PRODUCTIVITY ^a , 1997 = 100	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	ANNUAL CHANGE
												2004-05
Manufacturing	89.5	94.1	100.0	99.2	114.6	121.2	126.8	137.2	146.5	153.9	159.6	3.7%
Chemicals	91.9	94.3	100.0	100.9	105.1	109.3	113.0	125.4	126.5	130.5	133.6	2.4
Basic chemicals	92.9	92.3	100.0	99.4	116.9	118.5	113.8	133.5	138.1	152.8	155.8	1.9
Resins, synthetic rubber & fibers	94.5	94.1	100.0	105.7	109.0	109.2	109.3	123.0	123.4	130.5	128.2	-1.8
Agricultural chemicals	94.5	95.8	100.0	98.7	89.0	93.4	94.1	112.9	105.2	108.3	114.8	6.0
Pharmaceuticals	85.8	93.3	100.0	101.4	98.7	99.5	104.7	110.3	107.8	107.2	105.2	-1.9
Paints, coatings & adhesives	95.4	100.1	100.0	100.9	96.1	96.8	105.7	100.1	99.4	93.0	91.2	-2.0
Soaps & toiletries	94.0	96.4	100.0	95.2	90.5	99.4	102.8	121.1	114.0	115.9	116.8	0.8

... but labor costs per unit of production increased for all but paints and coatings

ANNUAL UNIT LABOR COSTS ^b , 1997 = 100	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	ANNUAL CHANGE
												2004-05
Manufacturing	104.9	103.1	100.0	103.2	92.0	89.9	88.6	84.8	81.8	79.8	79.0	-1.1%
Chemicals	102.4	103.3	100.0	101.9	98.9	99.1	98.5	90.8	92.7	93.0	93.3	0.3
Basic chemicals	101.8	105.4	100.0	103.3	86.6	88.5	93.8	81.5	79.8	75.4	75.8	0.5
Resins, synthetic rubber & fibers	97.6	103.1	100.0	97.1	96.6	99.7	101.7	92.1	92.2	89.0	94.6	6.4
Agricultural chemicals	100.3	101.7	100.0	104.4	120.1	120.6	128.7	117.0	121.9	121.7	126.8	4.1
Pharmaceuticals	108.3	103.5	100.0	102.6	107.1	110.8	108.4	104.9	117.1	124.5	129.1	3.7
Paints, coatings & adhesives	97.7	96.3	100.0	101.6	109.4	111.1	107.6	119.3	122.0	131.6	128.2	-2.6
Soaps & toiletries	102.2	101.2	100.0	109.9	122.6	120.1	118.8	102.0	107.5	109.9	114.1	3.8

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