

Value of U.S. shipments of agricultural chemicals in 2009:

\$35

billion

In 2010:

\$51

billion

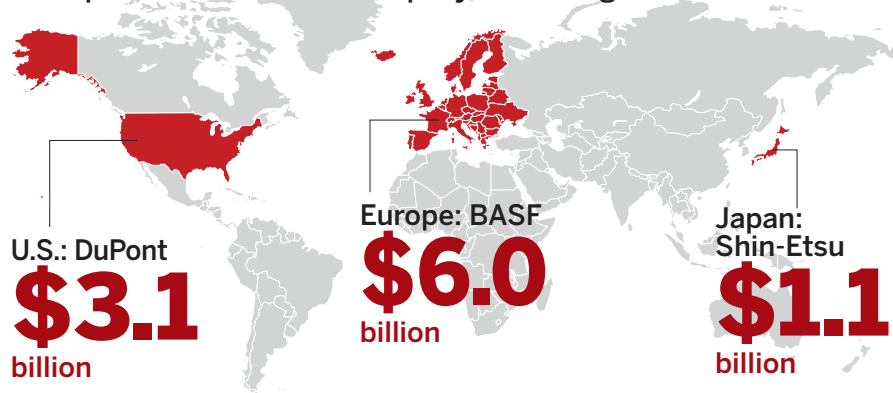
Annual ethylene production in China, thousands of metric tons in 2000:

4,743

In 2010:

14,188

Most profitable chemical company, in earnings:



R&D spending as percent of sales at 27 U.S. chemical companies:

4 spent more than 5%

1 spent between 4.0 and 4.9%

3 spent between 3.0 and 3.9%

8 spent between 2.0 and 2.9%

8 spent between 1.0 and 1.9%

3 spent 0.9% or less

FACTS & FIGURES OF THE CHEMICAL INDUSTRY

A leaner chemical industry made the most of a **SHALLOW RECOVERY**

THE GLOBAL CHEMICAL industry had a very good year in 2010. The tables in the following pages of this issue are chock-full of large, positive numbers. For executives, the phrase “global economic recovery” replaced the much more frightening words “inventory destocking” that were common in 2008 and 2009.

Those leaders began 2010 knowing that the recession was truly over, but that fact brought them little comfort. They had no way to predict the shape of the recovery, or what would happen to underlying demand for chemicals. Late 2009 saw customers finally starting to put in orders again—mainly because their shelves were empty—but that trend did not offer useful evidence.

So rather than compare their company performance with that of 2009, most firms were tracking sales on a quarter-to-quarter basis during 2010. Selling more electronic and performance materials was a positive sign, but it took the full year before demand picked up for other chemical products.

While they watched the quarterly re-

ports, chemical executives continued to control costs; however, most of the large cost-cutting programs wound down in early 2010. In conference calls with analysts, chief executive officers said that productivity improvements would allow them to increase output without hiring workers or building new plants. Indeed, capital spending and hiring were stagnant at most firms. Many firms did renew funding for research and development, however.

By the end of 2010, chemical production had increased at rates ranging from 3.5% for the U.S. to 11.1% for Taiwan. Still, it was not enough to make up for the significant drop in manufacturing that occurred in 2008–09. For the U.S., Canada, Western Europe, and Japan, meeting or surpassing the boom levels of 2007 will take many years. Meanwhile, chemical firms in South Korea and Taiwan are increasing production—and exports—at comparatively faster rates.

But global trade offered hope for companies in mature economies. The U.S., Europe, and Japan significantly increased chemical exports to developing nations such as China and Brazil in 2010. If U.S. chemical makers had to rely on domestic demand they would have been in a difficult spot. China’s gross domestic product increased by more than 10% in 2010; in contrast, GDP growth in the U.S. was an anemic 2.9%.

C&EN staff members who collected industry data from the major chemical-producing countries and regions are As-

sistant Managing Editor Michael McCoy, Senior Correspondent Marc S. Reisch, Senior Editor Alexander H. Tullo (all three in C&EN’s Northeast News Bureau), and Senior Correspondent Jean-François Tremblay (Hong Kong). Senior Editor Melody M. Bomgardner (C&EN’s Northeast News Bureau) collected data and coordinated the work. ■

CONTENTS

Finances	34
Employment	50
Production	55
Trade	64

Record year for overall chemical production in U.S. and Japan:

2007
In South Korea and Taiwan:
2010

Average U.S. commodity price increase from 2009:

6.8%

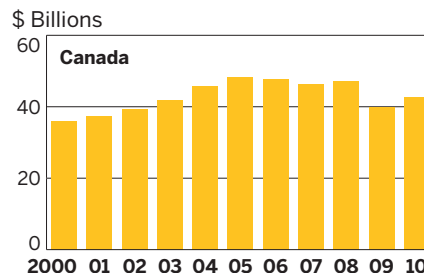
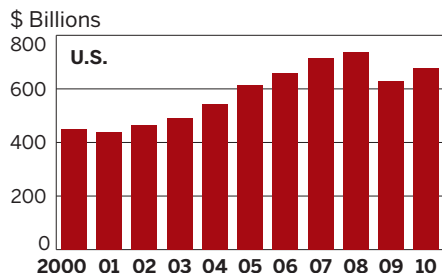
Industrial chemicals:

15.0%

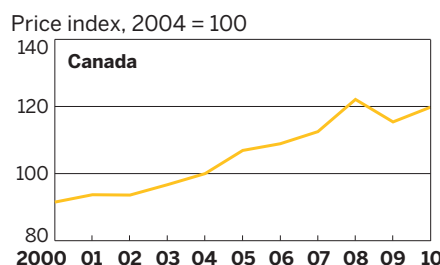
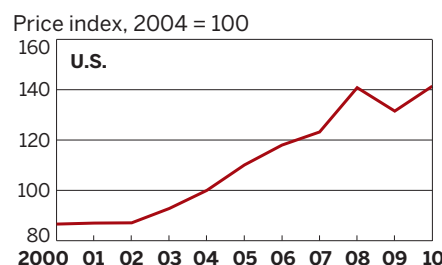
Pharmaceuticals:

5.2%

U.S. chemical shipments jumped 7.7%, and Canada's surged 6.8% ...



... U.S. and Canadian prices increased 7.5% and 3.8%, respectively



SOURCES: U.S. Departments of Labor and of Commerce, Statistics Canada

Average change in U.S. chemical firms' earnings per share from 2009:

27.0%

Average change in U.S. pharma and biotech firms' earnings per share from 2009:

-9.8%

Chemical prices % increase since 2004 in U.S.:

41.4
In Canada:
19.8

Research and development as a % of sales at European chemical firms:

4.2

Research and development as a % of sales at European pharmaceutical firms:

16.8

A LONG YEAR OF DEMAND RECOVERY

Cost cutting boosted **FINANCES**, but it took four quarters for sales volumes to return

THE CHEMICAL INDUSTRY saw its fortunes turn on a dime in early 2010. Demand from customers facing depleted inventories fueled a brisk rebound from the recession of 2007–09. As the year progressed, stronger sales spread to almost all sectors of the chemical economy.

For U.S. chemical makers, the recession hit its lowest point in the first quarter of 2009. One year later, earnings were up by a striking 167%. Electronics and performance materials were the first to bounce back, as a result of renewed global demand for photovoltaics, semiconductors, autos,

and consumer products. Although sales were strong in some segments, much of the earnings jump was due to severe cost-cutting programs that continued into 2010.

Dow Chemical was able to take advantage of the improvements in so-called early-cycle markets thanks to its integration of Rohm and Haas businesses. But it also profited on the commodity side by raising prices for basic plastics. Fast-growing customers in Asia-Pacific and Latin America were willing to absorb the hikes. Meanwhile, DuPont added profits from its agriculture and nutrition division, mostly due

to strong U.S. sales in its seed business.

Still, for Dow, DuPont, and most other U.S. chemical firms, it would take the rest of 2010 to approach prerecession sales volumes for many products. And chemical executives were careful to point out that the global economic recovery was modest. In the meantime, they warned investors that the flip side of recovery would be higher costs for energy and raw materials.

By midyear, demand had returned for intermediate chemicals and specialty chemicals for packaging and coatings, particularly from Asia. But few of those sales went to construction in the developed world, a market that stayed in the dumps throughout the year. And it wasn't until the fourth quarter that chemical firms could say that volumes grew in nonconstruction markets in the U.S. and Western Europe.

CHEMICAL COMPANIES based in Europe had a ride similar to that of their U.S. counterparts in 2010. Firms such as Arkema and DSM that were able to answer rising

demand for performance products were first to heal battered balance sheets. By the end of the year, most sectors had recovered to prerecession volumes. Construction chemicals and pharmaceuticals continued to be a drag on earnings, however.

Only two of the European chemical firms tracked by C&EN—Solvay and Kemira—posted a sales decline in 2010. But both completed major divestitures during the year. And earnings increased for every firm except Bayer and GlaxoSmithKline.

Japanese firms were also reporting strong earnings by the second quarter. The industry was in a good position to export electronics materials to other markets in Asia where demand was vigorous. Meanwhile, Shin-Etsu Chemical was able to do what other companies could not: It found

international buyers for polyvinyl chloride resins.

Still, the increased orders were not enough to entice chemical firms to invest in more plants and equipment. Indeed, manufacturing facilities were not working anywhere near maximum capacity. Capital expenditures were mostly flat in the U.S., Europe, and Japan. But all regions kept up their spending on research and development, because companies recognized that new products were what allowed them to increase earnings as the recession faded away.

RESEARCH SPENDING did not rescue the pharmaceutical industry in 2010. Compared with the chemical industry, drug makers had a lousy year, returning on average worse results for shareholders than in

2009. The reawakening global economy also did little to help firms make money in pharmaceuticals. Instead, companies were beset by expiring patents on blockbuster drugs, stalled pipelines for new compounds, pricing pressures, and even costs related to health care reform.

One example of a pain point was Pfizer's cholesterol drug Lipitor, which will lose patent protection in the U.S. in November of this year. In 2010, sales of the drug were hurt by new generics competition in Spain and Canada.

To help stop the bleeding, pharmaceutical firms have worked to drastically pare their R&D programs. Large acquisitions in 2009, such as Merck & Co.'s purchase of Schering-Plough, led to an acceleration of the streamlining process in 2010.

U.S. SHIPMENTS

Most categories of chemical shipments recovered; demand for agricultural chemicals soared

\$ BILLIONS	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	ANNUAL CHANGE	
												2009-10	2000-10
All chemicals	\$451.2	\$440.4	\$464.5	\$489.7	\$542.9	\$612.9	\$659.1	\$716.2	\$738.7	\$628.9	\$677.1	7.7%	3.8%
Chemicals, excluding pharmaceuticals	333.1	310.4	321.5	337.8	385.3	443.7	478.2	527.8	546.6	437.5	487.7	11.5	3.5
Agricultural chemicals	21.6	21.3	21.3	23.3	26.3	29.3	29.2	31.2	38.9	35.0	51.0	45.8	8.1
Coatings & adhesives	29.7	29.7	29.4	30.1	32.3	34.1	35.3	36.1	35.0	31.2	31.8	1.8	0.6
All other chemicals	281.8	259.4	270.8	284.5	326.7	380.3	413.7	460.5	472.7	371.4	404.9	9.0	3.4
Pharmaceuticals	118.0	130.0	143.0	151.9	157.6	169.2	180.9	188.4	192.1	191.4	189.4	-1.0	4.4

SOURCE: C&EN calculations using Department of Commerce data

CANADA SHIPMENTS

Chemical and manufacturing sectors bounced back

\$ BILLIONS	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	ANNUAL CHANGE	
												2009-10	2000-10
All manufacturing	\$545.1	\$527.6	\$543.7	\$547.3	\$565.7	\$581.9	\$588.0	\$580.4	\$574.9	\$472.6	\$514.5	8.9%	-0.6%
Chemical manufacturing	36.1	37.3	39.3	41.9	45.7	48.3	47.8	46.3	47.2	39.9	42.6	6.8	1.7
Basic chemicals	10.7	11.2	11.4	12.2	12.9	14.5	15.3	14.4	14.5	10.2	12.5	22.9	1.6
Petrochemicals	4.4	4.3	4.0	4.7	5.8	7.0	7.8	7.0	7.0	3.7	5.3	44.7	2.0
Resins & synthetic rubber	6.8	6.3	6.9	7.3	9.6	9.9	8.9	8.6	8.2	5.0	5.4	7.7	-2.2
Pesticide, fertilizer & other agricultural chemicals	2.4	2.4	2.5	3.2	3.6	3.9	3.6	4.1	5.2	4.2	3.8	-9.3	4.5
Pharmaceuticals & medicine	5.3	6.6	7.4	7.7	8.6	8.8	9.2	8.5	8.7	10.5	11.2	6.5	7.7
Paints, coatings & adhesives	2.4	2.5	2.5	2.7	2.7	2.9	2.9	2.7	2.8	3.0	2.4	-19.4	0.0
Soaps, cleaners & toilet preparations	3.3	3.0	3.0	3.4	3.0	2.9	3.1	3.1	2.9	2.7	2.6	-3.6	-2.3

NOTE: Monetary statistics for all years were converted at the 2010 average exchange rate of \$1.00 U.S. = \$1.0298 Canadian. SOURCE: Statistics Canada

EUROPE SHIPMENTS

European chemical industry far surpassed normal growth rates

\$ BILLIONS	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	ANNUAL CHANGE	
												2009-10	2000-10
Belgium	\$46.8	\$56.2	\$56.7	\$58.6	\$62.7	\$63.7	\$67.9	\$71.6	\$72.4	\$59.9	\$69.2	15.5%	4.0%
Germany	179.1	177.5	175.7	180.9	188.5	201.6	213.7	230.3	224.4	192.5	226.5	17.6	2.4
Netherlands	43.0	42.6	42.8	45.0	48.2	52.4	60.2	65.0	66.3	50.4	62.3	23.7	3.8
Spain	47.4	49.7	50.3	52.2	55.2	58.4	62.6	66.0	69.7	63.3	70.5	11.4	4.0

NOTE: Monetary statistics for all years were converted to U.S. dollars at the 2010 average exchange rate of \$1.00 U.S. = 0.7541 euros.

SOURCES: National statistical agencies, trade organizations

U.S. PRICE INDEX

All products captured higher prices compared with the sharp pullback in 2009

PRODUCER PRICE INDEX, 2004 = 100	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	ANNUAL CHANGE	
												2009-10	2000-10
All commodities	90.5	91.5	89.4	94.1	100.0	107.3	112.3	117.7	129.2	117.9	125.9	6.8%	3.0%
Industrial commodities	91.3	91.9	89.7	94.2	100.0	108.5	114.4	118.6	130.3	118.4	126.7	7.0	3.0
Finished goods	92.9	94.7	93.5	96.5	100.0	104.8	108.0	112.2	119.3	116.2	121.1	4.2	2.4
Chemicals & allied products	86.6	87.0	87.1	92.8	100.0	110.1	118.0	123.2	140.8	131.5	141.4	7.5	4.6
Industrial chemicals	79.3	78.9	78.2	87.0	100.0	115.8	130.5	139.1	168.7	143.8	165.4	15.0	6.9
Prepared paint	91.5	93.6	95.0	97.2	100.0	106.9	114.6	118.8	126.9	134.5	134.9	0.3	3.6
Paint materials	82.6	83.4	92.3	96.2	100.0	106.0	110.5	117.6	125.2	121.7	124.4	2.2	3.8
Drugs & pharmaceuticals	90.5	92.0	93.4	96.6	100.0	104.8	109.7	113.6	120.6	128.1	134.8	5.2	3.7
Fats & oils, inedible	45.6	50.5	58.8	80.3	100.0	95.6	96.3	123.3	187.7	136.9	159.0	16.1	12.0
Agricultural chemicals	86.5	90.9	86.0	94.0	100.0	106.3	110.1	126.0	194.0	139.5	141.3	1.3	4.6
Plastic resin & materials	86.8	82.3	80.1	89.6	100.0	118.3	121.6	120.1	131.8	117.0	128.8	10.1	3.7
Other chemicals & products	95.4	97.1	97.1	98.2	100.0	104.9	109.9	112.4	119.9	121.9	122.1	0.2	2.3

SOURCE: Department of Labor

CANADA PRICE INDEX

Prices for organic chemicals jumped in 2010

PRODUCER PRICE INDEX, 2004 = 100	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	ANNUAL CHANGE	
												2009-10	2000-10
All commodities	97.1	98.0	98.0	96.9	100.0	101.6	103.9	105.5	110.1	106.3	107.4	1.0%	1.0%
Chemicals & chemical products	91.5	93.7	93.6	96.7	100.0	106.9	108.9	112.5	122.1	115.4	119.8	3.8	2.7
Inorganic industrial chemicals	89.5	94.8	95.2	96.5	100.0	111.0	123.5	159.7	160.3	147.6	145.9	-1.2	5.0
Sulfuric acid	92.9	103.1	102.9	98.9	100.0	103.1	111.4	117.1	146.1	124.3	121.3	-2.4	2.7
Caustic soda	100.6	130.6	111.6	109.5	100.0	112.3	109.4	106.8	135.3	130.8	131.7	0.7	2.7
Ammonia	86.0	90.9	88.8	97.2	100.0	114.7	100.9	140.9	236.7	202.8	223.8	10.4	10.0
Organic industrial chemicals	80.5	86.8	83.8	91.6	100.0	116.5	117.8	119.8	140.3	115.2	133.6	16.0	5.2
Benzene-toluene-xylene	69.4	57.6	51.6	59.0	100.0	109.1	112.2	154.3	126.4	112.8	139.7	23.8	7.2
Olefins	76.9	85.5	78.3	91.5	100.0	124.0	125.1	125.9	154.6	125.4	149.6	19.3	6.9
Synthetic resins	98.7	96.3	94.7	97.5	100.0	106.4	104.8	97.2	103.4	100.7	102.4	1.7	0.4
Polyethylene (a)	100.8	98	94.2	100.1	100.0	107.2	112.1	109.8	118.9	109.6	115.1	5.0	1.3
Polystyrene	90.3	89.8	89.4	92.7	100.0	104.2	104.3	105.5	106.7	105.0	112.3	7.0	2.2
Thermosets	95.3	104.5	100.1	100.3	100.0	100.1	101.4	103.4	104.8	104.2	102.7	-1.4	0.8
Agricultural chemicals	98.9	98.9	98.9	99.2	100.0	100.1	100.2	100.4	100.7	100.8	100.9	0.1	0.2
Pharmaceuticals	93.8	94.4	98.1	99.2	100.0	100.9	103.7	104.4	105.8	107.6	109.0	1.4	1.5
Paints & varnishes	90.5	93.9	95.6	97.2	100.0	104.9	110.2	111.5	115.8	115.2	116.3	0.9	2.5
Soaps & cleaners	99.8	100.0	100.0	100.0	100.0	100.0	100.2	100.1	99.9	99.5	99.7	0.2	0.0
Toilet preparations	96.9	98.2	99.6	100.8	100.0	98.6	96.8	96.6	98.4	99.8	96.4	-3.4	-0.1
Pigments, lakes & toners	105.4	103.7	101.8	99.8	100.0	105.3	107.1	105.1	104.0	106.9	107.7	0.8	0.2

a Includes high- and low-density polyethylene. SOURCE: Statistics Canada

EXPLANATION

Column Headings In Tables Of Company Results

Year. Data are for the calendar year unless otherwise indicated. Data for earlier years are not restated to reflect subsequent acquisitions or divestitures.

Net sales. Gross sales less discounts, allowances, and returns; generally excludes excise taxes and other operating income or revenue.

Earnings. Net sales and other income less operating costs, nonoperating charges, depreciation, depletion, interest expense, deferred charges, minority interest in income, and taxes. Nonrecurring or extraordinary credits and charges may be included.

Profit margin. Earnings divided by net sales, expressed as a percentage.

Total assets. Sum at year's end of current assets, investments, prepaid expenses, net plant and equipment, and other tangible assets. Excludes insofar as possible intangible assets, including goodwill, value of patents, and the like.

Stockholders' equity. Equity at year's end of preferred and common stockholders, including value of capital stock, capital and earned surplus, and surplus reserves, as well as contingency and miscellaneous reserves for which no definite purpose is stated. Intangible

assets are deducted insofar as possible.

Return on equity. The amount of net income returned as a percentage of shareholders' equity.

Capital spending, % of sales. The percentage of sales revenues spent on long-term assets such as property, plant, and equipment.

R&D spending, % of sales. The percentage of sales revenues spent on research.

Earnings per share. Earnings less preferred dividends, divided by the number of shares of common stock outstanding.

Dividend, \$ per share. Cash dividends paid (or declared) on each share of common stock; excludes the value of stock dividends and adjusted for stock splits.

Dividend yield, % of price. Dividend per share divided by the average of the high and low prices of the common stock during the year.

Stock price range. High and low market prices of common stock during the year, adjusted for stock splits but not stock dividends.

Price/earnings ratio. Average of the high and low prices of the common stock during the year divided by earnings per share.

U.S. COMPANY RESULTS

Most chemical firms increased earnings in 2010, but lack of new products harmed pharma firms' earnings

YEAR	NET SALES	EARNINGS	PROFIT MARGIN	TOTAL ASSETS	STOCK- HOLDERS' EQUITY	RETURN ON EQUITY	CAPITAL SPEND- ING, % OF SALES	R&D SPEND- ING, % OF SALES	EARN- INGS PER SHARE	DIVIDEND, \$ PER SHARE	DIVIDEND YIELD, % OF PRICE	STOCK PRICE RANGE, PER SHARE		PRICE/ EARNINGS RATIO
												HIGH	LOW	
(Monetary figures, except per-share amounts, are in millions of dollars)														
CHEMICALS														
AIR PRODUCTS & CHEMICALS														
2010	\$9,026	\$1,029	11.4%	\$12,306	\$4,498	22.9%	14.4%	1.3%	\$4.85	\$1.92	2.6%	\$85.44	\$64.13	15.4
2009	8,256	640	7.8	11,850	3,616	17.7	14.3	1.4	3.01	1.79	2.9	80.60	41.46	20.3
2008	10,415	1,091	10.5	11,354	3,813	28.6	10.4	1.3	4.97	1.70	2.0	106.06	65.05	17.2
2007	10,038	1,043	10.4	11,154	3,990	26.1	10.5	1.4	4.67	1.48	1.8	98.51	66.19	17.6
ALBEMARLE														
2010	\$2,363	\$324	13.7%	\$2,661	\$1,069	30.3%	3.2%	2.5%	\$3.54	\$0.50	1.9%	\$57.34	\$34.49	7.5
2009	2,005	178	8.9	2,328	762	23.4	5.0	3.0	1.94	0.50	1.9	37.62	15.54	13.7
2008	2,467	194	7.9	2,427	620	31.3	4.0	2.7	2.09	0.48	1.5	45.90	16.16	14.8
2007	2,336	233	10.0	2,388	837	27.8	4.2	2.7	2.41	0.42	1.0	48.84	32.92	17.0
ARCH CHEMICALS														
2010	\$1,337	\$71	5.3%	\$886	\$91	78.0%	2.2%	1.5%	\$2.82	\$0.80	2.4%	\$38.20	\$27.30	11.6
2009	1,392	47	3.4	824	19	250.0	2.2	1.7	1.88	0.80	3.4	32.22	15.00	12.6
2008	1,492	37	2.5	850	-21	def	3.6	1.5	1.49	0.80	2.6	40.19	20.76	20.5
2007	1,488	49	3.3	838	118	41.8	2.8	1.4	1.43	0.80	2.1	48.02	29.29	27.0
ASHLAND (a)														
2010	\$9,012	\$332	3.7%	\$6,190	\$462	71.9%	2.3%	1.0%	\$4.26	\$0.45	0.9%	\$63.28	\$34.14	11.4
2009	8,106	71	0.9	6,206	183	38.8	2.1	1.2	0.98	0.30	1.2	44.62	5.60	25.6
2008	8,381	167	2.0	5,363	2,794	6.0	2.4	0.6	2.65	1.10	2.3	67.41	27.51	17.9
2007	7,785	230	3.0	5,309	2,777	8.3	2.0	0.6	3.66	1.10	1.8	74.01	50.23	17.0

a Acquired Hercules in 2008. def = deficit.

FINANCES

YEAR	NET SALES	EARNINGS	PROFIT MARGIN	TOTAL ASSETS	STOCK- HOLDERS' EQUITY	RETURN ON EQUITY	CAPITAL SPEND- ING, % OF SALES	R&D SPEND- ING, % OF SALES	EARN- INGS PER SHARE	DIVIDEND, \$ PER SHARE	DIVIDEND YIELD, % OF PRICE	STOCK PRICE RANGE, PER SHARE		PRICE/ EARNINGS RATIO
(Monetary figures, except per-share amounts, are in millions of dollars)														
CABOT														
2010	\$2,893	\$154	5.3%	\$2,843	\$1,374	11.2%	3.7%	2.4%	\$2.35	\$0.72	2.6%	\$34.00	\$20.95	11.7
2009	2,243	-77	def	2,637	1,095	def	4.7	3.2	def	0.72	3.6	32.00	7.97	def
2008	3,191	86	2.7	2,821	1,212	7.1	6.2	2.3	1.34	0.72	2.3	40.49	21.98	23.3
2007	2,616	127	4.9	2,598	1,156	11.0	5.4	2.6	1.87	0.72	1.7	49.87	34.48	22.6
CALGON CARBON														
2010	\$479	\$35	7.3%	\$466	\$307	11.4%	9.8%	1.6%	\$0.62	ne	ne	\$18.35	\$11.75	24.3
2009	398	35	8.8	394	275	12.7	12.1	1.3	0.72	ne	ne	19.31	10.93	21.0
2008	400	36	9.0	355	220	16.4	8.3	1.0	0.71	ne	ne	23.03	9.11	22.6
2007	351	15	4.3	312	136	11.0	3.4	1.1	0.31	ne	ne	16.96	5.43	36.1
CELANESE														
2010	\$5,918	\$377	6.4%	\$7,255	-\$100	def	3.4%	1.2%	\$2.42	\$0.18	0.6%	\$41.74	\$23.47	13.5
2009	5,082	484	9.5	7,318	-508	def	3.5	1.5	3.30	0.16	0.8	33.41	7.44	6.2
2008	6,823	372	5.5	6,023	-961	def	4.0	1.2	2.44	0.16	0.6	50.99	5.71	11.6
2007	6,444	336	5.2	6,767	-229	def	4.5	1.1	2.11	0.16	0.5	44.77	24.5	16.4
CF INDUSTRIES (b)														
2010	\$3,965	\$441	11.1%	\$8,756	\$2,348	18.8%	6.5%	ne	\$5.40	\$0.40	0.3%	\$138.74	\$92.41	21.4
2009	2,608	449	17.2	2,494	1,728	26.0	9.0	ne	7.54	0.40	0.6	95.13	42.30	9.1
2008	3,921	802	20.5	2,387	1,337	60.0	3.6	ne	12.53	0.40	0.4	172.99	37.11	8.4
2007	2,757	373	13.5	2,012	1,186	31.5	3.8	ne	12.39	0.08	0.1	118.88	68.30	7.6
CYTEC INDUSTRIES														
2010	\$2,748	\$175	6.4%	\$2,641	\$704	24.9%	4.2%	2.6%	\$3.49	\$0.05	0.1%	\$60.85	\$36.42	13.9
2009	2,790	123	4.4	2,458	462	26.6	7.0	2.7	def	0.16	0.6	39.20	10.58	def
2008	3,640	284	7.8	2,501	350	81.1	5.4	2.3	def	0.50	1.2	63.77	16.28	def
2007	3,504	207	5.9	2,957	825	25.0	3.3	2.2	4.20	0.40	0.6	71.78	53.83	15.0
DOW CHEMICAL (c)														
2010	\$53,674	\$1,970	3.7%	\$51,091	\$4,145	47.5%	4.0%	3.1%	\$1.75	\$0.60	2.1%	\$34.50	\$22.42	16.3
2009	44,875	676	1.5	46,857	2,044	33.1	3.1	3.3	0.32	0.60	3.4	29.50	5.89	55.3
2008	57,514	579	1.0	41,255	9,292	6.2	4.0	2.3	0.62	1.68	5.8	43.43	14.93	47.1
2007	53,513	2,887	5.4	44,448	15,036	19.2	3.9	2.4	2.99	1.64	3.8	47.96	38.89	14.5
DUPONT														
2010	\$31,505	\$3,054	9.7%	\$35,089	\$3,957	77.2%	4.8%	5.2%	\$3.32	\$1.64	4.0%	\$50.17	\$31.88	12.4
2009	26,109	1,755	6.7	33,496	2,526	69.5	5.0	5.3	1.92	1.64	6.3	35.62	16.05	13.5
2008	30,529	2,007	6.6	31,364	2,289	87.7	6.5	4.6	2.20	1.64	4.4	52.49	21.32	16.8
2007	29,378	2,988	10.2	29,201	6,206	48.1	5.4	4.6	3.25	1.52	3.2	53.90	42.25	14.8
EASTMAN CHEMICAL														
2010	\$5,842	\$438	7.5%	\$5,611	\$1,252	35.0%	4.2%	2.6%	\$6.07	\$1.79	2.6%	\$84.57	\$51.10	11.2
2009	5,047	136	2.7	5,200	1,198	11.4	6.1	2.7	1.85	1.76	4.4	61.95	17.76	21.5
2008	6,726	328	4.9	4,956	1,228	26.7	9.4	2.3	4.31	1.76	3.4	78.29	25.87	12.1
2007	6,830	321	4.7	5,693	1,766	18.2	7.6	2.3	3.84	1.76	2.7	72.44	57.54	16.9
FMC CORP.														
2010	\$3,117	\$173	5.6%	\$3,126	\$995	17.4%	4.6%	3.2%	\$2.38	\$0.60	0.9%	\$82.03	\$50.75	27.9
2009	2,826	239	8.5	2,927	924	25.9	5.7	3.3	3.37	0.50	1.1	58.13	34.90	13.8
2008	3,115	322	10.3	2,797	706	45.6	5.6	3.0	4.35	0.48	0.9	80.23	28.53	12.5
2007	2,633	157	6.0	2,553	884	17.8	4.4	3.6	2.08	0.41	0.9	59.00	35.63	22.7
H.B. FULLER (d)														
2010	\$1,356	\$71	5.2%	\$913	\$394	18.0%	2.7%	1.4%	\$1.46	\$0.28	1.3%	\$24.66	\$18.47	14.8
2009	1,235	84	6.8	856	346	24.3	1.9	1.4	1.70	0.27	1.6	23.06	9.70	9.6
2008	1,392	19	1.4	845	299	6.4	1.4	1.2	0.36	0.26	1.3	27.84	12.23	55.7
2007	1,400	101	7.2	1,021	455	22.2	1.5	1.2	1.68	0.26	1.0	31.53	20.66	15.5
b Acquired Terra Industries in 2010. c Acquired Rohm and Haas in 2009. d Fiscal year ends on Nov. 27. def = deficit. ne = nonexistent.														

YEAR	NET SALES	EARNINGS	PROFIT MARGIN	TOTAL ASSETS	STOCK- HOLDERS' EQUITY	RETURN ON EQUITY	CAPITAL SPEND- ING, % OF SALES	R&D SPEND- ING, % OF SALES	EARN- INGS PER SHARE	DIVIDEND, \$ PER SHARE	DIVIDEND YIELD, % OF PRICE	STOCK PRICE RANGE, PER SHARE		PRICE/ EARNINGS RATIO
												HIGH	LOW	
GEORGIA GULF														
2010	\$2,818	\$43	1.5%	\$1,442	\$221	19.5%	1.6%	ne	\$1.22	ne	ne	\$24.75	\$11.11	14.7
2009	1,990	145	7.3	1,570	174	83.3	1.5	ne	9.19	ne	ne	50.00	5.50	3.0
2008	2,916	-258	def	1,405	-345	def	2.1	ne	def	\$0.24	4.8%	9.00	1.01	def
2007	3,157	-255	def	1,844	-161	def	2.7	ne	def	0.32	2.3	21.54	6.36	def
W.R. GRACE														
2010	\$2,675	\$207	7.7%	\$4,146	-\$194	def	4.2%	2.2%	\$2.85	ne	ne	\$36.27	\$19.63	9.8
2009	2,825	81	2.9	3,850	-418	def	3.3	2.5	0.98	ne	ne	26.17	4.07	15.4
2008	3,317	122	3.7	3,758	-544	def	4.0	2.5	1.68	ne	ne	27.79	3.01	9.2
2007	3,115	80	2.6	3,747	-472	def	4.4	2.6	1.12	ne	ne	30.65	18.86	22.1
INTERNATIONAL FLAVORS & FRAGRANCES														
2010	\$2,623	\$264	10.1%	\$2,158	\$289	91.3%	4.0%	8.3%	\$3.29	\$1.04	2.2%	\$56.10	\$39.28	14.5
2009	2,326	196	8.4	1,924	48	408.3	2.9	8.3	2.46	1.00	3.0	41.85	25.30	13.6
2008	2,389	230	9.6	2,023	-154	def	3.6	8.9	2.87	0.96	2.7	47.20	24.90	12.6
2007	2,277	247	10.9	1,994	-116	def	2.9	8.7	2.82	0.88	1.8	54.20	46.00	17.8
LUBRIZOL														
2010	\$5,418	\$749	13.8%	\$3,902	\$1,206	62.1%	3.2%	4.2%	\$10.88	\$1.39	1.3%	\$116.26	\$95.23	9.7
2009	4,586	501	10.9	3,640	1,000	50.1	3.1	4.6	7.26	1.24	2.5	76.52	23.57	6.9
2008	5,028	-66	def	3,007	381	def	4.0	4.4	def	1.23	2.8	61.38	26.72	def
2007	4,499	283	6.3	3,092	399	71.0	4.1	4.9	4.05	1.16	2.0	69.95	48.76	14.7
MONSANTO (e)														
2010	\$10,502	\$1,128	10.7%	\$13,220	\$5,676	19.9%	7.2%	11.5%	\$2.04	\$1.08	1.6%	\$87.06	\$44.61	32.3
2009	11,724	2,109	18.0	13,288	5,467	38.6	7.8	9.4	3.80	1.04	1.1	121.32	63.47	24.3
2008	11,365	2,007	17.7	13,328	4,711	42.6	8.1	8.6	3.59	0.83	0.8	141.50	66.26	28.9
2007	8,563	922	10.8	8,943	3,463	26.6	5.9	9.1	1.66	0.55	1.0	70.88	42.75	34.2
NALCO HOLDING														
2010	\$4,251	\$196	4.6%	\$2,356	-\$2,140	def	3.7%	1.9%	\$1.42	\$0.14	0.5%	\$32.62	\$20.15	18.6
2009	3,747	68	1.8	2,109	-2,364	def	2.7	2.0	0.44	0.14	0.8	26.05	9.38	40.3
2008	4,212	-343	def	2,266	-2,383	def	3.2	1.8	def	0.14	0.8	26.28	7.80	def
2007	3,913	129	3.3	2,398	-2,104	def	2.9	1.7	0.88	0.14	0.5	30.98	19.94	28.9
NEWMARKET CORP. (f)														
2010	\$1,786	\$177	9.9%	\$1,016	\$445	39.8%	1.9%	5.1%	\$12.12	\$1.57	1.5%	\$131.76	\$81.80	8.8
2009	1,530	162	10.6	1,025	275	58.9	2.5	5.6	10.65	1.08	1.5	121.13	27.82	7.0
2008	1,617	73	4.5	757	237	30.8	2.0	5.1	4.75	0.80	1.4	93.57	23.37	12.3
2007	1,375	79	5.7	725	271	29.0	2.3	5.6	4.63	0.58	1.2	60.36	38.81	10.7
POLYONE (g)														
2010	\$2,622	\$163	6.2%	\$1,440	\$284	57.4%	1.5%	1.3%	\$1.75	ne	ne	\$13.99	\$6.93	6.0
2009	2,061	68	3.3	1,157	98	69.1	1.6	1.1	0.73	ne	ne	7.74	1.32	6.2
2008	2,739	-273	def	1,045	-57	def	1.6	1.0	def	ne	ne	6.39	2.33	def
2007	2,643	11	0.4	1,288	354	3.2	1.6	0.8	0.12	ne	ne	9.29	5.93	63.4
PPG INDUSTRIES (h)														
2010	\$13,423	\$769	5.7%	\$10,988	-\$154	def	2.5%	3.0%	\$4.67	\$2.18	3.1%	\$84.59	\$56.96	15.2
2009	12,239	336	2.7	10,040	-278	def	2.0	3.3	2.03	2.13	4.7	62.31	28.16	22.3
2008	15,849	538	3.4	10,585	-780	def	2.4	2.8	3.25	2.09	3.9	71.00	35.94	16.5
2007	11,206	815	7.3	10,541	2,063	39.5%	3.2	3.2	4.91	2.04	2.8	82.42	64.01	14.9
PRAXAIR														
2010	\$10,116	\$1,195	11.8%	\$13,076	\$3,594	33.2%	13.7%	0.8%	\$3.90	\$1.80	2.1%	\$96.34	\$73.13	21.7
2009	8,956	1,254	14.0	12,105	3,436	36.5	15.1	0.8	4.01	1.60	2.3	84.97	53.42	17.3
2008	10,796	1,211	11.2	11,024	1,979	61.2	14.9	0.9	3.80	1.50	2.0	99.73	47.40	19.4
2007	9,402	1,177	12.5	11,281	3,041	38.7	14.6	1.0	3.62	1.20	1.6	91.99	58.32	20.8

e Fiscal year ends on Aug. 31. f Formerly Ethyl Corp. g Acquired GLS, a provider of specialty thermoplastic elastomers, in 2008. h Acquired coatings firm SigmaKalon Group in 2008. def = deficit. ne = nonexistent.

FINANCES

YEAR	NET SALES	EARNINGS	PROFIT MARGIN	TOTAL ASSETS	STOCK- HOLDERS' EQUITY	RETURN ON EQUITY	CAPITAL SPEND- ING, % OF SALES	R&D SPEND- ING, % OF SALES	EARN- INGS PER SHARE	DIVIDEND, \$ PER SHARE	DIVIDEND YIELD, % OF PRICE	STOCK PRICE RANGE, PER SHARE		PRICE/ EARNINGS RATIO
												HIGH	LOW	
(Monetary figures, except per-share amounts, are in millions of dollars)														
QUAKER CHEMICAL														
2010	\$544	\$34	6.3%	\$373	\$110	30.9%	1.7%	2.9%	\$2.82	\$0.93	2.4%	\$45.80	\$32.30	13.8
2009	451	17	3.8	346	104	16.3	3.1	3.3	1.47	0.92	6.5	23.82	4.65	9.7
2008	582	11	1.9	338	79	13.9	2.1	2.9	1.05	0.92	4.2	33.82	10.19	21.0
2007	546	15	2.7	347	79	19.0	1.6	2.7	1.55	0.86	3.9	25.00	19.25	14.3
SIGMA-ALDRICH														
2010	\$2,271	\$384	16.9%	\$2,432	\$1,394	27.5%	4.4%	2.9%	\$3.17	\$0.64	1.1%	\$67.76	\$46.50	18.0
2009	2,148	347	16.2	2,184	1,156	30.0	5.6	2.9	2.80	0.58	1.3	56.29	31.45	15.7
2008	2,201	342	15.5	2,048	870	39.3	4.1	3.0	2.65	0.52	1.1	63.04	34.33	18.4
2007	2,039	311	15.3	2,072	1,059	29.4	3.9	2.9	2.34	0.46	1.0	55.87	37.70	20.0
SOLUTIA														
2010	\$1,950	\$82	4.2%	\$1,859	-\$936	def	3.4%	0.9%	\$0.65	ne	ne	\$23.84	\$12.14	27.7
2009	1,667	-109	def	1,952	-704	def	2.6	0.6	def	ne	ne	13.76	1.18	def
2008	2,110	786	37.3	2,400	-823	def	4.0	0.6	4.97	ne	ne	17.29	3.64	2.1
2007	3,535	-203	def	2,433	-1,801	def	4.2	1.3	def	ne	ne	0.79	0.18	def
STEPAN														
2010	\$1,431	\$65	4.5%	\$799	\$338	19.2%	5.2%	2.7%	\$6.36	\$0.98	1.6%	\$79.75	\$45.99	9.9
2009	1,276	63	4.9	625	281	22.4	3.4	2.8	5.84	0.90	2.0	67.98	22.80	7.8
2008	1,600	37	2.3	601	197	18.8	3.1	2.1	3.52	0.85	1.9	60.82	27.75	12.6
2007	1,330	15	1.1	562	185	8.1	3.0	2.3	1.50	0.83	2.8	34.90	25.40	20.1
PHARMACEUTICALS														
ABBOTT LABORATORIES														
2010	\$35,166	\$4,626	13.2%	\$31,381	\$6,546	70.7%	2.9%	10.6%	\$2.98	\$1.76	3.2%	\$56.79	\$52.86	18.4
2009	30,765	5,746	18.7	32,924	3,407	168.7	3.5	8.9	3.69	1.60	3.2	57.39	41.27	13.4
2008	29,528	4,734	16.0	27,281	2,341	202.2	4.4	9.1	3.12	1.44	2.6	60.50	49.45	17.6
2007	25,914	3,606	13.9	23,864	17,779	20.3	6.4	9.7	2.34	1.30	2.4	59.50	48.75	23.1
BRISTOL-MYERS SQUIBB														
2010	\$19,484	\$3,102	15.9%	\$25,843	\$10,480	29.6%	2.2%	18.3%	\$1.80	\$1.28	5.1%	\$27.93	\$22.44	14.0
2009	18,808	3,239	17.2	22,925	6,702	48.3	3.9	19.4	1.63	1.25	5.8	25.56	17.51	13.2
2008	20,597	3,155	15.3	23,574	6,263	50.4	4.6	17.4	1.59	1.24	5.6	27.08	17.54	14.0
2007	19,348	1,968	10.2	19,844	10,562	18.6	4.4	16.7	0.99	1.12	3.9	32.35	25.73	29.3
ELI LILLY & CO.														
2010	\$23,076	\$5,069	22.0%	\$26,182	\$7,594	66.8%	3.0%	21.2%	\$4.58	\$1.96	5.6%	\$37.35	\$32.25	7.6
2009	21,836	4,329	19.8	25,540	7,604	56.9	3.5	19.8	3.94	1.96	5.8	40.57	27.47	8.6
2008	20,378	-2,072	def	25,158	2,681	def	4.6	18.8	def	1.88	4.3	57.18	29.91	def
2007	18,634	2,953	15.8	24,333	13,664	21.6	5.8	18.7	2.71	1.70	3.1	60.56	49.09	20.2
JOHNSON & JOHNSON														
2010	\$61,587	\$13,334	21.7%	\$87,614	\$24,569	54.3%	3.9%	11.1%	\$4.85	\$2.11	3.4%	\$65.99	\$57.02	12.7
2009	61,897	12,266	19.8	63,497	19,403	63.2	3.8	11.3	4.40	1.93	3.5	65.41	46.25	12.7
2008	63,747	12,949	20.3	57,217	14,816	87.4	4.8	11.9	4.57	1.80	2.9	72.76	52.06	13.7
2007	61,095	10,576	17.3	52,191	14,556	72.7	4.8	12.6	3.65	1.62	2.6	65.45	59.72	17.1
MERCK & CO. (i)														
2010	\$45,987	\$982	2.1%	\$53,947	\$41,998	2.3%	3.6%	23.9%	\$0.28	\$1.52	4.2%	\$41.56	\$30.70	129.0
2009	27,428	13,024	47.5	52,512	49,569	26.3	5.3	21.3	5.65	0.26	0.9	38.42	16.32	4.8
2008	24,850	7,808	31.4	45,232	16,794	46.5	5.2	19.3	3.64	1.52	3.6	61.18	22.82	11.5
2007	24,197	3,275	13.5	46,183	18,185	18.0	4.2	20.2	1.51	1.52	2.9	61.62	42.35	34.4

i Acquired Schering-Plough in 2009. **def** = deficit. **ne** = nonexistent.

YEAR	NET SALES	EARNINGS	PROFIT MARGIN	TOTAL ASSETS	STOCK- HOLDERS' EQUITY	RETURN ON EQUITY	CAPITAL SPEND- ING, % OF SALES	R&D SPEND- ING, % OF SALES	EARN- INGS PER SHARE	DIVIDEND, \$ PER SHARE	DIVIDEND YIELD, % OF PRICE	STOCK PRICE RANGE, PER SHARE		PRICE/ EARNINGS RATIO
												HIGH	LOW	

(Monetary figures, except per-share amounts, are in millions of dollars)

PFIZER (j)

2010	\$67,809	\$8,257	12.2%	\$93,509	\$44,318	18.6%	2.2%	13.9%	\$1.03	\$0.72	4.2%	\$20.36	\$14.00	16.7
2009	50,009	8,635	17.3	102,558	48,070	18.0	2.4	15.7	1.23	0.80	5.2	18.99	11.62	12.4
2008	48,296	8,026	16.6	71,963	18,371	43.7	3.5	16.5	1.19	1.28	6.6	24.08	14.45	16.2
2007	48,418	8,213	17.0	73,388	65,010	12.6	3.9	16.7	1.19	0.96	3.8	28.60	22.16	21.3

BIOPHARMACEUTICALS

AMGEN

2010	\$14,660	\$4,627	31.6%	\$29,922	\$10,380	44.6%	4.0%	19.7%	\$4.82	ne	ne	\$61.14	\$50.36	11.6
2009	14,351	4,605	32.1	25,727	11,332	40.6	3.7	20.0	4.51	ne	ne	64.41	45.11	12.1
2008	14,687	4,196	28.6	22,116	6,059	69.3	4.6	20.6	2.82	ne	ne	75.85	46.44	21.7
2007	15,858	2,950	18.6	3,366	5,921	49.8	8.0	20.6	2.48	ne	ne	80.36	63.92	29.1


BIOGEN IDEC

2010	\$3,470	\$1,005	29.0%	\$5,173	\$2,477	40.6%	5.0%	36.0%	\$3.98	ne	ne	\$68.60	\$45.96	14.4
2009	3,153	977	31.0	7,413	5,123	19.1	5.3	40.7	3.35	ne	ne	54.00	41.75	14.3
2008	2,840	783	27.6	5,180	2,506	31.2	9.7	37.7	2.65	ne	ne	73.59	55.68	24.4
2007	2,137	638	29.9	4,999	5,534	11.5	13.3	43.3	2.82	ne	ne	84.75	42.86	22.6

GENZYME

2010	\$4,000	\$422	10.6%	\$7,752	\$4,425	9.5%	16.4%	21.2%	\$1.61	ne	ne	\$73.23	\$45.39	36.8
2009	4,077	422	10.4	8,657	6,280	6.7	16.2	21.2	1.54	ne	ne	73.75	47.09	39.2
2008	4,197	421	10.0	5,615	4,250	9.9	14.2	31.2	1.50	ne	ne	83.97	52.16	45.4
2007	3,458	480	13.9	5,343	6,613	7.3	11.9	21.3	1.82	ne	ne	76.90	58.71	37.3

j Acquired Wyeth in 2009. ne = nonexistent.



The Powerhouse for API Solutions

1 launch/small cGMP production plant

2 production sites

6 manufacturing units

55 active ingredients

89 reaction trains

mt of cGMP intermediates produced


410

470 mt of API produced

620 DMFs worldwide

700 employees

2100 m³ production capacity under cGMP (ab. 550,000 US gal)



Fabbrica Italiana Sintetici
The Powerhouse for API Solutions

F.I.S. - Fabbrica Italiana Sintetici SpA
Viale Milano, 26 - 36075 Montebelluna Maggiore - (Venezia) - Italy

www.fisvi.com

EUROPE COMPANY RESULTS

Most firms showed strong signs of recovery in sales and earnings in 2010

YEAR	NET SALES	EARNINGS	PROFIT MARGIN	TOTAL ASSETS	STOCK- HOLDERS' EQUITY	RETURN ON EQUITY	CAPITAL SPEND- ING, % OF SALES	R&D SPEND- ING, % OF SALES	EARNINGS PER SHARE	DIVIDEND, \$ PER SHARE	DIVIDEND YIELD, % OF PRICE	STOCK PRICE RANGE, PER SHARE		PRICE/ EARN- INGS RATIO
												HIGH	LOW	

(Monetary figures, except per-share amounts, are in millions of dollars)

CHEMICALS

BELGIUM

Solvay (a)

2010	\$9,427	\$2,356	25.0%	\$18,326	\$8,812	26.7%	7.6%	2.5%	\$28.97	\$3.05	3.1%	€81.90	€67.80	3.4
2009	11,252	684	6.1	16,321	6,527	10.5	6.7	6.5	8.33	2.92	3.7	77.80	42.00	9.5
2008	12,585	537	4.3	13,090	3,119	17.2	13.9	5.9	12.47	2.92	2.9	97.90	51.45	7.9
2007	12,687	1,035	8.2	13,941	5,033	20.6	8.1	5.8	12.54	2.92	2.0	123.20	92.00	11.4

FINLAND

Kemira (b)

2010	\$2,866	\$147	5.1%	\$2,468	\$906	16.2%	3.5%	1.9%	\$0.97	\$0.64	4.6%	€13.19	€7.89	14.4
2009	3,315	108	3.2	2,727	674	15.9	3.2	1.9	0.81	0.36	3.5	11.63	3.87	12.7
2008	3,756	-2	def	2,775	278	def	5.3	2.5	def	0.30	2.5	13.43	4.93	def
2007	3,725	84	2.3	3,003	564	15.0	8.7	2.3	0.64	0.60	3.1	17.45	11.92	30.6

FRANCE

Air Liquide (c)

2010	\$17,886	\$1,861	10.4%	\$23,176	\$5,373	34.6%	10.7%	1.3%	\$6.59	\$3.12	2.7%	€99.15	€75.42	17.6
2009	15,881	1,631	10.3	21,147	4,075	40.0	11.8	1.3	6.23	2.98	3.2	84.40	55.03	14.8
2008	17,376	1,618	9.3	21,147	2,957	54.7	14.6	1.2	6.19	2.98	3.0	95.65	55.78	16.2
2007	15,774	1,489	9.4	18,500	2,879	51.7	11.4	1.1	5.60	2.71	2.4	93.14	75.08	19.9

Arkema

2010	\$7,831	\$460	5.9%	\$5,734	\$2,315	19.9%	5.3%	2.4%	\$7.52	\$1.33	2.5%	€55.30	€23.71	7.0
2009	5,893	-228	def	4,594	1,766	def	6.8	3.1	def	0.80	3.0	29.94	9.94	def
2008	7,470	133	1.8	5,314	2,058	6.4	5.9	2.7	2.19	0.80	2.1	45.75	10.93	17.2
2007	7,522	161	2.1	5,270	1,955	8.3	5.7	2.8	2.67	0.99	1.7	50.88	36.35	21.7

Rhodia (d)

2010	\$6,930	\$343	5.0%	\$5,812	-\$1,400	def	4.5%	1.6%	\$3.34	\$0.66	2.7%	€24.91	€12.00	7.3
2009	5,345	-175	def	5,116	-1,516	def	4.1	1.8	def	0.33	3.3	13.28	2.02	def
2008	6,316	139	2.2	5,233	-999	def	5.1	1.5	1.38	ne	ne	27.35	3.93	15.0
2007	6,340	171	2.7	5,418	-1,032	def	5.3	1.9	1.68	0.33	10.1	2.99	1.96	1.9

GERMANY

Altana (e)

2010	\$2,036	\$201	9.9%	\$1,950	\$1,182	17.0%	4.8%	5.3%	ne	ne	ne	ne	ne	ne
2009	1,567	14	0.9	1,630	927	1.5	4.6	6.1	\$0.11	\$0.05	0.3%	€15.59	€12.39	174.9
2008	1,779	137	7.7	1,643	886	15.4	8.0	5.4	1.01	0.13	0.8	16.90	7.53	16.1
2007	1,829	170	9.3	1,612	836	20.4	6.6	4.9	1.26	0.68	1.4	55.89	14.57	37.1

BASF (f)

2010	\$84,701	\$6,043	7.1%	\$62,522	\$13,807	43.8%	4.0%	2.3%	\$6.58	\$2.92	4.3%	€61.73	€39.43	10.2
2009	67,223	1,870	2.8	54,129	10,821	17.3	4.9	2.8	2.04	2.25	5.3	43.95	20.71	21.0
2008	82,620	3,862	4.7	54,331	11,713	33.0	4.0	2.2	4.15	2.59	5.4	52.41	19.95	11.6
2007	76,812	5,388	7.0	49,357	14,240	37.8	4.4	2.4	5.52	2.59	4.5	50.81	35.98	10.4

Bayer

2010	\$46,530	\$1,725	3.7%	\$56,364	\$13,120	13.1%	4.3%	8.7%	\$2.08	\$1.99	2.9%	€58.62	€44.12	32.7
2009	41,331	1,802	4.4	56,144	13,588	13.3	5.1	8.8	2.25	1.86	3.1	56.45	32.69	26.2
2008	43,652	2,280	5.2	58,167	10,202	22.3	5.3	8.1	2.94	1.86	2.7	65.68	36.83	23.1
2007	42,925	6,244	14.5	57,206	11,412	54.7	5.7	8.0	7.74	1.79	2.6	62.53	40.20	8.8

NOTE: Monetary statistics for all years were calculated at the 2010 average exchange rate of \$1.00 U.S. = 0.7541 euros, 1.0432 Swiss francs, and 0.6472 pounds sterling. **a** Divested pharmaceuticals unit in 2010. **b** Spun off Tikkurila in 2010. **c** Two-for-one stock split in 2007. **d** One-for-12 reverse stock split in June 2007. **e** Went private in 2010. **f** Two-for-one stock split in 2008; acquired Ciba in 2009. **def** = deficit. **ne** = nonexistent.

YEAR	NET SALES	EARNINGS	PROFIT MARGIN	TOTAL ASSETS	STOCK- HOLDERS' EQUITY	RETURN ON EQUITY	CAPITAL SPEND- ING, % OF SALES	R&D SPEND- ING, % OF SALES	EARNINGS PER SHARE	DIVIDEND, \$ PER SHARE	DIVIDEND YIELD, % OF PRICE	STOCK PRICE RANGE, PER SHARE		PRICE/ EARN- INGS RATIO
												HIGH	LOW	
(Monetary figures, except per-share amounts, are in millions of dollars)														
Lanxess														
2010	\$9,442	\$503	5.3%	\$7,214	\$2,036	24.7%	7.0%	1.6%	\$6.05	\$0.93	1.6%	€59.49	€25.89	9.4
2009	6,706	53	0.8	6,461	1,656	3.2	5.4	2.0	0.64	0.66	2.6	27.64	11.06	40.3
2008	8,720	243	2.8	5,897	1,583	15.3	5.2	1.5	2.92	0.66	2.2	34.37	10.28	10.1
2007	8,758	149	1.7	5,239	1,833	8.1	4.3	1.3	1.75	1.33	2.8	43.75	26.72	26.7
Linde														
2010	\$17,064	\$1,333	7.8%	\$20,664	\$76	1763.2%	10.1%	0.7%	\$7.77	\$2.92	2.3%	€115.30	€76.70	16.4
2009	14,867	784	5.3	18,255	-1,894	def	10.1	0.8	4.61	2.39	2.6	87.95	49.66	19.8
2008	16,792	951	5.7	18,239	-2,415	def	11.6	0.8	5.62	2.39	2.5	97.90	46.51	17.0
2007	16,311	1,262	7.7	18,327	-2,542	def	8.4	0.8	7.56	2.25	2.0	91.75	75.26	14.7
Merck (g)														
2010	\$11,840	\$838	7.1%	\$13,133	-\$2,801	def	4.4%	15.6%	\$3.86	\$1.66	1.9%	€72.28	€57.62	22.3
2009	9,783	486	5.0	12,086	2,540	19.1%	6.3	18.2	2.23	1.33	1.5	74.37	57.24	39.2
2008	10,023	487	4.9	9,868	1,803	27.0	5.2	16.3	2.24	1.99	2.0	93.79	57.67	44.8
2007	9,354	4,639	49.6	8,952	689	673.8	4.0	14.6	21.50	1.59	1.3	106.55	79.96	5.8
Wacker														
2010	\$6,297	\$651	10.3%	\$7,251	\$3,201	20.3%	13.0%	3.5%	\$13.10	\$4.24	2.7%	€149.65	€87.47	12.0
2009	4,932	-94	def	5,994	2,547	def	20.7	4.4	def	1.59	1.4	122.60	46.60	def
2008	5,700	583	10.2	6,101	2,729	21.3	17.4	3.8	11.72	2.39	1.4	197.70	62.23	14.7
2007	5,011	560	11.2	5,180	2,459	22.8	14.9	4.0	11.26	2.98	1.5	197.70	98.05	17.4
NETHERLANDS														
AkzoNobel (h)														
2010	\$19,414	\$1,000	5.2%	\$16,955	\$2,919	34.3%	3.6%	2.3%	\$4.26	\$1.86	3.3%	€47.70	€37.18	13.2
2009	18,423	378	2.1	15,239	1,136	33.3	3.8	2.4	1.60	1.79	3.7	46.52	26.01	30.0
2008	20,442	-1,440	def	15,332	983	def	3.5	2.3	def	2.39	4.5	57.11	22.85	def
2007	13,543	769	5.7	24,619	13,864	5.5	3.5	2.8	1.95	2.39	3.3	65.56	44.41	37.4
DSM														
2010	\$12,001	\$672	5.6%	\$12,478	\$5,977	11.2%	4.1%	3.7%	\$3.49	\$1.79	3.7%	€42.85	€30.43	13.9
2009	11,036	447	4.0	11,353	5,249	8.5	4.6	3.7	2.67	1.59	4.6	34.84	16.93	12.9
2008	12,517	765	6.1	11,209	4,635	16.5	5.7	4.2	4.55	1.59	4.2	41.27	15.76	8.3
2007	11,825	568	4.8	11,651	5,760	9.9	4.3	4.2	3.09	1.59	3.4	39.87	31.63	15.3
SWITZERLAND														
Clariant														
2010	\$6,825	\$173	2.5%	\$5,418	\$1,473	11.7%	3.1%	1.9%	\$0.70	ne	ne	CHF19.73	CHF10.85	20.9
2009	6,340	-197	def	5,558	1,536	def	2.0	2.3	def	ne	ne	12.22	3.71	def
2008	7,737	-43	def	5,428	1,633	def	3.3	2.3	def	ne	ne	12.64	6.10	def
2007	8,173	5	0.1	6,653	1,947	0.2	3.6	2.5	def	\$0.24	1.6%	22.30	9.44	def
Givaudan														
2010	\$4,063	\$326	8.0%	\$4,043	\$710	45.9%	2.8%	7.9%	\$36.07	\$20.61	2.3%	CHF1062.00	CHF821.50	25.0
2009	3,795	191	5.0	3,900	-194	def	2.4	8.2	23.94	19.75	2.9	878.50	567.00	28.9
2008	3,918	106	2.7	3,752	-949	def	4.7	8.4	14.25	9.59	1.1	1,071.00	710.00	59.9
2007	3,958	91	2.3	4,041	-954	def	4.7	9.0	12.52	18.67	1.7	1,264.00	996.00	86.5
Lonza														
2010	\$2,569	\$279	10.9%	\$3,953	\$1,661	16.8%	10.6%	3.7%	\$5.30	\$2.06	2.7%	CHF90.85	CHF66.00	14.2
2009	2,579	155	6.0	4,049	1,600	9.7	18.8	3.8	3.04	1.68	1.8	120.10	71.50	30.2
2008	2,815	403	14.3	4,684	1,145	35.2	21.2	3.7	7.81	1.68	1.4	158.30	83.95	14.9
2007	2,749	288	10.5	4,213	1,203	24.0	20.8	3.1	5.64	1.68	1.4	138.00	103.50	20.5

NOTE: Monetary statistics for all years were calculated at the 2010 average exchange rate of \$1.00 U.S. = 0.7541 euros, 1.0432 Swiss francs, and 0.6472 pounds sterling. **g** Acquired Millipore in 2010. **h** Divested pharmaceuticals in 2007; acquired ICI in 2008. **def** = deficit. **ne** = nonexistent.

FINANCES

YEAR	NET SALES	EARNINGS	PROFIT MARGIN	TOTAL ASSETS	STOCK- HOLDERS' EQUITY	RETURN ON EQUITY	CAPITAL SPEND- ING, % OF SALES	R&D SPEND- ING, % OF SALES	EARNINGS PER SHARE	DIVIDEND, \$ PER SHARE	DIVIDEND YIELD, % OF PRICE	STOCK PRICE RANGE, PER SHARE		PRICE/ EARN- INGS RATIO
												HIGH	LOW	
(Monetary figures, except per-share amounts, are in millions of dollars)														
SWITZERLAND (continued)														
Syngenta														
2010	\$11,641	\$1,397	12.0%	\$14,198	\$4,362	32.0%	3.4%	8.9%	\$14.99	\$5.75	2.3%	CHF 305.50	CHF 222.00	16.9
2009	10,992	1,371	12.5	13,594	4,053	33.8	5.9	8.7	14.62	5.75	2.4	292.10	211.00	16.5
2008	11,624	1,385	11.9	11,501	2,818	49.1	3.8	8.3	14.63	5.75	2.4	342.50	162.90	16.6
2007	9,240	1,109	12.0	10,490	3,251	34.1	3.4	9.0	11.42	4.60	1.9	292.00	212.04	21.2
PHARMACEUTICALS														
FRANCE														
Sanofi-Aventis														
2010	\$40,292	\$7,250	18.0%	\$113,067	\$70,664	10.3%	5.2%	14.5%	\$5.54	\$3.32	4.9%	€58.90	€44.01	12.3
2009	38,862	6,982	18.0	106,152	64,243	10.9	6.1	15.6	5.34	3.18	5.0	56.78	38.43	11.8
2008	36,557	5,107	14.0	95,461	59,768	8.5	5.8	16.6	3.90	2.92	4.3	66.90	36.06	17.5
2007	37,182	6,976	18.8	95,319	59,273	11.8	5.7	16.2	5.16	2.74	3.2	71.95	56.20	16.5
SWITZERLAND														
Novartis														
2010	\$50,624	\$9,969	19.7%	\$123,318	\$69,769	14.3%	3.3%	17.9%	\$4.26	\$2.11	4.0%	CHF 60.25	CHF 50.55	12.5
2009	44,267	8,454	19.1	95,505	57,462	14.7	4.3	16.9	3.69	2.01	4.4	56.90	39.64	12.5
2008	41,459	8,233	19.9	78,299	50,437	16.3	5.1	17.4	3.59	1.92	3.6	66.25	45.62	14.9
2007	38,072	11,968	31.4	75,452	49,396	24.2	6.7	16.9	5.13	1.53	2.4	74.60	58.05	12.4
Roche														
2010	\$45,507	\$8,307	18.3%	\$58,493	\$11,179	74.3%	5.6%	21.1%	\$9.69	\$6.33	4.0%	CHF 191.70	CHF 134.30	16.1
2009	47,020	7,462	15.9	71,477	9,024	82.7	6.1	20.1	8.65	5.75	3.8	182.10	130.30	17.3
2008	43,728	8,598	19.7	72,938	51,593	16.7	6.9	19.4	9.81	4.79	2.6	229.50	155.20	18.8
2007	44,189	9,357	21.2	74,889	51,061	18.3	7.6	18.2	10.70	4.40	1.9	266.25	209.70	21.3
UNITED KINGDOM														
AstraZeneca														
2010	\$33,269	\$8,053	24.2%	\$56,127	\$23,410	34.4%	2.4%	16.0%	\$5.57	\$2.50	5.3%	£33.85	£27.32	8.5
2009	32,804	7,521	22.9	54,920	20,821	36.1	2.9	13.4	5.19	2.18	5.6	29.47	21.47	7.6
2008	31,601	6,101	19.3	46,784	16,060	38.0	3.5	16.4	4.20	2.05	5.7	28.88	17.48	8.5
2007	29,559	5,595	18.9	47,957	14,915	37.5	3.8	17.5	3.74	1.44	3.6	29.84	21.44	10.6
GlaxoSmithKline														
2010	\$43,869	\$4,237	9.7%	\$65,250	\$15,057	28.1%	3.6%	14.0%	\$0.49	\$1.00	5.3%	£13.40	£10.95	38.0
2009	43,832	9,495	21.7	66,227	16,598	57.2	5.0	13.9	1.67	0.94	5.3	13.34	9.87	10.7
2008	37,627	8,407	22.3	60,867	12,852	65.4	5.9	14.4	1.36	0.88	4.8	13.85	9.95	13.5
2007	35,134	8,616	24.5	47,951	15,328	56.2	6.7	14.2	1.45	0.82	4.0	14.77	11.69	14.1
NOTE: Monetary statistics for all years were calculated at the 2010 average exchange rate of \$1.00 U.S. = 0.7541 euros, 1.0432 Swiss francs, and 0.6472 pounds sterling.														

JAPAN COMPANY RESULTS

Price-to-earnings ratios retreated to a more reasonable level compared with 2009

YEAR	NET SALES	EARNINGS	PROFIT MARGIN	TOTAL ASSETS	STOCK- HOLDERS' EQUITY	RETURN ON EQUITY	CAPITAL SPENDING, % OF SALES	R&D SPEND- ING, % OF SALES	EARN- INGS PER SHARE	DIVIDEND, \$ PER SHARE	DIVIDEND YIELD, % OF PRICE	STOCK PRICE RANGE, PER SHARE		PRICE/ EARNINGS RATIO
												HIGH	LOW	
(Monetary figures, except per-share amounts, are in millions of dollars)														
ASAHI KASEI														
2010	\$18,209	\$687	3.8%	\$16,244	\$7,511	9.1%	4.1%	3.9%	\$0.49	\$0.13	2.2%	¥590	¥415	11.7
2009	16,332	288	1.8	15,595	6,982	4.1	5.9	4.4	0.21	0.11	2.3	513	355	24.0
2008	17,693	54	0.3	15,714	6,825	0.8	8.2	3.9	0.04	0.11	2.1	636	295	137.3
2007	19,330	797	4.1	16,238	6,984	11.4	4.9	3.3	0.57	0.15	1.8	902	505	14.1
DIC (a)														
2010	\$8,874	\$180	2.0%	\$8,017	\$2,492	7.2%	2.7%	1.5%	\$0.20	\$0.05	2.2%	¥222	¥135	10.1
2009	8,634	29	0.3	8,543	1,399	2.1	3.1	1.6	0.04	0.05	2.5	205	118	50.3
2008	10,621	30	0.3	8,413	1,241	2.4	4.7	1.6	0.04	0.07	2.4	367	124	73.3
2007	12,280	354	2.9	11,145	2,910	12.1	3.6	1.4	0.45	0.09	1.8	576	312	11.3
JSR CORP.														
2010	\$3,881	\$314	8.1%	\$4,450	\$3,026	10.4%	3.5%	5.0%	\$1.29	\$0.36	2.0%	¥1,975	¥1,208	14.1
2009	3,534	155	4.4	4,256	2,850	5.5	5.3	5.9	0.64	0.30	1.7	1,966	1,145	27.8
2008	4,016	159	4.0	3,868	2,789	5.7	5.4	6.1	0.64	0.36	2.0	2,455	801	28.9
2007	4,633	421	9.1	4,750	2,935	14.4	7.1	4.8	1.68	0.36	1.3	3,010	2,045	17.2
KANEKA														
2010	\$5,170	\$132	2.6%	\$5,185	\$2,912	4.5%	6.4%	4.0%	\$0.39	\$0.18	3.0%	¥617	¥465	15.8
2009	4,699	96	2.0	4,931	2,843	3.4	5.5	4.0	0.28	0.18	2.7	706	484	24.0
2008	5,122	-21	def	4,767	2,810	def	7.6	3.8	def	0.18	2.5	798	471	def
2007	5,730	214	3.7	5,156	2,889	7.4	6.3	3.3	0.63	0.18	1.8	1,207	605	16.4
MITSUBISHI CHEMICAL HOLDINGS (b)														
2010	\$36,076	\$952	2.6%	\$37,526	\$8,638	11.0%	3.7%	4.1%	\$0.67	\$0.11	1.9%	¥641	¥398	8.8
2009	28,652	146	0.5	38,222	7,673	1.9	4.4	5.4	0.11	0.09	2.1	481	294	41.6
2008	23,810	-765	def	31,224	7,621	def	6.7	6.1	def	0.14	2.3	758	299	def
2007	33,377	1,869	5.6	31,509	9,430	19.8	5.8	3.8	1.36	0.18	1.8	1,155	634	7.5
MITSUI CHEMICALS														
2010	\$15,855	\$283	1.8%	\$14,760	\$4,597	6.2%	3.2%	2.6%	\$0.28	\$0.07	2.2%	¥332	¥208	10.9
2009	13,759	-319	def	14,104	4,384	def	3.8	3.2	def	0.03	1.0	382	202	def
2008	16,947	-1,085	def	13,545	4,151	def	5.4	2.8	def	0.10	2.0	685	206	def
2007	20,354	283	1.4	16,738	5,463	5.2	4.7	2.4	0.37	0.14	1.3	1,179	648	28.4
SHIN-ETSU CHEMICAL														
2010	\$12,056	\$1,141	9.5%	\$20,325	\$16,254	7.0%	10.8%	3.5%	\$2.69	\$1.14	2.2%	¥5,700	¥3,540	19.6
2009	10,445	955	9.1	20,154	16,304	5.9	12.4	3.7	2.25	1.14	2.0	6,000	4,200	25.8
2008	13,680	1,763	12.9	19,195	15,562	11.3	13.3	3.1	4.13	1.14	1.9	6,920	3,400	14.2
2007	15,680	2,091	13.3	21,856	16,391	12.8	19.5	3.5	4.86	1.03	1.2	9,500	4,970	17.0
SHOWA DENKO														
2010	\$9,082	\$145	1.6%	\$10,532	\$2,729	5.3%	7.3%	2.6%	\$0.10	\$0.03	1.8%	¥208	¥132	20.0
2009	7,726	-433	def	10,917	3,266	def	5.3	3.1	def	0.03	1.8	217	109	def
2008	11,436	28	0.2	10,959	3,024	0.9	5.5	2.0	0.02	0.06	2.0	386	114	127.6
2007	11,657	377	3.2	11,730	3,402	11.1	6.8	1.7	0.31	0.06	1.3	472	313	14.3
SUMITOMO CHEMICAL														
2010	\$22,584	\$278	1.2%	\$26,969	\$8,645	3.2%	5.0%	7.0%	\$0.17	\$0.10	2.2%	¥483	¥332	27.4
2009	18,466	168	0.9	27,158	9,358	1.8	6.0	7.2	0.10	0.07	1.5	484	325	45.3
2008	20,372	-674	def	23,041	8,836	def	7.5	7.3	def	0.10	1.7	785	264	def
2007	21,606	719	3.3	26,873	11,461	6.3	7.5	5.6	0.44	0.14	1.4	1,035	637	21.9

NOTE: Monetary statistics, except stock prices, for all years were converted at the 2010 exchange rate of \$1.00 = 87.78 yen. Statistics were prepared on the basis of consolidated results. The fiscal year ends on March 31 of the following calendar year, except for Showa Denko's, which ends on Dec. 31. **a** Formerly Dainippon Ink & Chemicals. **b** Holding firm made up of Mitsubishi Chemical, Mitsubishi Rayon, Mitsubishi Tanabe Pharma, and Mitsubishi Plastics. **def** = deficit.

FINANCES

YEAR	NET SALES	EARNINGS	PROFIT MARGIN	TOTAL ASSETS	STOCK- HOLDERS' EQUITY	RETURN ON EQUITY	CAPITAL SPENDING, % OF SALES	R&D SPEND- ING, % OF SALES	EARN- INGS PER SHARE	DIVIDEND, \$ PER SHARE	DIVIDEND YIELD, % OF PRICE	STOCK PRICE RANGE, PER SHARE		PRICE/ EARNINGS RATIO
												HIGH	LOW	
(Monetary figures, except per-share amounts, are in millions of dollars)														
TEIJIN														
2010	\$9,292	\$287	3.1%	\$8,675	\$3,238	8.9%	3.6%	0.9%	\$0.29	\$0.06	1.5%	¥423	¥254	13.2
2009	8,725	-407	def	9,377	3,091	def	4.4	4.4	def	0.02	0.7	335	213	def
2008	10,747	-489	def	9,958	3,481	def	8.0	4.0	def	0.06	1.6	441	168	def
2007	11,809	144	1.2	11,574	4,685	3.1	8.2	3.5	0.15	0.09	1.5	682	374	40.1
TORAY INDUSTRIES														
2010	\$17,540	\$660	3.8%	\$17,857	\$6,755	9.8%	3.6%	3.4%	\$0.41	\$0.09	1.4%	¥633	¥423	14.5
2009	15,489	-161	def	17,735	5,367	def	3.9	3.4	def	0.06	1.0	568	395	def
2008	16,764	-186	def	17,357	5,840	def	6.3	3.4	def	0.09	1.4	691	352	def
2007	18,793	548	2.9	19,346	7,316	7.5	8.9	2.8	0.39	0.11	1.3	967	567	22.3
TOSOH														
2010	\$7,797	\$114	1.5%	\$8,270	\$1,877	6.1%	3.6%	2.0%	\$0.19	\$0.07	2.3%	¥304	¥210	15.4
2009	7,162	78	1.1	8,426	1,851	4.2	4.5	2.2	0.13	0.07	2.4	316	186	21.8
2008	8,356	-288	def	8,690	1,766	def	6.7	2.0	def	0.07	1.9	498	138	def
2007	9,426	287	3.0	9,307	2,263	12.7	8.8	1.6	0.48	0.09	1.4	825	298	13.4

NOTE: Monetary statistics, except stock prices, for all years were converted at the 2010 exchange rate of \$1.00 = 87.78 yen. Statistics were prepared on the basis of consolidated results. The fiscal year ends on March 31 of the following calendar year, except for Showa Denko's, which ends on Dec. 31. **def** = deficit.

U.S. CAPITAL SPENDING

Investments increased at most firms, but did not return to prerecession levels

\$ MILLIONS	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Air Products & Chemicals (a)	\$768	\$708	\$628	\$613	\$706	\$930	\$1,261	\$1,055	\$1,085	\$1,179	\$1,298
Albemarle	52	50	38	41	58	70	100	99	100	101	76
Arch Chemicals	62	45	35	20	18	18	27	42	53	30	29
Cabot (a)	137	122	146	129	119	186	188	141	199	106	108
Cytec Industries	77	64	62	94	89	105	103	115	196	194	116
Dow Chemical (b)	1,349	1,587	1,623	1,100	1,333	1,597	1,775	2,075	2,276	1,410	2,130
DuPont (c)	1,925	1,634	1,280	1,713	1,232	1,340	1,532	1,585	1,978	1,378	1,501
Eastman Chemical	226	234	427	230	248	343	289	518	634	137	243
FMC Corp. (d)	240	146	84	87	85	94	116	115	175	93	142
H.B. Fuller (e)	49	31	36	39	31	25	21	21	20	23	36
W.R. Grace	65	63	91	86	63	81	119	137	132	94	113
Lubrizol (f)	86	66	65	88	133	137	131	183	203	140	176
Monsanto (g)	582	382	224	206	210	281	370	509	918	916	755
NewMarket Corp. (h)	14	10	13	12	15	18	26	31	32	38	34
PPG Industries	561	291	238	217	244	288	372	353	383	239	341
Praxair	704	595	498	983	668	877	1,100	1,376	1,611	1,352	1,388
Quaker Chemical	6	8	11	13	9	7	12	9	12	14	9
Solutia	221	94	59	78	61	81	106	150	84	44	66
Stepan	28	34	36	33	34	42	46	40	50	43	74
TOTAL (i)	\$7,698	\$6,702	\$6,101	\$6,209	\$5,743	\$6,716	\$8,226	\$9,088	\$10,782	\$7,531	\$8,635

NOTE: Prior years are not restated to reflect company revisions. **a** Fiscal year ends on Sept. 30. **b** Acquired Union Carbide in 2001 and Rohm and Haas in 2009. **c** Sold drug operations in 2001. **d** Machinery business split off in 2001. **e** Fiscal year ends on Nov. 27. **f** Acquired Noveon in 2004. **g** Spun off from Pharmacia in 2002. **h** Formerly Ethyl Corp. **i** For companies reporting.

EUROPE CAPITAL SPENDING

Spending declined somewhat in 2010, but not as much as it did the year before

\$ MILLIONS	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Air Liquide (France)	\$1,207	\$1,021	\$1,207	\$971	\$1,160	\$1,293	\$1,496	\$1,802	\$2,530	\$1,871	\$1,923
AkzoNobel (Netherlands) (a)	961	1,090	914	770	731	679	701	476	708	708	708
Altana (Germany) (b)	ne	ne	ne	ne	ne	ne	99	121	143	72	98
Arkema (France) (c)	ne	ne	ne	393	398	442	446	431	444	399	418
BASF (Germany) (d)	4,815	4,027	3,550	3,041	2,559	2,583	3,197	3,399	3,343	3,324	3,379
Bayer (Germany)	3,510	3,470	3,160	1,892	1,321	1,841	2,306	2,467	2,333	2,089	2,008
Clariant (Switzerland)	513	484	325	289	277	334	343	293	259	129	215
DSM (Netherlands)	816	865	667	574	443	532	664	512	717	511	491
Givaudan (Switzerland) (e)	125	109	88	151	143	154	162	186	186	91	115
Kemira (Finland) (f)	289	395	322	310	212	150	217	326	200	107	100
Lanxess (Germany) (g)	ne	ne	ne	414	370	333	354	377	454	365	664
Linde (Germany)	1,298	964	1,150	1,135	952	1,146	1,288	1,371	1,949	1,508	1,727
Lonza (Switzerland)	142	253	334	406	239	261	356	571	596	484	273
Merck (Germany) (h)	566	623	500	373	310	355	335	375	524	620	525
Rhodia (France)	667	640	496	309	264	337	354	338	320	221	310
Solvay (Belgium) (i)	1,077	956	829	736	748	670	770	1,030	1,750	752	713
Syngenta (Switzerland)	185	253	165	211	166	174	217	317	444	652	396
Wacker (Germany) (j)	na	na	na	na	na	403	642	747	991	1,022	819
TOTAL (k)	\$16,171	\$15,152	\$13,706	\$11,975	\$10,292	\$11,685	\$13,948	\$15,139	\$17,891	\$14,924	\$14,881

NOTE: Monetary statistics for all years were converted at the 2010 average exchange rate of \$1.00 U.S. = 0.7541 euros and 1.0432 Swiss francs. **a** Divested pharmaceuticals in 2007; acquired ICI in 2008. **b** Divested pharmaceuticals in 2006; went private in 2010. **c** Spun off from Total in 2006; prior figures are pro forma. **d** Acquired Engelhard in 2006 and Ciba in 2009. **e** Spun off from Roche in 2000. **f** Spun off from Tikkurila in 2010. **g** Spun off from Bayer in 2005; prior figures are pro forma. **h** Acquired Millipore in 2010. **i** Divested its pharmaceuticals unit in 2010. **j** Became a publicly traded company in 2005. **k** For companies reporting. **na** = not available. **ne** = nonexistent.

JAPAN CAPITAL SPENDING

Lackluster expenditures were nearly unchanged from 2009

\$ MILLIONS	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Asahi Kasei	\$788	\$852	\$1,071	\$984	\$780	\$755	\$962	\$945	\$1,444	\$957	\$752
DIC (a)	622	575	491	521	521	480	562	444	501	269	237
JSR Corp.	125	151	183	195	207	266	252	331	217	189	134
Kaneka	279	275	203	262	264	395	405	360	387	260	333
Mitsubishi Chemical Holdings (b)	983	1,136	972	790	765	1,115	1,491	1,937	1,584	1,271	1,342
Mitsui Chemicals	701	1,340	784	521	537	927	828	965	923	524	514
Shin-Etsu Chemical	1,102	929	747	1,160	1,210	1,365	2,399	3,059	1,816	1,294	1,297
Showa Denko	456	368	324	465	341	470	1,035	790	624	413	661
Sumitomo Chemical	707	831	1,732	1,255	1,433	1,423	1,821	1,624	1,528	1,102	1,125
Teijin	561	637	800	604	617	761	862	964	864	388	333
Toray Industries	684	745	652	556	833	1,186	1,440	1,672	1,052	609	637
Tosoh	213	192	138	243	517	369	914	828	560	321	282
TOTAL	\$7,222	\$8,032	\$8,096	\$7,556	\$8,023	\$9,512	\$12,971	\$13,918	\$11,499	\$7,595	\$7,648

NOTE: Monetary statistics for all years were converted at the 2010 average rate of \$1.00 U.S. = 87.78 yen. Fiscal year ends on March 31 of the following calendar year, except Showa Denko's, which ends on Dec. 31. **a** Formerly Dainippon Ink & Chemicals. **b** Holding firm made up of Mitsubishi Chemical, Mitsubishi Rayon, Mitsubishi Tanabe Pharma, and Mitsubishi Plastics.

U.S. R&D SPENDING

DuPont and Merck boosted spending significantly, but most firms spent close to 2009 levels

CHEMICALS

\$ MILLIONS	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Air Products & Chemicals (a)	\$124	\$123	\$121	\$121	\$127	\$133	\$151	\$140	\$131	\$116	\$115
Albemarle	26	22	17	18	31	42	46	63	67	61	58
Arch Chemicals	17	25	23	24	15	21	18	20	22	23	20
Cabot (a)	43	48	48	64	53	59	58	69	74	71	70
Cytec Industries	39	32	34	35	40	69	74	76	82	75	73
Dow Chemical (b)	892	1,072	1,066	981	1,022	1,073	1,164	1,305	1,310	1,492	1,660
DuPont (c)	1,776	1,588	1,264	1,349	1,333	1,336	1,302	1,338	1,393	1,378	1,651
Eastman Chemical	149	160	159	173	154	162	167	156	158	137	152
FMC Corp. (d)	155	100	82	87	93	94	97	95	94	93	101
H.B. Fuller (e)	18	19	18	18	16	16	17	17	17	17	19
W.R. Grace	46	50	52	52	51	59	64	80	83	70	60
Lubrizol (f)	86	88	94	94	190	205	206	219	221	212	226
Monsanto (g)	588	560	527	510	511	588	725	780	980	1,098	1,205
NewMarket Corp. (h)	40	33	30	28	33	65	70	77	82	86	91
PPG Industries	282	266	289	306	303	309	318	354	451	403	408
Praxair	65	66	69	75	77	80	87	98	97	74	79
Quaker Chemical	9	9	9	10	14	14	13	15	17	15	16
Solutia	67	58	39	53	44	45	45	45	12	10	18
Stepan	13	14	15	15	15	30	30	31	34	36	38
TOTAL (i)	\$4,779	\$4,645	\$4,298	\$4,303	\$4,437	\$4,725	\$5,010	\$5,380	\$5,703	\$5,467	\$6,060

PHARMACEUTICALS

\$ MILLIONS	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Abbott Laboratories	\$1,351	\$1,578	\$1,562	\$1,734	\$1,697	\$1,821	\$2,255	\$2,506	\$2,689	\$2,744	\$3,724
Bristol-Myers Squibb (j)	1,939	2,259	2,218	2,279	2,500	2,746	3,067	3,282	3,585	3,647	3,566
Eli Lilly & Co.	1,784	2,019	2,235	2,350	2,149	3,025	3,129	3,487	3,841	4,327	4,884
Johnson & Johnson	3,105	3,591	2,957	4,684	5,203	6,312	7,125	7,680	7,577	6,986	6,844
Merck & Co. (k)	2,344	2,456	2,677	3,178	4,010	3,848	4,783	4,883	4,805	5,845	10,991
Pfizer (l)	4,435	4,847	5,176	7,131	7,684	7,442	7,599	8,089	7,945	7,845	9,413
TOTAL (i)	\$17,979	\$19,932	\$20,330	\$24,919	\$27,311	\$29,808	\$33,255	\$36,110	\$37,344	\$31,394	\$39,422

NOTE: Prior years are not restated to reflect company revisions. **a** Fiscal year ends on Sept. 30. **b** Acquired Union Carbide in 2001 and Rohm and Haas in 2009. **c** Sold drug operations in 2001. **d** Machinery business split off in 2001. **e** Fiscal year ends on Nov. 27. **f** Acquired Noveon in 2004. **g** Spun off from Pharmacia in 2002; fiscal year ends on Aug. 31. **h** Formerly Ethyl Corp. **i** For companies reporting. **j** Acquired DuPont Pharmaceuticals in 2001. **k** Acquired Schering-Plough in 2009. **l** Acquired Wyeth in 2009.

EUROPE R&D SPENDING

More European firms increased spending on research in 2010

\$ MILLIONS	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Air Liquide (France)	\$126	\$119	\$122	\$125	\$137	\$142	\$154	\$178	\$212	\$213	\$228
AkzoNobel (Netherlands) (a)	1,048	1,123	1,195	1,176	1,091	1,074	1,174	374	468	448	443
Altana (Germany) (b)	ne	ne	ne	ne	ne	ne	90	89	95	95	109
Arkema (France) (c)	ne	ne	ne	253	243	233	223	210	199	180	184
BASF (Germany) (d)	2,024	1,654	1,505	1,465	1,308	1,411	1,693	1,830	1,797	1,854	1,979
Bayer (Germany)	3,173	3,393	3,417	2,965	2,627	2,293	3,046	3,419	3,518	3,641	4,049
Clariant (Switzerland)	397	392	337	295	263	209	198	202	176	144	129
DSM (Netherlands)	350	395	359	355	379	385	178	493	522	521	448
Givaudan (Switzerland) (e)	178	191	197	208	199	211	236	356	330	313	322
Kemira (Finland) (f)	64	52	61	64	52	57	68	88	94	62	56
Lanxess (Germany) (g)	ne	ne	ne	223	167	134	115	117	129	134	154
Linde (Germany)	241	223	227	228	220	228	267	129	138	118	125
Lonza (Switzerland)	92	100	98	66	68	60	73	85	105	99	95
Merck (Germany) (h)	724	765	806	802	794	945	997	1,363	1,636	1,783	1,853
Rhodia (France)	257	261	267	248	302	137	138	123	97	97	109
Solvay (Belgium) (i)	477	452	526	536	548	626	747	737	748	736	240
Syngenta (Switzerland)	745	723	697	727	809	822	796	830	969	960	1,032
Wacker (Germany) (j)	na	na	na	na	na	195	202	202	216	217	219
TOTAL (k)	\$9,897	\$9,844	\$9,815	\$9,737	\$9,207	\$9,162	\$10,394	\$10,824	\$11,451	\$11,616	\$11,773

NOTE: Monetary statistics for all years were converted at the 2010 average exchange rate of \$1.00 U.S. = 0.7541 euros and 1.0432 Swiss francs. **a** Divested pharmaceuticals in 2007 and acquired ICI in 2008. **b** Divested pharmaceuticals in 2006 and went private in 2010. **c** Spun off from Total in 2006; prior figures are pro forma. **d** Purchased Engelhard in 2006 and Ciba in 2009. **e** Spun off from Roche in 2000. **f** Spun off from Tikkurila in 2010. **g** Spun off from Bayer in 2005; prior figures are pro forma. **h** Purchased Millipore in 2010. **i** Sold its pharmaceuticals unit in 2010. **j** Became a publicly traded company in 2005. **k** For companies reporting. **na** = not available. **ne** = nonexistent.

JAPAN R&D SPENDING

Research expenditures last year recovered nearly to the peak reached in 2008

\$ MILLIONS	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Asahi Kasei	\$567	\$565	\$562	\$414	\$415	\$408	\$425	\$640	\$693	\$717	\$710
DIC (a)	137	146	147	171	181	169	177	177	167	141	134
JSR Corp.	59	151	160	172	189	180	198	223	243	207	195
Kaneka	150	149	159	165	179	192	192	189	196	186	208
Mitsubishi Chemical Holdings (b)	775	964	1,037	1,008	1,016	1,021	1,039	1,277	1,456	1,559	1,490
Mitsui Chemicals	416	444	423	375	398	423	421	480	467	434	412
Shin-Etsu Chemical	296	321	311	300	318	365	475	546	423	382	425
Showa Denko	189	176	176	178	200	198	222	198	228	236	235
Sumitomo Chemical	673	760	830	857	891	1,047	1,113	1,201	1,494	1,336	1,573
Teijin	345	363	340	374	342	355	400	414	428	380	359
Toray Industries	442	424	406	407	437	452	481	522	570	526	592
Tosoh	109	112	118	117	116	126	145	155	164	157	153
TOTAL	\$4,158	\$4,574	\$4,669	\$4,537	\$4,684	\$4,937	\$5,289	\$6,021	\$6,529	\$6,263	\$6,488

NOTE: Monetary statistics for all years were converted at the 2010 average rate of \$1.00 U.S. = 8778 yen. Fiscal year ends on March 31 of the following calendar year, except Showa Denko's, which ends on Dec. 31. **a** Formerly Dainippon Ink & Chemicals. **b** Holding firm made up of Mitsubishi Chemical, Mitsubishi Rayon, Mitsubishi Tanabe Pharma, and Mitsubishi Plastics.

U.S. manufacturing employment in 2000:

All manufacturing employment:

17.3 million

Chemical employment:

0.98 million

In 2010:

All manufacturing employment:

11.5 million

Chemical employment:

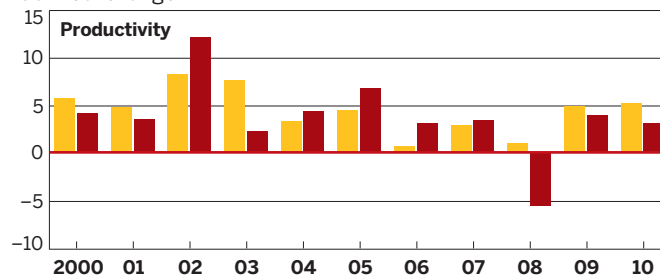
0.78 million

Number of employees per \$10 million in sales at chemical firms:

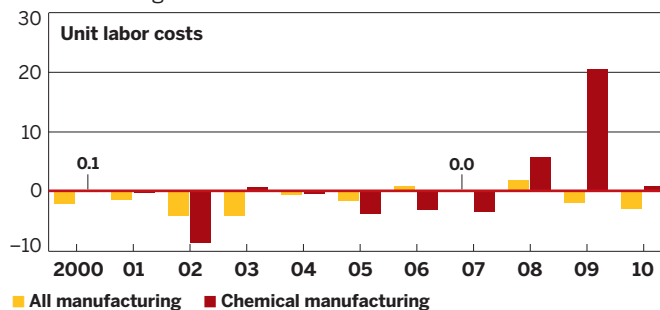
20.6 In Europe
16.3 In U.S.
15.1 In Japan

U.S. productivity rose, unit labor costs inched up

% annual change



% annual change



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

CHEMICAL SECTOR'S JOBLESS RECOVERY

A wobbly rebound, high productivity, and pharma mergers prevented **EMPLOYMENT** growth

ALTHOUGH 2010 marked the return of demand and earnings for the global chemical industry, there was no corresponding growth in employment. Chemical firms that devoted themselves to running lean during the recession were able to ramp up production without hiring—or rehiring—workers.

In the U.S., a years-long decline in chemical industry employment steepened during the recession years. From 2007 to 2009, the industry lost 57,000 jobs, of

which 25,000 were in production, according to the U.S. Department of Labor. In the decade since 2000, the industry lost 196,000 workers, a shrinkage rate of 2.0% per year. The pace of the decline in the chemical industry, however, is slower than the 3.6% annual decrease in employment in the overall manufacturing sector.

In 2010, the chemical workforce fell by 20,000 jobs or 2.5%, according to the Labor Department. On the output side, however, U.S. chemical shipments rose 11.5% com-

pared with 2009. Of 16 companies tracked by C&EN, Dow Chemical, H.B. Fuller, NewMarket Corp., PPG Industries, and Stepan had more employees in 2010 than in 2007, the peak year of U.S. chemical production.

Meanwhile, pharmaceuticals topped most other U.S. industries in laying off workers in 2010. According to outplacement firm Challenger, Gray & Christmas, drugmakers pink-slipped 54,000 employees. Among those workers were roughly 19,000 who were victims of Pfizer's purchase of Wyeth and 16,000 who were dropped during the combination of Merck & Co. and Schering-Plough.

OUTSIDE THE CHEMICAL industry, high unemployment was a drag on the U.S. economy. Throughout 2010, the unemployment rate stayed above 9.5%, although economists marked June 2009 as the official end of the Great Recession. Workers

who did have jobs spent the year worried about losing them, and consumer confidence remained low.

Low confidence in the global recovery was also evident in the hiring rates in Europe, where chemical employment remained flat. Yet the statistics show Europe's chemical industry was busy in 2010.

Each of the four European nations tracked by C&EN posted double-digit increases in chemical shipments. The Netherlands saw the sharpest increase, at 23.7%. The continent's largest chemical-producing country—Germany—reported a 17.6% increase in value of shipments to \$226.5 billion.

The story was similar in Japan, where

chemical companies tracked by C&EN employed the same number of workers in 2010 as in 2009, even as production increased 9.0%. In contrast to the long-term trend in the U.S., chemical employment at the Japanese and European firms tracked by C&EN was respectively equal to and slightly higher in 2010 than it was a decade ago.

OVERALL U.S. EMPLOYMENT

The shrinking workforce in the chemicals sectors mirrored that of the overall manufacturing economy in 2010

THOUSANDS	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	ANNUAL CHANGE	
												2009-10	2000-10
Manufacturing	17,263	16,441	15,259	14,510	14,315	14,226	14,155	13,879	13,406	11,847	11,524	-2.7%	-3.6%
Chemicals	980	959	928	906	887	872	866	861	847	804	784	-2.5	-2.0
Basic chemicals	188	181	170	162	156	150	147	149	152	145	142	-2.1	-2.5
Resin, synthetic rubber & fibers	136	126	115	112	110	108	105	106	104	92	90	-2.2	-3.7
Agricultural chemicals	48	46	45	42	42	40	38	36	37	37	35	-5.4	-2.8
Pharmaceuticals	274	283	291	292	290	288	292	295	291	284	277	-2.5	0.1
Paints, coatings & adhesives	79	75	72	69	68	68	67	65	62	57	56	-1.8	-3.1
Soaps & toiletries	129	127	121	119	115	114	111	110	107	103	101	-1.9	-2.2
Other chemicals	127	120	114	111	107	104	105	101	95	86	83	-3.5	-3.8

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

U.S. COMPANY EMPLOYMENT

Chemical employment showed no recovery from 2009

THOUSANDS	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Air Products & Chemicals	17.5	17.8	17.2	18.5	19.9	20.2	20.7	22.1	21.1	18.9	18.3
Albemarle	2.5	3.0	3.0	3.0	3.7	3.7	3.6	4.1	4.1	4.0	4.0
Cabot	4.5	4.3	4.5	4.4	4.3	4.4	4.3	4.3	4.3	4.0	3.9
Cytec Industries (a)	4.8	4.5	4.3	4.5	4.5	7.3	6.7	6.8	6.7	5.8	6.0
Dow Chemical (b)	41.9	52.7	50.0	46.4	43.2	42.4	42.6	45.9	46.1	52.2	49.5
DuPont	93.0	79.0	79.0	81.0	60.0	60.0	59.0	60.0	60.0	58.0	60.0
Eastman Chemical	14.6	15.8	15.7	15.0	12.0	12.0	11.0	10.8	10.5	10.0	10.0
H.B. Fuller	5.2	4.9	4.6	4.5	4.5	4.0	3.7	3.2	3.1	3.1	3.3
Georgia Gulf (c)	1.3	1.2	1.2	1.2	1.2	1.1	6.7	5.2	4.5	3.5	3.9
W.R. Grace	6.3	6.4	6.4	6.3	6.4	6.4	6.4	6.5	6.3	5.9	6.0
Lubrizol (d)	4.4	4.5	5.2	5.0	7.8	7.5	6.7	6.9	7.0	6.7	6.9
NewMarket Corp. (e)	1.5	1.1	1.1	1.1	1.1	1.1	1.1	1.2	1.3	1.1	1.6
PPG Industries	35.6	34.9	34.1	32.9	31.8	30.8	32.2	34.9	44.9	39.9	38.3
Praxair	23.4	24.3	25.0	25.4	27.0	27.3	27.0	28.0	26.9	26.2	26.3
Solutia	10.2	9.2	7.3	6.3	5.7	5.4	5.1	6.0	3.7	3.4	3.3
Stepan	1.4	1.5	1.5	1.4	1.4	1.5	1.5	1.5	1.6	1.6	1.8
TOTAL EMPLOYEES	268.1	265.1	260.1	256.9	234.5	235.1	238.3	247.4	252.1	244.3	243.1

NOTE: Data are not restated for acquisitions, divestitures, or similar developments. **a** Acquired Surface Specialties in 2005. **b** Acquired Union Carbide in 2001 and Rohm and Haas in 2009. **c** Acquired Royal Group in 2006. **d** Acquired Noveon in 2004. **e** Formerly Ethyl Corp. **SOURCE:** Company data

EUROPE COMPANY EMPLOYMENT

Little change happened in the European chemical sector in 2010 compared with 2009

THOUSANDS	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Air Liquide (France)	30.3	30.8	30.8	31.9	35.9	35.9	36.9	40.3	43.0	42.3	43.6
AkzoNobel (Netherlands) (a)	69.8	70.4	60.7	64.6	61.5	61.3	61.9	42.6	60.0	54.7	55.6
Altana (Germany) (b)	ne	ne	ne	ne	ne	ne	4.5	4.6	4.8	4.8	4.9
Arkema (France) (c)	ne	ne	ne	ne	18.6	17.7	17.0	15.2	15.0	13.8	13.9
BASF (Germany) (d)	103.3	92.5	89.4	87.2	82.0	80.9	95.2	95.2	96.9	104.8	109.1
Bayer (Germany)	122.1	116.9	122.6	94.9	93.3	93.7	106.0	106.2	108.6	111.0	111.4
Clariant (Switzerland)	31.5	28.9	27.8	27.0	24.8	23.4	21.7	20.3	20.1	17.5	16.1
DSM (Netherlands)	21.8	21.5	18.5	26.1	24.5	22.8	22.2	23.3	23.6	22.7	21.9
Givaudan (Switzerland) (e)	5.1	5.3	5.8	6.0	5.9	5.9	6.1	8.8	8.8	8.5	8.6
Kemira (Finland) (f)	9.6	10.2	10.4	10.5	9.7	7.7	9.2	10.0	10.0	8.8	5.6
Lanxess (Germany) (g)	ne	ne	ne	20.5	19.7	18.3	16.5	14.6	14.8	14.3	14.6
Linde (Germany)	47.1	46.4	46.0	46.2	41.4	42.2	55.5	50.5	51.9	47.7	48.4
Lonza (Switzerland)	4.6	6.2	6.2	5.9	5.7	5.0	6.1	6.9	8.5	8.4	8.3
Merck (Germany) (h)	33.5	34.3	34.5	34.2	28.9	29.1	30.0	31.0	32.8	33.1	40.6
Rhodia (France)	29.4	26.9	24.5	23.0	20.6	19.4	17.1	15.5	14.4	13.6	14.1
Solvay (Belgium) (i)	32.3	29.4	30.3	30.1	29.3	28.7	29.3	28.3	29.4	28.2	16.8
Syngenta (Switzerland)	21.0	20.5	20.0	19.1	19.5	19.0	19.5	21.2	24.1	25.9	26.2
Wacker (Germany) (j)	ne	ne	ne	ne	14.7	14.4	14.7	15.0	15.9	15.6	16.3
TOTAL EMPLOYEES (k)	561.4	540.2	527.5	527.2	536.0	525.4	569.4	549.5	582.6	575.7	576.0

a Divested pharmaceuticals in 2007 and purchased ICI in 2008. **b** Divested pharmaceuticals in 2006 and went private in 2010. **c** Spun off from Total in 2006; prior figures are pro forma. **d** Acquired Engelhard in 2006 and Ciba in 2009. **e** Spun off from Roche in 2000. **f** Spun off Tikkurila in 2010. **g** Spun off from Bayer in 2005; prior figures are pro forma. **h** Acquired Millipore in 2010. **i** Sold its pharmaceuticals unit in 2010. **j** Became a publicly traded company in 2005. **k** For companies reporting. **ne** = nonexistent. **SOURCE:** Company data

JAPAN COMPANY EMPLOYMENT

Overall headcount remained flat last year

THOUSANDS	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Asahi Kasei	26.7	26.2	25.7	25.0	23.8	23.0	23.7	23.9	24.2	25.1	25.0
DIC (a)	30.3	28.4	27.0	26.5	26.8	25.6	25.4	25.2	23.6	22.6	21.6
JSR	4.4	4.4	4.3	4.3	4.4	4.6	4.7	5.1	5.3	5.2	5.3
Kaneka	7.0	6.7	6.7	6.6	6.6	7.3	7.4	7.5	7.3	7.6	8.1
Mitsubishi Chemical (b)	33.0	38.6	37.6	33.5	33.3	33.0	33.4	39.3	41.8	53.9	53.9
Mitsui Chemicals	12.8	13.2	12.7	12.3	12.2	12.5	12.5	12.8	12.0	12.9	12.8
Shin-Etsu Chemical	19.4	16.5	16.6	17.4	18.2	18.9	19.2	20.2	19.2	16.9	16.3
Showa Denko	13.2	12.0	10.9	10.6	11.2	11.1	11.2	11.3	11.8	11.6	11.6
Sumitomo Chemical	17.4	17.0	17.9	19.0	20.2	24.2	24.7	25.6	26.9	27.8	29.4
Teijin	22.3	24.0	23.3	20.6	19.0	18.8	19.1	19.1	19.4	18.8	17.5
Toray	35.7	34.9	33.8	32.9	33.7	34.7	36.6	38.6	37.9	37.9	38.7
Tosoh	8.1	9.4	9.2	9.2	9.1	9.5	10.5	11.1	11.2	11.1	11.2
TOTAL EMPLOYEES	230.4	231.3	225.7	218.0	218.4	223.1	228.4	239.7	240.6	251.4	251.4

NOTE: Fiscal year ends on March 31 of the following year at all companies, except Showa Denko, where it ends on Dec. 31. **a** Formerly Daiinippon Ink & Chemicals. **b** Acquired Mitsubishi Rayon in 2009. **SOURCE:** Company data

U.S. PRODUCTION WORKERS

The annual loss in production workers slowed in 2010 compared with the recession's impact in 2009

THOUSANDS	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	ANNUAL CHANGE	
												2009-10	2000-10
Manufacturing	12,428	11,677	10,768	10,189	10,072	10,060	10,137	9,975	9,629	8,322	8,075	-3.0%	-3.8%
Chemicals	588	562	532	525	520	510	508	504	513	479	472	-1.5	-2.0
Basic chemicals	122	115	104	100	95	86	83	88	96	95	92	-3.2	-2.5
Resin, synthetic rubber & fibers	96	89	81	78	75	71	70	70	69	60	58	-3.3	-4.5
Agricultural chemicals	32	30	30	29	29	29	29	25	26	25	24	-4.0	-2.6
Pharmaceuticals	132	132	128	133	139	144	149	153	159	157	160	1.9	1.8
Paints, coatings & adhesives	42	39	38	37	40	41	39	38	37	32	32	0.0	-2.4
Soaps & toiletries	82	80	76	77	74	73	72	69	68	62	62	0.0	-2.5

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

U.S. PAY

Most chemical workers saw a pay increase in 2010

	HOURLY EARNINGS				WEEKLY EARNINGS			
	2007	2008	2009	2010	2007	2008	2009	2010
Manufacturing	\$17.26	\$17.75	\$18.24	\$18.61	\$711.56	\$724.46	\$726.12	\$765.08
Chemicals	19.55	19.50	20.30	21.08	819.54	809.29	841.18	888.84
Basic chemicals	23.23	23.30	24.09	24.93	1,010.21	1,030.55	1,056.85	1,113.94
Resin, synthetic rubber & fibers	21.04	20.54	21.08	21.11	911.97	881.65	907.46	935.54
Agricultural chemicals	21.62	20.36	19.06	19.56	960.05	831.13	768.96	761.52
Pharmaceuticals	20.35	20.10	21.12	21.95	840.75	821.24	862.90	923.42
Paints, coatings & adhesives	15.97	16.48	16.85	16.94	668.18	689.14	679.11	678.74
Soaps & toiletries	15.21	15.21	15.71	16.90	601.55	587.91	600.34	642.50
Other chemicals	16.23	16.08	17.04	18.41	668.97	652.31	719.23	803.02

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

U.S. PRODUCTIVITY

Nearly all sectors increased production but not hours worked ...

PRODUCTIVITY (a), 2004 = 100	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	ANNUAL CHANGE, 2009-10	
Manufacturing	79.9	83.7	90.5	97.1	100.0	104.3	105.1	109.7	109.0	111.8	117.6	5.2%	
Chemicals	81.0	83.9	93.6	96.2	100.0	106.6	109.1	117.2	107.4	105.6	108.9	3.1	
Basic chemicals	71.5	68.8	81.1	87.4	100.0	114.0	118.9	128.8	102.6	102.4	112.2	9.6	
Resin, synthetic rubber & fibers	86.4	86.3	96.4	97.5	100.0	112.1	112.9	120.1	104.5	119.5	127.5	6.7	
Agricultural chemicals	84.2	85.4	90.7	96.3	100.0	104.4	106.3	118.9	107.6	123.3	133.0	7.9	
Pharmaceuticals	93.0	97.6	104.1	103.4	100.0	101.9	103.4	103.0	97.7	93.3	89.8	-3.8	
Paints, coatings & adhesives	92.9	100.4	101.9	105.7	100.0	97.9	97.6	98.4	91.9	91.8	99.4	8.3	
Soaps & toiletries	73.1	76.2	89.5	86.4	100.0	110.3	116.2	133.8	128.8	129.7	135.5	4.5	

... and the resulting uptick in productivity outpaced hourly pay increases

UNIT LABOR COSTS (b), 2004 = 100	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	ANNUAL CHANGE, 2009-10	
Manufacturing	111.0	109.3	104.6	100.4	100.0	98.3	99.1	97.5	100.9	101.1	98.0	-3.1%	
Chemicals	110.1	109.3	100.1	100.3	100.0	96.3	93.7	87.0	94.7	100.3	101.0	0.7	
Basic chemicals	127.3	134.6	116.3	109.3	100.0	90.2	84.3	77.9	98.1	101.6	96.0	-5.5	
Resin, synthetic rubber & fibers	108.4	110.9	101.1	100.4	100.0	93.1	96.5	96.1	107.7	115.6	108.4	-6.2	
Agricultural chemicals	101.5	107.6	110.5	101.0	100.0	105.6	104.6	96.0	99.9	89.2	84.9	-4.8	
Pharmaceuticals	88.9	87.1	83.3	91.5	100.0	100.0	98.8	94.6	98.5	129.0	139.4	8.1	
Paints, coatings & adhesives	93.3	90.5	94.4	93.1	100.0	102.4	101.2	99.8	110.3	112.4	104.4	-7.1	
Soaps & toiletries	128.2	125.7	108.1	111.3	100.0	94.6	87.8	77.2	80.2	72.3	74.4	2.9	

a Productivity is output per hour, calculated by dividing indexes for production by indexes for workhours 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

SOCMA's 8th Annual CHEMICAL INDUSTRY GOLF TOURNAMENT

benefiting the ACS Scholars Program

September 27, 2011 | Close to Philadelphia! | Chester Valley Golf Club | Malvern, PA

 **SOCMA**
Society of Chemical Manufacturers & Affiliates



TOURNAMENT SCHEDULE

(Subject to change)

10:00 AM – 12:30 PM **Registration**

10:30 AM – 12:30 PM **Lunch Buffet**

10:30 AM – 12:30 PM . **Free Practice Area**

12:30 PM **Shotgun Start
Scramble Format**

5:45 PM – 6:45 PM **Cocktails**

6:45 PM – 9:00 PM **Buffet Dinner &
Awards Ceremony**

REGISTRATION FEES

(Competitive and "Red" Teams Available)

Early Bird: (ends August 26, 2011, 5:00 PM EDT)

- \$1,300 per foursome / \$325 per person
- \$ 85 Reception/Dinner only

Regular Rate:

- \$1,400 per foursome / \$350 per person
- \$ 100 Reception/Dinner only

Fee Includes: Greens Fee, Golf Cart Fees for Foursome, Range Balls, Beverage Cart, Buffet Lunch, Reception and Dinner Buffet

SOCMA is hosting a one-day golf tournament to raise money for the American Chemical Society (ACS) Scholars Program. Proceeds will help sponsor scholarships for qualified applicants who want to enter the fields of chemistry, biochemistry or chemical engineering and students seeking degrees in chemical technology. For the past seven years, SOCMA has teamed up with ACS to raise awareness of this cause and support careers in science.

REGISTER ONLINE TODAY! www.socma.com/golf
QUESTIONS? Contact Alicia Massey at (202) 721-4165.

Official Media Partner: **C&EN**

Sponsors:



AMPAC™
FINE CHEMICALS

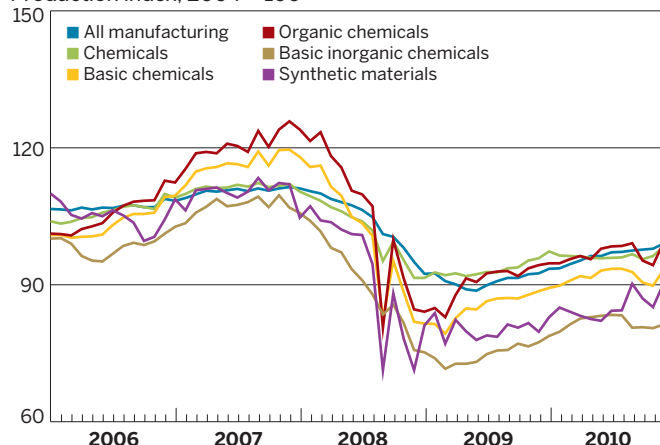
CHARTIS



ChemStewards®
A PROGRAM OF **SOCMA**

U.S. output rose again in all sectors

Production index, 2004 = 100



NOTE: Seasonally adjusted. SOURCE: Federal Reserve Board

Increase in U.S. linear low-density polyethylene output between 2000 and 2010:

2.6
million
metric tons

Percent increase in polyethylene production in 2010 in Canada:

0.1
In U.S.:
2.3

Drop in U.S. ammonia fertilizer production over 10 years:

4.8
million
metric tons

U.S. major inorganic chemical production in 2000:

86.4
million
metric tons
In 2010:

63.0
million
metric tons

Change in U.S. soap, cleaners, shampoo production from 2000 to 2010:

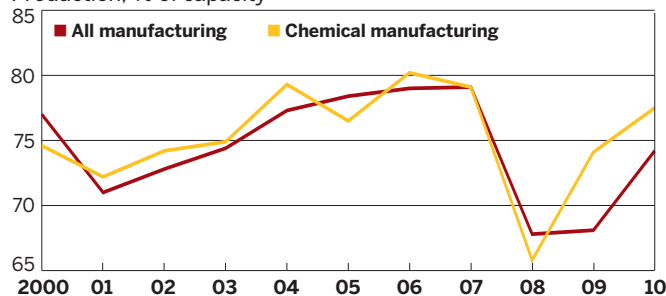
8.7%

Change in U.S. paints and coatings production from 2000 to 2010:

-24.7%

U.S. chemical manufacturing capacity continued to recover from 2008 low

Production, % of capacity



NOTE: As of December 2010. SOURCE: Federal Reserve Board

OUTPUT RAMPS UP IN ALL REGIONS

Chemical **PRODUCTION** increased markedly over that in 2009, thanks to demand from developing economies

THE GLOBAL ECONOMIC recovery lifted all boats in the chemical industry in 2010, as it did for manufacturing industries as a whole. Chemical production was up for almost all categories of chemicals in the U.S., Canada, Japan, South Korea, Taiwan, and China. Statistics for European chemical production lag by a year, so 2010 data are unavailable, but output in 2009 mirrored the sharp decreases experienced in the U.S. that year.

Although businesses and consumers in

the developed economies of the U.S. and Europe mostly stayed on the sidelines during the recovery, developing economies such as China and Brazil began to ramp up manufacturing as early as midyear 2009. Those regions continued to boost demand for chemicals in 2010.

Proximity to China may explain why production indexes showed that growth in chemicals was stronger in Asia than in the U.S. and Canada. Japan upped its output of all chemicals by 9.0% in 2010 compared

with 2009. In South Korea the increase was 6.8%, and in Taiwan it was 9.0%. For the latter two countries, 2010 marked a record year for chemical production. In Japan, by contrast, chemical output would need to increase again by more than 9% to reach the record set in 2007.

In the U.S., overall chemical output nudged up 3.5%. It would need to tack on another 15.5% of improvements in production to reach 2007 levels, and that will likely take many years. The story in Canada was similar. Although a years-long decline in chemical output was reversed in 2010, it is about 15% below the high-watermark year of 2004. Still, Canadian plants' output grew 4.3% from the prior year.

U.S. output shot up for aniline, benzene, 1,3-butadiene, and cumene, all of which grew at double-digit rates. For inorganics, all but ammonium nitrate, hydrochloric and phosphoric acid grew more than 10% compared with 2009. Among plastics, production of

PRODUCTION

PVC and copolymers grew at just under 10%. And even nylon, olefin, and polyester fibers turned around a decadelong slide.

In Asia, production of acrylonitrile, benzene, and purified terephthalic acid increased almost 10%. In Japan, production

of hydrogen peroxide and nitrogen soared 23.4% and 16.5%, respectively. But Japan has slid to third place in the production of the building block chemical ethylene, after South Korea and China.

For its part, China expanded its output of

methanol, which it produces from abundant coal reserves, by 38.9%. Japan, South Korea, and Taiwan all boosted manufacturing of plastics, especially polypropylene in Japan, polystyrene in South Korea, and acrylonitrile-butadiene-styrene in Taiwan.

U.S. PRODUCTION INDEX

Most chemical categories rose, but alkalis and chlorine showed the strongest recovery

PRODUCTION INDEX, 2004 = 100	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	ANNUAL CHANGE	
												2009-10	2000-10
Total index	99.7	96.3	96.5	97.8	100.0	103.3	105.5	108.3	104.3	92.7	97.6	5.3%	-0.2%
All manufacturing	99.1	95.2	95.7	97.2	100.0	104.2	107.0	110.4	105.2	91.0	96.3	5.8	-0.3
Nondurable manufacturing	100.0	97.0	98.2	98.4	100.0	102.5	103.1	104.3	98.1	90.1	93.5	3.7	-0.7
Chemicals	90.3	88.8	94.7	96.3	100.0	103.3	105.9	111.2	102.8	93.1	96.4	3.5	0.7
Basic chemicals	92.2	83.3	89.0	91.8	100.0	100.4	103.2	115.9	102.3	84.9	91.6	8.0	-0.1
Basic inorganic chemicals	95.7	91.7	100.1	99.8	100.0	103.0	98.3	107.0	92.1	74.7	81.5	9.2	-1.6
Alkalis & chlorine	68.6	57.6	84.8	85.9	100.0	112.8	96.9	97.1	86.6	63.2	71.2	12.6	0.4
Synthetic dyes & pigments	97.7	90.8	104.7	105.2	100.0	102.5	103.5	114.7	102.7	86.0	90.2	4.9	-0.8
Other basic inorganic chemicals	100.8	96.6	101.4	98.1	100.0	102.4	93.6	102.1	84.0	69.2	76.3	10.2	-2.7
Organic chemicals	90.9	78.9	83.1	87.6	100.0	99.2	105.2	119.9	107.2	90.0	96.6	7.4	0.6
Synthetic materials (a)	106.8	96.5	98.6	96.6	100.0	107.0	104.9	110.5	93.9	80.2	85.1	6.1	-2.2
Plastic materials & resins	102.6	94.2	98.5	94.8	100.0	109.6	107.4	114.8	97.0	84.6	89.2	5.4	-1.4
Artificial & synthetic fibers	127.4	114.5	100.9	102.5	100.0	94.9	94.6	88.7	76.4	57.6	64.7	12.3	-4.5
Chemical products	82.4	86.9	95.3	97.6	100.0	105.2	108.9	109.4	105.3	97.1	96.9	-0.2	1.6
Pharmaceuticals & medicines	82.9	89.2	96.3	99.7	100.0	103.9	108.2	109.6	107.0	101.0	102.0	0.9	2.1
Soap, cleaning compounds & toiletries	80.5	81.8	91.2	89.4	100.0	108.0	113.6	123.5	114.5	104.5	108.7	4.0	3.0
Paint & coatings	96.2	94.0	94.9	93.8	100.0	97.4	93.3	89.0	79.1	65.2	71.5	9.7	-2.9
Pesticides, fertilizers & other agricultural chemicals	96.5	88.9	91.7	95.9	100.0	103.7	108.2	99.6	86.1	93.7	93.7	0.0	-0.3

a Includes synthetic rubber. SOURCE: Federal Reserve Board

CANADA PRODUCTION INDEX

The manufacturing and chemical sectors reversed their long slide in 2010

PRODUCTION INDEX, 2004 = 100	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	ANNUAL CHANGE	
												2009-10	2000-10
All manufacturing	103.2	98.1	98.9	98.1	100.0	101.8	100.3	98.1	90.9	79.3	84.7	6.7%	-2.0%
Chemicals	91.1	93.2	97.2	99.9	100.0	98.3	99.5	95.9	91.4	82.0	85.5	4.3	-0.6
Basic chemicals	110.5	110.5	109.2	107.5	100.0	107.7	112.3	106.7	98.4	81.8	91.8	12.2	-1.8
Pharmaceuticals & medicines	70.7	92.2	105.4	110.5	100.0	97.3	108.6	91.2	93.8	103.3	107.3	3.9	4.3

SOURCE: Statistics Canada

ASIA PRODUCTION INDEXES

Manufacturing rebounded in Japan, South Korea, and Taiwan last year

PRODUCTION INDEX, 2004 = 100	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	ANNUAL CHANGE 2009-10 2000-10	
JAPAN													
Mining & manufacturing	100.9	95.9	91.8	94.8	100.0	101.1	105.6	108.6	104.9	82.0	95.4	16.4%	-0.6%
All chemicals (a)	100.2	97.1	97.1	98.6	100.0	100.6	100.3	102.3	95.5	85.8	93.6	9.0	-0.7
Petrochemicals	98.1	93.6	94.5	97.4	100.0	101.0	99.0	102.2	92.1	85.0	92.5	8.8	-0.6
Aromatics	91.1	88.9	91.7	96.9	100.0	104.6	104.4	107.7	97.8	97.2	101.4	4.3	1.1
Industrial sodium chemicals	104.7	97.0	98.7	100.0	100.0	100.8	98.3	98.4	95.5	90.6	98.7	8.9	-0.6
Inorganic chemicals & dyes	98.1	93.5	95.5	97.6	100.0	101.2	99.5	100.6	98.1	70.0	83.7	19.5	-1.6
Organic chemicals	99.9	93.6	93.9	99.3	100.0	101.4	98.8	102.7	90.0	87.1	92.5	6.3	-0.8
Cyclic intermediates & dyes	98.7	94.9	96.6	97.6	100.0	97.0	95.4	96.4	83.1	76.8	86.0	11.9	-1.4
Plastics	102.2	96.5	96.5	96.9	100.0	100.0	99.6	100.1	91.7	75.0	86.4	15.2	-1.7
Synthetic rubber	97.9	90.1	94.1	97.6	100.0	100.6	99.4	102.3	102.1	80.2	98.4	22.7	0.1
Fertilizers	124.7	115.5	107.4	99.5	100.0	98.2	96.5	95.7	90.6	70.7	80.3	13.5	-4.3
SOUTH KOREA													
All manufacturing	79.2	79.4	85.9	90.5	100.0	106.2	115.4	123.6	127.3	126.6	148.6	17.4%	6.5%
Chemicals & chemical products	84.0	86.3	91.8	95.3	100.0	103.1	105.7	113.0	113.8	119.9	128.0	6.8	4.3
Rubber & plastic products	86.4	88.6	94.4	96.8	100.0	102.0	108.9	115.3	111.4	102.5	114.3	11.5	2.8
TAIWAN													
All manufacturing	83.8	76.2	83.0	90.9	100.0	103.7	108.3	117.4	115.5	98.2	136.7	39.3%	5.0%
Chemicals	57.3	65.4	73.8	85.3	100.0	104.0	98.1	99.4	90.4	109.0	118.9	9.0	7.6
Basic chemicals	77.6	78.9	80.5	88.4	100.0	101.5	118.9	122.2	117.6	109.7	157.7	43.8	7.4
Petrochemicals	59.7	72.1	80.9	92.1	100.0	102.6	104.4	123.8	117.2	120.6	140.3	16.4	8.9
Fertilizers	115.7	108.0	103.4	103.2	100.0	107.1	108.5	110.0	105.1	99.1	115.6	16.7	0.0
Man-made fibers	96.1	93.0	100.3	98.8	100.0	87.5	84.4	81.2	65.2	78.6	72.4	-7.9	-2.8
Plastics & resins	84.7	84.9	91.2	95.8	100.0	98.1	98.6	107.2	95.7	99.1	106.8	7.8	2.4
Synthetic rubber	79.4	81.8	89.8	93.8	100.0	99.0	103.1	113.0	105.1	107.0	119.0	11.3	4.1

a Excludes pharmaceuticals. SOURCES: Japan's Ministry of Economy, Trade & Industry; Korea National Statistical Office, Republic of Korea; Taiwan's Ministry of Economic Affairs

U.S. ORGANICS

All products grew, but aniline, benzene, 1,3-butadiene, and cumene grew at double-digit rates

THOUSANDS OF METRIC TONS UNLESS OTHERWISE INDICATED	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	ANNUAL CHANGE	
												2009-10	2000-10
Aniline	846	865	921	969	1,034	964	930	978	1,009	845	1,064	25.9%	2.3%
Benzene (thousands of liters) (a,b)	9,156	7,271	8,130	7,926	8,781	7,574	7,642	7,979	6,359	5,772	6,862	18.9	-2.8
1,3-Butadiene (c)	2,009	1,721	1,869	1,901	2,204	2,046	1,987	2,047	1,633	1,427	1,580	10.7	-2.4
Cumene	3,741	3,186	3,503	3,397	3,736	3,509	3,559	3,702	3,386	2,705	3,478	28.6	-0.7
Ethylbenzene	5,967	4,642	5,412	5,578	5,779	5,251	5,286	5,538	4,104	4,110	4,240	3.2	-3.4
Ethylene	25,113	22,513	23,644	22,976	25,682	23,974	25,020	25,412	22,554	22,610	23,975	6.0	-0.5
Ethylene dichloride	9,911	9,336	9,328	9,994	12,163	11,308	9,732	9,562	8,973	8,121	8,810	8.5	-1.2
Ethylene oxide	3,867	3,343	3,447	3,660	3,772	3,166	3,445	3,415	2,903	2,579	2,664	3.3	-3.7
Propylene (d)	14,457	13,176	14,425	13,939	15,345	15,490	15,650	16,187	14,783	13,280	14,085	6.1	-0.3
Styrene	5,405	4,214	4,899	5,167	5,394	5,042	4,827	5,100	4,100	3,960	4,102	3.6	-2.7
Vinyl acetate	1,497	1,188	1,349	1,306	1,431	1,327	1,315	1,391	1,267	1,302	1,386	6.5	-0.8

a Production by tar distillers and coke-oven operators is not included. b Specification grades. c Rubber grade. d All grades.

SOURCE: National Petrochemical & Refiners Association

PRODUCTION

ASIA ORGANICS

The majority of organics grew strongly last year

THOUSANDS OF METRIC TONS	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	ANNUAL CHANGE	
												2009-10	2000-10
JAPAN													
Acetic acid	675	594	569	592	589	599	597	587	500	384	450	17.2%	-4.0%
Acetone	508	476	472	492	539	546	531	593	491	477	521	9.2	0.3
Acrylonitrile	732	738	708	780	711	742	667	743	600	602	663	10.1	-1.0
Benzene (a)	4,425	4,261	4,313	4,551	4,758	4,980	4,874	5,245	4,581	4,259	4,764	11.9	0.7
Butadiene	1,044	976	993	1,062	1,041	1,040	1,002	1,024	953	871	977	12.2	-0.7
Butanol	461	472	476	519	506	513	537	537	482	436	520	19.3	1.2
Caprolactam	599	531	508	530	503	458	467	467	432	342	422	23.4	-3.4
Cyclohexane	673	598	607	685	676	722	731	703	557	407	483	18.7	-3.3
Ethylene	7,614	7,361	7,152	7,367	7,570	7,618	7,522	7,739	6,882	6,913	7,018	1.5	-0.8
Ethylene dichloride	3,431	3,275	3,352	3,463	3,594	3,687	3,514	3,603	3,212	3,242	3,222	-0.6	-0.6
Ethylene glycol	930	787	733	814	786	841	763	754	629	581	596	2.6	-4.4
Ethylene oxide	990	891	868	939	941	1,005	974	966	865	759	845	11.3	-1.6
Octanol	278	262	302	306	307	279	280	270	259	267	286	7.1	0.3
Phenol	916	884	891	926	966	938	860	961	772	786	853	8.5	-0.7
Phthalate plasticizers	396	369	377	382	357	315	279	281	246	172	212	23.3	-6.1
Phthalic anhydride	290	259	262	262	257	239	175	179	176	134	159	18.7	-5.8
Polypropylene glycol	304	294	299	314	346	339	344	343	308	240	284	18.3	-0.7
Propylene	5,453	5,342	5,309	5,610	5,767	6,030	6,090	6,286	5,674	5,590	5,986	7.1	0.9
Purified terephthalic acid	1,527	1,496	1,624	1,443	1,531	1,472	1,432	1,254	1,015	893	1,131	26.7	-3.0
Styrene	2,968	3,004	3,016	3,201	3,345	3,392	3,295	3,533	2,851	2,996	2,939	-1.9	-0.1
Toluene (a)	1,489	1,423	1,548	1,584	1,634	1,676	1,633	1,637	1,437	1,415	1,393	-1.6	-0.7
Toluene diisocyanate	214	214	223	230	245	216	232	229	224	na	na	na	na
Xylene (a)	4,681	4,798	4,900	5,213	5,395	5,570	5,727	6,006	5,698	5,628	5,935	5.5	2.4
p-Xylene	2,920	2,814	2,920	3,097	3,164	3,358	3,357	3,301	3,039	3,218	3,177	-1.3	0.8
SOUTH KOREA													
Benzene	2,834	2,650	2,852	3,246	3,462	3,594	3,719	4,065	4,006	4,075	4,417	8.4%	4.5%
Butadiene	808	777	816	860	917	939	948	1,078	1,072	1,097	1,161	5.8	3.7
Ethylene	5,439	5,398	5,636	5,872	5,945	6,058	6,055	6,788	6,989	7,349	7,290	-0.8	3.0
Propylene	3,409	3,273	3,557	3,753	3,892	3,945	4,172	4,669	4,772	5,205	5,333	2.5	4.6
Vinyl chloride	1,133	1,392	1,416	1,441	1,498	1,501	1,521	1,512	1,473	1,446	na	na	na
TAIWAN													
Acrylonitrile	186	292	339	352	379	386	418	451	360	412	458	11.2%	9.4%
Benzene	690	1,070	931	998	1,088	1,204	1,180	1,606	1,550	1,558	1,708	9.6	9.5
Butadiene	220	349	346	390	412	387	394	521	513	527	577	9.5	10.1
Caprolactam	171	184	186	216	216	247	257	257	216	253	290	14.6	5.4
Diocetyl phthalate	198	280	257	243	239	204	211	244	189	224	122	-45.5	-4.7
Ethylene	1,592	2,584	2,393	2,679	2,864	2,890	2,888	3,666	3,623	3,852	3,929	2.0	9.5
Ethylene glycol	612	1,036	939	1,169	1,459	1,413	1,343	1,795	2,014	2,039	2,139	4.9	13.3
Propylene	930	1,410	1,462	1,752	1,995	2,012	2,105	2,835	2,663	2,881	2,976	3.3	12.3
Purified terephthalic acid	3,140	3,217	3,705	4,079	4,620	4,597	4,400	4,437	4,096	4,406	5,163	17.2	5.1
Styrene	956	1,146	1,249	1,274	1,247	1,248	1,222	1,824	1,679	1,906	1,921	0.8	7.2
Toluene	26	54	42	64	140	86	30	36	16	39	167	328.2	20.4
Vinyl chloride	1,410	1,452	1,557	1,718	1,763	1,783	1,609	1,810	1,633	1,773	1,758	-0.8	2.2

a Petroleum and nonpetroleum sources. na = not available. SOURCES: Japan's Ministry of Economy, Trade & Industry; Korea National Statistical Office, Republic of Korea; Petrochemical Industry Association of Taiwan; Taiwan's Ministry of Economic Affairs

CANADA ORGANICS

Petrochemicals saw a robust recovery in 2010

THOUSANDS OF METRIC TONS	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	ANNUAL CHANGE	
												2009-10	2000-10
Benzene	859	751	849	843	915	798	743	794	704	515	638	23.9%	-2.9%
Butadiene	252	245	276	276	289	246	262	234	na	170	213	25.3	-1.7
Ethylene (a)	4,069	4,261	4,734	4,729	5,095	na	na	5,055	4,859	4,297	4,373	1.8	0.7
Formaldehyde	194	179	212	245	269	na	236	195	165	147	127	-13.6	-4.1
Propylene	934	882	956	938	939	737	833	917	771	591	660	11.7	-3.4
Toluene	218	222	256	289	na	na	253	211	na	166	274	65.1	2.3
Xylenes	312	271	294	336	351	na	na	na	na	256	292	14.1	-0.7

NOTE: Some data are not being released because of confidentiality requirements. **a** Data for 2008, 2009, and 2010 are C&EN estimates. **na** = not available. **SOURCE:** Statistics Canada

EUROPE ORGANICS

Petrochemical production took an enormous hit in 2009

THOUSANDS OF METRIC TONS	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	ANNUAL CHANGE, 2008-09	
Acetic acid	593	754	495	716	676	1,451	1,500	866	869	960	623	-35.1%	
Acetone	1,307	1,325	404	1,011	1,235	1,567	1,336	1,536	1,559	1,529	1,381	-9.7	
Benzene	3,705	4,565	6,670	6,817	6,535	7,931	7,089	6,052	6,110	5,107	4,929	-3.5	
Butadiene	2,027	2,097	1,992	2,024	2,131	2,221	2,221	2,182	2,188	2,020	1,813	-10.2	
1-Butanol	44	67	531	575	542	788	816	417	419	399	333	-16.5	
Ethylbenzene	937	149	1,180	769	911	4,262	4,276	1,146	1,130	1,226	1,091	-11.0	
Ethylene	19,362	19,444	19,674	20,159	20,686	21,408	21,600	21,191	21,818	19,968	18,768	-6.0	
Ethylene dichloride	1,056	1,122	2,759	3,358	3,374	6,044	6,646	1,407	1,450	1,323	1,145	-13.5	
Ethylene glycol	1,177	1,195	268	239	857	1,404	1,637	1,470	1,501	1,283	962	-25.0	
Ethylene oxide	592	637	934	717	792	2,960	2,800	2,650	2,856	2,619	2,400	-8.4	
Formaldehyde	947	954	2,463	3,299	3,295	4,017	4,057	1,076	1,210	1,175	1,058	-10.0	
Methanol	869	1,148	2,030	1,844	2,009	2,878	3,248	2,395	2,100	1,589	1,558	-2.0	
Phenol	na	na	689	797	724	2,375	2,332	2,355	2,446	2,353	1,980	-15.9	
Phthalic anhydride	446	488	371	442	430	848	852	475	512	na	na	na	
Propylene	13,153	13,330	13,352	14,107	14,708	15,187	15,532	15,353	15,675	14,758	14,430	-2.2	
Propylene glycol	429	443	316	305	329	1,987	2,179	723	773	593	na	na	
Propylene oxide	845	908	735	777	861	2,292	2,338	2,259	2,424	2,229	2,023	-9.2	
Styrene	2,989	3,215	958	3,078	3,215	6,220	4,963	4,380	4,656	4,032	2,982	-26.0	
Toluene	1,172	1,155	886	919	848	1,913	2,014	1,699	1,691	1,569	1,408	-10.3	
Vinyl acetate	718	644	457	667	502	881	800	910	946	na	na	na	
Xylenes	2,497	2,602	579	1,122	626	4,382	4,282	4,257	3,766	2,630	2,705	2.9	

NOTE: Data for 2010 were not available by C&EN's deadline. Data from 2005 forward are for 27 countries in the European Union; between 2002 and 2005, for 25 countries; and prior to 2002, for 15 countries. Thus, 10-year comparisons are not meaningful. **na** = not available. **SOURCE:** European Union, Association of Petrochemical Producers in Europe

U.S. INORGANICS

Production of all inorganics rose, with majority showing double-digit gains

THOUSANDS OF METRIC TONS	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	ANNUAL CHANGE	
												2009-10	2000-10
Ammonium nitrate (a)	7,237	5,833	6,436	5,733	6,558	6,541	6,411	7,475	7,111	6,297	6,878	9.2%	-0.5%
Chlorine	12,698	11,487	11,681	10,359	12,326	10,275	10,331	10,789	9,680	8,518	9,735	14.3	-2.6
Hydrochloric acid	4,278	3,969	4,037	4,179	5,301	4,618	4,232	4,223	3,808	3,433	3,556	3.6	-1.8
Phosphoric acid (P ₂ O ₅)	11,330	10,472	11,146	11,324	11,511	11,447	10,700	10,957	9,213	8,655	9,378	8.4	-1.9
Sodium chlorate	853	792	721	668	556	523	558	560	551	381	485	27.4	-5.5
Sodium hydroxide	10,451	9,811	9,459	8,793	9,618	8,519	8,061	8,044	7,357	6,568	7,520	14.5	-3.2
Sulfuric acid (b)	39,584	36,338	36,062	37,373	38,021	37,183	35,909	36,049	31,614	29,139	32,511	11.6	-1.9

a Original solution. **b** Gross (new and fortified). **SOURCES:** Department of Commerce, Bureau of the Census

PRODUCTION

CANADA INORGANICS

Large-volume inorganics reported strong increases in 2010

THOUSANDS OF METRIC TONS	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	ANNUAL CHANGE	
												2009-10	2000-10
Aluminum sulfate	167	170	176	171	167	175	164	199	224	210	175	-16.7%	0.5%
Carbon black	229	215	215	205	223	235	225	na	na	198	228	15.2	0.0
Chlorine	1,079	1,054	1,095	994	1,057	1,008	929	601	570	486	466	-4.1	-8.1
Hydrochloric acid	155	143	151	153	149	142	155	138	154	130	128	-1.5	-1.9
Hydrogen peroxide	237	203	222	226	244	244	na	236	247	217	217	0.0	-0.9
Nitric acid	1,074	1,054	1,143	1,105	1,219	1,147	1,180	1,132	821	502	513	2.2	-7.1
Sodium chlorate	1,107	1,082	1,055	1,129	1,183	1,169	1,111	1,073	1,072	865	1,007	16.4	-0.9
Sodium hydroxide	1,094	1,074	1,111	1,059	1,146	1,119	1,012	676	684	714	687	-3.8	-4.5
Sulfuric acid	3,804	3,846	3,887	3,465	3,933	3,743	3,823	3,833	4,098	3,412	3,755	10.1	-0.1

NOTE: Some data are not being released because of confidentiality requirements. **na** = not available. **SOURCE:** Statistics Canada

EUROPE INORGANICS

Production of inorganics declined across the board in 2009

THOUSANDS OF METRIC TONS UNLESS OTHERWISE INDICATED	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	ANNUAL CHANGE, 2008-09	
Carbon black	1,322	1,342	1,059	1,025	1,009	1,468	1,388	1,662	1,818	1,615	1,252	-22.5%	
Chlorine	9,219	9,697	9,265	9,222	9,525	10,396	10,382	10,315	9,734	10,116	9,058	-10.5	
Hydrochloric acid	2,098	2,050	2,608	4,142	3,784	5,165	6,002	3,071	3,531	3,121	3,024	-3.1	
Hydrogen (mcm)	2,252	2,196	5,553	7,519	8,962	10,690	11,251	6,526	8,000	9,000	8,000	-11.1	
Hydrogen peroxide	438	847	372	655	736	1,085	1,123	911	977	1,182	978	-17.3	
Nitrogen (mcm)	7,422	8,091	12,829	13,942	17,807	22,326	22,457	23,123	23,163	24,807	21,858	-11.9	
Oxygen (mcm)	5,592	5,965	12,678	19,026	22,554	27,112	27,824	27,754	28,525	29,558	23,741	-19.7	
Phosphoric acid (P ₂ O ₅)	995	692	2,463	3,921	3,574	4,304	4,257	703	671	638	426	-33.2	
Sodium carbonate	4,567	4,401	1,451	1,493	3,874	6,609	6,956	6,828	6,609	7,633	6,055	-20.7	
Sodium hydroxide	5,418	5,780	6,756	9,114	7,937	9,994	9,829	8,773	8,891	8,381	6,675	-20.4	
Sodium sulfate	2,237	2,314	1,806	2,951	3,082	3,406	3,565	3,221	3,103	2,831	2,490	-12.0	
Sulfuric acid (SO ₃)	7,109	6,598	8,157	13,835	12,746	16,584	16,609	9,739	9,577	9,313	7,851	-15.7	
Titanium oxides	433	538	na	440	419	588	602	623	626	614	473	-23.0	

NOTE: Data for 2010 were not available by C&EN's deadline. Data from 2005 forward are for 27 countries in the European Union; between 2002 and 2005, for 25 countries; and prior to 2002, for 15 countries. Thus, 10-year comparisons are not meaningful. **mcm** = millions of cubic meters. **na** = not available. **SOURCES:** European Union, Euro Chlor

JAPAN INORGANICS

Output of hydrogen peroxide and nitrogen exceeded recent highs

THOUSANDS OF METRIC TONS UNLESS OTHERWISE INDICATED	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	ANNUAL CHANGE	
												2009-10	2000-10
Ammonia	1,715	1,604	1,450	1,291	1,340	1,318	1,328	1,355	1,244	1,021	1,178	15.4%	-3.7%
Ammonium sulfate (a)	1,749	1,585	1,564	1,570	1,526	1,458	1,439	1,463	1,412	1,213	1,336	10.1	-2.7
Carbon black	788	742	755	788	804	805	827	835	821	575	729	26.8	-0.8
Chlorine, liquid	847	777	754	723	619	601	571	550	520	411	468	13.9	-5.8
Hydrochloric acid	2,494	2,342	2,317	2,363	2,324	2,308	2,326	2,343	2,387	2,069	2,272	9.8	-0.9
Hydrogen peroxide	151	159	167	176	196	197	221	218	214	175	216	23.4	3.6
Nitrogen (mcm)	10,290	10,296	10,455	10,835	11,281	11,435	11,998	12,696	13,211	11,686	13,612	16.5	2.8
Oxygen (mcm)	10,655	10,373	10,720	11,250	11,278	11,371	11,766	12,407	11,941	8,763	12,254	39.8	1.4
Sodium hydroxide	4,471	4,291	4,271	4,369	4,493	4,552	4,453	4,482	4,373	3,895	4,217	8.3	-0.6
Sodium silicate	720	679	622	596	577	546	541	524	471	409	429	4.9	-5.0
Sulfuric acid	7,059	6,727	6,763	6,534	6,444	6,546	6,843	7,098	7,227	6,396	7,037	10.0	0.0
Titanium dioxide	270	257	240	253	253	259	240	246	225	162	208	28.4	-2.6

a For agricultural and nonagricultural use. **mcm** = millions of cubic meters. **SOURCE:** Ministry of Economy, Trade & Industry

CHINA BASIC CHEMICALS

Methanol and sulfuric acid led their sectors in output growth

THOUSANDS OF METRIC TONS	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	ANNUAL CHANGE	
												2009-10	2000-10
ORGANICS													
Benzene (pure)	1,850	1,988	2,131	2,408	2,556	3,061	3,441	4,069	4,034	4,638	5,530	19.2%	11.6%
Caprolactam	164	152	170	201	228	214	291	299	290	na	na	na	na
Ethylene	4,743	4,807	5,414	6,118	6,266	7,555	8,765	10,477	10,256	10,697	14,188	32.6	11.6
Methanol (refined)	1,967	2,065	2,110	2,989	4,406	5,356	7,623	10,764	11,263	11,334	15,740	38.9	23.1
INORGANICS													
Hydrochloric acid (31%)	4,454	4,705	4,926	5,276	6,007	6,582	7,306	7,476	7,571	8,035	8,390	4.4	6.5
Sodium carbonate	9,199	9,144	10,189	11,075	12,668	14,211	15,972	17,718	18,813	20,014	20,293	1.4	8.2
Sodium hydroxide	7,123	7,880	8,227	9,399	10,603	12,400	15,118	17,593	18,522	18,910	20,866	10.3	11.3
Sulfuric acid	23,888	26,963	29,674	33,191	38,249	44,621	48,603	53,907	51,101	59,584	70,601	18.5	11.4

na = not available. **SOURCE:** China National Chemical Information Center

U.S. PLASTICS

Polyvinyl chloride and copolymers grew more rapidly than other resins last year

THOUSANDS OF METRIC TONS	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	ANNUAL CHANGE	
												2009-10	2000-10
Polyethylene													
Low-density (a,b)	3,436	3,491	3,647	3,540	3,763	3,558	3,586	3,596	3,176	3,024	3,057	1.1%	-1.2%
Linear low-density (a,b)	3,607	4,659	5,139	5,052	5,640	5,395	5,919	6,162	5,469	5,954	6,255	5.1	5.7
High-density (b,c)	6,336	6,933	7,243	7,125	7,960	7,328	7,966	8,265	7,369	7,691	7,660	-0.4	1.9
Polypropylene (d)	7,139	7,228	7,691	8,013	8,415	8,149	8,442	8,820	7,606	7,540	7,826	3.8	0.9
Polystyrene (e)	3,104	2,773	3,025	2,900	3,062	2,854	2,807	2,728	2,368	2,207	2,293	3.9	-3.0
Polyvinyl chloride & copolymers (d)	6,551	6,467	6,939	6,669	7,251	6,921	6,758	6,625	5,663	5,785	6,358	9.9	-0.3

a Density 0.940 and below. b Data include Canadian production from 2001. c Density above 0.940. d Data include Canadian and Mexican production. e Data include Canadian production. **SOURCE:** American Plastics Council

EUROPE PLASTICS

The recession squeezed plastics volumes in 2009

THOUSANDS OF METRIC TONS	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	ANNUAL CHANGE, 2008-09	
Polyethylene	10,223	10,579	11,487	11,599	11,942	13,859	14,529	13,550	14,043	13,868	12,558	-9.4%	
Polystyrene	675	331	2,410	2,550	2,540	1,790	1,859	na	na	na	na	na	
Acrylonitrile-butadiene-styrene	971	1,038	466	793	495	811	891	690	742	682	475	-30.4	
Polyvinyl chloride	3,209	4,893	5,681	6,531	6,694	6,485	6,594	7,008	6,885	7,375	5,940	-19.5	
Epoxy resins	393	419	215	464	356	633	693	801	788	719	580	-19.3	
Polypropylene	6,524	6,984	7,526	8,113	8,638	9,237	9,424	9,520	9,464	8,688	na	na	
Polyamides	766	1,412	1,209	1,833	1,769	2,052	2,119	1,940	1,963	1,828	1,539	-15.8	
Synthetic rubber	2,239	2,342	2,691	3,250	3,713	4,415	4,170	4,391	4,175	3,973	3,416	-14.0	

NOTE: Data for 2010 were not available by C&EN's deadline. Data from 2005 forward are for 27 countries in the European Union; between 2002 and 2005, for 25 countries; and prior to 2002, for 15 countries. Thus, 10-year comparisons are not meaningful. na = not available. **SOURCES:** European Union, Association of Petrochemical Producers in Europe

PRODUCTION

CANADA PLASTICS

Polyethylene saw a tiny increase in 2010

THOUSANDS OF METRIC TONS	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	ANNUAL CHANGE	
												2009-10	2000-10
Polyesters, unsaturated	120	115	113	139	100	90	81	62	53	33	38	15.2%	-10.9%
Polyethylene (a)	2,751	3,035	3,330	3,083	3,587	3,366	3,594	3,736	3,282	3,881	3,885	0.1	3.5
Polystyrene (b)	203	186	195	183	207	198	195	83	na	na	na	na	na

NOTE: Some data are not being released because of confidentiality requirements. **a** Includes high-, low-, and linear low-density polyethylene. **b** Includes acrylonitrile-butadiene-styrene. **na** = not available. **SOURCE:** Statistics Canada

ASIA PLASTICS

Most plastics enjoyed some growth last year

THOUSANDS OF METRIC TONS	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	ANNUAL CHANGE	
												2009-10	2000-10
JAPAN													
Polyethylene	3,342	3,294	3,176	3,165	3,238	3,240	3,166	3,232	3,089	2,805	2,964	5.7%	-1.2%
Polyethylene terephthalate	1,308	1,243	1,211	1,076	1,195	1,126	1,110	1,104	1,052	760	912	20.0	-3.5
Polypropylene	2,721	2,696	2,641	2,751	2,908	3,063	3,049	3,087	2,871	2,411	2,709	12.4	0.0
Polystyrene	2,024	1,810	1,837	1,801	1,824	1,734	1,745	1,749	1,596	1,245	1,385	11.2	-3.7
Polyvinyl chloride	2,410	2,195	2,225	2,164	2,153	2,151	2,146	2,162	1,797	1,668	1,749	4.9	-3.2
Epoxy resins	243	192	201	195	215	211	229	239	214	149	188	26.2	-2.5
Phenolic resins	262	232	242	261	287	280	284	295	287	227	284	25.1	0.8
Polycarbonate	354	370	386	409	411	431	413	418	347	280	369	31.8	0.4
Synthetic rubber	1,590	1,466	1,522	1,577	1,616	1,627	1,607	1,655	1,651	1,300	1,595	22.7	0.0
SOUTH KOREA													
Acrylonitrile-butadiene-styrene	777	932	1,120	1,143	1,105	980	1,077	1,145	1,056	1,192	1,243	4.3%	4.8%
Polyethylene, high-density	1,706	1,839	1,871	1,925	1,882	1,949	1,936	1,984	2,031	2,210	2,046	-7.4	1.8
Polyethylene, low-density	1,576	1,614	1,624	1,627	1,706	1,744	1,728	1,790	1,783	1,893	1,983	4.8	2.3
Polypropylene	2,413	2,485	2,622	2,811	2,930	3,013	3,040	3,240	3,391	3,756	3,931	4.7	5.0
Polystyrene	1,212	1,354	1,361	1,427	1,176	1,093	1,009	1,072	1,014	952	1,089	14.4	-1.1
Polyvinyl chloride	1,191	1,238	1,244	1,278	1,306	1,184	1,203	1,161	1,164	1,142	na	na	na
TAIWAN													
Acrylonitrile-butadiene-styrene	1,067	985	1,078	1,105	1,166	1,215	1,274	1,324	1,130	1,245	1,365	9.6%	2.5%
Polyester resin	198	204	219	212	185	168	162	168	144	114	120	5.3	-4.9
Polyethylene, high-density	306	510	507	547	537	515	521	577	512	578	544	-5.9	5.9
Polyethylene, low-density	273	477	492	536	609	663	597	700	623	661	691	4.5	9.7
Polypropylene	564	773	830	937	1,020	1,098	1,174	1,262	1,179	1,231	1,215	-1.3	8.0
Polystyrene	711	866	848	858	817	830	713	761	638	777	845	8.8	1.7
Polyurethane resin	185	170	189	193	214	195	191	184	169	164	205	25.0	1.0
Styrene-butadiene rubber	83	81	78	69	108	96	102	112	102	93	101	8.6	2.0
Polybutadiene rubber	50	52	52	54	56	53	50	54	50	53	59	11.3	1.7

na = not available. **SOURCES:** Japan's Ministry of Economy, Trade & Industry; Korea National Statistical Office, Republic of Korea; Petrochemical Industry Association of Taiwan; Taiwan's Ministry of Economic Affairs

U.S. SYNTHETIC FIBERS

All noncellulosic fibers bounced back, but cellulosic fibers remained unchanged

THOUSANDS OF METRIC TONS	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	ANNUAL CHANGE	
												2009-10	2000-10
NONCELLULOSIC FIBERS													
Nylon	1,215	1,019	1,112	1,115	1,142	1,082	1,023	937	732	592	616	4.0%	-6.6%
Olefin	1,461	1,316	1,397	1,374	1,388	1,403	1,290	1,294	1,090	922	1,037	12.5	-3.4
Polyester	1,775	1,474	1,494	1,391	1,492	1,403	1,304	1,235	1,061	907	1,088	19.9	-4.8
CELLULOSIC FIBERS													
Acetate (a) & rayon	158	103	81	75	67	49	27	27	27	27	27	0.0%	-16.1%

a Includes diacetate and triacetate; excludes production for cigarette filters. **SOURCE:** Fiber Economics Bureau

JAPAN SYNTHETIC FIBERS

Production rebounded in 2010, with nylon showing strongest growth

THOUSANDS OF METRIC TONS	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	ANNUAL CHANGE	
												2009-10	2000-10
Man-made (a)	1,643	1,564	1,416	1,316	1,279	1,249	1,209	1,193	1,071	835	923	10.5%	-6.5%
Polyester (a)	665	628	564	528	520	496	483	465	435	309	347	12.3	-7.4
Acrylic (b)	377	365	358	298	267	261	243	236	145	124	141	13.7	-10.5
Polypropylene (a)	111	117	114	116	120	125	127	127	125	107	114	6.5	0.2
Nylon (c)	176	162	126	121	121	118	118	117	112	74	93	25.7	-8.3

a Sum of staple and filament. b Staple only. c Filament only. **SOURCE:** Ministry of Economy, Trade & Industry

U.S. FERTILIZERS

Ammonia, monoammonium phosphate, and phosphoric acid had the strongest recoveries last year

THOUSANDS OF METRIC TONS	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	ANNUAL CHANGE	
												2009-10	2000-10
NITROGEN PRODUCTS													
Ammonia	13,438	10,455	11,306	10,475	9,164	8,945	7,209	7,888	8,226	7,609	8,600	13.0%	-4.4%
Ammonium nitrate	2,873	2,192	2,246	2,142	2,165	2,473	2,045	2,180	2,105	1,959	1,841	-6.0	-4.4
Ammonium sulfate	2,595	2,353	2,405	2,595	2,669	2,676	2,706	2,597	2,809	2,357	2,598	10.2	0.0
Urea	4,742	3,678	4,477	4,443	3,095	3,086	2,284	2,603	2,436	2,340	2,320	-0.9	-6.9
Nitrogen solutions	9,038	9,143	7,985	8,863	7,781	8,062	7,022	8,549	8,545	7,628	8,370	9.7	-0.8
PHOSPHATE PRODUCTS													
Diammonium phosphate	12,670	10,049	10,825	9,991	10,404	9,988	9,474	8,202	8,018	6,745	7,419	10.0%	-5.2%
Monoammonium phosphate	4,106	4,087	4,175	4,734	5,328	5,213	4,170	4,838	5,004	3,307	4,300	30.0	0.5
Phosphate rock	36,088	34,219	29,183	32,327	35,338	35,183	33,127	29,370	29,673	26,332	26,118	-0.8	-3.2
Phosphoric acid (P ₂ O ₅)	10,751	9,406	10,125	10,253	10,530	10,533	9,802	9,379	8,912	6,775	7,895	16.5	-3.0

NOTE: Years ending on June 30. Figures are based on Fertilizer Institute surveys and might not represent the entire industry. **SOURCE:** Fertilizer Institute

CANADA FERTILIZERS

Only ammonia saw production increase in 2010

THOUSANDS OF METRIC TONS	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	ANNUAL CHANGE	
												2009-10	2000-10
Ammonia	4,888	4,297	4,501	4,455	4,996	4,607	4,623	4,411	4,730	4,364	4,432	1.6%	-1.0%
Ammonium nitrate	1,110	1,174	1,152	1,031	1,096	1,206	1,181	1,188	1,277	1,064	1,053	-1.0	-0.5
Urea	3,887	3,363	3,436	3,311	3,654	3,549	na	3,574	3,837	3,884	3,675	-5.4	-0.6

NOTE: Some data are not being released because of confidentiality requirements. na = not available. **SOURCE:** Statistics Canada

EUROPE FERTILIZERS

Production of nitrogen fertilizers slumped in 2009

THOUSANDS OF METRIC TONS	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	ANNUAL CHANGE	
												2008-09	2008-09
Ammonium nitrate	897	721	687	1,505	1,168	6,656	6,138	2,394	2,379	2,366	2,245	-5.1%	-5.1%
Ammonium sulfate	566	675	1,442	769	832	1,735	1,703	1,382	1,643	1,997	2,049	2.6	2.6
Anhydrous ammonia	2,213	2,078	2,362	9,394	4,752	12,364	13,187	3,907	4,120	4,125	3,640	-11.8	-11.8
Nitric acid	264	153	600	612	2,378	6,581	6,326	849	906	922	1,025	11.2	11.2
Urea	600	725	214	947	767	2,407	2,822	2,560	2,525	2,412	2,345	-2.8	-2.8

NOTE: Data for 2010 were not available by C&EN's deadline. Data from 2005 forward are for 27 countries in the European Union; between 2002 and 2005, for 25 countries; and prior to 2002, for 15 countries. Thus, 10-year comparisons are not meaningful. **SOURCE:** European Union

54% Share of 2010 U.S. chemical imports from Europe

6% Share of 2010 U.S. chemical imports from China

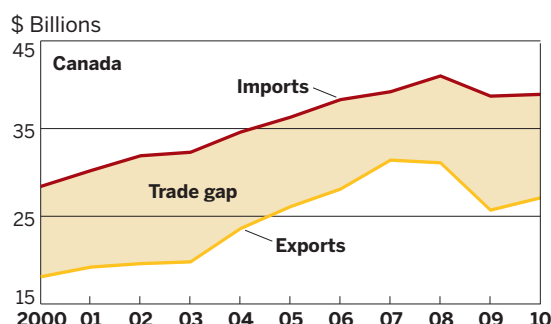
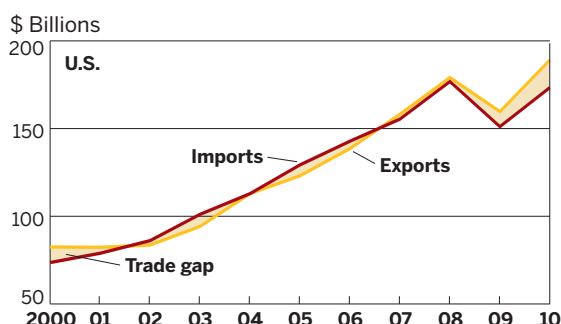
Increase in U.S. chemical exports in 2010: **18%**

Share of Canada's exports to U.S. in 2010: **76%**

Increase in U.S. organic chemical exports in 2010: **38%**

Chemicals' share of total U.S. manufacturing exports in 2010: **15%**

U.S. trade surplus grew, while Canada's gap narrowed in 2010



NOTE: Canadian trade data for all years were converted at the 2010 average exchange rate of \$1.00 U.S. = \$1.0298 Canadian.
SOURCES: U.S. Department of Commerce, Industry Canada, Statistics Canada

U.S. trade balance in plastics:

\$21.2 billion

U.S. trade balance in medicinals and pharmaceuticals:

-\$20.7 billion

Chinese imports of organic chemicals in 2010:

\$48 billion

Chinese chemical trade deficit in 2010:

\$18 billion

Ratio of European Union exports to Russia over EU imports from Russia:

3.4:1

GROWING ECONOMIES PUMP UP COMMERCE

Jump in **TRADE** was a measure of recovery for the chemical industry

IN THE DECADE through 2008, the value of chemical products shipped around the globe increased at a faster pace than chemical production. In 2009, the trade fervor finally took a break, but it resumed again with a bang last year, restarting a trend that the recession had interrupted.

In the U.S., trade ran ahead of the recovery; chemical exports in 2010 surpassed the 2008 high watermark, reaching a new peak of \$189.1 billion. Meanwhile, chemical production in the U.S. was still significantly down from its 2007 level.

The increase in demand for chemicals,

especially from economies growing faster than the U.S. economy, helped power a near-doubling of the U.S. chemical trade surplus to \$15.6 billion. In particular, the U.S. enjoyed a growing plastics surplus, and it shrank its trade deficit in organic chemical products in 2010 compared with 2009.

Trade with the developing world also boosted exports from Europe. On the plus side were European shipments to Brazil, China, India, and Russia, all of which grew by more than 20% in 2010. On the import side, Europe's imports of chemical

products decreased only from Canada.

Canada, the largest single-country trading partner of the U.S., whittled its trade deficit to \$12.6 billion from \$13.0 billion in 2009. The biggest swing came from basic chemicals, which changed from a \$342 million deficit to a \$426 million surplus in just one year.

South Korea and Japan continued to enjoy a healthy trade surplus in chemicals, as they have for many years. The amount of trade increased considerably in 2010, compared with a severe contraction in 2009. South Korea exported twice as many petrochemicals as it imported, for a surplus of just over \$20 billion. Japan's exports of high-value synthetic resins were responsible for more than half of the \$27.1 billion chemical trade surplus.

China, by contrast, is a major importer of chemicals, and it had an \$18.1 billion overall trade deficit in chemicals in 2010. Most of that gap was due to a shortfall in organic chemicals worth \$16.5 billion. China's fertilizer surplus was \$2.9 billion.

U.S. TOTAL TRADE

Chemical industry held on to its number two spot among exporting sectors

\$ BILLIONS	EXPORTS				IMPORTS			
	2007	2008	2009	2010	2007	2008	2009	2010
Machinery & transport equipment	\$536.4	\$556.6	\$441.4	\$520.7	\$738.7	\$721.2	\$569.7	\$714.1
Miscellaneous manufactures	127.1	134.1	119.9	133.9	293.8	290.0	247.6	287.3
Chemicals	158.2	179.1	159.7	189.1	155.4	176.8	151.1	173.4
Manufactured goods classified by material	112.5	125.0	94.6	119.5	227.2	231.7	152.0	194.5
Food & live animals	62.3	85.8	71.6	82.7	60.9	66.2	62.0	70.3
Crude materials, inedible (except fuels)	62.4	76.5	61.8	81.0	30.5	32.9	20.7	28.3
Mineral fuels & lubricants	42.0	76.5	54.7	80.7	360.9	487.9	270.3	353.5
Beverages & tobacco	5.4	5.5	5.0	5.5	17.3	17.2	15.6	16.7
Animal & vegetable oils, fats & waxes	2.9	4.4	3.2	4.3	3.3	5.1	3.7	4.2
Other	53.5	56.5	45.0	60.2	65.7	71.1	65.3	70.0
TOTAL	\$1,162.7	\$1,300.1	\$1,056.9	\$1,278.0	\$1,953.7	\$2,100.1	\$1,557.9	\$1,912.0

NOTE: Totals may not sum because of rounding. SOURCE: Department of Commerce

U.S. CHEMICAL TRADE, BY REGION

Trade with Latin America, Asia, and the Middle East soared

\$ MILLIONS	2007		2008		2009		2010		CHANGE, 2009-10	
	EXPORTS	IMPORTS	EXPORTS	IMPORTS	EXPORTS	IMPORTS	EXPORTS	IMPORTS	EXPORTS	IMPORTS
Europe	\$52,546	\$85,976	\$59,352	\$94,902	\$55,049	\$85,822	\$59,310	\$93,939	7.7%	9.5%
Canada	25,498	24,335	27,118	27,099	24,438	20,448	28,526	24,314	16.7	18.9
Latin America	34,345	10,358	40,123	12,893	33,208	7,912	41,238	10,218	24.2	29.1
Japan	9,373	8,599	10,636	8,731	8,943	7,809	11,766	9,140	31.6	17.0
China-Vietnam	8,648	7,315	9,588	10,823	10,437	8,593	13,052	10,788	25.1	25.5
Rest of Asia	19,593	12,290	23,075	13,612	19,006	13,382	25,212	15,076	32.7	12.7
Australia	2,843	843	3,299	893	3,050	892	3,291	999	7.9	12.0
Middle East	2,931	4,509	3,419	6,346	3,151	5,408	3,943	7,799	25.1	44.2
Africa	1,502	963	1,690	1,298	1,618	630	1,785	952	10.3	51.1
Other	911	171	835	227	779	177	966	225	24.0	27.1
TOTAL	\$158,190	\$155,359	\$179,137	\$176,825	\$159,678	\$151,073	\$189,089	\$173,449	18.4%	14.8%

NOTE: Totals may not sum because of rounding. SOURCE: Department of Commerce

EUROPE CHEMICAL TRADE, BY COUNTRY

Trade with Brazil, India, and Russia saw the sharpest increase

\$ MILLIONS	2007		2008		2009		2010		CHANGE, 2009-10	
	EXPORTS	IMPORTS	EXPORTS	IMPORTS	EXPORTS	IMPORTS	EXPORTS	IMPORTS	EXPORTS	IMPORTS
Brazil	\$5,734	\$2,338	\$6,759	\$2,887	\$6,711	\$2,463	\$9,206	\$2,787	37.2%	13.2%
Canada	6,880	2,607	6,518	3,029	6,466	3,157	7,148	2,795	10.5	-11.5
China	9,817	9,993	11,074	12,323	13,388	10,524	16,815	14,537	25.6	38.1
India	3,289	3,938	3,988	4,400	3,964	3,981	5,208	5,337	31.4	34.1
Japan	11,513	8,661	11,508	8,045	12,655	7,370	15,811	8,634	24.9	17.1
Russia	16,435	5,872	18,251	7,056	15,023	4,413	21,003	6,239	39.8	41.4
Saudi Arabia	3,236	3,433	3,681	3,309	3,958	2,124	4,950	3,698	25.1	74.1
South Korea	5,520	2,073	5,853	2,262	5,125	1,956	6,495	2,428	26.7	24.1
U.S.	72,846	47,515	70,664	46,235	71,807	44,953	80,216	52,238	11.7	16.2

NOTE: Data represent a total for 27 countries in the European Union. All figures were converted at the 2010 average exchange rate of \$1.00 U.S. = 0.7541 euros.
SOURCE: European Union

U.S. CHEMICAL TRADE, BY PRODUCT

Almost all sectors saw double-digit increases in exports and imports

\$ MILLIONS	2007		2008		2009		2010		CHANGE, 2009-10	
	EXPORTS	IMPORTS	EXPORTS	IMPORTS	EXPORTS	IMPORTS	EXPORTS	IMPORTS	EXPORTS	IMPORTS
Organic chemicals	\$34,407	\$42,238	\$34,815	\$47,773	\$28,152	\$42,145	\$38,806	\$45,825	37.8%	8.7%
Plastics in primary form	28,458	11,440	30,918	12,088	24,998	8,172	32,128	10,938	28.5	33.8
Medicinals & pharmaceuticals	33,464	53,688	38,225	59,565	44,244	59,910	44,607	65,270	0.8	8.9
Inorganic chemicals	10,958	13,375	13,094	16,832	10,531	10,793	12,133	13,830	15.2	28.1
Plastics in nonprimary form	9,278	6,811	10,059	6,830	8,849	5,519	10,822	6,886	22.3	24.8
Perfume, toilet & cleaning materials	10,645	8,870	12,149	9,564	11,680	8,404	13,173	9,565	12.8	13.8
Dyeing, tanning & coloring materials	5,906	3,116	6,367	3,074	5,700	2,423	7,578	3,104	32.9	28.1
Fertilizers	3,742	4,969	7,468	8,393	4,109	4,146	4,574	6,652	11.3	60.4
Other	21,332	10,852	26,041	12,706	21,416	9,561	25,268	11,377	18.0	19.0
TOTAL	\$158,190	\$155,359	\$179,137	\$176,825	\$159,678	\$151,073	\$189,089	\$173,449	18.4%	14.8%

NOTE: Totals may not sum because of rounding. SOURCE: Department of Commerce

ASIA CHEMICAL TRADE, BY PRODUCT

Value of chemical exports and imports surged

\$ MILLIONS	2007		2008		2009		2010		CHANGE, 2009-10	
	EXPORTS	IMPORTS	EXPORTS	IMPORTS	EXPORTS	IMPORTS	EXPORTS	IMPORTS	EXPORTS	IMPORTS
CHINA										
Inorganic chemicals	\$9,661	\$6,417	\$13,354	\$9,191	\$7,817	\$6,218	\$11,765	\$9,956	50.5%	60.1%
Organic chemicals	20,597	34,826	29,125	39,301	24,198	36,174	31,459	48,232	30.0	33.3
Pharmaceutical products	2,053	3,451	2,881	4,886	3,450	6,020	4,485	7,236	30.0	20.2
Fertilizers	3,737	2,906	4,383	3,482	2,584	1,993	5,431	2,572	110.2	29.1
Dyes & pigments	3,577	3,806	3,713	4,023	3,068	3,592	4,310	4,426	40.5	23.2
Other (a)	11,490	17,163	15,450	16,078	12,909	15,424	17,540	20,730	35.9	34.4
TOTAL	\$51,115	\$68,569	\$68,906	\$76,961	\$54,026	\$69,421	\$74,990	\$93,152	38.8%	34.2%
JAPAN										
Organic chemicals	\$20,751	\$13,024	\$20,228	\$15,606	\$18,866	\$14,078	\$22,072	\$16,216	17.0%	15.2%
Inorganic chemicals	4,101	6,967	5,116	8,542	3,510	5,521	4,484	7,922	27.7	43.5
Synthetic resins	22,047	10,183	23,814	12,101	21,702	9,788	29,237	12,675	34.7	29.5
Photographic materials	4,684	406	4,641	383	3,890	370	4,681	392	20.3	5.9
Fertilizers	130	787	225	1,627	99	862	146	850	47.5	-1.4
Dyes & pigments	3,621	1,264	3,997	1,501	3,655	1,134	4,808	1,536	31.5	35.4
Rubber	10,450	4,268	11,749	5,455	9,686	3,463	12,830	5,399	32.5	55.9
Other	17,016	17,555	18,453	20,341	15,837	21,828	20,677	26,872	30.6	23.1
TOTAL	\$82,800	\$54,454	\$88,223	\$65,556	\$77,245	\$57,044	\$98,935	\$71,862	28.1%	26.0%
SOUTH KOREA										
Chemicals & chemical products	\$37,545	\$32,433	\$42,710	\$36,658	\$37,415	\$31,505	\$48,951	\$41,148	30.8%	30.6%
Petrochemicals (b)	28,824	11,624	32,124	12,319	27,466	9,535	35,715	13,301	30.0	39.5

NOTE: Totals may not sum because of rounding. a Calculated by C&EN. b Defined as synthetic resins, synthetic fiber raw materials, and synthetic rubber.

SOURCES: General Administration of Customs of the People's Republic of China; Japan Chemical Exporters & Importers Association; Korea National Statistical Office, Republic of Korea; Korea Petrochemical Industry Association

CANADA CHEMICAL TRADE, BY PRODUCT

Exports of basic chemicals saw the largest increase compared to last year

\$ MILLIONS	2007		2008		2009		2010		CHANGE, 2009-10	
	EXPORTS	IMPORTS	EXPORTS	IMPORTS	EXPORTS	IMPORTS	EXPORTS	IMPORTS	EXPORTS	IMPORTS
Basic chemicals	\$11,983	\$9,998	\$10,566	\$10,241	\$7,797	\$8,139	\$9,491	\$9,064	21.7%	11.4%
Resin, synthetic rubber & fibers	7,183	6,603	7,292	6,793	5,036	5,303	5,823	6,385	15.6	20.4
Pesticides, fertilizers & other agricultural chemicals	1,629	1,695	2,332	2,335	1,597	1,995	1,548	1,914	-3.1	-4.0
Pharmaceuticals & medicine	6,605	11,979	6,572	12,320	7,350	14,116	5,992	12,945	-18.5	-8.3
Other chemical products	4,003	8,984	4,306	9,245	3,930	9,204	4,271	9,398	8.7	2.1
TOTAL	\$31,403	\$39,259	\$31,068	\$40,932	\$25,710	\$38,756	\$27,125	\$39,706	5.5%	2.5%
TOTAL WITH U.S.	\$22,735	\$23,707	\$23,731	\$24,068	\$19,443	\$22,387	\$20,549	\$23,686	5.7%	5.8%
U.S. SHARE	72.4%	60.4%	76.4%	58.8%	75.6%	57.8%	75.8%	59.7%		

NOTE: Monetary statistics for all years were converted at the 2010 average exchange rate of \$1.00 U.S. = \$1.0298 Canadian. Totals may not sum because of rounding.
SOURCES: Industry Canada, Statistics Canada

U.S. CHEMICAL TRADE BALANCE, BY PRODUCT

Trade surplus nearly doubled, aided by growing plastics surplus, shrinking organics deficit

\$ MILLIONS	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Organic chemicals	-\$9,632	-\$12,680	-\$13,373	-\$12,425	-\$8,835	-\$11,304	-\$11,900	-\$7,831	-\$12,958	-\$13,993	-\$7,019
Plastics in primary form	7,439	7,189	7,471	7,761	9,858	10,380	12,475	17,018	18,830	16,826	21,190
Medicinals & pharmaceuticals	-1,572	-3,203	-8,570	-12,307	-11,123	-13,087	-16,848	-20,224	-21,340	-15,666	-20,663
Inorganic chemicals	-582	-463	-406	-1,663	-1,833	-2,315	-2,172	-2,417	-3,738	-262	-1,697
Plastics in nonprimary form	1,983	1,715	1,656	1,710	1,682	1,678	1,899	2,467	3,229	3,330	3,936
Perfume, toilet & cleaning materials	2,005	2,278	1,940	1,246	794	483	1,163	1,775	2,585	3,276	3,608
Dyeing, tanning & coloring materials	1,529	1,399	1,619	1,801	2,021	2,048	2,406	2,790	3,293	3,277	4,474
Fertilizers	796	357	643	422	316	-496	-271	-1,227	-925	-37	-2,078
Other	6,944	6,857	6,556	6,558	7,038	7,446	9,053	10,480	13,335	11,855	13,891
TOTAL	\$8,910	\$3,449	-\$2,464	-\$6,897	-\$82	-\$5,167	-\$4,195	\$2,831	\$2,312	\$8,605	\$15,640

NOTE: Totals may not sum because of rounding. **SOURCE:** Department of Commerce

CANADA CHEMICAL TRADE BALANCE, BY PRODUCT

Trade deficit shrank for the first time since 2007

\$ MILLIONS	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Basic chemicals	-\$979	-\$1,225	-\$1,152	-\$1,368	-\$744	\$10	\$160	\$1,985	\$325	-\$342	\$426
Resin, synthetic rubber & fibers	-361	-56	-406	-227	152	105	453	580	499	-268	-561
Pesticides, fertilizers & other agricultural chemicals	-175	-338	-245	-368	-75	147	20	-65	-4	-397	-366
Pharmaceuticals & medicine	-3,990	-4,600	-5,359	-5,480	-5,390	-5,528	-5,755	-5,374	-5,748	-6,766	-6,953
Other chemical products	-4,750	-4,696	-5,187	-5,066	-4,898	-4,973	-4,996	-4,982	-4,938	-5,274	-5,128
TOTAL	-\$10,255	-\$10,915	-\$12,349	-\$12,509	-\$10,956	-\$10,241	-\$10,117	-\$7,857	-\$9,865	-\$13,047	-\$12,581

NOTE: Monetary statistics for all years were converted at the 2010 average exchange rate of \$1.00 U.S. = \$1.0298 Canadian. Totals may not sum because of rounding.
SOURCES: Industry Canada, Statistics Canada