

GYP SUM

By Ronald F. Balazik

The gypsum industry in the United States was distinguished by several notable developments in 1997—(1) mined output reached a record high in response to strong demand for wallboard and other gypsum products used in the construction industry, (2) trends toward the increasing use of byproduct gypsum generated by various industrial processes became more prominent as consumption of the material grew significantly and leading producers announced plans to build plants that will use only byproduct gypsum, and (3) several gypsum companies implemented plans to modernize and expand their wallboard production capacity in anticipation of greater market demand. Growing production and demand, as well as increasing use of byproduct gypsum, also characterized the industry in other parts of the world during the year. Details on these developments and others are provided in the text and tables that follow.

Gypsum industry data for this report¹ are collected by the U.S. Geological Survey (USGS) from monthly, semiannual, and annual surveys of gypsum operations and derived from statistics provided by the Gypsum Association in Washington, DC. The 1997 USGS survey, which canvassed more than 100 gypsum production operations, accounting for almost all domestic output, had a response rate of 93%. The output of producers who did not respond to the survey was estimated from their survey responses in previous years or from other sources familiar with the gypsum industry.

Production

In 1997, the United States continued to be the world's leading gypsum producer, accounting for 18% of reported global output. Domestic output of crude gypsum rose by 6% during the year to a record high of 18.6 million metric tons. (See table 1.)

Crude gypsum was mined in the United States by 30 companies at 61 mines in 20 States. The top producing States (in descending order) were Oklahoma, Texas, Iowa, Michigan, California, Nevada, and Indiana. These States, with 36 mines, produced more than 1 million tons each and together accounted for 73% of total domestic output. (See table 2.)

Companies with the most mines were U.S. Gypsum Co., 11; Georgia-Pacific Corp., 8; National Gypsum Co., 7; and Harrison Gypsum Inc., 3. These companies produced almost two-thirds of total U.S. crude gypsum. The 10 largest gypsum mines in the United States accounted for 41% of domestic output in 1997. These mines, owned by six companies, had an average output of 770,000 tons.

During 1997, gypsum was “calcined” (i.e., partially dehydrated by heating) at 62 plants operated by 10 companies in 27 States,

principally to produce feedstock for wallboard and plaster plants. The leading States, in descending order, were California, Florida, Texas, Iowa, Oklahoma, Indiana, and New York. These States, with 25 plants, accounted for 48% of national output. (See table 3.)

Companies with the most calcining plants were U.S. Gypsum, 20; National Gypsum, 18; Georgia-Pacific, 12; and Celotex Corp., 4. These companies produced 82% of national output. The largest 10 calcining plants in the United States accounted for more than one-third of domestic production in 1997. These plants, owned by seven companies, had an average output of more than 542,000 tons.

In addition to mined gypsum, byproduct gypsum is generated by various industrial processes, including flue gas desulfurization (FGD) at coal-burning electric powerplants. Byproduct gypsum is used as a substitute for mined gypsum, principally for wallboard manufacturing, agricultural purposes, highway construction, and cement production. In response to USGS surveys, seven companies operating in five States reported that 2.3 million tons of byproduct gypsum generated by industrial processes in their plants were sold or provided for such uses in 1997. In addition to these companies, about 60 domestic coal-fired electric utilities generated 21.2 million tons of FGD gypsum during 1997. Only 1.8 million tons of the FGD material generated in 1997 was used, primarily for wallboard production (American Coal Ash Association, 1997). Use of FGD gypsum, however, has been increasing in recent years, and reportedly grew by more than 30% in 1997.

During 1997, 13 companies manufactured gypsum wallboard products at 78 plants in the United States. In response to growing demand, plant production capacity expanded to 2.49 billion square meters (26.9 billion square feet) during the year; plans for additional capacity increases were announced by several leading producers, such as Georgia Pacific, National Gypsum, and U.S. Gypsum (Tradeship Publications, 1997). Wallboard shipments totaled 2.26 billion square meters (24.4 billion square feet), or 91% of production capacity.

Four major domestic producers also continued with their plans to build six new wallboard plants designed to use only FGD gypsum from electric utilities. The plants will be constructed in Alabama, Indiana, Missouri, Pennsylvania, and Tennessee. When operational within the next few years, the new plants will significantly increase the amount of byproduct gypsum used in wallboard manufacturing. Some gypsum companies are planning to expand FGD use at existing wallboard plants as well. It is estimated that more than a dozen wallboard plants in the United States already use some byproduct gypsum to augment their feedstock from gypsum mines.

A total of more than 4 million tons of gypsum waste probably

¹Except where noted, all quantities cited herein are in metric units.

is generated every year by wallboard manufacturing, wallboard installation, and building demolition. A portion of the scrap is recycled, but most is discarded, primarily to landfills. The recycled gypsum is used chiefly for agricultural purposes and new wallboard (Turley, 1998; Integrated Waste Management Board, December 18, 1997, Drywall recycling, accessed February 9, 1998, at URL [http://www.ciwmb.ca.gov/mrt/cnstdemo/factsht/dwall_t5 .htm](http://www.ciwmb.ca.gov/mrt/cnstdemo/factsht/dwall_t5.htm)).

Consumption

Increased construction of new homes, commercial buildings, and office space stimulated wallboard demand and boosted gypsum consumption in the United States to a record high during 1997. Apparent domestic consumption² reached 31 million tons during the year. Domestic sources (mining plus a reported 3.9 million tons of byproduct gypsum) met 73% of domestic consumption requirements; remaining needs were satisfied with imports.

Gypsum output is categorized as either calcined or uncalcined. (See table 4.) Calcined gypsum was produced domestically for use in wallboard and plaster products during 1997. Uncalcined gypsum used for portland cement production and agriculture accounted for virtually all remaining consumption.

Most of the calcined gypsum consumed in wallboard manufacturing during 1997 was used to produce regular ½-inch wallboard and special fire-resistant wallboard. Mobile-home board, water- and moisture-resistant board, lath, veneer base, and sheathing composed almost all of the balance. (See table 5.) The leading sales areas for gypsum wallboard products, in descending order, were the South Atlantic, East-North-Central, West-South-Central, and Pacific regions of the United States.

During 1997, most of the uncalcined gypsum consumed in the United States was used in portland cement production, and the remainder was used primarily for agricultural purposes.

Gypsum, which is added to cement to retard its setting time, comprised about 2% to 5% of cement output (Dutton, 1997). Finely ground gypsum rock is used in agriculture to neutralize acidic soils, to improve soil permeability, to add calcium and sulfur, and to provide catalytic support for maximum fertilizer benefits. Small amounts of pure gypsum also are used in a wide range of industrial operations, including glassmaking, papermaking and production of pharmaceuticals.

Prices

The average values per ton (f.o.b. mine or plant) reported by producers for 1997 were \$7.11 for crude gypsum and \$17.58 for calcined gypsum. The average per-ton values reported for plaster, wallboard, and uncalcined gypsum products were \$131, \$100, and \$12, respectively. The reported value of byproduct gypsum (excluding FGD material) was \$4.68 per ton in 1997. Estimated prices for uncalcined gypsum delivered to agricultural markets and cement plants ranged from \$15 to \$40 per ton, depending on

²Apparent consumption is defined as mine output plus net imports, industry stock changes, and byproduct use.

transport mode and distance shipped.

Mid-year prices for comparable gypsum wallboard products in 20 U.S. cities varied considerably in 1997. Regular ½-inch wallboard prices per 93 square meters (1,000 square feet) ranged from \$93 in Cincinnati to \$245 in Detroit. The average year-end price for the 20 cities was \$164 per 93 square meters, or about \$9 more than at the beginning of the year (Stussman, 1997).

Foreign Trade

The United States is the world leader in the international trade of gypsum and gypsum products; in 1997, crude gypsum was imported from 13 countries, and gypsum wallboard was exported to 54 countries and territories. The imports accounted for most of the world's waterborne shipment of crude gypsum (Phillips, 1998). Only a small amount of crude gypsum was exported by the United States. (See tables 6 and 7.)

Net imports of crude gypsum, which increased slightly during the year, accounted for almost one-third of apparent consumption. Much of this import dependence can be attributed to the lack of adequate gypsum resources near large East Coast wallboard markets. Canada and Mexico, the major U.S. sources of crude gypsum imports, primarily supplied wallboard plants in coastal markets; most imports from Canada went to East Coast plants, while Mexican sources chiefly served the West Coast. Foreign subsidiaries of domestic gypsum companies produced much of the gypsum that was imported for the wallboard plants. Smaller amounts of imported gypsum were used for portland cement production as well.

Wallboard exports totaling about 8.5 million square meters (92 million square feet) and valued at \$24 million were shipped to 72 countries and territories, primarily in Asia, Europe, and Latin America. Wallboard imports were about 94 million square meters (1 billion square feet), valued at \$113 million. The imports were from four countries, but virtually all came from Canada and Mexico.

World Review

More than 90 countries produced gypsum throughout the world in 1997. (See table 8.) In 1997, global production of gypsum is estimated to have reached at least 104 million tons, a record high.³ This estimate probably is low because, in some countries, output that is used by the gypsum producers themselves to make other products onsite was not reported. Moreover, production from small deposits in developing countries was intermittent and frequently unreported.

As a low-value, high-bulk commodity drawn from deposits widely distributed throughout the world, gypsum tends to be consumed within the many countries that mine it. Less than 20% of the world's crude gypsum production is estimated to enter international trade. Nevertheless, a few countries are significant exporters. Canada and Mexico, for example, export much of their output to large, nearby markets in the United States.

Industrialized nations, such as the United States, use gypsum

³An equal amount of byproduct gypsum also may have been generated worldwide.

primarily for wallboard products. In developing countries (particularly those of Asia), however, most gypsum is used by cement plants.

Estimated world production capacity for gypsum wallboard in early 1997 was at least 5 billion square meters (54 billion square feet) at approximately 240 plants worldwide (Miels, 1996). Most of this capacity was in the United States (45%), Western Europe (20%), and Asia (20%). Plans for the construction and/or expansion of wallboard plants in at least 10 countries (for example, China, Germany, and the United States) were reported during the year (White, 1998).

As in the United States, the use of FGD gypsum by other industrialized nations is expected to increase, particularly in Japan and Western Europe. Japan leads the world in FGD gypsum consumption, and FGD gypsum accounts for about one-third of gypsum products sold in Western Europe (White, 1998).

The largest gypsum mine in Australia was opened in 1997. The mine, located near Carnarvon in western Australia, reportedly encompasses the largest known gypsum deposit in the world (White, 1998).

Outlook

Early indicators suggest that the gypsum production and consumption records set in the United States and abroad during 1997 may be sustained and even exceeded during the next few years. Supply and demand trends favoring more gypsum industry growth include the continued rise of new home construction in the United States and the expansion of wallboard plant capacity worldwide. Moreover, new Federal transportation legislation,⁴ which authorizes \$200 billion for improving the U.S. highway system, will be a very important demand stimulant for gypsum used by the domestic cement industry. Later in the next century, however, the use of mined gypsum may decline notably, at least in the United States, when larger quantities of FGD gypsum supplement it as a feedstock for wallboard manufacturing.

Additional industry trends portend significant consequences in the coming decade. The pace and magnitude of wallboard plant

⁴The legislation (P.L. 105-178; enacted June 9, 1998) is titled, "Transportation Equity Act for the 21st Century," and will fund road building/repair through 2003.

construction in China, for example, indicates that the country will become one of the world's leading gypsum wallboard markets (Roskill Information Services, 1997). Elsewhere, the extent of wallboard capacity growth in many regions of Asia, Europe, and Latin America reveals that wallboard manufacturing is likely to become a more significant consumer of gypsum worldwide.

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⁵Prior to January 1996, published by the U.S. Bureau of Mines.

TABLE 1
SALIENT GYPSUM STATISTICS 1/

(Thousand metric tons and thousand dollars)

	1993	1994	1995	1996	1997
United States:					
Active mines and plants 2/	112	108	115	111	115
Crude:					
Mined	15,800	17,200	16,600	17,500	18,600
Value	\$107,000	\$115,000	\$121,000	\$124,000	\$132,000
Imports for consumption	7,390	8,470	8,160	8,050	8,420
Byproduct gypsum sales	846	950	1,220	2,420	3,080
Calcined:					
Produced	15,200	16,700	16,700	17,000 r/	17,200
Value	\$272,000	\$288,000	\$290,000	\$287,000 r/	\$302,000
Products sold (value)	\$1,780,000	\$2,630,000	\$2,120,000	\$2,380,000	\$2,550,000
Exports (value)	\$77,600	\$73,400	\$75,100	\$81,400	\$89,700
Imports for consumption (value)	\$111,000	\$141,000	\$166,000	\$196,000	\$229,000
World: Production	97,200 r/	96,400 r/	99,100 r/	103,000 r/	104,000 e/

e/ Estimated. r/ Revised.

1/ Data are rounded to three significant digits.

2/ Each mine, calcining plant, or combination mine and plant is counted as one establishment; includes plants that sold byproduct gypsum.

TABLE 2
CRUDE GYPSUM MINED IN THE UNITED STATES, BY STATE OR REGION 1/

State	1996			1997		
	Active mines	Quantity (thousand metric tons)	Value (thousands)	Active mines	Quantity (thousand metric tons)	Value (thousands)
Arizona and New Mexico	6	1,200	\$8,880	6	1,180	\$8,660
Arkansas, Kansas, Louisiana	5	1,580	12,400	5	1,870	16,600
California, Nevada, Utah	13	3,310	20,700	14	3,340	20,000
Colorado, South Dakota, Wyoming	7	883	6,720	7	862	6,070
Indiana, New York, Ohio, Virginia	5	1,950	19,200	5	1,990	18,200
Iowa	6	2,090	12,800	5	2,080	12,200
Michigan	5	1,590	14,400	5	1,920	17,300
Oklahoma	7	2,690	16,500	8	3,100	17,500
Texas	6	2,240	12,100	6	2,270	15,700
Total	60	17,500	124,000	61	18,600	132,000

1/ Data are rounded to three significant digits; may not add to totals shown.

TABLE 3
CALCINED GYPSUM PRODUCED IN THE UNITED STATES, BY STATE OR REGION 1/

State	1996			1997		
	Active plants	Quantity (thousand metric tons)	Value (thousands)	Active plants	Quantity (thousand metric tons)	Value (thousands)
Arizona, Colorado, New Mexico, Utah	5	1,150	\$9,300	5	1,210	\$9,100
Arkansas, Louisiana, Oklahoma	7	2,240	30,900	7	2,240	34,200
California	5	1,450	25,000 r/	5	1,520	26,600
Delaware, Maryland, North Carolina, Virginia	6	1,420	31,600 r/	5	1,350	31,200
Florida	3	1,290	30,900	3	1,360	30,000
Georgia	3	638	15,700	3	570	14,900
Illinois, Indiana, Kansas	6	1,270	21,700	6	1,530	30,000
Iowa	5	1,730	20,900	4	1,280	17,600
Massachusetts, New Hampshire, New Jersey	5	1,050	23,200	4	1,020	23,700
Michigan	4	544	12,400	4	592	13,300
Nevada	3	805	7,060	3	788	7,470
New York	4	1,010	18,100	3	852	14,800
Ohio	3	433 r/	9,300	3	479	9,820
Texas	5	1,320	18,900	4	1,330	21,900
Washington and Wyoming	3	636	12,000	3	1,050	17,100
Total	67	17,000 r/	287,000 r/	62	17,200	302,000

r/ Revised.

1/ Data are rounded to three significant digits; may not add to totals shown.

TABLE 4
GYPSUM PRODUCTS (MADE FROM DOMESTIC, IMPORTED,
AND BYPRODUCT GYPSUM) SOLD OR USED
IN THE UNITED STATES, BY USE 1/

(Thousands metric tons and thousand dollars)

Use	1996		1997	
	Quantity	Value	Quantity	Value
Uncalcined:				
Portland cement	5,310	59,000	5,120	55,800
Agriculture and miscellaneous 2/	2,280	35,000	2,750	41,300
Total	7,600	94,000	7,870	97,100
Calcined:				
Plasters	653	96,500	1,030	136,000
Prefabricated products 3/	21,200	2,180,000	23,200	2,310,000
Total calcined	21,900	2,280,000	24,200	2,450,000
Grand total	29,500	2,380,000	32,100	2,550,000

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Includes byproduct gypsum.

3/ Includes weight of paper, metal, or other materials and some byproduct gypsum.

TABLE 5
 PREFABRICATED GYPSUM PRODUCTS SOLD OR USED IN THE UNITED STATES 1/

Product	1996			1997		
	Thousand square feet	Thousand metric tons 2/	Value (thousands)	Thousand square feet	Thousand metric tons 2/	Value (thousands)
Lath:						
3/8 inch	5,360	3	\$1,160	5,050	3	\$1,140
1/2 inch	76	(3/)	16	285	(3/)	14
Other	9,510	10	2,470	5,520	4	172
Total	14,900	13	3,640	10,900	7	1,320
Veneer base	467,000	458	41,500	414,000	421	44,700
Sheathing	346,000	319	42,000	331,000	327	42,700
Regular gypsumboard:						
3/8 inch	868,000	785	75,600	772,000	744	79,200
1/2 inch	11,400,000	9,540	1,010,000	11,400,000	10,300	1,030,000
5/8 inch	1,750,000	1,750	100,000	1,760,000	1,900	110,000
1 inch	186,000	199	38,100	211,000	227	42,400
Other 4/	347,000	328	31,700	571,000	544	62,300
Total	14,500,000	12,600	1,250,000	14,700,000	13,700	1,320,000
Type X gypsumboard	5,840,000	5,790	556,000	6,240,000	6,430	597,000
Predecorated wallboard	89,600	87	30,700	90,400	90	31,600
5/16-inch mobile home board	1,630,000	1,200	156,000	1,600,000	1,200	154,000
Water-moisture-resistant board	703,000	640	88,100	747,000	722	99,600
Other	121,000	103	13,100	243,000	252	24,400
Grand total	23,700,000	21,200	2,180,000	24,400,000	23,200	2,310,000

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Includes weight of paper, metal, or other materials.

3/ Less than 1/2 unit.

4/ Includes 1/4-, 7/16-, and 3/4-inch gypsumboard.

TABLE 6
 IMPORTS FOR CONSUMPTION OF CRUDE GYPSUM, BY COUNTRY 1/

(Thousand metric tons and thousand dollars)

Country	1996		1997	
	Quantity	Value	Quantity	Value
Australia	3	72	24	311
Bahamas, The	163	759	--	--
Canada 2/	5,490	45,200	5,930	54,500
China	--	--	3	42
Dominican Republic	(3/)	31	(3/)	45
Hong Kong	(3/)	2	(3/)	3
Ireland	--	--	(3/)	1
Italy	(3/)	1	(3/)	124
Japan	(3/)	44	(3/)	36
Mexico	1,860	11,700	1,900	12,800
Philippines	(3/)	17	(3/)	27
Spain	541	4,400	559	4,870
United Kingdom	1	251	(3/)	170
Total	8,050	62,500	8,420	72,900

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Includes anhydrite.

3/ Less than 1/2 unit.

Source: Bureau of the Census.

TABLE 7
SUMMATION OF U.S. GYPSUM AND GYPSUM PRODUCTS TRADE DATA 1/

(Thousand metric tons and thousand dollars)

Year	Crude 2/		Plasters 3/		Boards 4/		Other 5/	Total
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Exports:								
1996	136	6,120	142	25,800	80	22,800	26,700	81,400
1997	174	10,100	224	29,800	78	24,100	25,700	89,700
Imports for consumption:								
1996	8,050	62,500	11	2,220	748	89,300	42,400	196,000
1997	8,420	72,900	9	2,100	847	113,000	41,200	229,000

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Import and export data are for "Gypsum; anhydrite," Harmonized Tariff Schedule 2520.10.0000.

3/ Import and export data are for "Plasters, " Harmonized Tariff Schedule 2520.20.0000.

4/ Import and export data are for " Boards, sheets, panels, tiles and similar articles, not ornamented -- faced or reinforced with paper or paperboard only," Harmonized Tariff Schedule 6809.11.0000.

5/ Import and export data are for "Boards, sheets, panels, tiles, and similar articles, not ornamented: other, " Harmonized Tariff Schedule 6809.19.000 and "Other articles," Hamonized Tariff Schedule 6809.90.0000.

Source: Bureau of the Census.

TABLE 8
GYPSUM: WORLD PRODUCTION, BY COUNTRY 1/ 2/

(Thousand metric tons)

Country	1993	1994	1995	1996	1997 e/
Afghanistan e/	3	3	3	3	3
Algeria e/	230 r/ 3/	230 r/	250 r/	250 r/	275
Angola e/	50	50	50	50	50
Argentina	519	550 r/	590 r/	633 r/	600
Australia e/	2,000	2,000	2,000	2,000	2,100
Austria 4/	876	1,069	873	996 r/	1,000
Azerbaijan e/	75	60	50	55	60
Bhutan	20 e/	45	52	55 r/	50
Bolivia	4 e/	1	2	(5/) r/	1
Bosnia and Herzegovina e/	30	30	30	30	30
Brazil 4/	906 r/	834 r/	953 r/	1,048 r/	1,050
Bulgaria 4/	143	--	163	169	150
Burma	28	38	35	38	39
Canada 4/	7,880	8,500	8,055	8,202 r/	8,503 p/
Chile	511	552	464 r/	520 r/	398 p/
China e/	10,600	6,820	7,340	7,780 r/	7,800
Colombia	439	450	450 e/	450 e/	450
Croatia	50 e/	50 e/	97	86	102 3/
Cuba e/	125	125	130	130	130
Cyprus	40	89	85 r/ e/	90 e/	90
Czech Republic	560	591	542	443 r/	450
Dominican Republic	86 r/	93 r/	95 r/	86 r/	113 3/
Ecuador	105 r/	108 r/	110 r/	100 r/	100
Egypt 4/	1,199	1,200 e/	2,032 r/	2,000 r/ e/	2,000
El Salvador e/	5	5	5	5	6
Eritrea	(5/)	(5/)	(5/)	(5/)	(5/)
Ethiopia e/ 4/ 6/	3	31	124 r/ 3/	124 r/	124
France 4/	5,000 e/	5,200	4,800	4,550 r/	5,000
Germany (marketable) 4/	2,678	2,264	2,829 r/	3,000 r/ e/	3,000
Greece 4/	446	454	485 r/	546 r/	500
Guatemala e/	75	89 3/	90	90	91
Honduras e/	26	26	26	26	28
Hungary 4/	125	150 e/	198	190 e/	190
India	1,805	1,730	1,744 r/	2,442 r/	2,500
Indonesia	2	1	1	1 e/	1
Iran 7/	7,799	8,430	8,230	8,300 e/	8,500
Iraq e/ 8/	300 r/	300 r/	250 r/	300 r/	300
Ireland	318	367	406	422 r/	400
Israel e/	48 3/	48	50 r/	50 r/	50
Italy	1,200 e/	1,361	2,362 r/	2,000 r/ e/	2,000
Jamaica	152	204	208	339 r/	264 3/
Japan	3,953	3,873	5,334	5,432 r/	5,500
Jordan	195	193	190 e/	190 e/	200
Kenya e/ 4/	36	30 r/	28 r/	28 r/	28
Laos e/	80	85	85	85	85
Latvia	300 e/	61	81	64 r/	117 3/
Lebanon e/	2	2	2	3 r/	3
Libya e/	160	180 r/	180 r/	180 r/	180
Luxembourg e/ 4/	(5/)	(5/)	(5/)	(5/)	(5/)
Macedonia e/	30	25	25	25	25
Mali e/	1	1	(5/) r/	1	1
Mauritania	3	4 r/	6 r/	9 r/	10
Mexico 4/	5,340	5,040	4,854	6,065 r/	5,869 3/
Moldova	25 e/	15	14	13 r/	14
Mongolia e/	25	25	25	25	58 3/
Morocco e/	450	450	450	450	450
Namibia e/	(5/)	(5/) 3/	--	--	--
Nicaragua e/ 4/	11 3/	11	13	13	13
Niger e/	2	2	2	2	2
Nigeria e/	20	20	150 3/	383	400
Pakistan	535	607	314	504	550

See footnotes at end of table.

TABLE 8--Continued
 GYPSUM: WORLD PRODUCTION, BY COUNTRY 1/ 2/

(Thousand metric tons)

Country	1993	1994	1995	1996	1997 e/
Paraguay e/	5	5	5	5	4
Peru e/	35	35	35	35	35
Philippines e/ 4/	-- r/	-- r/	-- r/	-- r/	--
Poland 4/	832	1,055	1,023	1,028 r/	1,000
Portugal e/ 4/	459 3/	450	450	450	450
Romania	100	124	111	91 r/	79 3/
Russia e/	1,500	1,200	1,200	850	800
Saudi Arabia	327	375 e/	370 r/	363 r/	365
Serbia and Montenegro	--	40	40	44	45
Sierra Leone e/	4	4	(5/)	(5/)	(5/)
Slovakia 4/	75	122	131	110	110
Slovenia e/	10	10	10	10	10
Somalia e/	2	2	2	2	2
South Africa	284	304	288	317	369 3/
Spain 4/	7,250	7,250 e/	7,495 r/	7,259 r/	7,400
Sudan e/ 4/	10	10	10	5	5
Switzerland e/	299 r/ 3/	298 r/ 3/	300 r/	300 r/	300
Syria	300	302	336	325 r/	325
Taiwan	3	3	3	3	3
Tajikistan e/	400	300	200	150	100
Tanzania 4/	1	8	1	9 r/	9
Thailand	7,455	8,140	8,533	8,934 r/	8,560
Tunisia e/	650	650	700	700	700
Turkey	493	597	597 r/	600 e/	600
Turkmenistan	200 e/	150 e/	216	170	85
United Arab Emirates e/	95	95	90	90	90
United Kingdom e/ 4/	2,500	2,500	2,000	2,000	2,000
United States 9/	15,800	17,200	16,600	17,500	18,600 3/
Uruguay e/	145	145	145	145	140
Venezuela	210 r/	135	100 r/	30 r/	50
Vietnam e/	30	30	30	30	30
Yemen e/	90 3/	80	80	80	80
Zambia e/ 8/ 10/	14 r/	11 r/	11 r/	11 r/	11
Total	97,200 r/	96,400 r/	99,100 r/	103,000 r/	104,000

e/ Estimated. p/ Preliminary. r/ Revised.

1/ World totals, U.S. data, and estimated data are rounded to three significant digits; may not add to totals shown.

2/ Table includes data available through July 15, 1998.

3/ Reported figure.

4/ Includes anhydrite.

5/ Less than 1/2 unit.

6/ Data are for years ending July 7 of that stated. Reported in cubic meters and estimated at mean weight of 1.5 tons per cubic meter. Data for 1993 probably does not include production for cement manufacture (normally 3%-5% of finished cement, equivalent of an additional 10,000 to 15,000 tons per year).

7/ Data are for years beginning March 21 of that stated.

8/ For cement production only. Information is insufficient to formulate reliable estimates for output for other uses (plaster, mortar, etc.).

9/ Excludes byproduct gypsum.

10/ Data are for years beginning March 1 of that stated.