

GYPSUM

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Gypsum, one of the most widely used minerals in the world, literally surrounds us every day. Most gypsum in the United States is used to make wallboard for homes, offices, and commercial buildings; every new American home contains more than 7 metric tons (t) of gypsum alone (Mineral Information Institute, 1994). Moreover, gypsum is used worldwide in concrete for highways, bridges, buildings, and many other structures that are part of our everyday life. Gypsum also is used extensively as a soil conditioner on large tracts of land in suburban areas, as well as in agricultural regions.

The gypsum industry in the United States was distinguished by several notable developments in 1998—robust demand for gypsum products in the construction industry drove mine production and domestic consumption to record highs, surpassing the previous records set in 1997; 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 continued construction of eight new wallboard plants that will only use byproduct gypsum, and in response to record-high market demand, several companies expanded existing wallboard plants, continued construction on new units, and announced plans for additional facilities. Increased wallboard demand and production capacity, as well as greater use of byproduct gypsum, also characterized the gypsum 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 report are collected by the U.S. Geological Survey (USGS) from semiannual and annual surveys of gypsum operations and are derived from monthly statistics provided by the Gypsum Association in Washington, DC. The 1998 USGS survey, which canvassed 115 gypsum production operations, accounting for almost all domestic output, had a response rate of 88%. 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 1998, the United States continued to be the world's leading gypsum producer, accounting for 18% of reported global output. During the year, domestic output of crude gypsum rose to a record high of 19 million metric tons (Mt) valued at \$132 million (table 1).

Crude gypsum was mined in the United States by 32 companies at 61 mines in 19 States. Most of the gypsum, however, was mined by only 3 companies with 26 mines. The top producing States were, in descending order, Oklahoma, Iowa, Texas, Michigan, California, Nevada, and Indiana.

These States, with 36 mines, each produced more than 1 Mt and together accounted for 72% of total domestic output (table 2).

The U.S. gypsum industry primarily consisted of a few large companies that mined gypsum, as well as manufactured wallboard, plaster, and other gypsum products. 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 40% of domestic output in 1998. These mines, owned by six companies, had an average output of 764,000 t.

During 1998, gypsum was “calcined” (partially dehydrated by heating) at 65 plants operated by 10 companies in 28 States, principally to produce feedstock for wallboard and plaster plants. The leading States were, in descending order, Iowa, California, Nevada, Texas, New York, and Florida. These States, with 25 plants, each produced more than 1 Mt and together accounted for almost one-half of national output (table 3).

Companies with the most calcining plants were U.S. Gypsum, 20; National Gypsum, 18; Georgia-Pacific, 14; and Celotex Corp., 4. These companies produced 79% of national output. The largest 10 calcining plants in the United States accounted for almost one-third of domestic production in 1998. These plants, owned by five companies, had an average output of more than 687,000 t.

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 was used as a substitute for mined gypsum, principally for wallboard manufacturing, agricultural purposes, highway construction, and cement production. In response to USGS surveys, six companies operating in five States reported that approximately 500,000 t of byproduct gypsum generated by industrial processes at their plants was sold or used for such applications in 1998. In addition to these companies, about 60 domestic coal-fired electric utilities generated more than 25 Mt of FGD gypsum during 1998. Only 2.5 Mt of the FGD material that was generated during the year was used, primarily for wallboard production (American Coal Ash Association, 1999). Use of FGD gypsum, however, has been increasing in recent years and reportedly grew by more than 30% in 1998.

During 1998, 11 companies manufactured gypsum wallboard products at 75 plants in the United States. In response to the growing demand, plant production capacity was expanded by 7%, to 28.8 billion square feet, by yearend (Gypsum Association, 1999); plans for additional capacity increases were announced by several leading producers, including National Gypsum and U.S. Gypsum (Sharpe, 1999). Wallboard

shipments totaled 26.9 billion square feet, or about 97% of production capacity.

During 1998, 6 gypsum companies were building or planning to build 13 new wallboard plants in response to the high market demand of recent years. All the new plants were scheduled to be operational by 2001 and may increase total domestic wallboard capacity by as much as 30% (Henkels, 1999). Of the new plants, 10, accounting for three-quarters of the new capacity, will use only FGD gypsum generated by electric utilities. Some gypsum companies were planning to expand FGD use at existing wallboard plants as well. At least a dozen wallboard plants in the United States may already use some byproduct gypsum to augment their feedstock from gypsum mines.

More than 4 Mt of gypsum waste was believed to be generated every year by wallboard manufacturing, wallboard installation, and building demolition. A portion of the scrap was recycled, but most is discarded, primarily to landfills. The recycled gypsum was used chiefly for agricultural purposes and new wallboard (Turley, 1998; Integrated Waste Management Board, December 1997, Drywall recycling, Publication 431-95-069, accessed July 1, 1999, at URL <http://www.ciwmb.ca.gov/condemo/factsheets/drywall.htm>).

Consumption

In 1998, the construction of new homes, commercial buildings, and office space stimulated wallboard demand and boosted gypsum consumption in the United States to a record high. Apparent domestic consumption¹ was about 31 Mt during the year. Domestic sources (mining plus an estimated 3 Mt of byproduct gypsum) met more than two-thirds of domestic consumption requirements; remaining needs were satisfied with imports.

Gypsum output is categorized as either calcined or uncalcined (table 4). Calcined gypsum was produced domestically from crude gypsum to manufacture wallboard and plaster products during 1998. Uncalcined gypsum used for portland cement production and agriculture accounted for virtually all remaining consumption during the year.

In 1998, almost one-half of the calcined gypsum used to manufacture wallboard was consumed for the production of regular 1/2-inch wallboard. Fire-resistant wallboard, mobile-home board, water- and moisture-resistant board, lath, veneer base, and sheathing composed almost all the balance (table 5). Metropolitan areas in the Atlantic and the Pacific coastal regions were the leading sales areas for gypsum wallboard products.

During 1998, 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 was added to cement to retard its setting time, composed about 2% to 5% of cement output (Dutton, 1997). Finely ground gypsum rock was used in agriculture and other industries to neutralize acidic soils, to improve soil permeability, to add nutrients, to stabilize slopes, and to provide catalytic support for maximum fertilizer benefits. Small amounts of high-purity gypsum also were used in a wide

¹Apparent consumption is defined as mine output plus net imports, industry stock changes, and byproduct use.

range of industrial operations, including the production of glass, paper, foods, and pharmaceuticals.

Prices

In 1998, the average values per ton (f.o.b. mine or plant) reported by U.S. producers were \$6.92 for crude gypsum and \$17.02 for calcined gypsum. The average value reported by domestic producers for plaster during the year was about \$7.00 per 100 pounds. In 1998, the average value of uncalcined gypsum for use in agriculture and for cement production was approximately \$14 per metric ton.

During 1998, prices for gypsum wallboard rose considerably in response to high demand coupled with supply shortages. Prices for regular 1/2-inch wallboard rose in 13 of the 20 major U.S. metropolitan areas that were sampled. The price increases ranged from \$5 to \$84 per 1,000 square feet. Prices in the 20 U.S. cities ranged from \$93 to \$265 per 1,000 square feet by yearend (Engineering News Record, 1998a, b).

Foreign Trade

In 1998, the United States was the world leader in the international trade of gypsum and gypsum products. Crude gypsum was imported from 13 countries, and gypsum wallboard was exported to 72 countries and territories (table 6). 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 (table 7).

Net imports of crude gypsum, which increased slightly during the year, accounted for about one-quarter of apparent consumption. Much of this import dependence can be attributed to the lack of adequate domestic gypsum resources near large East Coast wallboard markets. The imports came from five countries, but virtually all came from Canada and Mexico. The two countries primarily supplied wallboard plants in coastal markets; most imports from Canada went to East Coast plants, and Mexican sources chiefly served the West Coast. Foreign subsidiaries of U.S. 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.

Wallboard exports, totaling at least 77 million square feet and valued at \$24 million, were shipped primarily to countries and territories in Asia, Europe, and Latin America. Wallboard imports were about 1.2 billion square feet valued at \$137 million.

World Review

Although more than 90 countries produced gypsum in 1998, just 6 of them accounted for more than one-half of all output (table 8). Global gypsum production during the year is estimated to have reached at least 107 Mt.² The high demand generated for gypsum in the United States by the booming domestic construction industry apparently was not matched abroad, except in Mexico, which also exports to U.S. markets.

²More than 100 Mt of byproduct gypsum also may be generated worldwide each year (Roskill Information Services, 1997).

The estimate for world production, however, probably is low because output that is used by the gypsum producers in some countries to make other products onsite was not reported. Moreover, production from small deposits in developing nations was intermittent and frequently unreported.

As a low-value, high-bulk commodity drawn from deposits widely distributed throughout the world, gypsum tended to be consumed within the many countries that mine it. Less than 20% of the world's crude gypsum production was estimated to enter international trade. Nevertheless, a few countries, such as Spain and Thailand, were major exporters; export controls, however, reportedly may cripple Thai trade (Taura and Kawata, 1998). Australian exports were expected to grow as a new mine at the world's largest known gypsum deposit on that country's west coast reaches full capacity (Dickson, 1999). The proximity of large U.S. wallboard markets also has made Canada and Mexico significant gypsum exporters.

Although use of gypsum wallboard increased worldwide, only industrialized nations, such as the United States, used gypsum primarily for wallboard products. In developing countries (especially in the Middle East and Asia), most gypsum was used in the production of cement or as a cement itself.

Estimated world production capacity for gypsum wallboard in 1998 was at least 60 billion square feet at more than 250 plants worldwide. Approximately one-half of this capacity was in the United States; Asia and Western Europe each accounted for about one-fifth. Plans to construct and/or expand dozens of wallboard plants were underway during the year in many countries throughout the world, including Brazil, Chile, China, Germany, India, Poland, and the United Kingdom (White, 1998; Ambolt, 1999; Dickson, 1999; Mullick, 1999).

As in the United States, the use of FGD gypsum by other industrialized nations increased, particularly in Japan and Western Europe (Dickson, 1999). Japan probably led the world in FGD gypsum consumption, and FGD gypsum accounted for about one-third of gypsum products sold in Western Europe (Gypsum Lime & Building Products, 1998; White, 1998).

Outlook

Early evidence, such as building permits and housing starts, suggests that U.S. production and consumption records set for gypsum during 1998 will be matched or exceeded in 1999. Other supply-and-demand indicators that favor more gypsum industry growth include record high construction rates for new office and commercial space, as well as the continuing trend to construct larger homes with more rooms. Furthermore, Federal transportation legislation,³ enacted in 1998 and 1999 to authorize more than \$200 billion for improving the U.S. highway system, will be an important stimulant for the domestic cement industry and its use of gypsum.

During the next several years, the use of mined gypsum may decline significantly in the United States as greater quantities of byproduct gypsum supplant it in wallboard manufacturing. Some actual and planned mine closings already have been attributed to substitution by byproduct gypsum (Gersten, 1999). Moreover, at least an additional 6 billion square feet of new

wallboard capacity designed for FGD gypsum feedstock is scheduled to come online by 2002 (Henkels, 1999). This rate of substitution seems likely to accelerate additional mine closings during the next decade.

Industry trends also portend significant consequences abroad in the coming decade. The pace and magnitude of wallboard plant construction in China, for example, indicates that the country, with more than 1 billion potential consumers, could become one of the world's leading gypsum wallboard markets. Elsewhere, the extent of wallboard capacity growth in regions of Asia, Europe, and Latin America reveals that wallboard manufacturing is likely to become a more significant consumer of gypsum worldwide.

References Cited

- Ambolt, Lawrence, 1999, The European plasterboard industry: Gypsum, Lime & Building Products, April, p. 10-13.
- American Coal Ash Association, 1999, 1998 coal combustion byproduct and use: American Coal Ash Association, August, 3 p.
- Dickson, Ted, 1999, Gypsum, in Metals and minerals annual review—1998: Mining Journal, p. 119.
- Dutton, John, 1997, Global growth for gypsum: Gypsum, Lime & Building Products, April, 2 p.
- Engineering News Record, 1998a, Construction economics: Engineering News Record, v. 240, no. 3, January 19, p. 35-36.
- 1998b, Construction economics: Engineering News record, v. 241, no. 23, December 21, 1998, p. 153-154.
- Gersten, Alan, 1999, US housing boost for gypsum: Mining Finance, Issue 15, June, p. 32.
- Gypsum Association, 1999, Annual gypsumboard shipments & industry capacity: Washington, DC, Gypsum Association, January, 1 p.
- Gypsum, Lime & Building Products, 1998, Strengthening market for gypsum-based products: Gypsum, Lime, & Building Products, April, p. 5.
- Henkels, P.J., 1999, Synthetic gypsum use in wallboard: The 1999 SME Annual Meeting and Exhibit, Denver, March 1-3, handout, 5 p.
- Mineral Information Institute, 1994, Look around... everything is made from something: Denver, Mineral Information Institute, poster, 1 p.
- Mullick, A.K., 1999, Gypsum in India: Gypsum, Lime & Building Products, April, p. 22-29.
- Phillips, Keri, 1998, Buoyant global demand: International Bulk Journal, February, p. 55-59.
- Roskill Information Services, 1997, The economics of gypsum and anhydrite (7th ed.): London, Roskill Information Services, p. 19.
- Sharpe, R.D., 1999, Gypsum: Mining Engineering, v. 51, no. 6, June, p. 31-32.
- Taura, Yoshifumi, and Kawata, Katsuya, Export quotas crippling Thai gypsum trade: Global Gypsum, May, p. 14-16.
- Turley, William, 1998, What's happening in gypsum recycling: C&D Debris Recycling, v. 5, no. 1, p. 8-12.
- White, Davina, 1998, Gypsum supply—Building on firm foundations: Industrial Minerals, no. 364, January, p. 27-43.

SOURCES OF INFORMATION

U.S. Geological Survey Publications

Coal combustion products. Ch. in Minerals Yearbook, annual.

Gypsum. Ch. in Mineral Commodity Summaries, annual.⁴

Gypsum. Mineral Industry Surveys, monthly.⁴

Gypsum. Ch. in United States mineral resources, U.S. Geological Survey Professional Paper 820, 1973.

Other

Gypsum Association, Washington, DC.

Gypsum. Ch. in Mineral facts and problems, U.S. Bureau of Mines Bulletin 675, 1985.

³The multibillion-dollar legislation includes the Transportation Equity Act for the 21st Century (P.L. 105-178), which will fund road building and repair through 2003.

⁴Prior to January 1996, published by the U.S. Bureau of Mines.

TABLE 1
SALIENT GYPSUM STATISTICS 1/

(Thousand metric tons and thousand dollars)

	1994	1995	1996	1997	1998
United States:					
Crude:					
Mined	17,200	16,600	17,500	18,600	19,000
Value	\$115,000	\$121,000	\$124,000	\$132,000	\$132,000
Imports for consumption	8,470	8,160	8,050	8,420	8,680
Byproduct gypsum sales	1,800 r/	2,300 r/	2,500 r/	2,700 r/	3,000
Calcined:					
Produced	16,700	16,700	17,000	17,200	19,400
Value	\$288,000	\$290,000	\$287,000	\$302,000	\$330,000
Products sold, value	\$2,630,000	\$2,120,000	\$2,380,000	\$2,550,000	\$3,150,000
Exports, value	\$73,400	\$75,100	\$81,400	\$89,700	\$96,300
Imports for consumption, value	\$141,000	\$166,000	\$196,000	\$229,000	\$262,000
World: Production	96,300 r/	98,400 r/	104,000 r/	106,000 r/	107,000 e/

e/ Estimated. r/ Revised.

1/ Data are rounded to three significant digits.

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

	1997			1998		
	Active mines	Quantity (thousand metric tons)	Value (thousands)	Active mines	Quantity (thousand metric tons)	Value (thousands)
Arizona and New Mexico	6	1,180	\$8,660	6	1,590	\$9,490
Arkansas, Kansas, Louisiana	5	1,870	16,600	5	1,830	16,600
California, Nevada, Utah	14	3,340	20,000	15	3,410	18,600
Colorado, South Dakota, Wyoming	7	862	6,070	6	907	5,970
Indiana, New York, Ohio, Virginia	5	1,990	18,200	5	1,860	15,800
Iowa	5	2,080	12,200	6	2,320	15,100
Michigan	5	1,920	17,300	4	1,830	15,000
Oklahoma	8	3,100	17,500	8	3,020	19,500
Texas	6	2,270	15,700	6	2,260	15,500
Total	61	18,600	132,000	61	19,000	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	1997			1998		
	Active plants	Quantity (thousand metric tons)	Value (thousands)	Active plants	Quantity (thousand metric tons)	Value (thousands)
Arizona, Colorado, New Mexico, Utah	5	1,210	\$9,100	5	1,600	\$11,900
Arkansas, Louisiana, Oklahoma	7	2,240	34,200	7	2,100	29,000
California	5	1,520	26,600	6	1,480	24,200
Maryland, North Carolina, Virginia	5	1,350	31,200	5	1,400	32,500
Florida	3	1,360	30,000	3	1,230	26,600
Georgia	3	570	14,900	3	845	27,600
Illinois, Indiana, Kansas	6	1,530	30,000	6	1,570	29,400
Iowa	4	1,280	17,600	5	1,670	19,800
Massachusetts, New Hampshire, New Jersey	4	1,020	23,700	5	1,300	27,000
Michigan	4	592	13,300	3	814	11,800
Nevada	3	788	7,470	3	1,430	10,800
New York	3	852	14,800	4	1,380	39,400
Ohio	3	479	9,820	3	526	10,900
Texas	4	1,330	21,900	4	1,420	17,600
Washington and Wyoming	3	1,050	17,100	3	586	10,900
Total	62	17,200	302,000	65	19,400	330,000

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 USES 1/

(Thousand metric tons and thousand dollars)

Use	1997		1998	
	Quantity	Value	Quantity	Value
Uncalcined:				
Portland cement	5,120	55,800	5,120	67,600
Agriculture and miscellaneous 2/	2,750	41,300	2,840	42,100
Total	7,870	97,100	7,960	110,000
Calcined:				
Plasters	1,030	136,000	1,040	150,000
Prefabricated products 3/	23,200	2,310,000	25,300	2,890,000
Total	24,200	2,450,000	26,400	3,040,000
Grand total	32,100	2,550,000	34,300	3,150,000

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	1997			1998		
	Thousand square feet	Thousand metric tons 2/	Value (thousands)	Thousand square feet	Thousand metric tons 2/	Value (thousands)
Lath:						
3/8 inch	5,050	3	\$1,140	3,820	2	\$866
1/2 inch	285	(3/)	14	(3/)	(3/)	1
Other	5,520	4	172	12,700	10	2,180
Total	10,900	7	1,320	16,500	13	3,050
Veneer base	414,000	421	44,700	426,000	433	47,900
Sheathing	331,000	327	42,700	395,000	384	50,400
Regular gypsumboard:						
3/8 inch	772,000	744	79,200	790,000	737	102,000
1/2 inch	11,400,000	10,300	1,030,000	12,700,000	11,300	1,230,000
5/8 inch	1,760,000	1,900	110,000	2,040,000	2,130	163,000
1 inch	211,000	227	42,400	211,000	235	44,700
Other 4/	571,000	544	62,300	526,000	542	64,600
Total	14,700,000	13,700	1,320,000	16,200,000	14,900	1,610,000
Type X gypsumboard	6,240,000	6,430	597,000	6,890,000	7,050	816,000
Predecorated wallboard	90,400	90	31,600	83,900	85	29,400
5/16-inch mobile home board	1,600,000	1,200	154,000	1,680,000	1,340	170,000
Water- and moisture-resistant board	747,000	722	99,600	885,000	849	122,000
Other	243,000	252	24,400	243,000	234	46,200
Grand total	24,400,000	23,200	2,310,000	26,900,000	25,300	2,890,000

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	1997		1998	
	Quantity	Value	Quantity	Value
Australia	24	311	5	72
Canada 2/	5,930	54,500	5,530	47,600
China	3	42	(3/)	12
Dominican Republic	(3/)	45	(3/)	26
Germany	--	--	(3/)	2
Hong Kong	(3/)	3	(3/)	6
Ireland	(3/)	1	--	--
Italy	(3/)	124	(3/)	7
Jamaica	--	--	(3/)	2
Japan	(3/)	36	(3/)	23
Mexico	1,900	12,800	2,110	14,500
Philippines	(3/)	27	--	--
South Africa	--	--	17	177
Spain	559	4,870	1,020	7,840
United Kingdom	(3/)	170	(3/)	81
Total	8,420	72,900	8,680	70,300

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 value 5/	Total value
	Quantity	Value	Quantity	Value	Quantity	Value		
Exports:								
1997	174	10,100	224	29,800	78	24,100	25,700	89,700
1998	166	11,700	209	30,400	65	24,500	29,700	96,300
Imports for consumption:								
1997	8,420	72,900	9	2,100	847	113,000	41,200	229,000
1998	8,680	70,300	12	2,570	962	138,000	50,800	262,000

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," Harmonized Tariff Schedule 6809.90.0000.

Source: Bureau of the Census.

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

(Thousand metric tons)

Country	1994	1995	1996	1997	1998 e/
Afghanistan e/	3	3	3	3	3
Algeria e/	230	250	250	275	275
Angola e/	-- r/	-- r/	-- r/	-- r/	--
Argentina	550	590	633	697 r/	650
Australia e/	2,000	2,000	2,000	2,100	2,100
Austria 3/	1,069	873	996	1,000 e/	1,000
Azerbaijan e/	60	50	55	60	60
Bhutan	45	52	55	50 e/	53
Bolivia	1	2	(4/)	(4/) r/	--
Bosnia and Herzegovina e/	30	30	30	30	30
Brazil 3/	834	953	1,126 r/	1,396 r/	1,400
Bulgaria 3/	--	163	169	156 r/	160
Burma	38	35	38	38 r/	36
Canada 3/	8,500	8,055	8,202	8,628 r/	8,095 p/
Chile	552	464	520	398	781 5/
China e/	6,820	7,340	7,780	9,100 r/	9,000
Colombia e/	450 5/	450	522 r/	565 r/	570
Croatia	50 e/	97	86	102	100
Cuba e/	125	130	130	130	130
Cyprus	89	85 e/	150 r/ e/	222 r/	270 5/
Czech Republic	591	542	443	241 r/	250
Dominican Republic	93	95	86	113	81 5/
Ecuador	108	2 r/	2 r/	2 r/ 5/	2
Egypt e/ 3/	1,200	2,032 5/	2,000	2,000	2,000
El Salvador e/	5	5	5	6	6
Eritrea	(4/)	(4/)	(4/)	(4/) r/ 5/	(4/) 5/
Ethiopia e/ 3/	31	124 5/	124	120 r/	100
France 3/	5,200	4,800	4,550	4,500 r/	4,500
Germany (marketable) 3/	2,264	2,829	3,000 e/	3,000 e/	3,000
Greece 3/	454	485	546	500 e/	500
Guatemala e/	89 5/	90	28 r/ 5/	30 r/	30
Honduras e/	26	26	26	28	30
Hungary e/ 3/	150	198 5/	190	190	180
India	1,730	1,744	2,442	2,500 e/	2,400
Indonesia	1	1	1 e/	1 e/	1
Iran 6/	8,430	8,230	8,300 e/	8,900 r/ e/	9,000
Iraq e/ 7/	300	250	300	300	300
Ireland	367	406	422	400	450
Israel e/	48	50	50	50	50
Italy	1,361	2,362	2,000 e/	2,000 e/	2,000
Jamaica	204	208	339	264	270
Japan	3,873	5,334	5,432	5,371 r/	5,300
Jordan	193	190 e/	190 e/	194 r/	176 5/
Kenya e/ 3/	30	28	28	25 r/	25
Laos e/	102 r/ 5/	85	113 r/	145 r/	150
Latvia	61	81	64	117	120
Lebanon e/	2	2	3	3	3
Libya e/	180	180	180	180	180
Luxembourg e/ 3/	(4/)	(4/)	(4/)	(4/)	(4/)
Macedonia e/	25	25	25	25	25
Mali e/	1	(4/)	1	1	(4/)
Mauritania	4	6	9	10 e/	10
Mexico 3/	5,040	4,854	6,065	5,869	7,045 5/
Moldova	15	14	13	14 e/	14
Mongolia e/	25	25	25	25 r/	10
Morocco e/	450	450	450	450	450
Namibia e/	(4/) 5/	--	--	--	--
Nicaragua e/ 3/	11	13	13	13	14
Niger e/	2	2	2	2	2
Nigeria e/	10 r/	150 5/	383	300 r/	300
Pakistan	607	314	504	550 e/	249 5/

See footnotes at end of table.

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

(Thousand metric tons)

Country	1994	1995	1996	1997	1998 e/
Paraguay e/	5	5	5	4	5
Peru e/	35	35	35	35	35
Poland 3/	1,055	1,023	1,028	1,000 e/	1,000
Portugal e/ 3/	450	450	521 r/	500 r/	500
Romania	124	111	91	79	75
Russia	1,200 e/	697 r/	1,534 r/	559 r/	500
Saudi Arabia	375 e/	370	363	365 e/	365
Serbia and Montenegro	40	40	44	32 r/	35
Sierra Leone e/	4	(4/)	(4/)	(4/)	(4/)
Slovakia 3/	122	131	110 e/	110 e/	110
Slovenia e/	10	10	10	10	10
Somalia e/	2	2	1 r/	1 r/	2
South Africa	304	288	341 r/	365 r/	360
Spain 3/	7,250 e/	7,495	7,259	7,400 e/	7,400
Sudan e/ 3/	10	10	5	5	5
Switzerland e/	298 5/	300	300	300	300
Syria	302	336	325	325 e/	325
Taiwan	3	3	3	2 r/	2
Tajikistan e/	300	200	150	100	75
Tanzania 3/	8	1	9	9 r/ e/	9
Thailand	8,140	8,533	8,934	8,860 r/ e/	9,000
Tunisia e/	650	700	700	700	700
Turkey	597 e/	597	754	700 e/	750
Turkmenistan	150	216	170 r/	85 r/ e/	100
United Arab Emirates e/	95	90	90	90	90
United Kingdom e/ 3/	2,500	2,000	2,000	2,000	2,000
United States 8/	17,200	16,600	17,500	18,600	19,000
Uruguay e/	145	145	130 r/ 5/	183 r/ 5/	180
Venezuela	135	100	57 r/	30 r/	80
Vietnam e/	-- r/	-- r/	-- r/	-- r/	--
Yemen e/	80	80	80	80	80
Zambia e/ 7/ 9/	11	11	11	11	11
Total	96,300 r/	98,400 r/	104,000 r/	106,000 r/	107,000

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, 1999.

3/ Includes anhydrite.

4/ Less than 1/2 unit.

5/ Reported figure.

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

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

8/ Excludes byproduct gypsum.

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