



2016 Minerals Yearbook

GYPSUM [ADVANCE RELEASE]

GYPSUM

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In 2016, the United States ranked second worldwide in the production of crude mined gypsum, with 17.0 million metric tons (Mt) of production and a reported value of \$136 million. That represented a 3% increase in tonnage and a 5% increase in value from the revised 2015 production of 16.6 Mt valued at \$129 million. China was the world's leading producer and consumer of mined gypsum, with estimated production of 130 Mt of crude gypsum, followed by the United States (17 Mt) (table 7). The apparent consumption of gypsum in the United States increased by 3% to 37.9 Mt in 2016 from 36.6 Mt in 2015. Calcined gypsum production increased by 9% to 17.1 Mt in 2016 compared with 15.6 Mt produced in 2015.

The sales of synthetic gypsum increased by 3% to an estimated 16.5 Mt in 2016. Coal-burning powerplants in the United States are required to operate sulfur dioxide scrubbing systems, which results in the precipitation of large quantities of byproduct gypsum. Because byproduct gypsum is available at a substantially lower cost than its mined counterpart, a number of wallboard production facilities have been constructed adjacent to coal-fired electric powerplants. Since 2009, approximately 50% of the synthetic gypsum produced in the United States was neither sold nor used and in most cases was discarded (American Coal Ash Association, 2017).

Legislation and Government Programs

Several million tons of gypsum waste are generated every year during building demolition, wallboard installation, and wallboard manufacturing. Construction costs are lower when full pieces of uncut wallboard are used rather than multiple, smaller remnants. As a result, between 10% and 12% of the wallboard used in new construction and renovation is discarded as scrap and only a small part of this waste has been recycled. The most recent legislative action concerning the disposal of gypsum was in 2010 when the Massachusetts Department of Energy and Environmental Affairs banned the disposal of clean wallboard from State waste disposal facilities (Massachusetts Department of Energy and Environmental Affairs, 2011). To date, no other State has instituted a similar regulation that addresses the disposal of wallboard. As landfill space becomes scarcer, recycling is expected to increase. In addition to recycling scrap in wallboard plants, wallboard scrap may also be ground and used as a soil conditioner.

Wallboard manufacturers and the construction industry have been exploring ways to return scrap and waste wallboard to plants for recycling. Other potential markets for recycled gypsum include cement production, as a stucco additive, sludge drying, water treatment, grease absorption, and marking of athletic fields. Until costs and legislation associated with the disposal of scrap gypsum in landfills become more restrictive, recycling likely will continue to remain a low priority within the industry.

Imports of corrosive wallboard from China into the United States remained an issue, although new complaint reports have ceased. By yearend 2016, the U.S. Consumer Product Safety Commission received 4,051 reports of possible corrosive wallboard from residents in 44 States, the District of Columbia, American Samoa, and Puerto Rico. Most complaints were filed for homes constructed during 2006 and 2007 (U.S. Consumer Product Safety Commission, 2017). Sulfide gases emitted from the problematic drywall were suspected of damaging copper wiring and plumbing and also posed concerns for human health (Global Gypsum Magazine, 2010a). Following several years of complaints regarding corrosive wallboard imported from China, a class-action settlement among owners of approximately 20,000 affected single-family homes, most of which are located in Gulf Coast States and the southern United States, and Chinese wallboard manufacturer, Knauf Plasterboard Tianjin Co. Ltd., was settled on July 9, 2013, with claims accepted through October 25, 2013 (U.S. District Court, 2013). By March 2016, a total of 24,312 received claims had been reviewed with disbursed payments of \$82,565,727 under the Chinese Drywall Settlement Program (U.S. District Court, 2016).

Production

Industry data for gypsum were collected by the U.S. Geological Survey (USGS) from semiannual and annual surveys of gypsum operations and from quarterly data provided by the Gypsum Association. In 2016, the USGS annual survey canvassed 116 gypsum operations that accounted for all domestic output of crude, calcined, and byproduct gypsum. Data were available for all the operations through this survey, the Gypsum Association, the American Coal Ash Association, State agencies, and Federal agencies. Of the 116 operations, 5 did not respond to the survey and their respective production levels were estimated on the basis of prior reported production levels in conjunction with employment records published by the Mine Safety and Health Administration.

The United States was the world's second-ranked producer of crude gypsum in 2016, accounting for 7% of global output (table 7) and increasing from third-ranked in 2015. During 2016, crude gypsum in the United States was produced at 45 mines in 16 States (table 2). The leading crude-gypsum-producing States were, in descending order, Nevada, Oklahoma, Texas, Kansas, Iowa, Colorado, Arkansas, California, Utah, and Michigan, which together accounted for 84% of total domestic output.

The U.S. gypsum industry primarily consisted of a few large, vertically integrated companies that mined gypsum and manufactured wallboard, plaster, and other gypsum products. Companies with the highest production levels of crude gypsum were USG Corp. with nine mines, National Gypsum Co. with six mines, CertainTeed Corp. with four mines, American Gypsum Co. LLC with three mines, Georgia-Pacific LLC with three

mines, and PABCO Gypsum with one mine. In 2016, these six companies produced an estimated 55% of U.S. crude gypsum.

In 2016, domestic output of calcined gypsum increased by 9% to 17.1 Mt valued at \$513 million (table 1); 14.5 Mt of calcined gypsum was used in the production of plasters and prefabricated products (table 3).

In addition to crude gypsum production, synthetic gypsum was generated as a byproduct of various industrial processes. The primary source of synthetic gypsum was flue gas desulfurization (FGD) systems at coal-fired electric powerplants. Smaller quantities of synthetic gypsum were derived as byproducts of chemical processes such as acid neutralization, citric acid production, sugar production from sugar beets, and titanium dioxide production. Synthetic gypsum was used as a substitute for crude gypsum, principally for wallboard manufacturing, cement production, and agricultural purposes, in descending order of tonnage.

Approximately 400 synthetic gypsum producers synthesized an estimated 29.6 Mt of flue-gas desulfurized gypsum in 2015, the most recent year for which data were available. Of the total synthetic gypsum produced, only 16.7 Mt was sold or used in 2016, with a total estimated value of \$83.3 million. An estimated 57% of all synthetic gypsum produced in 2016 was neither sold nor used and in most cases was discarded (American Coal Ash Association, 2017).

In 2016, gypsum-derived products, including agricultural products, cement, plasters, and wallboard, totaled 21.3 Mt with a value of \$3.89 billion. This represented a 6% increase in tonnage and a 12% increase in value compared with the 20.1 Mt produced in 2015 valued at \$3.48 billion (table 3).

During 2016, seven companies manufactured gypsum wallboard products in the United States. Approximately 2.29 billion square meters (24.7 billion square feet) of wallboard products were shipped, which is a 12% increase compared with that of 2015 (table 4).

The decline in the U.S. housing market that began in 2007 and continued through 2010 resulted in flat and declining sales for most gypsum producers, which, in turn, led to layoffs and the idling of wallboard production plants (Crangle, 2011). However, beginning in late 2010 and continuing through 2016, housing starts, an indicator of gypsum consumption in residential construction, increased each year. In 2016, housing starts increased by 6% from those of 2015 (U.S. Census Bureau, 2017b).

Consumption

In 2016, U.S. apparent consumption of domestically sourced gypsum was 37.9 Mt, 3% more than that of 2015. Domestic sources (mined crude plus an estimated 16.5 Mt of synthetic gypsum sales) met approximately 89% of domestic consumption requirements; imports, totaling 4.34 Mt, satisfied the remaining need. Sales of synthetic gypsum were an estimated 3% more than those of 2015. Significant use of synthetic gypsum in place of mined gypsum is largely the result of the lower costs associated with the purchase and transportation of FGD gypsum, which is often located near wallboard production facilities.

Gypsum products are categorized as either calcined or uncalcined (table 3). Calcined gypsum is produced by heating

powdered natural or synthetic gypsum to approximately 350 degrees Fahrenheit, which partially dehydrates the gypsum to form a hemihydrate base needed to manufacture a variety of gypsum products, including plaster and wallboard. Calcined gypsum was produced domestically from mined crude and synthetic gypsum to manufacture wallboard and plaster products. Uncalcined gypsum was used to produce portland cement and in agriculture. Miscellaneous uses, such as athletic field markings, accounted for less than 1% of consumption.

In 2016, more than 99% of calcined gypsum was used in the production of plaster and prefabricated products, most of which consisted of wallboard (table 3). Type X gypsum board, so named because of extra fire retardation qualities, consumed 43%, by weight, of calcined gypsum. Half-inch wallboard accounted for 37% of total calcined gypsum consumption. Water- and moisture-resistant board, typically used in bathroom and kitchen walls, accounted for 10% of calcined gypsum. Other wallboard, including mobile-home board, predecorated wallboard, sheathing, and veneer base constituted most of the balance (table 4).

Uncalcined gypsum consumption in the United States decreased by 5% to 6.78 Mt in 2016 from 7.16 Mt in 2015. About 4.11 Mt, or 61%, was consumed in portland and masonry cement production (table 3). Gypsum is added to cement to retard its setting time and accounts for 3% to 7%, by weight, of cement output (van Oss, 2005, p. 8; Roskill Information Services Ltd., 2009, p. 320). Most of the remainder of the uncalcined gypsum consumed, about 2.67 Mt, was used for agricultural purposes, a decrease of 11% from that of 2015. Finely ground gypsum rock was used in agriculture and other industries to neutralize acidic soils, improve soil permeability, add nutrients, stabilize slopes, and provide catalytic support for maximum fertilizer benefits. Small quantities of high-purity gypsum also were used in a wide range of industrial applications, including the production of food, glass, paper, and pharmaceuticals.

Prices

In 2016, the average U.S. unit values (free on board, mine or plant) were estimated to be \$8 per metric ton for crude gypsum, a 3% increase from that of 2015, and \$30 per ton for calcined gypsum, an increase of 7% from that of 2015 (table 1). The average unit value for plaster reported by domestic producers during the year was \$427 per ton, 3% less than that in 2015 (table 3). The average unit value of uncalcined gypsum used primarily for agricultural purposes was estimated to be \$35 per ton, 6% more than that in 2015, and that used in cement production was about \$26 per ton, 4% more than that in 2015 (table 3).

During 2016, the average unit value of gypsum wallboard increased slightly and total wallboard production increased by an estimated 12% (table 4).

Foreign Trade

The United States imported crude gypsum from 18 countries and exported it to 69 countries and territories; 50% of total exports went to Canada. Imports of crude gypsum in 2016 increased by 8% from those of 2015 and accounted for 11% of

apparent consumption. Canada, Mexico, and Spain accounted for more than 98% of imported gypsum. The majority of imports from Canada went to east coast plants, and sources in Mexico chiefly served the west coast. Most of the crude gypsum imported by the United States from Mexico was produced by Compañía Minera Caopas, S.A. de C.V. and Compañía Occidental Mexicana S.A. de C.V., in Baja California Sur, both of which operate mines on the Baja California Peninsula (Compañía Occidental Mexicana S.A. de C.V., 2005; Secretaría de Economía, 2017). Almost all gypsum imported from Canada came from Nova Scotia. The completion of large wallboard manufacturing plants near coal-fired electric powerplants along the east coast may reduce gypsum imports in the future.

Wallboard exports decreased by 5% in 2016, totaling about 725,000 metric tons (t) valued at \$131 million, of which more than 90% went to Canada. Wallboard imports, almost all of which originated from Canada and Mexico, increased by 15% in 2016 to 399,000 t valued at \$94.8 million (table 6).

World Review

Global crude gypsum production in 2016 was estimated to be 261 Mt, a slight increase from that of 2015 (table 1). In 2016, 84 countries produced gypsum, with the top 10 producers accounting for 82% of total world production (table 7). China was the leading producer of crude gypsum in 2016 with an estimated 130 Mt, followed by, in decreasing order of tonnage, the United States with 17.0 Mt, Iran with 16.0 Mt, Thailand with 11.3 Mt, Turkey with 9.0 Mt, Italy with 8.6 Mt, Spain with 7.0 Mt, Oman with 6.0 Mt, Mexico with 5.4 Mt, and Japan with 4.7 Mt. Gypsum production in Iran of 16.0 Mt in 2016 was based on dated historical production data that may not fully account for 25 years of double-digit inflation, unemployment as high as 10%, or the increased cost of land and housing in urban areas, all of which may have limited the actual production of gypsum (Esmaili, 2008; Khajehpour, 2013). The Iranian economy expanded in 2016, likely boosting the domestic housing sector and leading to a corresponding increase in gypsum production (World Bank Group, The, 2017).

Production in North America accounted for 9% of total crude gypsum production. Although the use of gypsum wallboard increased worldwide, only industrialized nations used gypsum primarily for wallboard products. In developing countries, especially in Asia and the Middle East, most gypsum was used in the production of cement or plaster products. World production may have been underestimated because output by some foreign gypsum producers was used to manufacture products onsite, which may not have been reported. Additionally, production from small deposits in developing nations was intermittent and in many cases unreported.

Worldwide, the leading use of gypsum is in the manufacture of cement and concrete. Cement manufacture accounted for approximately 50% of worldwide gypsum consumption, and plaster products, including wallboard, accounted for approximately 30% of all consumption.

As a low-value, high-bulk mineral commodity mined from deposits widely distributed throughout the world, gypsum tended to be used within the many countries where it was

produced. Less than 20% of the world's crude gypsum production was estimated to enter international trade. Only a few countries, such as Canada, Mexico, Spain, and Thailand, were major crude gypsum exporters; of these, Canada and Mexico were significant exporters because their large deposits were near wallboard markets in the United States.

Estimated world production capacity for gypsum wallboard in 2016 exceeded about 17 billion square meters per year (183 billion square feet per year) at more than 250 plants worldwide.

Australia.—Boral Ltd., Australia's leading building and construction materials producer, recorded a 2016 gypsum-related revenue of \$1.1 billion, 10% higher than that of 2015. The primary factors that led to the increase in year-over-year revenue were related to the growth in plasterboard sales and related products (Boral Ltd., 2017, p. 6). Increases in U.S. residential construction, combined with lower energy and fuel prices, also contributed to Boral's increased profitability in 2016 (Boral Ltd., 2017, p. 7). A joint venture owned equally by Boral and USG, named Boral Gypsum, which began in March 2014, earned \$59 million in fiscal year (FY) 2016, a 21% increase in income compared with that in FY 2015 (Boral Ltd., 2017, p. 14).

Knauf Plasterboard announced that a new wallboard plant was anticipated to open in 2017 following the completion of a 28-kilometer (17-mile) natural gas pipeline to the Port of Bundaberg facility in Queensland (Global Gypsum Magazine, 2016).

Canada.—Canada produced an estimated 1.63 Mt of crude gypsum in 2016, slightly less than that of 2015. About 1.09 Mt, or 67% of production, was exported to the United States. In 2016, CGC Inc. (a subsidiary of USG) was the leading manufacturer of gypsum wallboard in eastern Canada and accounted for approximately 42% of total domestic shipments (USG Corp., 2017, p. 1). CertainTeed Gypsum Canada Inc., a subsidiary of Saint-Gobain, S.A., had plasterboard sales of about \$260 million in Canada where it employed 611 people (Saint-Gobain S.A., 2017, p. 10).

China.—In 2016, Beijing New Building Materials PLC (BNBM) was the leading gypsum board producer in the world and benefited from increased wallboard sales following the banning of clay brick by many municipalities in China. Smog problems in urban areas were attributed, in part, to brick production (Ziman, 2016). Between 2006 and 2013, China's wallboard production increased at an annual rate of 17%, with 2.7 billion square meters of wallboard manufactured in 2013 (Tiwari, 2014). Wallboard has become a standard building material in commercial construction for non-load-bearing walls and ceilings in China, with an estimated 80% of all domestically consumed wallboard used in commercial construction (Global Gypsum Magazine, 2011).

India.—Saint-Gobain announced a planned expansion of gypsum wallboard production and sales in India. As the world's second-ranked producer of cement, which requires considerable use of gypsum in the cement manufacturing process, the consumption of gypsum in India remained strong. India produced an estimated 3.5 Mt of gypsum but ranked only 20th in terms of gypsum wallboard production (Global Gypsum Magazine, 2015).

Japan.—Yoshino Gypsum Co., Ltd., which opened Japan's first wallboard factory in 1921, was the leading wallboard producer with 16 plants throughout Japan. The company's combined capacity of 350 million square meters per year of its Tiger Board product accounted for 78% of Japan's total wallboard output (Global Gypsum Magazine, 2012; Yoshino Gypsum Co., Ltd., 2017). With few crude gypsum mining resources, Japan stopped mining gypsum in 1976 and has relied on synthetic, recycled, and imported gypsum since then to meet much of its domestic demand (Pressler, 1984; Global Gypsum Magazine, 2010b).

Mexico.—In 2016, gypsum production in Mexico was estimated to be 5.38 Mt, unchanged from that of 2015. About 1.86 Mt, or 35% of Mexico's 2016 crude gypsum production, was exported to the United States. In 2016, USG Mexico, S.A. de C.V., the leading manufacturer of wallboard in Mexico with three manufacturing facilities, produced more than 50% of Mexico's wallboard with net sales of \$188 million, a slight increase compared with net sales in 2015 of \$187 million (USG Corp., 2017, p. 1, 25, 29).

Outlook

The average sales price for residential new homes increased nationwide in 2016 by approximately 3% from that of 2015 (U.S. Census Bureau, 2017a). A combination of increased housing starts, up by more than 6% in 2016, coupled with historically low 30-year mortgage interest rates and a low level of housing inventory continued to encourage increased sales activities within the housing sector in 2016, and by extension, the wallboard market (Carlyle, 2015; Federal Home Loan Mortgage Corp., 2017; Oyedele, 2017). Because the residential housing market is responsible for approximately 60% of the consumption of gypsum products, a key economic indicator used by the gypsum and wallboard industries is the number of new housing starts, as measured by the issuance of new building permits. Since 1959, an increase in housing starts has been closely paired with an increase in gypsum consumption. Likewise, during periods of economic recession when housing starts often precipitously declined, gypsum consumption also decreased (fig. 1).

The average number of housing starts from 1959 through 2016, including multidwelling units, was 1.5 million per year. Housing starts averaged about 1.8 million per year during the 5 years preceding the recessionary years that began in 2007. Housing starts in 2015 and 2016 were 1,112,000 and 1,174,000, respectively (U.S. Census Bureau, 2017b). As the surplus of residential real estate constructed before 2009 is drawn down, the Nation's annual population growth of more than 3,000,000 may necessitate an increase in residential construction in the near future (Bachman, 2015; Reyes, 2015; U.S. Census Bureau, 2017c).

The future of synthetic gypsum, following more than 20 years of large annual growth rates, may begin to slow as significant supplies of comparatively less expensive and cleaner burning natural gas compete with coal in the generation of electric power. The increased production and consumption of domestic shale gas could lead to a corresponding decrease in coal consumption and, with it, a decrease in the production

of synthetic gypsum. Shale-gas production in 2015, the most recent year for which data were available, was 431 million cubic meters (15.2 billion cubic feet), which was 13% more than that of 2014 and nearly three times the 151 million cubic meters (5.34 billion cubic feet) produced in 2010 (U.S. Energy Information Administration, 2016).

In the long term, as disposal areas for excess synthetic gypsum reach capacity and the opening of new disposal sites becomes increasingly difficult, power companies may continue in the trend of converting electric generation plants to operate on natural gas, especially if shale-gas supplies continue to offer an economically attractive alternative to coal. Because the retrofitting of coal-fired electric powerplants with desulfurization systems has been accomplished for most plants and less expensive natural gas is available for electrical generation, FGD gypsum production may stabilize. The changeover from using crude gypsum for wallboard production to FGD gypsum likely will be limited to FGD plants within close proximity to wallboard production facilities or to new wallboard plants that would be constructed adjacent to existing FGD facilities.

The U.S. gypsum industry has been moving toward the use of large-capacity wallboard plants supplied from multiple sources, including synthetic gypsum from coal-fired electric powerplants. These larger wallboard plants have been built in regions of high population and new construction growth, which are the areas of highest consumption. Older and less efficient crude-gypsum-fed plants could become less competitive but could see a revival with regard to the possibility of lesser quantities of FGD gypsum produced. In response to increased public awareness, the gypsum industry may boost the recycling of scrap gypsum in its raw materials streams. The industry may also increase the use of labels, such as the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) program, which certifies varying levels of ecologically conscious building practices (U.S. Green Building Council, undated).

Industry trends indicate significant developments abroad in the coming decade. The pace and magnitude of wallboard plant construction in Asia, particularly in China, India, and Thailand, suggest that the continent, with billions of potential consumers, will likely become one of the world's leading gypsum wallboard markets. Should the economic conditions in the United States more favorably affect the U.S. housing sector, and in turn domestic consumption for gypsum, Canada's gypsum production could increase. Elsewhere, wallboard production capacity growth and the recognition of the convenience and economy of wallboard as a building material in Central America, Europe, and South America means that wallboard manufacturing may require increased gypsum production in the future. A decline in national and global economic conditions, however, could hamper such growth.

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- Gypsum Deposits of the United States, Bulletin 697, 1920.
- Historical Statistics for Mineral and Material Commodities in the United States. Data Series 140.

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- Gypsum. Ch. in Mineral Facts and Problems, U.S. Bureau of Mines Bulletin 675, 1985.
- Gypsum Association.

TABLE 1
SALIENT GYPSUM STATISTICS¹

(Thousand metric tons and thousand dollars)

	2012	2013	2014	2015	2016
United States:					
Crude:					
Production:					
Quantity	14,200 ^r	15,700 ^r	16,200 ^r	16,600 ^r	17,000
Value	90,000 ^r	118,000 ^r	129,000 ^r	129,000 ^r	136,000
Imports for consumption	3,250	3,290	3,720	4,030	4,340
Synthetic gypsum sales ²	12,100	10,800	15,200	16,000	16,500 ^e
Calcined:					
Production:					
Quantity	13,400 ^r	15,200 ^r	15,300 ^r	15,600 ^r	17,100
Value	349,000 ^r	381,000 ^r	414,000 ^r	437,000 ^r	513,000
Products sold, value	2,230,000	2,940,000	3,090,000	3,240,000	3,660,000
Exports, value	39,200	44,100	46,000	41,700 ^r	36,800
Imports for consumption, value	7,150	5,830	7,620	7,210	15,300
World, production	250,000 ^r	259,000 ^r	265,000 ^r	260,000 ^r	261,000 ^p

^eEstimated. ^pPreliminary. ^rRevised.

¹Includes data available through February 23, 2018. Data are rounded to no more than three significant digits.

²Source: American Coal Ash Association.

TABLE 2
CRUDE GYPSUM MINED IN THE UNITED STATES, BY STATE¹

State	2015			2016		
	Active mines	Quantity (thousand metric tons)	Value (thousands)	Active mines	Quantity (thousand metric tons)	Value (thousands)
Arizona, Colorado, New Mexico	6	1,040	\$9,300	5	2,010	\$18,100
Nevada and Utah	9	3,460 ^r	44,600 ^r	9	3,690	33,700
Arkansas and Louisiana	2	W	W	2	W	W
California	4	690	5,930	4	814	7,180
Iowa and Indiana	4	995	8,550	4	1,550	13,700
Michigan	2	W	W	2	W	W
South Dakota and Wyoming	3	W	W	3	W	W
Kansas, Oklahoma, Texas	20	8,780	71,500	16	6,150	49,400
Total	50	16,600 ^r	129,000 ^r	45	17,000	136,000

^rRevised. W Withheld to avoid disclosing company proprietary data; included in "Total."

¹Includes data available through February 23, 2018. Data are rounded to no more than three significant digits; may not add to totals shown.

TABLE 3
GYPSUM PRODUCTS (MADE FROM DOMESTIC, IMPORTED, AND
SYNTHETIC GYPSUM) SOLD OR USED IN THE UNITED STATES, BY USE¹

(Thousand metric tons and thousand dollars)

Use	2015		2016	
	Quantity	Value	Quantity	Value
Uncalcined:				
Portland and masonry cement	4,150	104,000	4,110	107,000
Agriculture and miscellaneous ²	3,010	99,400	2,670	93,400
Total	7,160	203,000	6,780	200,000
Calcined:				
Plaster	80	35,100	82	35,000
Prefabricated products ³	12,800	3,240,000	14,400	3,660,000
Total	12,900	3,270,000	14,500	3,690,000
Grand total	20,100	3,480,000	21,300	3,890,000

¹Includes data available through February 23, 2018. Data are rounded to no more than three significant digits; may not add to totals shown.

²Includes synthetic gypsum.

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

TABLE 4
PREFABRICATED GYPSUM PRODUCTS SOLD OR USED IN THE UNITED STATES¹

Product	2015			2016		
	Quantity (thousand square feet)	Quantity ² (thousand metric tons)	Value (thousands)	Quantity (thousand square feet)	Quantity ² (thousand metric tons)	Value (thousands)
Veneer base	261,000	189	\$52,200	292,000	212	\$58,400
Sheathing	480,000	348	161,000	502,000	364	181,000
Regular gypsum board:						
³ / ₈ -inch	358,000	114	25,100	395,000	125	27,600
¹ / ₂ -inch	10,800,000	4,890	1,080,000	11,900,000	5,400	1,190,000
⁵ / ₈ -inch	645,000	381	101,000	704,000	415	110,000
Total	11,800,000	5,380	1,200,000	13,000,000	5,940	1,330,000
Type X gypsum board	7,530,000	5,470	1,360,000	8,550,000	6,200	1,540,000
Water- and moisture-resistant board	1,740,000	1,270	419,000	2,020,000	1,470	502,000
Other	277,000 ^r	195 ^r	47,300 ^r	307,000	217	52,600
Grand total	22,100,000	12,800	3,240,000	24,700,000	14,400	3,660,000

^rRevised.

¹Includes data available through February 23, 2018. Data are rounded to no more than three significant digits; may not add to totals shown.

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

TABLE 5
IMPORTS FOR CONSUMPTION OF CRUDE GYPSUM, BY COUNTRY OR LOCALITY¹

(Thousand metric tons and thousand dollars)

Country or locality	2015		2016	
	Quantity	Value	Quantity	Value
Bulgaria	--	--	23	214
Canada ²	1,240	14,300	1,090	13,100
Malta	--	--	10	104
Mexico	1,720	19,000	1,860	23,000
Oman	--	--	33	413
Spain	1,060	20,500	1,330	26,200
Other	1 ^r	289	1	246
Total	4,030	54,100	4,340	63,200

^rRevised. -- Zero.

¹Includes data available through February 23, 2018. Data are rounded to no more than three significant digits; may not add to totals shown.

²Includes anhydrite.

Source: U.S. Census Bureau.

TABLE 6
U.S. GYPSUM AND GYPSUM PRODUCTS FOREIGN TRADE¹

(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:								
2015	63	28,000	95	41,700 ^r	767	137,000	79,100	286,000
2016	42	18,600	93	36,800	725	131,000	75,900	262,000
Imports for consumption:								
2015	4,030	54,100	21	7,210	348	86,100	37,000	184,000
2016	4,340	63,200	41	15,300	399	94,800	35,600	209,000

^rRevised.

¹Includes data available through February 23, 2018. Data are rounded to no more than three significant digits; may not add to totals shown.

²Data are for "Gypsum, anhydrite," Harmonized Tariff Schedule of the United States (HTS) code 2520.10.0000.

³Data are for "Plasters," HTS code 2520.20.0000.

⁴Data are for "Boards, sheets, panels, tiles, and similar articles, not ornamented—Faced or reinforced with paper or paperboard only," HTS code 6809.11.0000.

⁵Data are for "Boards, sheets, panels, tiles, and similar articles, not ornamented: Other," HTS code 6809.19.0000, and "Other articles," HTS code 6809.90.0000.

Source: U.S. Census Bureau.

TABLE 7
MINED GYPSUM: WORLD PRODUCTION, BY COUNTRY OR LOCALITY¹

(Thousand metric tons)

Country or locality ²	2012	2013	2014	2015	2016 ^P
Albania	91	112	106	85	85
Algeria	1,958	2,078	2,130	2,340 ^r	2,130
Angola	122	189	190	190	190
Argentina	1,433 ^r	1,548	1,520 ^{r,e}	1,500 ^e	1,500
Armenia	30	29	22	19	22
Australia	2,120 ^e	2,270 ^e	2,580 ^e	2,900 ^{r,e}	2,580
Austria	792	635	730	715	715
Azerbaijan	150	170	145	130	130
Belarus	69	71	64	43	43
Bhutan	313	351	414	389	410
Bolivia	1	1	1	1 ^e	1
Bosnia and Herzegovina	73	73	68	59	59
Brazil	3,750	3,333	3,447 ^r	3,400 ^r	3,400
Bulgaria	114	119	88	99 ^e	99
Burma	39	61	105	100	100
Canada	1,832	1,837	1,811	1,726 ^r	1,633
Chile, crude	799	1,015	843	860 ^r	860
China, natural	128,000	129,000	130,000	130,000	130,000
Croatia	183	114	120	138	138
Cuba	131	87	98	91	98
Cyprus, crude	328	315	348	472	472
Czechia	14	11	11	11	11
Dominican Republic	116	90	152	152	152
Egypt ³	458 ^{r,e}	941 ^{r,e}	872 ^r	872 ^r	2,200
Eritrea	12 ^e	12 ^e	12 ^e	10 ^e	10
Ethiopia	74 ^e	150 ^e	244	290	320
France ³	3,685	3,460 ^{r,e}	3,280 ^{r,e}	3,280	3,280
Germany, marketable ³	1,949	1,778	1,802	1,800	1,800
Greece	700	760	664	649	661
Guatemala	100	118	82	110	82
India	3,537	3,190 ^r	2,902 ^r	2,640 ^{r,e}	3,500
Iran ⁴	19,000 ^r	21,119 ^r	19,550 ^r	17,794 ^r	16,000
Iraq	1,369	1,500 ^e	1,200 ^e	1,000	1,000
Ireland	300	210	210 ^e	300	300
Israel	45	27	82	159	159
Italy	2,563	2,994	8,551	8,550	8,550
Jamaica	65	48	45	45	45
Japan	5,002	4,771	4,674	4,670	4,670
Jordan	857	857	900	900	900
Kazakhstan	148 ^e	124	113 ^e	82 ^e	1,000
Kenya	7	6	6	6	6
Laos	579	772	708	710	708
Libya	250 ^e	120 ^e	150 ^e	150	150
Mauritania	60 ^e	60 ^e	60 ^e	70	70
Mexico ³	4,693	5,091	5,496	5,378	5,378
Moldova	115	120	125	120	120
Nicaragua	35	37	57	50	47
Niger	1	--	--	--	--
Nigeria	54	56	32	34 ^e	28
Oman	1,915	2,785	3,387 ^r	6,049	6,049
Pakistan	1,173	1,253 ^r	1,436	1,660	1,660
Paraguay	5 ^e	5 ^e	5 ^e	5	5
Peru, crude	391	298	544	438	438
Poland, gypsum rock	1,077 ^r	952 ^r	905 ^r	882 ^r	905
Portugal	322	299	329	310	330
Qatar	145 ^e	150 ^e	200 ^e	210	210
Romania	765	676	807	676	676
Russia	4,179	4,223	4,420 ^{r,e}	4,223 ^r	4,400
Saudi Arabia	1,700 ^e	1,700 ^e	1,780 ^e	1,860 ^e	1,860

See footnotes at end of table.

TABLE 7—Continued
MINED GYPSUM: WORLD PRODUCTION, BY COUNTRY OR LOCALITY¹

(Thousand metric tons)

Country or locality ²	2012	2013	2014	2015	2016 ^P
Slovakia	88	60	65	65	65
South Africa	558	559	376	232	267
Spain ³	6,360	7,125	7,000 ^e	7,000 ^e	7,000
Sri Lanka	1	1	1	1	1
Sudan	117	132	111	100	100
Switzerland	320	340	340	310	310
Syria	328	300	181	150	150
Tajikistan	14	12	12	8	8
Tanzania	92	172	200	239	240
Thailand	11,447	12,383	12,445	11,267 ^r	11,267
Tunisia	776	632	850	900	850
Turkey	11,442	13,357	12,600 ^r	8,639 ^r	9,000
Turkmenistan	105 ^e	105 ^e	107 ^e	110	110
Ukraine	2,190	2,180 ^e	1,530 ^e	1,255	430
United Arab Emirates	680 ^e	700 ^e	700 ^e	700	700
United Kingdom ³	1,200 ^e	1,200 ^e	1,200 ^e	1,200 ^e	1,200
United States ⁵	14,200 ^r	15,700 ^r	16,200 ^r	16,600 ^r	17,000
Uzbekistan	50 ^e	50 ^e	40 ^e	42	35
Yemen	100	100	100	100	100
Total	250,000 ^r	259,000 ^r	265,000 ^r	260,000 ^r	261,000

^eEstimated. ^PPreliminary. ^rRevised. -- Zero.

¹Includes data available through August 30, 2017. All data are reported unless otherwise noted. Totals, U.S. data, and estimated data are rounded to no more than three significant digits; may not add to totals shown.

²In addition to the countries and (or) localities listed, Colombia, El Salvador, Honduras, Latvia, Luxembourg, Mongolia, and Serbia produced gypsum, but available information was inadequate to make reliable estimates of output.

³Includes anhydrite.

⁴Data are for years beginning March 21 of that stated.

⁵Does not include byproduct gypsum.

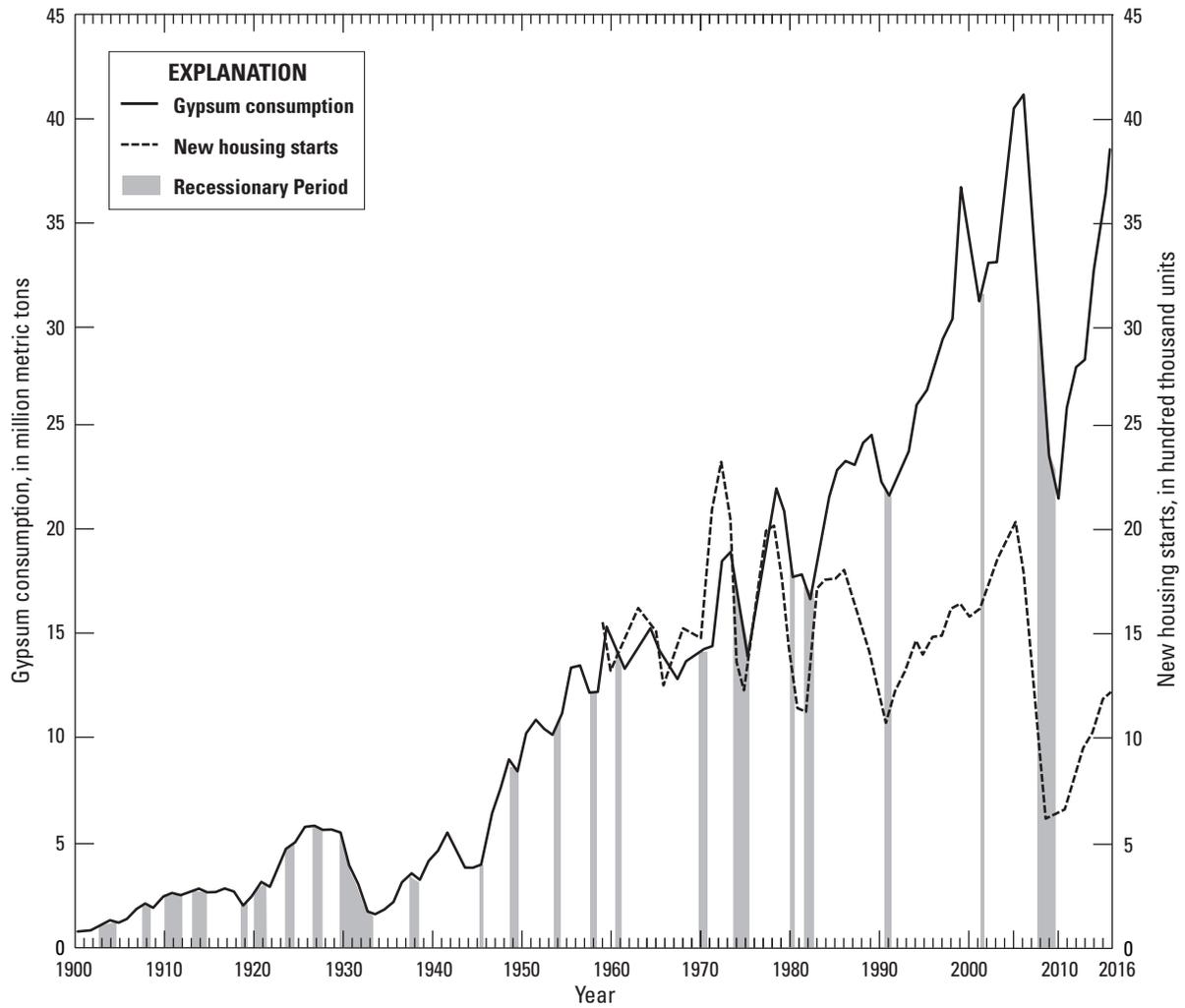


Figure. 1 U.S. gypsum consumption and economic recessions from 1900 through 2017 and new residential building permits beginning in 1959.