

CEMENT

(Data in thousand metric tons unless otherwise noted)

Domestic Production and Use: Production of cement in 2016 in the United States increased slightly to about 82.9 million tons of portland cement and 2.5 million tons of masonry cement; output was from 97 plants in 34 States. Cement also was produced at two plants in Puerto Rico. Production remained well below the record level of 99 million tons in 2005, and reflected continued full-time idle status at a few plants, underutilized capacity at many others, and plant closures in recent years. Sales of cement increased significantly in 2016, with much of the increase accounted for by imports; overall, sales were nearly 32 million tons lower than the record volume in 2005. The overall value of sales was about \$10.7 billion. Most of the sales of cement were to make concrete, worth at least \$60 billion. As in recent years, about 70% of cement sales went to ready-mixed concrete producers, 10% to concrete product manufacturers, 9% to contractors (mainly road paving), 4% each to oil and gas well drillers and to building materials dealers, and 3% to others. Texas, California, Missouri, Florida, and Alabama were, in descending order, the five leading cement-producing States and accounted for nearly 50% of U.S. production.

Salient Statistics—United States:¹	2012	2013	2014	2015	2016^e
Production:					
Portland and masonry cement ²	74,151	76,804	82,600	^e 83,700	85,400
Clinker	67,173	69,420	74,372	^e 76,000	77,000
Shipments to final customers, includes exports	79,951	83,187	90,070	93,340	96,300
Imports of hydraulic cement for consumption	6,107	6,289	7,584	10,376	12,000
Imports of clinker for consumption	786	806	720	942	1,700
Exports of hydraulic cement and clinker	1,749	1,670	1,397	1,294	1,100
Consumption, apparent ³	77,900	81,800	89,200	^e 93,300	96,200
Price, average mill value, dollars per ton	89.50	95.00	100.50	^e 105.50	111.00
Stocks, cement, yearend	6,900	6,570	6,140	^e 5,600	5,700
Employment, mine and mill, number ^e	10,500	10,300	10,000	10,000	9,500
Net import reliance ⁴ as a percentage of apparent consumption	7	7	8	11	13

Recycling: Cement kiln dust is routinely recycled to the kilns, which also can make use of a variety of waste fuels and recycled raw materials such as slags and fly ash. Various secondary materials can be incorporated as supplementary cementitious materials (SCMs) in blended cements and in the cement paste in concrete. Cement is not directly recycled, but significant quantities of concrete are recycled for use as construction aggregate.

Import Sources (2012–15):⁵ Canada, 46%; Republic of Korea, 15%; Greece, 11%; China, 10%; and other, 18%.

Tariff: Item	Number	Normal Trade Relations 12–31–16
Cement clinker	2523.10.0000	Free.
White portland cement	2523.21.0000	Free.
Other portland cement	2523.29.0000	Free.
Aluminous cement	2523.30.0000	Free.
Other hydraulic cement	2523.90.0000	Free.

Depletion Allowance: Not applicable. Certain raw materials for cement production have depletion allowances.

Government Stockpile: None.

Events, Trends, and Issues: On a year-on-year basis, monthly cement sales in 2016 were erratic and the overall increase for the year was lower than had been expected at yearend 2015. Construction spending levels were moderately higher during the year, but continued low oil and gas prices significantly constrained the amount of oil and gas well drilling, as well as the consumption of general and oil well cements for this activity. This contributed to reduced overall cement sales in a number of States, especially Texas. Production of cement remained well below capacity, with some multikiln plants continuing to rely primarily on a single kiln during the year. As in 2015, much of the growth in cement sales in 2016 was of imported rather than domestic material; this appears to reflect technical, economic, and environmental difficulties in returning long-idle kilns to full production at some plants. Imports resumed or increased at several terminals that had been idle or substantially inactive during the recession.

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The purchase, announced in 2015, of one major Europe-based international company by another led to the merger of the U.S. subsidiaries of both companies in July 2016 following regulatory approval. Approval of the merger had been expected to require the sale of two cement plants (one in Indiana, and another plant in either Maryland or West Virginia); only one plant (West Virginia) was, in fact, required to be sold. As part of a debt-reduction effort, a major cement company announced the sale of a plant in northern Texas and later, of one in Ohio. The Texas plant was sold in November 2016, and the Ohio plant sale was expected to be completed in January 2017. No new plants opened in 2016, however, a dry kiln plant in Maryland was upgraded to precalciner technology during the year, and two plants (one in Oklahoma, and another in New York) had nearly completed upgrades from wet to precalciner dry technology at yearend.

The 2010 National Emissions Standards for Hazardous Air Pollutants (NESHAP) protocol for cement plants went into effect in September 2015 and reduced the acceptable emissions levels of mercury and certain other pollutants. Many plants installed emissions reduction technologies to comply with the NESHAP, but it remained unclear if such modifications would be economic at all plants or for all individual kilns (some being of older technology) at multikiln plants. It was possible that some kilns would be shut down, or used only sparingly, in light of the NESHAP limits, with a proportional reduction in overall U.S. clinker production capacity.

World Production and Capacity:

	Cement production		Clinker capacity ^e	
	<u>2015</u>	<u>2016^e</u>	<u>2015</u>	<u>2016</u>
United States (includes Puerto Rico)	84,300	85,900	107,000	109,000
Brazil	65,300	60,000	60,000	60,000
China	2,350,000	2,410,000	2,000,000	2,000,000
Egypt	55,000	55,000	46,000	46,000
India	300,000	290,000	280,000	280,000
Indonesia	58,000	63,000	64,000	78,000
Iran	58,600	53,000	79,000	79,000
Japan	54,800	56,000	53,000	53,000
Korea, Republic of	51,700	55,000	50,000	50,000
Russia	62,100	56,000	80,000	80,000
Saudi Arabia	61,900	61,000	65,000	75,000
Turkey	71,400	77,000	76,000	77,000
Vietnam	67,400	70,000	80,000	90,000
Other countries (rounded)	<u>760,000</u>	<u>810,000</u>	<u>560,000</u>	<u>620,000</u>
World total (rounded)	4,100,000	4,200,000	3,600,000	3,700,000

World Resources: Although individual plant reserves are subject to exhaustion, limestone and other cement raw materials are geologically widespread and abundant and overall shortages are unlikely in the future.

Substitutes: Almost all portland cement is used in making concrete, mortars, or stuccos, and competes in the construction sector with concrete substitutes, such as aluminum, asphalt, clay brick, fiberglass, glass, gypsum (plaster), steel, stone, and wood. A number of materials, especially fly ash and ground granulated blast furnace slag, develop good hydraulic cementitious properties by reacting with the lime released by the hydration of portland cement. Where readily available (including as imports), these SCMs are increasingly being used as partial substitutes for portland cement in many concrete applications, and are components of finished blended cements.

^eEstimated.

¹Portland plus masonry cement unless otherwise noted; excludes Puerto Rico.

²Includes cement made from imported clinker.

³Production of cement (including from imported clinker) + imports (excluding clinker) – exports + adjustments for stock changes.

⁴Defined as imports (cement and clinker) – exports.

⁵Hydraulic cement and clinker.