

CEMENT

(Data in thousand metric tons unless otherwise noted)

Domestic Production and Use: Domestic production of cement in 2014 increased to about 80.5 million tons of portland cement and 2.2 million tons of masonry cement; output was from 97 plants in 34 States. Cement also was produced at two plants in Puerto Rico. Production continued to be well below the record level of 99 million tons in 2005, and reflected continued full-time idle status at several plants, underutilized capacity at many others, and plant closures in recent years. Cement sales were markedly higher in 2014, but were about 41 million tons below the record volume in 2005. The overall value of sales was about \$8.9 billion. Most of the sales of cement were to make concrete, worth at least \$48 billion. As in recent years, about 70% of cement sales went to ready-mixed concrete producers, 11% to concrete product manufacturers, 9% to contractors (mainly road paving), 4% each to oil and gas well drillers and to building materials dealers, and 2% to others. Texas, California, Missouri, Florida, and Michigan were, in descending order, the five leading cement-producing States and accounted for 53% of U.S. production.

Salient Statistics—United States: ¹	2010	2011	2012	2013	2014^e
Production:					
Portland and masonry cement ²	66,447	67,895	74,151	76,804	82,700
Clinker	59,802	61,241	67,173	69,394	72,300
Shipments to final customers, includes exports	71,169	73,402	79,951	83,291	89,100
Imports of hydraulic cement for consumption	6,013	5,812	6,107	6,289	7,200
Imports of clinker for consumption	613	606	786	806	720
Exports of hydraulic cement and clinker	1,178	1,414	1,749	1,670	1,300
Consumption, apparent ³	71,200	72,200	77,900	81,700	89,100
Price, average mill value, dollars per ton	92.00	89.50	89.50	95.00	98.50
Stocks, cement, yearend	6,180	6,270	6,920	6,580	6,100
Employment, mine and mill, number ^e	12,000	11,500	10,500	10,300	10,000
Net import reliance ⁴ as a percentage of apparent consumption	8	7	7	7	7

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 there is significant recycling of concrete for use as construction aggregate.

Import Sources (2010–13):⁵ Canada, 51%; Republic of Korea, 18%; China, 8%; Greece, 5%; and other, 18%.

Tariff: Item	Number	Normal Trade Relations 12–31–14
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: Sales of cement continued to increase in 2014 owing to higher spending levels for new residential construction and for nonresidential buildings. Public sector construction spending remained relatively weak, but was expected to gradually increase as property tax revenues to the States continued to increase. Imports of cement increased, but several major cement-dedicated import terminals remained idle. Cement production remained well below capacity levels and some multikiln plants continued to operate only one kiln in 2014. No new plants opened in 2014, although a number of plant upgrades were underway, including conversions of some wet kilns to more energy-efficient dry, precalciner technology. No plant closures were announced during the year. In 2014, two of the world's largest cement companies announced their planned merger; this would create the highest capacity cement company in the world. Although granted in the European Union, approval of the merger had not been given in the United States as of yearend but was anticipated to require the sale of certain U.S. assets, although overlap in cement production capacity by the two companies existed in only one State.

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The manufacture of clinker for cement releases a great deal of carbon dioxide. Carbon dioxide reduction strategies by the cement industry were mainly aimed at reducing emissions per ton of cement product rather than by cement plant. Approaches include installation of more fuel-efficient kilns, partial substitution of noncarbonate sources of calcium oxide in the kiln raw materials, and partial substitution of SCMs, such as pozzolans, for portland cement in the finished cement products and in concrete. Because SCMs do not require the energy-intensive clinker manufacturing (kiln) phase of cement production, their use, and the use of inert additives or extenders, reduces the unit costs and emissions of the cement component of concrete. The ASTM C-595 standard for blended cement allows for the addition of up to 15% limestone in some blends, but widespread use of limestone addition was still not evident in 2014. Research continued toward developing cements that require less energy to manufacture than portland cement, and (or) that use raw materials that result in reduced emissions.

The cement industry was granted a delay until 2015 in the implementation of the 2010 National Emissions Standards for Hazardous Air Pollutants (NESHAP) protocol for cement plants. The protocol would significantly lower the acceptable emissions levels of mercury and certain other pollutants. Mercury scrubbing technology was being installed at a number of plants, but it remained unclear how many plants could afford the technology. The mercury limits were expected to make it difficult for cement plants to continue to burn fly ash as a raw material for clinker manufacture.

World Production and Capacity:

	Cement production		Clinker capacity	
	2013 ^e	2014 ^e	2013 ^e	2014 ^e
United States (includes Puerto Rico)	77,400	83,300	104,300	104,300
Brazil	70,000	72,000	60,000	60,000
China	2,420,000	2,500,000	1,900,000	2,000,000
Egypt	50,000	50,000	46,000	46,000
Germany	31,300	31,000	31,000	31,000
India	280,000	280,000	280,000	280,000
Indonesia	56,000	60,000	51,000	50,000
Iran	72,000	75,000	80,000	80,000
Italy	22,000	22,000	46,000	46,000
Japan	57,400	58,000	55,000	55,000
Korea, Republic of	47,300	47,700	50,000	50,000
Mexico	34,600	35,000	42,000	42,000
Pakistan	31,000	32,000	43,400	44,000
Russia	66,400	69,000	80,000	80,000
Saudi Arabia	57,000	63,000	55,000	55,000
Thailand	42,000	42,000	50,000	50,000
Turkey	71,300	75,000	68,500	69,000
Vietnam	58,000	60,000	80,000	80,000
Other countries (rounded)	<u>536,000</u>	<u>525,000</u>	<u>348,000</u>	<u>349,000</u>
World total (rounded)	4,080,000	4,180,000	3,470,000	3,570,000

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

Substitutes: Most portland cement is used in making concrete or mortars and, as such, competes in the construction sector with concrete substitutes, such as aluminum, asphalt, clay brick, rammed earth, fiberglass, glass, 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 not constrained in supply, 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.