

CEMENT

(Data in thousand metric tons unless otherwise noted)

Domestic Production and Use: In 2010, about 61 million tons of portland cement and 1.8 million tons of masonry cement were produced at 102 plants in 36 States. Cement also was produced at two plants in Puerto Rico. Overall production was the lowest since 1982 and reflected continued plant closures and indefinite idlings. Although the rate of decline abated significantly, sales volumes in 2010 were the lowest in 27 years and were nearly 59 million tons or 45% below the record level of 2005. The overall value of sales was about \$6.5 billion. Most of the cement was used to make concrete, worth at least \$35 billion. About 73% of cement sales went to ready-mixed concrete producers, 12% to concrete product manufacturers, 10% to contractors (mainly road paving), 2% to building materials dealers, and 3% to other users. In descending order, Texas, California, Missouri, Pennsylvania, Alabama, and Michigan were the six leading cement-producing States and accounted for about 50% of U.S. production.

Salient Statistics—United States: ¹	2006	2007	2008	2009	2010^e
Production:					
Portland and masonry cement ²	98,167	95,464	86,310	63,929	62,800
Clinker	88,555	86,130	78,382	56,116	59,000
Shipments to final customers, includes exports	129,240	115,426	97,322	71,489	71,100
Imports of hydraulic cement for consumption	32,141	21,496	10,744	6,211	6,300
Imports of clinker for consumption	3,425	972	621	556	590
Exports of hydraulic cement and clinker	723	886	823	884	1,000
Consumption, apparent ³	127,660	116,600	96,800	71,500	69,500
Price, average mill value, dollars per ton	101.50	104.00	103.50	99.00	92.00
Stocks, cement, yearend	9,380	8,890	8,360	6,130	4,700
Employment, mine and mill, number ^e	16,300	16,000	15,000	13,000	12,000
Net import reliance ⁴ as a percentage of apparent consumption	27	19	11	8	8

Recycling: Cement kiln dust is routinely recycled to the kilns, which also can burn a variety of waste fuels and recycled raw materials such as slags and fly ash. Certain secondary materials can be incorporated 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 aggregate.

Import Sources (2006–09):⁵ China, 24%; Canada, 23%; Republic of Korea, 10%; Taiwan, 7%; and other, 36%.

Tariff: Item	Number	Normal Trade Relations 12-31-10
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: Construction spending levels remained low because of the combined effects of the ongoing depressed housing market, high numbers of housing foreclosures, reduced tax revenues to the States, credit tightening, and high levels of unemployment. In the construction sectors requiring significant amounts of concrete (hence cement), stimulus spending had little impact in 2009 and through the first half of 2010. Cement production began to pick up modestly after the first quarter in 2010 but still registered a decline for the year. The spate of announced plant closures and idlings begun in 2008 abated somewhat in 2010, although it was uncertain if some of the still idle plants would ever reopen. From 2008 through 2010, at least six plants were closed permanently, another plant permanently shut its only kiln, and nine plants were placed into indefinite idle status. Many multiple-kiln plants reduced the number of kilns in operation, and plants overall idled kilns temporarily for slow sales and extended the periods of maintenance downtime on the kilns. One new plant was expected to open toward yearend 2010.

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The manufacture of clinker for cement releases a great deal of carbon dioxide, and plant-level reporting of these emissions to the U.S. Environmental Protection Agency (EPA) became mandatory in 2010. Carbon dioxide reduction strategies by the cement industry largely aim at reducing emissions per ton of cement product rather than by plant overall. These strategies include installation of more fuel-efficient kiln technologies, partial substitution of noncarbonated sources of calcium oxide in the kiln raw materials, and partial substitution of supplementary cementitious materials (SCM), such as pozzolans, for portland cement in the finished cement products and in concrete. Because SCM do not require the energy-intensive clinker manufacturing (kiln) phase of cement production, their use, or the use of inert additives or extenders, reduces the unit monetary and environmental costs of the cement component of concrete. Research was ongoing toward developing cements that require less energy to manufacture than portland cement, and/or that utilize more benign raw materials.

A new emissions limitation protocol for cement plants was finalized in 2010 by the EPA after initial release in 2009 and revisions in the interim. The protocol would significantly lower the acceptable emissions levels of mercury and certain other pollutants. It was unclear how many plants would be able to comply with the new limits; the mercury limits were further 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 ^e	
	2009	2010 ^e	2009	2010
United States (includes Puerto Rico)	64,900	63,500	⁶ 114,000	⁶ 109,000
Brazil	51,700	59,000	50,000	55,000
China	1,629,000	1,800,000	1,300,000	1,500,000
Egypt	46,500	48,000	45,000	46,000
Germany	30,400	31,000	31,000	31,000
India	^e 205,000	220,000	250,000	260,000
Indonesia	^e 40,000	42,000	42,000	42,000
Iran	^e 50,000	55,000	50,000	57,000
Italy	36,300	35,000	46,000	46,000
Japan	54,800	56,000	63,000	63,000
Korea, Republic of	50,100	46,000	50,000	50,000
Mexico	35,200	34,000	42,000	42,000
Pakistan	^e 32,000	30,000	42,000	45,000
Russia	44,300	49,000	65,000	65,000
Saudi Arabia	^e 40,000	45,000	40,000	50,000
Spain	^e 50,000	50,000	42,000	42,000
Thailand	31,200	31,000	50,000	50,000
Turkey	54,000	60,000	63,000	65,000
Vietnam	47,900	50,000	50,000	55,000
Other countries (rounded)	^e 466,000	520,000	460,000	470,000
World total (rounded)	^e 3,060,000	3,300,000	2,900,000	3,100,000

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: Virtually all portland cement is used either 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 (the ability to set and harden under water) by reacting with the lime released by the hydration of portland cement. These SCM are increasingly being used as partial substitutes for portland cement in many concrete applications.

^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.

⁶Capacity includes at least 7 million tons (2009) and nearly 6 million tons (2010) classified as indefinite idle status rather than closed.