CEMENT

(Data in thousand metric tons unless otherwise noted)

Domestic Production and Use: In 2009, about 70 million tons of portland cement and 2 million tons of masonry cement were produced at 107 plants in 37 States. Ongoing plant closures left the yearend plant count at 101. Cement also was produced at two plants in Puerto Rico. Sales volumes fell sharply, but prices fell only modestly; the overall value of sales was about $7.3 billion. Most of the cement was used to make concrete, worth at least $40 billion. About 72% of cement sales went to ready-mixed concrete producers, 13% to concrete product manufacturers, 7% to contractors (mainly road paving), 3% to building materials dealers, and 5% 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]	2005	2006	2007	2008	2009[e]
Production:					
Portland and masonry cement[2]	99,319	98,167	95,464	86,310	71,800
Clinker	87,405	88,555	86,130	78,381	58,000
Shipments to final customers, includes exports	129,791	129,240	115,426	97,322	73,000
Imports of hydraulic cement for consumption	30,403	32,141	21,496	10,744	6,400
Imports of clinker for consumption	2,858	3,425	972	621	500
Exports of hydraulic cement and clinker	766	723	886	858	800
Consumption, apparent[3]	128,260	127,660	116,800	96,700	73,800
Price, average mill value, dollars per ton	91.00	101.50	104.00	103.00	100.00
Stocks, cement, yearend	7,450	9,380	8,890	8,360	12,000
Employment, mine and mill, number[e]	16,300	16,300	16,000	15,000	14,000
Net import reliance[4] as a percentage of apparent consumption	25	27	19	11	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 (2005-08):[5] China, 22%; Canada, 19%; Republic of Korea, 9%; Thailand, 7%; and other, 43%.

Tariff: Item	Number	Normal Trade Relations 12-31-09
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: The dominant issue in 2009 was the ongoing severe decline in construction spending and associated cement sales. The decline, which continued a trend begun in about mid-2006, was evident in all construction sectors (especially in housing), and affected all States. Unlike in 2007, where lower sales had been largely accommodated by reductions in imported cement, there was also a sharp decline in cement production in 2008-09, and a rash of plant closures. By yearend 2009, 14 plants had closed, and only 3 new plants had opened. A number of planned expansion projects at existing plants continued to be suspended, as were plans for at least two new plants. Toward yearend 2009, a large number of plants were idled temporarily, owing to full cement silos. A return to cement sales volumes more in line with the 2005-06 record years was expected to take about 5 years.

A number of environmental issues, especially carbon dioxide emissions, affect the cement industry. Plant-level reporting of carbon dioxide emissions was expected to become 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. 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

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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. Plant-level reporting of carbon dioxide emissions was expected to become mandatory in 2010. Recent revisions to the major portland cement standard ASTM-C150 and the similar AASHTO M85 allow for the incorporation of up to 5% ground limestone as an inert extender, but it was unclear how many plants would be able to adopt this practice. The C-150 standard was further revised in 2009 to allow for the addition of up to 5% of inorganic process additions. 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 released in 2009 that would significantly lower the acceptable emissions levels of mercury and some 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]	
	2008	2009[e]	2008	2009
United States (includes Puerto Rico)	87,600	72,800	108,000	111,000
Brazil	51,900	53,000	45,000	45,000
China	1,390,000	1,400,000	1,000,000	1,100,000
Egypt	40,000	40,000	38,000	38,000
France	21,700	21,000	22,000	22,000
Germany	33,600	33,000	31,000	31,000
India	[e]177,000	180,000	200,000	200,000
Indonesia	[e]37,000	37,000	42,000	42,000
Iran	44,400	45,000	36,000	40,000
Italy	43,000	43,000	46,000	46,000
Japan	62,800	60,000	70,000	70,000
Korea, Republic of	53,900	53,000	62,000	62,000
Mexico	47,600	45,000	42,000	42,000
Pakistan	[e]39,000	40,000	36,000	38,000
Russia	53,600	55,000	65,000	65,000
Saudi Arabia	31,800	32,000	29,000	30,000
Spain	42,100	42,000	42,000	42,000
Thailand	[e]35,600	35,000	50,000	50,000
Turkey	51,400	51,000	45,000	45,000
Vietnam	[e]37,000	37,000	35,000	35,000
Other countries (rounded)	[e]459,000	450,000	400,000	410,000
World total (rounded)	[e]2,840,000	2,800,000	2,400,000	2,600,000

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.

[e]Estimated.

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

[2]Includes cement made from imported clinker.

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

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

[5]Hydraulic cement and clinker.