

CEMENT

(Data in thousand metric tons unless otherwise noted)

Domestic Production and Use: In 2008, about 85 million tons of portland cement and about 3 million tons of masonry cement were produced at 113 plants in 37 States; total cement production capacity was about 130 million tons. Cement also was produced at two plants in Puerto Rico. Notwithstanding a significant decline in sales volumes, sales prices rose modestly in 2008 and implied a value of cement production, excluding that of Puerto Rico, of about \$10.5 billion. Most of the cement was used to make concrete, worth at least \$50 billion. As in 2007, the bulk of the sales decline was of imported cement. About 75% of cement sales went to ready-mixed concrete producers, 13% to concrete product manufacturers, 6% to contractors (mainly road paving), 3% to building materials dealers, and 3% to other users. Texas, California, Florida, Pennsylvania, Michigan, and Alabama, in descending order, were the six leading cement-producing States and accounted for about 48% of U.S. production.

Salient Statistics—United States: ¹	2004	2005	2006	2007	2008^e
Production:					
Portland and masonry cement ²	97,434	99,319	98,167	95,464	87,700
Clinker	86,658	87,405	88,555	86,106	80,200
Shipments to final customers, includes exports	120,731	129,791	129,240	115,426	99,000
Imports of hydraulic cement for consumption	25,396	30,403	32,141	21,496	11,000
Imports of clinker for consumption	1,630	2,858	3,425	972	610
Exports of hydraulic cement and clinker	749	766	723	885	950
Consumption, apparent ³	121,950	128,250	127,660	116,700	98,600
Price, average mill value, dollars per ton	79.50	91.00	101.50	105.00	107.00
Stocks, cement, yearend	6,740	7,450	9,380	8,760	7,900
Employment, mine and mill, number ^e	16,200	16,300	16,300	16,000	15,000
Net import reliance ⁴ as a percentage of apparent consumption	21	25	26	19	12

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 (2004-07):⁵ China, 19%; Canada, 18%; Thailand, 9%; Republic of Korea, 8%; and other, 46%.

Tariff: Item	Number	Normal Trade Relations 12-31-08
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 2008 was the continuation of a trend, begun in 2006, of declines in overall construction spending related to the combined effects of the severe decline in the housing market (especially in speculative purchasing of homes, which more or less ceased in 2006), escalating mortgage rates on subprime loans and related increases in foreclosures, and tighter credit overall. In 2008, the construction declines broadened significantly into nonhousing sectors, spurred by widespread financial difficulties in the private sector, and, in the public sector, by shortfalls in State funding related to reduced property tax revenues. Whereas the lower levels of cement sales had largely been accommodated in 2007 by sharp drops in cement imports and only slightly by decreased domestic cement production, both fell significantly in 2008. Although two new cement plants came online in 2008, three others closed, and announcements were made of additional plant closures (mostly of older wet kiln facilities) planned for 2009. Likewise, a number of ongoing capacity expansion projects were postponed or halted.

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A number of environmental issues, especially carbon dioxide emissions, affect the cement industry. 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 noncarbonate 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. 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 as yet unclear how many plants would be able to adopt this practice. Research was ongoing toward developing cements that require less energy to manufacture than portland cement, and/or that utilize more benign raw materials.

Fossil fuel cost increases continued to be of concern to the cement industry. Some cement companies burn waste materials in their kilns as a low-cost substitute for fossil fuels. Cement kilns can be an effective and benign way of destroying such wastes. The viability of the practice and the type of waste burned hinge on current and future environmental regulations and their associated costs. The trend appears to be toward increased use of waste fuels.

World Production and Capacity:

	Cement production		Clinker capacity ^e	
	2007	2008 ^e	2007	2008
United States (includes Puerto Rico)	96,500	89,100	102,000	104,000
Brazil	46,400	48,000	45,000	45,000
China	1,350,000	1,450,000	1,300,000	1,400,000
Egypt	38,400	40,000	37,000	38,000
France	^e 22,300	22,000	22,000	22,000
Germany	33,400	33,000	31,000	31,000
India	^e 170,000	175,000	160,000	170,000
Indonesia	^e 36,000	36,000	42,000	42,000
Iran	^e 36,000	35,000	35,000	36,000
Italy	47,500	47,000	46,000	46,000
Japan	67,700	67,000	70,000	70,000
Korea, Republic of	57,000	56,000	62,000	62,000
Mexico	40,700	40,000	40,000	40,000
Pakistan	^e 26,000	30,000	35,000	36,000
Russia	59,900	61,000	65,000	65,000
Saudi Arabia	30,400	30,000	29,000	29,000
Spain	^e 54,500	55,000	42,000	42,000
Thailand	35,700	35,000	50,000	50,000
Turkey	49,500	48,000	45,000	45,000
Vietnam	^e 36,400	37,000	32,000	35,000
Other countries (rounded)	^e 437,000	466,000	420,000	430,000
World total (rounded)	^e 2,770,000	2,900,000	2,700,000	2,800,000

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 (revised to include clinker) – exports + adjustments for Government (nil) and industry stock changes.

⁵Hydraulic cement and clinker.