CEMENT

(Data in thousand metric tons, unless otherwise noted)

Domestic Production and Use: In 2003, almost 87 million tons of portland cement and 4.5 million tons of masonry cement were produced at 116 plants in 37 States and at 2 plants in Puerto Rico. The value of cement production, excluding Puerto Rico, was about $7 billion, and the value of total sales (including imported cement) was about $8.3 billion. Most of the cement was used to make concrete, worth at least $40 billion. Imported cement and clinker (to make cement) accounted for about 21% of the cement sold; total imports declined significantly, owing to higher domestic production capacity and flattening of overall demand. Clinker, the main intermediate product in cement manufacture, was produced at 109 plants, with a combined apparent annual capacity of about 101 million tons. Including several facilities that merely ground clinker produced elsewhere, total finished cement (grinding) capacity was about 110 million tons. California, Texas, Pennsylvania, Michigan, Missouri, and Alabama, in descending order, were the six largest producing States and accounted for about one-half of U.S. production. 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.

Salient Statistics—United States:[1]	1999	2000	2001	2002	2003[e]
Production:					
Portland and masonry cement[2]	85,952	87,846	88,900	89,732	91,000
Clinker	76,003	78,138	78,451	81,517	82,000
Shipments to final customers, includes exports	108,862	110,048	113,136	108,778	109,000
Imports of hydraulic cement for consumption	24,578	24,561	23,694	22,198	21,000
Imports of clinker for consumption	4,164	3,673	1,782	1,603	1,600
Exports of hydraulic cement and clinker	694	738	746	834	900
Consumption, apparent[3]	108,862	110,470	112,810	110,020	112,000
Price, average mill value, dollars per ton	78.27	78.56	76.50	76.00	76.00
Stocks, cement, yearend	6,367	7,566	6,600	7,680	6,500
Employment, mine and mill, number[e]	18,000	18,000	18,000	18,100	18,100
Net import reliance[4] as a percentage of apparent consumption	25	24	21	20	20

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. Fly ash and granulated blast furnace slag also can be incorporated in blended cements and in the cement paste in concrete. Cement itself generally is not recycled, but there is a small amount of recycling of concrete for use as aggregate.

Import Sources (1999-2002):[5] Canada, 19%; Thailand, 18%; China, 12%; Venezuela, 7%; Greece, 6%; and other (31 countries), 38%.

Tariff: Item	Number	Normal Trade Relations 12/31/03
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: Record low interest rates and continued strong public sector and residential construction spending in 2003 partially offset wet weather conditions and general economic weakness to yield flat sales levels relative to 2002. Cement consumption in 2004 is expected to remain similar to levels in 2003; a key determinant is likely to be continued tenuous State cofunding of public sector projects.

Concern continued over the environmental impact of cement manufacture, particularly the emission of carbon dioxide, handling of cement kiln dust (CKD), emissions of trace metals, and emissions of nitrogen oxides. The cement industry is one of the largest sources of carbon dioxide emissions, and U.S. cement producers were voluntarily seeking ways to reduce emissions.

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CEMENT

Carbon dioxide reduction strategies by the cement industry were aimed at lowering emissions per ton of cement product rather than by plant. Emissions reduction strategies included installation of more fuel-efficient kiln technologies, partial substitution of noncarbonate sources of calcium oxide in the kiln raw materials, and partial substitution of cementitious additives for portland cement in the finished cement products.

Higher fossil fuel costs were of concern to the cement industry; the resulting increased production costs were not easily passed on to customers given stagnant cement prices. Oceanic shipping charges were increasing, making imported cement less attractive to consumers. 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(s) burned hinge on current and future environmental regulations and their associated costs. The trend appears to be toward increased use of waste fuels.

Although little used by cement companies themselves in the United States, there is growing direct use by concrete manufacturers of cementitious extenders, such as pozzolans, as partial replacements for portland cement. The United States lags behind many foreign countries in this practice. Pozzolans are materials that, in the presence of free lime, have hydraulic cementitious properties; examples include some volcanic ashes and industrial byproducts such as granulated blast furnace slag, fly ash, and silica fume. Inclusion of these materials in concrete mixes can yield performance advantages over straight portland cement concretes for certain applications. Because pozzolans do not require the energy-intensive clinker manufacturing (kiln) phase of cement production, their use reduces the monetary and environmental costs per ton of cement manufactured.

World Production and Capacity:

	Cement production		Yearend clinker capacity[e]	
	2002[e]	2003[e]	2002	2003
United States (includes Puerto Rico)	[6]91,300	92,600	[6]101,000	103,000
Brazil	39,500	40,000	45,000	45,000
China	[6]705,000	750,000	700,000	730,000
Egypt	23,000	26,000	35,000	35,000
France	20,000	20,000	22,000	22,000
Germany	30,000	28,000	31,000	31,000
India	100,000	110,000	120,000	120,000
Indonesia	33,000	34,000	50,000	50,000
Iran	30,000	31,000	30,000	33,000
Italy	40,000	40,000	46,000	46,000
Japan	[6]71,800	72,000	80,300	80,000
Korea, Republic of	[6]55,500	56,000	62,000	62,000
Mexico	[6]31,100	31,500	40,000	40,000
Russia	[6]37,700	40,000	65,000	65,000
Saudi Arabia	21,000	23,000	24,000	24,000
Spain	42,500	40,000	40,000	40,000
Thailand	[6]31,700	35,000	47,000	50,000
Turkey	[6]32,600	33,000	35,000	35,000
Other countries (rounded)	360,000	360,000	330,000	340,000
World total (rounded)	1,800,000	1,860,000	1,900,000	1,950,000

World Resources: Although individual company 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 utilized 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. Pozzolans and similar materials, especially fly ash and ground granulated blast furnace slag, are being used as partial substitutes for portland cement in some 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 – changes in stocks.

[4]Defined as imports (revised to include clinker) – exports + adjustments for Government and industry stock changes.

[5]Hydraulic cement and clinker.

[6]Reported data rounded to three significant digits.