CEMENT

(Data in thousand metric tons, unless otherwise noted)[1]

Domestic Production and Use: In 1998, nearly 82 million tons of portland cement and 3.7 million tons of masonry cement were produced at a total of 116 plants, spread among 37 States, by 1 State agency and 41 companies. In addition, there were two cement plants in Puerto Rico. The ex-plant value of production, excluding Puerto Rico, was about $6.5 billion, and the dominant portland cement component was used to make concrete worth at least $27 billion. Total domestic cement consumption (sales) were again at record levels, exceeding 100 million tons for the first time. There were 108 plants making clinker—the main intermediate product in cement manufacture—with a total calculated annual production capacity of about 83 million tons. Together with eight other cement plants that were just grinding facilities for clinker produced elsewhere, total finish grinding capacity at yearend amounted to about 96 million tons. If Puerto Rico is included, the clinker and grinding capacities become about 85 million tons and 98 million tons, respectively. The top 5 cement companies together accounted for about 43% of total U.S. clinker production and capacity and the top 10 companies accounted for about 60%. California, Texas, Pennsylvania, Michigan, Missouri, and Alabama, in descending order, were the six largest cement-producing States and together accounted for 50% of total U.S. production. In terms of use, cement manufacturers sold about 70% of their portland cement output to ready-mixed concrete producers; 10% to producers of concrete products, such as block, pipe, and precast slabs; 10% to contractors (largely for roadpaving); 5% to building material dealers; and 5% to miscellaneous users, including Government and other contractors.

Salient Statistics—United States:[2]	1994	1995	1996	1997	1998[e]
Production, portland and masonry[3]	77,948	76,906	79,266	82,582	85,500
Shipments to final customers, including exports	85,934	86,561	91,438	96,801	101,500
Imports for consumption[4]	9,074	10,969	11,566	14,523	18,000
Exports	633	759	803	791	800
Consumption, apparent[5]	86,476	86,003	90,355	96,018	103,000
Price, average mill value, dollars per ton	61.26	67.87	71.19	73.49	75.00
Stocks, mill yearend	4,701	5,814	5,488	5,784	5,500
Employment, mine and mill, number[e]	17,900	17,800	17,900	17,900	17,800
Net import reliance[6] as a percent of apparent consumption	10	12	12	14	17

Recycling: None for cement; there is a small amount of recycling of concrete for use as aggregate.

Import Sources (1994-97):[7] Canada, 35%; Spain, 11%; Venezuela, 10%; Greece, 9%; and other, 35%.

Tariff: Item	Number	Normal Trade Relations (NTR) 12/31/98	Non-NTR[8] 12/31/98
Cement clinker	2523.10.0000	Free	$1.32/t.
White portland cement	2523.21.0000	4¢/t	$1.76/t.
Other portland cement	2523.29.0000	Free	$1.32/t.
Aluminous cement	2523.30.0000	Free	$1.32/t.
Other hydraulic cement	2523.90.0000	Free	$1.32/t.

Depletion Allowance: Certain raw materials for cement production, such as limestone, bauxite, and gypsum, have depletion allowances.

Government Stockpile: None.

Events, Trends, and Issues: A strong construction market in 1998 generated record consumption levels for cement. Demand growth in 1998 was met through increased production and a large increase in imports. Passage of a major transportation infrastructure spending bill in 1998 augured well for higher U.S. consumption levels in 1999, although demand growth was expected to be tempered by spillover effects of economic problems in Southeast Asia and in Latin America. One new cement plant was expected to come online in 1999 and several other plants continued to be engaged in projects to upgrade their capacities.

There continued to be concern over the environmental impact of cement manufacture, particularly the emissions of carbon dioxide and cement kiln dust (CKD). A yearend 1997 accord was reached in Kyoto, Japan, that would have so-called developed countries, including the United States, reduce their carbon dioxide emissions to levels below those in 1990. This accord had yet to be signed or ratified by the U.S. Government. There was much debate as to how this reduction was to be achieved and what its cost would be to the economy. The Environmental Protection

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Agency has released proposed, but not yet final, guidelines on CKD emissions, and it has, as yet, to designate the material a hazardous waste.

A number of cement companies burn a proportion of solid or liquid waste materials in their kilns as a low-cost substitute for fossil fuels. Technically, 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 applicable current and future environmental regulations and their associated costs. The overall trend, tempered by administrative constraints, appears to be towards increased use of waste fuels. A number of environmental issues, such as restrictions on silica in dust, also affect cement raw materials quarries, but these are common to other types of mines as well.

Although still relatively minor in the United States, there is growing use worldwide of natural and synthetic pozzolans as partial or complete replacements for portland cement. Pozzolans are materials which, in the presence of free lime, have hydraulic cementitious properties; examples include certain volcanic rocks and industrial byproducts such as granulated blast furnace slag, fly ash, and silica fume. Pozzolonic cements, including blends with portland, can have performance advantages over some straight portland cements for certain applications. Because pozzolans do not require the energy-intensive clinker manufacturing (kiln) phase of production, their use reduces the unit monetary and environmental costs of cement manufacture. In the United States, most pozzolan consumption continued to be by concrete manufacturers rather than by cement plants.

World Production and Capacity:

	Cement production		Yearend clinker capacity	
	1997	**1998**[e]	**1997**[e]	**1998**[e]
United States (includes Puerto Rico)	84,255	87,200	83,147	83,700
Brazil	38,096	39,000	38,500	39,000
China	492,600	495,000	410,000	420,000
France	[e]19,000	19,000	24,000	24,000
Germany	[e]37,000	37,000	41,900	42,000
India	[e]80,000	85,000	72,000	75,000
Indonesia	[e]26,000	23,000	26,000	27,000
Italy	33,721	33,500	45,700	46,000
Japan	91,938	91,000	95,949	95,500
Korea, Republic of	59,796	59,000	55,800	57,000
Mexico	27,548	28,000	43,000	43,000
Russia	26,600	25,000	63,000	63,000
Spain	27,632	28,000	33,800	34,000
Taiwan	21,522	22,000	24,000	24,000
Thailand	[e]36,000	34,000	40,000	40,000
Turkey	36,035	37,000	28,600	28,600
Other countries	[e]379,000	357,000	336,000	340,000
World total (rounded)	[e]1,515,000	1,500,000	1,440,000	1,470,000

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 foreseeable future. Local shortages generally can be met through outside purchases, and both clinker and cement are widely traded on the world market.

Substitutes: Virtually all portland cement is utilized either in making concrete or mortars and, as such, competes with substitutes for concrete in the construction sector. These substitutes include brick clay, glass, aluminum, steel, fiberglass, wood, and stone. In the important road paving market, the main competitor is asphalt. There is a moderate but growing use in the United States of pozzolans as partial or complete substitutes for portland cement for some concrete applications.

[e]Estimated.

[1]See Appendix A for conversion to short tons.

[2]Portland plus masonry cement, unless otherwise noted. Excludes Puerto Rico.

[3]Includes cement made from imported clinker.

[4]Hydraulic cement. Excludes clinker.

[5]Production of cement (including from imported clinker) + imports (excluding clinker) - exports - changes in stocks.

[6]Defined as imports - exports + adjustments for Government and industry stock changes.

[7]Hydraulic cement and clinker.

[8]See Appendix B.