CEMENT

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This report covers hydraulic cement varieties that can be loosely grouped as portland cement and masonry cement; unless otherwise specified, activity levels in this report exclude Puerto Rico. In 2001, U.S. production of portland and masonry cements, combined, increased by about 1% to a new record of about 88.9 million metric tons (Mt) (table 1). Output of clinker, the intermediate product of cement manufacture, increased by about 0.4% to a new record of 78.5 Mt. The small relative production increases for cement and clinker may reflect the fact that 2000 was a leap year, with an extra working day. The United States continued to rank third in the world in overall hydraulic cement output, behind China and India; world output was about 1.7 billion metric tons (Gt).

Domestic consumption of cement continued to grow at a modest rate and reached a new overall record despite continued general weakness in the U.S. economy. Apparent consumption of cement in 2001 increased by about 2% to about 112.7 Mt (table 1). These growth rates were similar to those in 2000, but significantly lower than those of the immediately preceding years. As with previous years, the large production shortfall in 2001 was met by imports of cement, although the overall import levels declined. The 3% overall decline in cement prices was offset by the higher sales volumes. The total value (at the plant) of annually reported cement sales to final domestic customers rose by about 3.7% to about $8.6 billion (table 1), and essentially the same total value applies to the 2001 consumption tonnage (defined as shipments to final customers and based on monthly data) reported in table 9; the total value of 2000 sales in table 9 was also $8.6 billion. The delivered value of concrete, excluding mortar, in the United States was estimated to be at least $40 billion in 2001, based on typical portland cement contents of concrete.

The range of cements included within the general portland cement designation as used in this report can be found in table 16. Data for sales of blended cements listed separately from other portland cements (combined) are available within the monthly cement reviews of the U.S. Geological Survey (USGS) Mineral Industry Surveys series, starting with January 1998. In this report, masonry cement includes true masonry cements, portland-lime cements, and plastic cements. Excluded from this report are data on the production and sales of aluminous cements and pure cementitious or pozzolanic additives, such as fly ash and ground granulated blast furnace slag (GGBFS, but increasingly being referred to as slag cement).

In 2001, U.S. production of portland cement rose by about 1.1% to about 84.5 Mt, yet another new record. The top five producing States, in descending order, were Texas, California, Pennsylvania, Michigan, and Missouri. Portland cement producers in the United States ranged widely in size and in the number of plants operated. If companies having common parents are combined under the larger subsidiary's name and if joint ventures are apportioned, then the top 10 companies at yearend 2001, in descending order of cement production, were Lafarge North America, Inc; Holcim (US) Inc.; CEMEX, S.A. de C.V.; Lehigh Cement Co.; Ash Grove Cement Co.; Essroc Cement Corp.; Lone Star Industries Inc.; RC Cement Co. (including Alamo Cement Co.); Texas Industries Inc. (TXI); and California Portland Cement Co. The top 5 of these had about 52% of total U.S. production and production capacity, and all 10 together accounted for about 75% of total U.S. production and production capacity. Of the companies listed, all except Ash Grove and TXI were foreign-owned as of yearend.

Widespread consolidation in the international cement industry continued in 2001, with three significant ownership changes affecting the U.S. industry during the year. Following its well publicized but unsuccessful takeover bid in 2000 for Blue Circle Industries, Lafarge made an improved offer for Blue Circle in early 2001 that was accepted. Lafarge became the world's largest cement producer and the largest in the United States as a result of this merger. The merger resulted in Lafarge's operating subsidiary in the United States and Canada (Lafarge Corp.) having 13 integrated cement plants in the United States as well as 2 (clinker) grinding plants in Florida (Port Manatee and Tampa) and a large grinding plant for GGBFS at Sparrows Point, MD. In September, Lafarge Corp. changed its name to Lafarge North America, Inc.

As part of the Blue Circle takeover, Lafarge agreed to sell St. Marys Cement Corp. (a Blue Circle subsidiary that operated a large grinding plant in Detroit, MI, as well as several U.S. terminals). St. Marys was bought by Votorantim Cimentos Ltda., the largest Brazilian cement producer; this was Votorantim's first foray into the North American cement market. Also during the year, Grupo Cementos de Chihuahua, S.A. de C.V. (GCC), a Mexican cement company, purchased Dacotah Cement Co. from the State of South Dakota. Prior to the sale, the Rapid City, SD, facility had been the only U.S. cement plant under State ownership. After the purchase, Dacotah Cement was renamed GCC Dacotah, Inc. The only other U.S. cement plant owned by GCC was Rio Grande Portland Cement Co. at Tijeras, NM. In December, the Swiss corporation Holderbank Financière Glaris Ltd., the world's largest cement producer prior to the Lafarge-Blue Circle merger, formally changed its name to Holcim Ltd. Its main U.S. subsidiary, Holnam Inc., became Holcim (US) Inc. In August, Australian-owned CSR America, Inc., changed its name to Rinker Materials Corp. The company owned two cement plants in Florida—the Rinker plant in Miami and the Florida Crushed Stone Co. plant in Brooksville.

In May, seven cement companies involved with grinding or using GGBFS formed the Slag Cement Association, based in Sugar Land, TX, to promote the use of this product as an

additive in blended portland cements and as a partial replacement for portland cement in concrete mixes.

The bulk of this report is based on data compiled from USGS annual questionnaires sent to cement and clinker manufacturing plants and associated distribution facilities and import terminals, some of which are independent of U.S. cement manufacturers. For 2001, responses were received from 125 of 144 facilities canvassed, a response rate of 87%. The 19 forms not received included 12 integrated plants, 1 grinding plant, and 6 independently reporting import terminals. The forms that were received accounted for approximately 90% of the U.S. total cement and clinker production shown and approximately 85% of total cement sales. In contrast, responses received for the 2000 data year totaled 143 of 144 facilities canvassed, included all the producers, and covered 100% of actual production and more than 99% of sales.

The need to estimate data for so many survey forms not received for the 2001 survey required the rounding of some State, district, and national totals on a number of tables; these rounded data have been footnoted. However, data were not rounded for districts where the data were obtained by telephone inquiry, were unaffected by missing forms, or were available from the monthly surveys (e.g., clinker production).

Legislation and Government Programs

Economic Issues.—Government economic policies and programs affecting the cement industry are those affecting cement trade, interest rates, and public sector construction spending. In terms of trade, the major issue in 2001 remained that of antidumping tariffs against Japan and Mexico; in a 2000 sunset review judgement, these tariffs were ruled as still necessary. On March 8, 2001, the U.S. Department of Commerce released its determination for the ninth review period, covering August 1998 to July 1999, for gray portland cement and clinker from Mexico; the dumping margin for the period was set at 39.34% (Southern Tier Cement Committee, 2001).

The major Government construction funding program in 2001 remained the Transportation Equity Act for the 21st Century (TEA-21), passed in 1998, which authorized $216.3 billion in funding for the 6-year period from 1998 to 2003 to upgrade the country's transportation infrastructure. The level of funding in TEA-21 exceeded previous spending levels by an average of about 44% per State, and the bill contained substantial funding guarantees. Funding provided for about $173 billion for new roads and bridges and existing infrastructure upgrades and repairs, of which about 95% was guaranteed. Although Federal public sector expenditures on highways increased since the passage of TEA-21, the increases were below expectations, as have been the levels of cement consumption for this work. Various factors have been blamed for the actual TEA-21 funding and consumption levels, including delays in or unavailability of State funding for cofunded projects, greater than anticipated lag times between project initiation and actual cement consumption, greater than anticipated work not requiring significant concrete, and as pointed out by Engineering News-Record (2001), environmental issues that have caused delays to or cancellation of some projects and, in many cases, raised project costs.

Environmental Issues.—Cement production involves both mining and manufacturing activities. Environmental issues related to mining of cement raw materials are mostly local and are common to most surface mines; they include potential problems with dust, increased sediment loads to local streams, noise, and ground vibrations from blasting.

Emissions of cement kiln dust (CKD), nitrogen and sulfur oxides, and carbon dioxide (CO_2) accompanying the manufacture of clinker are the main environmental issues concerning the cement industry. These issues have been discussed in more detail in previous editions of this report. The most important emissions are of CO_2, amounting to nearly 1 metric ton (t) of gas per ton of clinker, about one-half of which is derived from the calcination of calcium carbonate raw materials, and the rest from the combustion of fuels. Overall, CO_2 generation by the U.S. industry in 2001 was about 75 Mt.

Many individual cement companies and the industry in general view CO_2 issues in a multinational or global context while remaining cognizant of potential country-level statutory limitations or remedies regarding emissions. The major concern by the industry is that strategies designed to reduce CO_2 emissions by the largest cumulative sources (powerplants and motor vehicles) may disproportionately impact the cement industry. The levels of national CO_2 emissions reductions currently under consideration are those specified by the Kyoto Protocol, signed at the United Nations Framework Convention on Climate Change held in Kyoto, Japan, in 1997. Although the U.S. Government did not ratify the Kyoto Protocol and, in early 2001, formally withdrew from its provisions, the Government continues to acknowledge the desirability of reducing U.S. emissions of CO_2, and consequently, the U.S. cement industry has continued to study ways to reduce such emissions. In January, a long-term strategy for reducing the environmental impact of concrete production was released (American Concrete Institute, 2001). In addition, member companies of the Portland Cement Association agreed to a voluntary goal to reduce their average CO_2 emissions, as calculated per ton of cementitious product, by 10% below 1990 levels by the year 2020.

Cement kilns are considered to be a relatively environmentally benign way of burning a variety of hazardous and nonhazardous wastes owing to the very high temperatures at which clinker is made and the long residence times of materials in the kiln. However, the ability of plants to burn waste materials, either as fuels or raw materials, can be constrained by the degree to which such materials increase fugitive emissions of regulated trace elements or compounds. These limits can impact normal (non-waste-burning) operations as well. In 2001, the U.S. Environmental Protection Agency released new toxic release inventory (TRI) threshold guidelines for mercury, lead, and some persistent bioaccumulative toxics that were much lower than previous thresholds. For example, the new threshold for lead was set at 100 pounds per year, down from 10,000 pounds per year. The new threshold for mercury was just 10 pounds per year, down from 25,000 pounds per year. Although the thresholds are levels above which a plant must report their emissions, they are not emissions limits. Given the large quantities of fuels and raw materials burned by cement plants, it was likely that many plants would reach or exceed the new TRI thresholds, even where the materials burned contained these substances only in trace quantities, and the industry was concerned that it would suffer adverse publicity as a result.

Production

In 2001, cement was produced in 37 States and in Puerto Rico (tables 3-4). In addition to the portland and masonry cement plants, there were several grinding facilities that produced GGBFS from unground slag brought in from domestic or foreign sources.

There were no new (greenfields) portland cement plant openings during 2001[1]. In the related field of cementitious products, however, grinding plants to make GGBFS or slag cement were opened at two locations. The St. Lawrence Cement Group opened a 0.5-million-metric-ton-per-year (Mt/yr) GGBFS grinding plant in Camden, NJ; the plant came onstream in June and was commissioned in September (Cement Americas, 2002d; Holcim Ltd., 2002, p. 24). All the granulated slag feed for the facility is imported. Holcim completed and commissioned a 0.45-Mt/yr slag-grinding plant in Midfield, AL, which services United States Steel Corporation's Fairfield, AL, steel plant, to which a 1,200-metric-ton-per-day (t/d) granulator had been added as part of the project (Cement Americas, 2002b). Lafarge was constructing a GGBFS grinding plant in South Chicago, Il; the facility will be fed with imported slag (Cement Americas, 2001).

A number of existing portland cement plants completed major capacity upgrade projects during the year. In June, Holcim permanently shut down the two remaining operational wet kilns at its Portland Plant in Florence, CO, in anticipation of the operation of the plant's newly completed 1.9-Mt/yr dry kiln line in August. Unfortunately, major structural problems in the preheater-precalciner tower were discovered within 2 weeks of the new kiln's startup, which forced the shutdown of the new kiln until the tower could be repaired. The repairs were expected to continue into mid-2002. Holcim had announced that the Portland Plant's new kiln line would allow the closure of the company's plant in LaPorte, CO (near Fort Collins), but this plant's closure was delayed indefinitely until the problems at the Portland plant were resolved (International Cement Review, 2001b). Because the Portland plant briefly had production from both wet and dry kilns during the year, the facility is incorporated in the combined (wet and dry) technology grouping for 2001, rather than within the wet technology grouping, in tables 5, 7, and 8. Three other wet plants operated dry kilns during the year for the first time and are likewise grouped under the combined grouping. In July, Ash Grove started up a new 1.5-Mt/yr dry kiln line at its Chanute, KS, plant. The new kiln line replaced two wet kilns (Cement Americas, 2002a; Ash Grove Cement Co., 2001). In April, RC Cement Co. started up its new 0.72-Mt/yr kiln line and shut down a pair of wet kilns at its Signal Mountain, TN, plant. The plant's new finish mill had been brought online in mid-2000 (Maranzana, 2000). A new 5,500-t/d dry kiln line was brought online by TXI at its Midlothian, TX, plant in January; the accompanying finish mill had been completed in late 2000 (International Cement Review, 2000). Although the new kiln would replace some of the existing wet kiln clinker output, TXI had no plans to permanently idle any of the four existing wet kilns.

Test kiln firing commenced in late October, with the first clinker produced in early November, at the new 5,500-t/d dry kiln line at Lehigh's plant in Union Bridge, MD (Krupp Polysius AG, 2002). The facility's four long dry kilns were expected to be shut down permanently in mid-2002.

At its Victorville, CA, plant, CEMEX retired a long dry kiln and started up a newly completed 5,500-t/d dry kiln. This completed a multiyear expansion program at the plant (CEMEX, S.A. de C.V., 2002). Lafarge was nearing completion of the expansion projects at the Sugar Hill, MO, and Calera, AL, plants. The new kiln lines were expected to be operational in 2002 (Lafarge North America, Inc., 2002, p. 31). Rinker Materials' plant in Miami, FL, had its first full year of operation on its new dry kiln line, which was completed in 2000. Roanoke Cement Co. opened a large, new cement bagging facility in December; this completed a 5-year general modernization and upgrade program at the plant (Cement Americas, 2002c).

Hawaiian Cement Co. completed construction of its twin 30,000-t cement silos as part of its plan to rely solely on imported cement (Wurlitzer, 2001). The company ceased importing clinker in March and permanently closed its grinding plant in September. In the only other permanent plant closure during the year, Kosmos Cement Co. [a joint venture between CEMEX (75%) and Lone Star Industries Inc. (25%)], shut down the kiln at its Pittsburgh, PA, plant in March and closed the grinding plant in September. The facility will be maintained as a distribution terminal.

Portland Cement.—Portland cement was manufactured in the United States in 2001 at a total of 115 plants. There were also two portland cement plants in Puerto Rico. Six of the portland-cement-producing facilities were only grinding plants that did not produce their own clinker. Excluded from the count in 2001 was one plant (counted in 2000) that reported portland cement production but, in fact, only reground imported portland cement into another variety (i.e., it did not grind clinker). Of the six grinding plants counted, one was operated only intermittently during the year, and several also ground slag in addition to clinker. The distribution, by district, of portland cement plants, cement production, grinding capacities, and yearend cement stockpiles, is listed in table 3.

There was a substantial mix of significant production increases and decreases among the districts (table 3). The closure of the Kosmos plant in Pittsburgh probably explains much of the decline seen in western Pennsylvania. The declines seen in Kansas, Missouri, and South Carolina appear to be the result of disruptions to normal operations caused by upgrade projects at plants in those States. The decline in the Colorado-Wyoming district appears to be largely a result of the problems at Holcim's Florence, CO, plant, and the decline in the Alaska-Hawaii district reflects the cessation of production (grinding) in Hawaii noted above. Declines in the Georgia-Virginia-West Virginia district and in California appear to be mostly owing to relatively weak markets during the year. The very strong increase in the Kentucky-Mississippi-Tennessee district appears to reflect the 2000 upgrade of the Kosmos Cement plant in Louisville, KY, and the Signal Mountain, TN, plant upgrade in 2001. The strong increase in northern Texas reflects the 2000 and 2001 upgrades of the Midlothian plants of Holcim and TXI, respectively. In most States showing production declines that can be related to production disruptions, large drawdowns in

[1]One small (clinker) grinding plant opened late in the year in Milwaukee, WI, but no data were as yet available for it, and it is not included in this report's tabulations.

yearend cement stockpiles were seen. Yearend stockpiles for the country dropped by almost 1 Mt, or about 13.6%, to about 6.1 Mt.

The overall grinding capacity rose by about 3.2% to 106.8 Mt; however, grinding capacity utilization fell by about 2%. The capacity utilization percentages shown in table 3 are relative to portland cement production, but if they are calculated on a total cement (including masonry) basis, then the utilization percentage in 2001 improves to 83.3%, still down by about 2% from 2000 levels. Many cement plants have excess grinding capacity because it is relatively inexpensive to provide for such. Also, the capacities shown in table 3 for some districts include reported clinker grinding capacity that is currently utilized to grind slag (GGBFS). This is especially true in Florida, which shows a relatively low capacity utilization level. The low value for Alaska-Hawaii reflects the closure, noted earlier, of the district's sole grinding plant during the year. Some low utilization rates also reflect plant upgrades late in the year; the full new capacity is credited without commensurate full year production at the upgraded levels. In contrast to recent years, many districts showed capacity utilization rates in 2001 that were perhaps slightly below full practical operational levels.

Data are not collected on the production of specific varieties of portland cement, but it may be presumed that production levels approximate the breakdown, by type, of portland cement sales (shipments) listed in table 16. Ideally, this comparison should be adjusted for the import component of sales. Imports are dominated by Types I and II portland cement but include significant Type V (mainly into southern California) and white cement. Production of Types I and II (or hybrids thereof) accounted for about 90% of total portland cement output.

Masonry Cement.—Production of masonry cement rose by about 2.7% to about 4.5 Mt in 2001 (table 4), following a 1.4% decline the previous year. Unlike portland cement, little if any masonry cement is imported; accordingly, production is virtually identical to the consumption levels (as defined by shipments to final customers) in table 9. The data in both tables 4 and 9, however, underrepresent true production and consumption levels of masonry cement because it is common for masonry cement (particularly the portland lime variety) to be made at the jobsite from purchased portland cement and lime. There are no data on this jobsite activity. In 2001, all but about 5% of the masonry cement continued to be reported by cement companies as having been made directly from clinker rather than starting from a finished portland cement.

Clinker.—Output of clinker increased by about 0.4% to 78.5 Mt in 2001, a new record (table 1). Unlike the case of cement production, clinker production data were not rounded even for States for which plant forms were not received because monthly clinker production data were available for all the nonrespondent facilities (table 5). This does not apply to the capacity or stockpile data, some entries for which have been rounded. As with portland cement production, there was a broad mix of district-level clinker production increases and declines. Most of the production increases could be attributed to capacity upgrades that occurred either late in 2000 or early enough in 2001 that significantly enhanced production could be realized; cases in point are Arizona, Indiana, Kentucky and Tennessee, and northern Texas. Some upgrade work (e.g., southern California and Maryland), on the other hand, led to kiln output disruptions or shutdowns of old kilns in advance of new kiln startups. The large decline in the Colorado-Wyoming district output was because of the startup problems at one new kiln line in Colorado.

In 2001, clinker was produced by a total of 111 integrated cement plants operating 206 kilns. Two of these plants and kilns were in Puerto Rico. Of the total, 77 plants were dry process facilities. The number of wet process plants declined to 28, because 4 wet plants were reclassified into the "Integrated plants: Both" (wet and dry) category owing to the addition and operation of dry kilns during the year. Three of these plants likely will be reported as dry process plants in the 2002 edition of this report. The dry process plant category includes one semidry plant in Indiana.

California, Texas, Pennsylvania, Missouri, and Michigan, in descending order, remained the top five clinker-producing States in 2001 (table 5). Combining companies as much as possible under common ownership, the top 5 companies had 52% of total U.S. clinker production and 55% of capacity, and the top 10 companies had 75% of production and 77% of capacity. The top 10 companies, in descending order of clinker production, were Holcim, CEMEX (ranked first in capacity), Lafarge (including Blue Circle), Lehigh, Ash Grove, Essroc, TXI, Lone Star, RC Cement, and California Portland.

Annual clinker capacity and capacity utilization data are highly sensitive to reported kiln shutdown periods, specifically those for routine maintenance. This downtime sensitivity means that changes of a few percentage points in regional annual clinker production capacity or capacity utilization rates have little statistical significance. Apparent clinker capacity in 2001 increased by about 10% to 98.4 Mt/yr, despite the 1-day shorter working year (table 5). Overall capacity utilization fell to 80% from 87.5% in 2000, but this includes the inclusion of new capacity added late in the year (hence not offset by production) or capacity that was unavailable because of technical problems (one plant in Colorado). With few exceptions, the capacity utilization rates depict an industry running its kilns at full or close to full practicable production levels nationwide.

Based on the data in table 5, average plant clinker capacity in 2001 was about 0.90 Mt/yr, up by about 10%, and average kiln capacity was 0.48 Mt/yr, up by 7%. Plants operating only dry process kilns in 2001 produced 75.2% of the total clinker, which was unchanged from 2000 (table 7). Wet kiln plants accounted for 18.5%, down from 22.5% in 2000, and combination plants, 6.3%, compared with 2% in 2000; the changes here represent the four extra combination technology plants in 2001.

Yearend 2001 clinker stockpiles totaled 4.5 Mt, down by 0.8 Mt. The apparent drawdown of stockpiles may explain part of the large reduction in clinker imports during the year (tables 1, 22).

Raw Materials and Energy Consumed in Cement Manufacture.—The differentiation between raw materials consumed for clinker manufacture and those added in the finish mill to make cement is primarily of environmental interest. Materials used to make clinker are burned in the kiln and are associated with various chemical changes and emissions, whereas those used in the finish mill are just ground. The amount of nonfuel raw materials consumed to make cement and clinker are listed in table 6. About 1.7 t of nonfuel raw materials is needed to make 1 t of clinker. This ratio also approximately holds to make cement, provided that the

imported foreign clinker is first converted to its raw materials equivalent. Limestone or other calcareous materials account for about 85% of the total raw materials, including converted imported clinker, required to make cement and about 87% of those required to make clinker.

Overall, the ratio among raw materials types did not change appreciably in 2001. Some of the few specific changes seen may still simply reflect improved reporting rather than a net change in true consumption. Also, some materials may be inconsistently classified from year to year or among plants; for example, one plant's limestone might be another's cement rock. The chemical grouping of materials under terms like "calcareous" and "siliceous" is to some degree arbitrary because many of the raw materials supply more than one oxide. The CKD data for both years remain significantly underrepresented because few plants routinely measure consumption of this material; the apparent increase in consumption for clinker in 2001 thus likely reflects improved reporting. The changes in 2001 among slag varieties appear to represent mischaracterization of these materials—a common reporting error.

Among the siliceous raw materials, some of the pozzolans continue to appear to be out of balance with the sales (a proxy for production) of blended cements listed in table 16. This is especially true for GGBFS, the consumption of which is too high for the sales of the appropriate blended cement. The reason for this apparent excess is that most of the material listed in table 6 was not consumed by the cement industry to make blended cements but was introduced in unground form as a finish mill grinding aid in those States allowing a minor amount (3% or less) of GGBFS to be included in Type I portland cement. The GGBFS consumed for cement is only about 10% of the total GGBFS ultimately consumed by the concrete industry, as concrete manufacturers, especially ready-mixed producers, purchase GGBFS directly from the slag processors and incorporate it as a partial portland cement substitute within their concrete mixes.

In contrast to GGBFS, the amount of fly ash listed in the table 6 cement column could be accommodated within the equivalent blended cement sales in table 16, although at a lower ratio than that seen for 2000. The fly ash consumed to make clinker is far less than the roughly 10 Mt/yr of this material purchased directly by the concrete industry for use as a cement extender (American Coal Ash Association, 2000).

The natural rock pozzolan consumption shown in table 6 is in reasonable balance with the equivalent blended cement sales in table 16. The ratio to sales may be better examined through inclusion of the clay and shale (for cement) tonnages, on the assumption that this material is in burned or activated form. The amount of "other" pozzolans consumed for cement appears to be significantly too low relative to the equivalent blended cement sales (table 16), but the ratio would improve if the clay and shale for cement entries are included here instead of with the natural rock pozzolans, or if some of the CKD is included.

Many cement plants are able to switch among a variety of primary fuel types, and many routinely burn a mix of fuels (table 7). Some of the specific fuel declines seen for the wet (kiln) plants in 2001 merely reflect the move of four wet plants into the combination (wet and dry) process category as a result of upgrades during the year (three will become dry process plants in 2002).

As usual, dry process plants had a higher average electricity consumption per ton of product than wet process plants (table 8). This reflects the complex array of fans and blowers associated with modern dry kilns. The average unit consumption for wet plants increased in 2001, evidently reflecting the transfer of four, relatively efficient, wet plants into the combined technology category for the data year. The average for the combined process plants declined slightly because of this reclassification, and the decrease also reflects a net decline at these plants in the latter part of the year in the number of wet kilns in favor of single, larger capacity dry kilns. Multikiln plants tend to have higher unit electricity consumption rates than overall equivalent capacity single-kiln plants. The average consumption by dry plants did not change in 2001 but likely will do so in 2002 as the category receives the upgraded plants from the combined technology category.

The increase in unit electricity consumption for grinding plants followed an increase in 2000, and likely represents increased output of GGBFS from some of these facilities; GGBFS is harder to grind, and is typically ground finer, than clinker.

Consumption

Apparent consumption of portland and masonry cement is listed in table 1 and rose by about 2% in 2001 to a total of 112.7 Mt. Although apparent consumption is a standard statistic of comparison among various commodities, the measure of consumption preferred by the cement industry for its market analyses is that of cement shipments to final customers (i.e., sales). These monthly data are listed for 2000 and 2001 in tables 9 and 10 and are based on monthly shipment surveys of the cement-producing companies and importers, for which the response rate was 100% for both years. The definition of "final customer" is left to the reporting cement producer but is generally understood to include concrete manufacturers, building supply dealers, construction contractors, and others.

A significant tonnage difference commonly exists between the annual U.S. sales totals derived from annual canvasses for portland cement listed in tables 1 and 11-16 and the monthly survey-based totals listed in tables 9 and 10. The differences likely are the result of imported cement handled by certain terminals acting independently of the manufacturing plants. This imported material is captured on the monthly surveys because of the consolidated nature of monthly reporting but can be missed on the more facility-specific annual forms. The annual reporting protocols have been modified and the size of the discrepancy has declined. For example, in 1999 (data not listed), the discrepancy was 5.3 Mt; the discrepancy was 4.0 Mt and about 0.2 Mt in 2000 and 2001, respectively. The small size of the gap in 2001 is due, in part, to the use of monthly data as estimates for nonrespondent facilities in the annual canvass. Nevertheless, some significant amount of real decline for 2001 is indicated, based on lower discrepancies for many of the forms that were received. In contrast to portland cement, masonry cement tends not to show significant discrepancies between the monthly and annual sales totals, likely because little of this material is imported.

Superficial similarities between table 9 and tables 12-13 belie key differences in their component data. It should be noted that, apart from the fact that the national totals in table 12 are missing

some imported material, the district data in tables 12-13 show the locations of the reporting facilities, not the location of consumption. In contrast, table 9 shows the locations of the final customers and the quantities they consumed. For example, where a single-State district in table 12 shows a higher tonnage than the same State in table 9, it implies that the State was a net exporter of cement. Where table 9 shows the higher tonnage, the State in question was a net importer of cement.

In 2001, portland cement consumption grew by about 2.7% (compared with 1.1% in 2000 and 5.0% in 1999) to a new record of about 108 Mt (table 9). The imported cement component of consumption fell slightly (table 9), and the imported clinker component (tables 1, 22) fell substantially, both reflecting higher domestic cement and clinker production and, perhaps, drawdowns in stockpiles (tables 3, 5). Nonetheless, import dependence remained high—about 22% for cement and about 24% for cement and clinker combined. Masonry cement consumption grew by about 3.4% to about 4.5 Mt, about 1% of which was imported (table 9).

Because of its key role as a construction material, cement consumption levels broadly reflect those of construction spending. Relative to revised 2000 U.S. Census Bureau data quoted by the Portland Cement Association (2002), overall construction spending levels in 2001 declined by about 1% to $704.7 billion (constant 1996 dollars). Most of the spending decline was seen in residential ($322.3 billion, down by 0.5%) and nonresidential ($166.6 billion, down by 6.5%) building construction; both appeared to reflect the generally weak economy during the year and were despite continued low interest rates. Office construction, in particular, was down by about 9% to $43.1 billion. In contrast, public construction spending was up by about 4.5% to $162.0 billion, led by buildings ($80.3 billion, up by about 6%) and highway ($45.4, up by about 6%) construction. The increase for highway construction was less than that expected based on TEA-21 authorized funding levels.

Construction spending and cement consumption can be examined in terms of overall cement "penetration rates," namely the amount of total cement consumed per $1 million in construction spending. Although many variables affect this type of analysis, especially the distribution of spending among different types of construction, changes in penetration rates can reflect cost or performance advantages of concrete over competing construction materials, promotional efforts by the concrete industry, shifts in spending between new construction and repairs to existing infrastructure, lag times between construction spending and concrete consumption, and underreported cement consumption because of partial substitution in concrete mixes of portland cement by pozzolans. Using the apparent consumption data in table 1, the overall construction spending data show a generally increasing trend in penetration rates for 1997 to 2001; $1 million in construction spending bought, in chronological order, 151.8 t of cement in 1997; 155.5 t, in 1998; 156.8 t, in 1999; 155.3 t, in 2000; and 159.9 t, in 2001.

Table 9 lists consumption of portland cement by State and the general origins of the total cement consumed. The increase of overall portland cement consumption was fairly broadly distributed among States. Relatively few States showed large changes in consumption relative to 2000 levels. Relatively large increases were seen in Colorado, Illinois, Kansas, Missouri, Nebraska, New Jersey, western New York, Oklahoma, Pennsylvania, Texas, Virginia, and Wisconsin. Relatively large declines were only seen in Florida, Tennessee, and Utah (the latter reflecting the completion in 2000 of some major construction projects). In terms of portland cement, the 10 largest consuming States, in declining order, were Texas, California, Florida, Illinois, Ohio, Pennsylvania, Michigan, Georgia, New York, and Arizona. The top 5 States, combined, had about 38% of total U.S. consumption, and the top 10 States had about 54%.

Consumption levels for masonry cement changed little in 2001, with only six States showing large increases, and no States showing large decreases, in absolute tonnage terms. The strong increase shown for northern California is partially due to improved reporting. As with production, data for masonry cement sales to final customers in table 9 underrepresent true consumption because it is common for masonry cement to be mixed from components at the jobsite rather than being brought in as a finished product. Also, the data exclude the output of a few small masonry-cement-blending plants, which are treated instead as final customers for portland cement.

Cement Customer Types.—Data on portland cement usage are collected on the basis of the types of customers to whom the cement is sold rather than the direct application itself (table 15). The distinction is that a customer, although classified in one category, may in fact use cement in more than one way. The customer type data in table 15 are approximations and include a high proportion of estimates by the companies themselves. The customer breakouts are presented unrounded, however, to avoid very large relative errors in the smaller customer type categories; these categories tend to be underrepresented in estimated data. As in past years, the dominant customers for cement are the ready-mixed concrete producers.

Types of Portland Cement Consumed.—Sales to final customers of varieties falling within the broad definition of portland cement are listed in table 16. In 2001, Types I and II, combined, continued to account for 88% of total portland cement sales, a typical proportion though slightly lower than in 1999. Sales of Type III portland increased slightly but declined as a percentage of total sales. Sales of block cement declined by 13.5%, and sales of white cement declined by 2.7%. These declines are in accord with the decrease in building construction expenditures noted earlier. Sales of Type V cements rose by 9.4%, which is counter to the decline in total cement consumption in southern California, Nevada, and the fairly stagnant levels in Arizona. As with the large increase in Type V sales in 2000, some of the increase may be due to a reclassification to Type V of some sulfate-resistant Type II cement made and sold in California.

Blended cement sales in 2001 increased by 16.5% to 1.5 Mt, but this still represented only about 1.4% of total portland cement sales, about the same as in 2000. The 2001 tonnage closely matches that from the monthly surveys included within the table 9 total. Overall, the proportion of total blended to total portland cement sales have remained virtually unchanged during the past several years despite the fact that the concrete producers, particularly of ready-mixed product, have significantly increased their use of cementitious extenders during this period. This illustrates the concrete producers' preference, for cost reasons, to do the blending themselves. Notwithstanding the consistency of total blended cement sales

tonnages over the years, the tonnages of different types of blended cement have been variable.

Prices

Monetary data collected by the USGS reflect total and unit mill net values provided by the plants and import terminals (terminal nets) for their total shipments to domestic final customers of gray portland cement, white cement, and masonry cement (tables 12-14). The value data make no distinction between bulk and container (bag or package) shipments; however, container shipments would be expected to have higher unit values. Regional values for white cement have been lumped with those for gray portland cement, with the exception of the national total for white cement in table 14. In 2001, value data had to be estimated for 21.5% of the facilities surveyed, including nonrespondents and respondents who declined to provide value data. In contrast, estimates in 2000 were required for fewer than 10% of the facilities. All of the values listed should be considered to be estimates, even though they may be presented unrounded. Mill net values are better viewed as price indices for cement, suitable for crude comparisons among regions and over time. The data for portland cement are assumed to be dominated by bulk sales of the Types I and II varieties.

The average mill net value of portland cement in 2000 was about $75 per ton, down by 3%. Only Alaska plus Hawaii (both unusual markets dominated by imports) and California showed mill net unit value increases. For the national total consumption levels listed in table 9 and 12, portland cement sales in 2001 were worth a total of $8.1 billion. For the total value in table 12, this was a modest increase relative to total in 2000. The relative value totals in table 9 were essentially unchanged for the 2 years shown.

The unit value of imported hydraulic cement (table 18 data minus table 22 data) fell by 1.2% to $48.99 per ton on a cost, insurance, freight (c.i.f.) basis; this is well below the terminal net price to the final customer. It is likely that the availability of imported cement, although in lower quantities, helped to prevent price increases in regions with access to this material. Another constraint on portland cement prices continued to be the direct use of pozzolans by ready-mixed concrete companies as partial replacements for portland cement.

Although general world cement mill net price data are lacking, they can be approximated by the customs value data listed in tables 18-22. The average unit customs value for hydraulic cement in 2001 was just $38.03 per ton, down by 0.4%, and for gray portland cement, it was $35.21 per ton, down by 0.8% (tables 18, 20, 22). The average U.S. mill net value noted above is very high by comparison, and this makes the United States a very attractive export target for many foreign producers.

The average unit value of masonry cement sales was essentially stagnant in 2001 at $107 per ton (table 13). The total value of sales rose by about 4% to about $479 million. It should be noted, however, that the mill net values for masonry cement contain more component estimates than those for portland cement, and for a number of respondents, the masonry cement mill net values appear to have been reported on a bulk-equivalent basis instead of being inclusive of bagging charges.

The value data for white cement should be viewed with caution because there are only a few producers and importers of this product, and a significant share of white cement sales to final customers are resales by gray cement companies. Additionally, white cement includes a larger component of relatively costly package shipments, of imported material, and of estimated values. Thus, the 3% unit mill net value decrease in 2001 to $155 per ton, if real, may not be statistically significant (table 14). A discussion of prices for imported white cement is given in the "Foreign Trade" section.

Foreign Trade

Tables 17-22 list trade data from the U.S. Census Bureau. Exports of hydraulic cement and clinker increased in 2001 but, excepting sales to Canada, continued to be insignificant, and overall, the exports continued to be of almost no consequence to the U.S. cement market (table 17). Almost all of the exported material was cement.

The U.S. cement market continued to be significantly import dependent, although total imports of hydraulic cement and clinker declined by 9.8% to 25.9 Mt; this includes Puerto Rico (tables 18-19). Following the 2.3% decrease in 2000, the decline in 2001 was only the second annual decline since 1992 and reflected a combination of a slowing growth in demand and an increase in domestic production capacity. The import tonnage decrease was in stark contrast to increases of 22% in 1999, 37% in 1998, and 24% in 1997. The 2000 import tonnage represented approximately 25% of the total world trade in cement and clinker based on global estimates (International Cement Review, 2001a). The 2001 figure may represent an even higher fraction of the total world trade. The average unit c.i.f. value of imports rose by 0.5% to $48.96 per ton.

The hydraulic cement component of imports totaled 23.9 Mt, about 1 Mt less than in 2000 (tables 18, 22). Gray portland cement imports were 95% of this total and were down by 4.7% (table 20). The c.i.f. value of gray portland cement imports fell by 1.2% to $46.07 per ton, and the customs value fell by 0.8% to $35.21 per ton. The total c.i.f. value of gray portland cement imports fell by 5.9% to $1.05 billion. Customs values in 2001 ranged from $21.11 per ton for cement from the Philippines to $53.06 per ton for Canadian cement. As mentioned in the "Prices" section, the customs values listed are much lower than the U.S. mill net and/or terminal net values of portland cement sold to final customers, making the United States an attractive market for surplus foreign production and making it relatively easy for U.S. importers to absorb rising transportation costs, even for material sourced from vast distances.

White cement imports increased by about 1.4% to 0.94 Mt (table 21). The overall value fell by about 4%, reflecting a unit c.i.f. value decline of 5.8% to $104.32 per ton. However, some of the component country values (e.g., Indonesia, $69.78 per ton; Norway, $70.31 per ton; and Venezuela, $38.49 per ton) appear to be too low to be white cement or entirely white cement. Likewise the import tonnages appear to be too high; it is very unlikely that the tonnage of imported white cement would exceed the sales of white cement listed in table 16, especially when the sales include material produced at three U.S. plants. The most likely explanation for the low unit values for the countries noted above, especially Venezuela, is that their data include some gray portland cement or even clinker. Importers sometimes enter the wrong invoice codes; the Harmonized Tariff Schedule of the United States code for gray portland cement is 2523.29.00, which is not much different

from the codes for white cement (2523.21.00) or clinker (2523.10.00).

Imports of clinker are listed in table 22. Total imports in 2001 fell by 49% to just 1.9 Mt (possibly off by the 0.1 Mt of white cement imports listed in table 21 for Venezuela, if this material is clinker). The average c.i.f. value rose by 12.9% to $48.70 per ton. The fact that this is higher than the average unit value for gray portland cement is explained by the large influence of the clinker imports from France ($177.65 per ton); this material is aluminous cement clinker. If the French clinker is removed, the total remaining imports drop to 1.8 Mt (down by almost 50%) at a unit value of $43.88 per ton, up by 9.4%.

World Review

The world hydraulic cement production data listed in table 23 were derived from data collected by USGS country specialists from a variety of sources. The data for some countries may include their exports of clinker. Although the data are supposed to include all forms of hydraulic cement, the data for the United States are for portland plus masonry cement only, and the data for some other countries also may not be all-inclusive. World hydraulic cement production increased by about 2.4% in 2001 to an estimated 1.7 Gt.

Outlook

U.S. cement consumption is likely to decline by a small percentage in 2002 before recovering somewhat in 2003 because of the weak U.S. economy and the reduced capability of States to cofund TEA-21 infrastructure projects. Medium-term consumption beyond 2002 is anticipated to grow fairly steadily at rates in the range of 1% to 3% per year. A lot of new capacity is slated to come onstream in the 2002 to 2005 period, and this is expected to displace some imports. Average U.S. prices for cement are not expected to increase significantly during this timeframe. The terrorist attacks of September 11, 2001, had remarkably little direct effect on cement consumption rates, even in metropolitan New York; the main worry of the industry about the long-term effects of the attacks relates to the degree to which new or renewed U.S. security policies affect future public sector construction expenditures.

Despite the U.S. formal withdrawal from the provisions of the Kyoto Protocol, there is little expectation that there will not be continued pressure on the U.S. industry to reduce its emissions of CO_2 and other pollutants, especially given the fact that the companies controlling the U.S. industry also operate in countries likely to ratify or adopt reduction targets similar to those of the Kyoto Protocol. A number of major world cement producers are formulating a set of cohesive and proactive policies to both improve the environmental performances of their plants and adopt "greener" marketing strategies. Cement companies are expected to become increasingly involved in the production and marketing of cementitious extenders or partial substitutes for cement, particularly GGBFS.

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TABLE 1
SALIENT CEMENT STATISTICS 1/ 2/

(Thousand metric tons unless otherwise specified)

	1997	1998	1999	2000	2001
United States:					
Production of cement 3/	82,582	83,931	85,952	87,846	88,900
Production of clinker	72,686	74,523	76,003	78,138	78,451
Shipments from mills and terminals 4/ 5/	90,359	96,857	103,271	105,557	112,510
Value 4/ 6/ thousands	$6,637,464	$7,404,394	$8,083,247	$8,292,625	$8,600,000
Average value per ton 4/ 7/	$73.46	$76.45	$78.27	$78.56	$76.50
Stocks at mills and terminals, yearend	5,784	5,393	6,367	7,566	6,600
Exports 4/ 8/	791	743	694	738	746
Imports for consumption:					
Cement 9/	14,523	19,878	24,578	24,561	23,591
Clinker	2,867	3,905	4,164	3,673	1,884
Total 10/	17,390	23,783	28,742	28,234	25,476
Consumption, apparent 11/	96,018	103,457	108,862	110,470	112,710
World, production e/ 12/	1,540,000 r/	1,530,000 r/	1,600,000 r/	1,660,000 r/	1,700,000

e/ Estimated. r/ Revised.
1/ Portland and masonry cements only unless otherwise indicated. Even where presented unrounded, data are believed to be accurate to no more than three significant digits.
2/ Excludes Puerto Rico.
3/ Includes cement produced from imported clinker.
4/ Includes imported cement and cement produced from imported clinker. Includes sales by import terminals.
5/ Shipments are to final domestic customers. Data are based on annual survey of individual plants and terminals and may differ from tables 9 and 10, which are based on consolidated monthly shipments data from companies.
6/ Value at mill or import terminal of portland (all types) and masonry cement shipments to final domestic customers. Although presented unrounded, the data contain estimates for survey nonrespondents.
7/ Total value at mill or import terminal of cement shipments to final customers divided by total tonnage sold. Although presented unrounded, the data contain estimates for survey nonrespondents.
8/ Portland, masonry, and other hydraulic cements, plus clinker. Includes cement made in the United States from imported clinker.
9/ Hydraulic cement, all types.
10/ Data may not add to totals shown because of independent rounding.
11/ Production (including that from imported clinker) of portland and masonry cement plus imports of hydraulic cement minus exports of cement minus change in stocks.
12/ Total hydraulic cement. May incorporate clinker exports for some countries.

TABLE 2
COUNTY BASIS OF SUBDIVISION OF STATES IN CEMENT TABLES

State subdivision	Defining counties
California, northern	Alpine, Fresno, Kings, Madera, Mariposa, Monterey, Tulare, Tuolumne, and all counties farther north.
California, southern	Inyo, Kern, Mono, San Luis Obispo, and all counties farther south.
Chicago, metropolitan	Cook, DuPage, Kane, Kendall, Lake, McHenry, and Will Counties in Illinois.
Illinois	All counties other than those in metropolitan Chicago.
New York, eastern	Delaware, Franklin, Hamilton, Herkimer, Otsego, and all counties farther east and south, excepting those within metropolitan New York.
New York, western	Broome, Chenango, Lewis, Madison, Oneida, St. Lawrence, and all counties farther west.
New York, metropolitan	New York City (Bronx, Kings, New York, Queens, and Richmond), Nassau, Rockland, Suffolk, and Westchester.
Pennsylvania, eastern	Adams, Cumberland, Juniata, Lycoming, Mifflin, Perry, Tioga, Union, and all counties farther east.
Pennsylvania, western	Centre, Clinton, Franklin, Huntingdon, Potter, and all counties farther west.
Texas, northern	Angelina, Bell, Concho, Crane, Culberson, El Paso, Falls, Houston, Hudspeth, Irion, Lampasas, Leon, Limestone, McCulloch, Reeves, Reagan, Sabine, San Augustine, San Saba, Tom Green, Trinity, Upton, Ward, and all counties farther north.
Texas, southern	Brazos, Burnet, Crockett, Jasper, Jeff Davis, Llano, Madison, Mason, Menard, Milam, Newton, Pecos, Polk, Robertson, San Jacinto, Schleicher, Tyler, Walker, Williamson, and all counties farther south.

TABLE 3
PORTLAND CEMENT PRODUCTION, CAPACITY, AND STOCKS IN THE UNITED STATES, BY DISTRICT 1/

(Thousand metric tons unless otherwise specified)

	2000					2001				
			Capacity 2/					Capacity 2/		
District 3/	Active plants	Production 4/	Finish grinding	Percentage utilized	Stocks at yearend 5/	Active plants	Production 4/	Finish grinding	Percentage utilized	Stocks at yearend 5/
Maine and New York	5	3,140	3,846	81.6	313	5	3,250 6/	4,150 6/	78.2 6/	260 6/
Pennsylvania, eastern 7/	7	4,685	5,374	87.2	251	7	4,866	5,374	90.5	312
Pennsylvania, western	4	1,950	2,540	79.8	183	4	1,670 6/	2,540 6/	65.7 6/	120 6/
Illinois	4	2,861	3,787	75.5	290	4	2,869	3,769	76.1	176
Indiana	4	2,634	3,456	76.2	303	4	2,903	3,493	83.1	244
Michigan	5	5,785	7,881	73.4	411	5	5,920 6/	7,930 6/	74.7 6/	380 6/
Ohio	2	1,034	1,497	69.1	73	2	1,037	1,497	69.3	60
Iowa, Nebraska, South Dakota	5	4,255	5,479	77.7	424	5	4,365	5,393	80.9	272
Kansas	4	1,983	2,085	95.1	206	4	1,830 6/	2,320 6/	78.8 6/	110 6/
Missouri	5	4,884	5,186	94.2	634	5	4,715	5,312	88.8	493
Florida 8/	7	3,753	6,817	55.1	411	6	4,055	7,040 6/	57.6 6/	420 6/
Georgia, Virginia, West Virginia	4	3,042	4,656	65.3	209	4	2,918	4,619	63.2	188
Maryland	3	1,756	1,992	88.2	107	3	1,718	2,321	74.0	149
South Carolina	3	2,912	3,361	86.6	172	3	2,555	3,406	75.0	83
Alabama	5	4,337	5,020	86.4	331	5	4,480 6/	5,040 6/	88.9 6/	220 6/
Kentucky, Mississippi, Tennessee	4	2,209	3,545	62.3	191	4	2,990 6/	3,630 6/	82.4 6/	190 6/
Arkansas and Oklahoma	4	2,663	3,162	84.2	281	4	2,650 6/	3,160 6/	83.9 6/	190 6/
Texas, northern 7/	6	4,752	6,012	79.0	370	6	5,793	7,581	76.4	373
Texas, southern	5	4,515	4,842	93.2	247	5	4,560 6/	4,850 6/	93.9 6/	220 6/
Arizona and New Mexico	3	2,175	2,336	93.1	111	3	2,189	2,638	83.0	120 6/
Colorado and Wyoming	4	2,253	2,453	91.9	133	4	2,020 6/	2,450 6/	82.4 6/	120 6/
Idaho, Montana, Nevada, Utah	7	2,818	3,415	82.5	260	7	2,972	3,669	81.0	282
Alaska and Hawaii	1	286	288	99.5	27	1	112	288	39.1	64
California, northern	3	2,811	2,880	97.6	124	3	2,687	2,880	93.3	171
California, southern 7/	8	8,066	9,015	89.5	334	8	7,382	8,902	82.9	355
Oregon and Washington	4	1,953	2,498	78.2	170	4	1,947	2,500 6/	78.0 6/	190 6/
Independent importers, n.e.c. 9/	--	--	--	--	510	--	--	--	--	350
Total or average 10/	116	83,514	103,426	80.7	7,073 r/	115	84,450 11/	106,770 11/	79.1 11/	6,110 11/
Puerto Rico	2	1,664	2,065	80.6	33	2	1,546	2,156	71.7	73
Grand total 10/	118	85,178	105,491	80.7	7,106 r/	117	86,000	108,920	79.0	6,190

r/ Revised. -- Zero.

1/ Even where presented unrounded, data are believed to be accurate to no more than three significant digits.

2/ Reported annual grinding capacity is based on fineness necessary to grind individual plants' normal product mixes, making allowance for downtime required for routine maintenance.

3/ District assignation is the location of the reporting facilities. Includes independent importers for which regional assignations were possible.

4/ Includes cement produced from imported clinker.

5/ Includes imported cement. Includes mills and terminals.

6/ Data are rounded because they contain estimates for nonrespondent facilities.

7/ Includes data for white cement.

8/ Plant count excludes one plant that reported cement (clinker) grinding capacity but no output of portland cement.

9/ Data include only those importers for which regional assignations were not possible.

10/ Data may not add to totals shown because of independent rounding.

11/ Data exclude one small grinding plant that commenced operations late in the year in Wisconsin.

TABLE 4
MASONRY CEMENT PRODUCTION AND STOCKS IN THE UNITED STATES, BY DISTRICT 1/

(Thousand metric tons unless otherwise specified)

	2000			2001		
District 2/	Active plants	Production 3/	Stocks at yearend 4/	Active plants	Production 3/	Stocks at yearend 4/
Maine and New York	4	130	11	4	130 5/	10 5/
Pennsylvania, eastern	6	225	41	6	239	43
Pennsylvania, western	4	99	16	4	90 5/	10 5/
Indiana	4	W	62	4	W	53
Michigan	5	296	37	5	290 5/	40 5/
Ohio	2	92	27	2	74	13
Iowa, Nebraska, South Dakota	3	W	10	2	W	W
Kansas	2	W	W	2	25	15
Missouri	1	W	W	2	111	23
Florida	5	543	35	5	556	37
Georgia, Virginia, West Virginia	5	331	36	5	318	32
Maryland	3	78	19	3	77	14
South Carolina	3	411	25	3	487	39
Alabama	4	401	57	4	380	58
Kentucky, Mississippi, Tennessee	3	83	6	3	80 5/	10 5/
Arkansas and Oklahoma	4	142	25	4	130 5/	30 5/
Texas, northern	4	156	9	4	165	11
Texas, southern	3	112	7	3	126	9
Arizona and New Mexico	3	W	W	3	109	8
Colorado and Wyoming	2	W	W	2	W	W
Idaho, Montana, Nevada, Utah	1	W	W	1	W	W
Alaska and Hawaii	1	3	--	1	3	--
California	6	484	18	7	564 6/	23 6/
Independent importers, n.e.c.	--	--	5	--	--	4
Total 7/	78	4,332 8/	492	79	4,450 5/ 8/	490 5/

W Withheld to avoid disclosing company proprietary data; included in "Total." -- Zero.

1/ Includes masonry, portland-lime, and plastic cements. Even where presented unrounded, data are believed to be accurate to no more than three significant digits.

2/ District assignation is the location of the reporting facilities. Includes independent importers for which regional assignations were possible.

3/ Includes cement produced from imported clinker.

4/ Includes imported cement.

5/ Data are rounded because they contain estimates for nonrespondent facilities.

6/ Total for northern California includes production--85 and ending stocks--10. The total for southern California includes production--479 and ending stocks--13.

7/ Data may not add to totals shown because of independent rounding.

8/ Production directly from clinker accounted for 95% of the total in 2000 and 2001. Production from portland cement accounted for the remainder.

TABLE 5
CLINKER CAPACITY AND PRODUCTION IN THE UNITED STATES IN 2001, BY DISTRICT 1/

(Thousand metric tons unless otherwise specified)

District	Active plants 2/ Process used Wet	Dry	Both	Total	No. of kilns 3/	Daily capacity 4/	Average days of routine maintenance	Apparent annual capacity 5/	Production 6/	Percentage of capacity utilized	Yearend stocks 7/
Maine and New York	3	1	--	4	5	10.4 8/	28.2	3,520 8/	3,094	88.0 8/	110 8/
Pennsylvania, eastern	2	5	--	7	14	15.6	24.9	5,256	4,651	88.5	140
Pennsylvania, western	3	1	--	4	8	6.1 8/	25.0 8/	2,100 8/	1,450	69.0 8/	50 8/
Illinois	--	4	--	4	8	8.4	19.4	2,823	2,497	88.4	156
Indiana	1	3 9/	--	4	8	10.3	25.6	3,466	2,855	82.4	80
Michigan	1	2	--	3	8	13.5	24.8	4,544	4,305	94.8	300 8/
Ohio	1	1	--	2	3	3.5	13.7	1,213	1,058	87.2	99
Iowa, Nebraska, South Dakota	--	4	1	5	9	13.7	25.2	4,638	3,939	84.9	142
Kansas	1	2	1	4	12	9.8 8/	22.0 8/	3,390 8/	1,789	53.0 8/	210 8/
Missouri	2	3	--	5	7	13.8	23.1	4,671	4,308	92.2	215
Florida	1	4	--	5	7	12.5 8/	26.0 8/	4,200 8/	3,589	85.5 8/	240 8/
Georgia, Virginia, West Virginia	1	3	--	4	7	10.6	24.7	3,617	2,869	79.3	243
Maryland	1	2	--	3	8	11.0	28.9	3,731	1,622	43.5	48
South Carolina	2	1	--	3	7	8.8	20.4	3,025	2,478	81.9	94
Alabama	--	5	--	5	6	14.1 8/	19.5 8/	4,830 8/	4,150	86.0 8/	240 8/
Kentucky, Mississippi, Tennessee	1	2	1	4	6	11.0 8/	15.0 8/	3,800 8/	2,920	77.0 8/	290 8/
Arkansas and Oklahoma	2	2	--	4	10	7.7 8/	24.0 8/	2,620 8/	2,522	96.0 8/	120 8/
Texas, northern	2	3	1	6	16	21.6	16.8	7,444	5,630	75.3	205
Texas, southern	--	4	1	5	6	13.4 8/	22.0 8/	4,610 8/	4,234	92.0 8/	260 8/
Arizona and New Mexico	--	3	--	3	9	7.4	19.0	2,516	2,201	87.5	200 8/
Colorado and Wyoming	--	3	1	4	7	11.0 8/	18.0 8/	3,880 8/	1,793	46.0 8/	80 8/
Idaho, Montana, Nevada, Utah	3	4	--	7	9	8.6	25.9	2,929	2,695	92.0	152
California, northern	--	3	--	3	3	8.7	25.0	2,964	2,628	88.7	140
California, southern	--	8	--	8	18	30.2	25.2	10,505	7,520	71.6	592
Oregon and Washington	1	2	--	3	3	4.3 8/	33.0 8/	2,100 8/	1,656	79.0 8/	90 8/
Total or average 10/	28	75	6	109	204	288.0 8/	22.0 8/	98,390 8/	78,451	80.0 8/	4,490 8/
Puerto Rico	--	2	--	2	2	5.9	30.0	1,975	1,528	77.4	334
Grand total 10/	28	77	6	111	206	294.0 8/	22.0 8/	100,360 8/	79,979	80.0 8/	4,830 8/

-- Zero.

1/ Even where presented unrounded, data are believed to be accurate to no more than three significant digits.

2/ Includes white cement plants. Includes plants active for at least one day during the year.

3/ Kilns active at least 1 day during year. Excludes idle kilns (full year) that cannot be restarted (fully permitted) in less than 6 months.

4/ Sum of reported daily kiln capacities for each plant in district.

5/ Sum of apparent individual kiln capacities; for each kiln calculated as 365 days minus reported days shut down for routine maintenance and multiplied by the unrounded reported daily capacity.

6/ Several districts have one or more annual survey nonrespondent facilities for which estimates were made for most data categories. However, for all nonrespondent clinker producers, reported 12-month production data were available from monthly surveys and were incorporated.

7/ Includes imported clinker and clinker stockpiles at grinding plants.

8/ Data are rounded because they contain estimates for nonrespondent facilities.

9/ Includes one semidry kiln.

10/ Data may not add to totals shown because of independent rounding.

TABLE 6
RAW MATERIALS USED IN PRODUCING CLINKER AND CEMENT IN THE UNITED STATES 1/ 2/

(Thousand metric tons)

Raw materials	2000		2001 3/	
	Clinker	Cement 4/	Clinker	Cement 4/
Calcareous:				
Limestone (includes aragonite, marble, chalk, coral)	93,947	1,263	95,600	1,600
Cement rock (includes marl)	21,820	133	21,900	100
Cement kiln dust 5/	351	155	600	100
Lime 6/	19	49	300	40
Other	21	225	20	20
Aluminous:				
Clay	4,205	8	4,500	10
Shale	3,743	3	3,200	10
Other (includes staurolite, bauxite, aluminum dross, alumina, other)	400	--	500	--
Ferrous, iron ore, pyrites, millscale, other	1,310	--	1,500	--
Siliceous:				
Sand and calcium silicate	3,142	--	3,500	--
Sandstone, quartzite, other	925	--	500	--
Fly ash	1,679	88	1,600	70
Other ash, including bottom ash	930	--	800	--
Granulated blast furnace slag 7/	--	303	--	300
Other blast furnace slag	43	--	200	--
Steel slag	805	--	500	--
Other slags	12	10	50	5
Natural rock pozzolans 8/	--	40	--	50
Other pozzolans 9/	38	8	100	9
Other:				
Gypsum and anhydrite	--	4,655	--	4,800
Clinker, imported 10/	--	4,573	--	2,950
Other, n.e.c.	--	46	40	50
Total 11/	133,391	11,558	135,420	10,110

-- Zero.

1/ Includes Puerto Rico. Even where presented unrounded, data are believed to be accurate to no more than three significant digits.

2/ Nonfuel materials only.

3/ Data are rounded because they include estimates for a number of nonrespondent plants.

4/ Includes portland, blended, and masonry cements.

5/ Data are probably underreported.

6/ Data are probably underreported on the basis of reported volumes of masonry cements.

7/ Includes both ground and unground material.

8/ Includes pozzolana and burned clays and shales (where not reported directly as clay or shale).

9/ Includes diatomite, other microcrystalline silica, silica fume, and other pozzolans, whether or not used as such.

10/ Outside purchases by domestic plants; excludes purchases of domestic clinker.

11/ Data may not add to totals shown because of independent rounding.

TABLE 7
CLINKER PRODUCED AND FUEL CONSUMED BY THE CEMENT INDUSTRY IN THE UNITED STATES, BY PROCESS 1/ 2/

	Clinker produced			Fuel consumed					Waste fuel		
Kiln process	Active plants	Quantity (thousand metric tons)	Percentage of total	Coal 3/ (thousand metric tons)	Coke (thousand metric tons)	Petroleum coke (thousand metric tons)	Oil (thousand liters)	Natural gas (thousand cubic meters)	Tires (thousand metric tons)	Solid (thousand metric tons)	Liquid (thousand liters)
2000:											
Wet	32	17,911	22.5	2,409	96	390	32,513	51,482	106	149	801,288
Dry	77	60,172	75.5	7,479	346	920	91,153	206,729	259	867	127,799
Both	2	1,574	2.0	208	--	41	--	80,049	8	--	--
Total 4/	111	79,656	100.0	10,095	442	1,351	123,666	338,261	374	1,016	929,087
2001: 5/											
Wet	28	14,782	18.5	2,050	40	400	33,110	33,000	130	220	653,000
Dry	77	60,169	75.2	7,520	320	930	59,760	251,000	150	40	117,000
Both	6	5,029	6.3	670	60	40	450	113,000	20	60	59,000
Total 4/	111	79,979	100.0	10,240	420	1,370	93,320	397,000	300	320	829,000

-- Zero.

1/ Includes portland and masonry cement. Excludes grinding plants. Even where presented unrounded, data are believed to be accurate to no more than three significant digits.

2/ Includes Puerto Rico.

3/ All reported to be bituminous.

4/ Data may not add to totals shown because of independent rounding.

5/ Fuel consumption data are rounded as they contain estimated data for nonrespondent plants. For nonrespondent plants, however, clinker production data were available from monthly surveys and were incorporated without rounding.

TABLE 8
ELECTRIC ENERGY USED AT CEMENT PLANTS IN THE UNITED STATES, BY PROCESS 1/

	Electric energy used							
	Generated at plant		Purchased		Total		Finished cement 2/ produced (thousand metric tons)	Average consumption (kilowatt-hours per ton of cement produced)
Plant process	Number of plants	Quantity (million kilowatt-hours)	Number of plants	Quantity (million kilowatt-hours)	Quantity (million kilowatt-hours)	Percentage		
2000:								
Integrated plants:								
Wet	--	--	32	2,685	2,685	21.4	20,544	131
Dry	4	497	77	9,095	9,592	76.6	64,930	148
Both	--	--	2	249	249	2.0	1,593	157
Total or average 3/	4	497	111	12,029	12,526	100.0	87,067	144
Grinding plants 4/	--	--	6	164	164	--	2,294	71
Exclusions 5/	--	--	2	--	--	--	149	--
2001: 6/								
Integrated plants:								
Wet	--	--	28	2,260	2,260	17.6	16,690	136
Dry	5	560	77	9,180	9,740	75.9	65,960	148
Both	--	--	6	830	830	6.5	5,400	154
Total or average 3/	5	560	111	12,300	12,800	100.0	88,050	146
Grinding plants 4/	--	--	6	160	160	--	2,280	75
Exclusions 5/	--	--	2	--	--	--	120	--

-- Zero.

1/ Includes Puerto Rico.

2/ Includes portland and masonry cements.

3/ Data may not add to totals shown because of independent rounding.

4/ Excludes plants that reported production only of masonry cement.

5/ Tonnage of cement produced by plants that reported production of masonry cement only. One plant reported portland cement grinding capacity and so is included in table 3.

6/ Electricity data are rounded because they include estimates for a number of nonrespondent plants.

TABLE 9
CEMENT SHIPMENTS TO FINAL CUSTOMER, BY DESTINATION AND ORIGIN 1/ 2/

(Thousand metric tons)

Destination and origin	Portland cement		Masonry cement	
	2000	2001	2000	2001
Destination:				
Alabama	1,565	1,569	145	141
Alaska 3/	127	133	--	--
Arizona	3,236	3,265	109	107
Arkansas	952	976	54	56
California, northern	4,706	4,668	63	111
California, southern	7,959	7,924	368	390
Colorado	2,597	2,660	43	45
Connecticut 3/	838	812	15	15
Delaware 3/	165	162	11	11
District of Columbia 3/	178	184	2	1
Florida	7,694	7,527	591	635
Georgia	3,434	3,412	302	310
Hawaii	288	280	4	4
Idaho	558	568	1	1
Illinois, excluding Chicago	1,524	1,698	24	23
Chicago, metropolitan 3/	2,312	2,464	62	66
Indiana	2,208	2,252	96	98
Iowa	1,710	1,698	8	6
Kansas	1,490	1,624	15	14
Kentucky	1,322	1,353	98	101
Louisiana 3/	1,790	1,770	55	50
Maine	221	225	5	6
Maryland	1,333	1,381	88	94
Massachusetts 3/	1,580	1,644	23	24
Michigan	3,489	3,557	160	160
Minnesota 3/	2,010	1,973	37	29
Mississippi	936	950	56	54
Missouri	2,562	2,672	42	43
Montana	318	353	1	1
Nebraska	1,079	1,201	9	9
Nevada	1,963	1,943	31	28
New Hampshire 3/	268	260	6	7
New Jersey 3/	1,915	2,069	73	78
New Mexico	831	888	6	7
New York, eastern	637	644	30	30
New York, western 3/	871	1,044	36	34
New York, metropolitan 3/	1,677	1,651	57	65
North Carolina 3/	2,764	2,734	319	327
North Dakota 3/	308	303	3	2
Ohio	3,907	4,029	190	194
Oklahoma	1,421	1,543	45	46
Oregon	1,003	981	1	1
Pennsylvania, eastern	2,212	2,312	66	62
Pennsylvania, western	1,162	1,283	66	69
Rhode Island 3/	154	182	3	4
South Carolina	1,318	1,386	139	140
South Dakota	432	460	3	2
Tennessee	2,097	1,963	223	215
Texas, northern	5,540	6,810	198	217
Texas, southern	6,005	5,942	126	126
Utah	1,432	1,297	1	1
Vermont 3/	145	122	3	4
Virginia	2,216	2,326	156	160
Washington	2,016	1,961	3	3
West Virginia	417	461	26	27
Wisconsin 3/	2,185	2,298	33	32
Wyoming	248	365	1	1
U.S. total 4/	105,322	108,212	4,333	4,482
Foreign countries 5/	393	442	--	--
Puerto Rico	1,954 r/	1,865	--	--
Grand total 4/	107,669 r/	110,520	4,333	4,482

See footnotes at end of table.

TABLE 9--Continued
CEMENT SHIPMENTS TO FINAL CUSTOMER, BY DESTINATION AND ORIGIN 1/ 2/

(Thousand metric tons)

Destination and origin	Portland cement		Masonry cement	
	2000	2001	2000	2001
Origin:				
United States	83,318 r/	86,602	4,281	4,435
Puerto Rico	1,663	1,523	--	--
Foreign countries 6/	22,688 r/	22,395	52	48
Total shipments 4/	107,669 r/	110,520	4,333	4,482

r/ Revised. -- Zero.

1/ Includes cement produced from imported clinker and imported cement shipped by domestic producers and importers.

2/ Data are developed from consolidated monthly surveys of shipments by companies and may differ from data in tables 1, 11-13, 15, and 16, which are from annual surveys of individual plants and importers. Although presented unrounded, data are believed to be accurate to no more than three significant figures.

3/ Has no cement plants.

4/ Data may not add to totals shown because of independent rounding.

5/ Includes shipments to U.S. possessions and territories.

6/ Imported cement distributed in the United States by domestic producers and other importers. Data do not match the imports calculated from tables 19 and 22.

TABLE 10
CEMENT SHIPMENTS, BY DESTINATION (REGION AND CENSUS DISTRICT) 1/ 2/

Region and census district	Portland cement				Masonry cement			
	Quantity (thousand metric tons)		Percentage of U.S. total		Quantity (thousand metric tons)		Percentage of U.S. total	
	2000	2001	2000	2001	2000	2001	2000	2001
Northeast:								
New England 3/	3,206	3,245	3	3	55	58	1	1
Middle Atlantic 4/	8,474	9,003	8	8	328	337	8	8
Total 5/	11,680	12,249	11	11	383	395	9	9
South:								
South Atlantic 6/	19,519	19,572	19	18	1,634	1,705	38	38
East south central 7/	5,920	5,834	6	5	522	511	12	11
West south central 8/	15,708	17,041	15	16	478	494	11	11
Total 5/	41,147	42,447	39	39	2,634	2,710	61	60
Midwest:								
East north central 9/	15,625	16,298	15	15	565	573	13	13
West north central 10/	9,591	9,931	9	9	117	105	3	2
Total 5/	25,216	26,230	24	24	682	678	16	15
West:								
Mountain 11/	11,183	11,339	11	10	193	191	4	4
Pacific 12/	16,099	15,948	15	15	439	508	10	11
Total 5/	27,282	27,287	26	25	632	699	15	16
U.S. total 5/	105,322	108,212	100	100	4,333	4,482	100	100

1/ Includes imported cement shipped by importers and cement ground from imported clinker. Excludes Puerto Rico. Even where presented unrounded, data are believed to be accurate to no more than three significant digits.

2/ Data are based on table 9.

3/ New England includes Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont.

4/ Middle Atlantic includes New Jersey, New York, and Pennsylvania.

5/ Data may not add to totals shown because of independent rounding.

6/ South Atlantic includes Delaware, District of Columbia, Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, and West Virginia.

7/ East south central includes Alabama, Kentucky, Mississippi, and Tennessee.

8/ West south central includes Arkansas, Louisiana, Oklahoma, and Texas.

9/ East north central includes Illinois, Indiana, Michigan, Ohio, and Wisconsin.

10/ West north central includes Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, and South Dakota.

11/ Mountain includes Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, and Wyoming.

12/ Pacific includes Alaska, California, Hawaii, Oregon, and Washington.

TABLE 11
SHIPMENTS OF PORTLAND CEMENT FROM MILLS IN THE UNITED STATES, IN BULK AND IN CONTAINERS, BY TYPE OF CARRIER 1/

(Thousand metric tons)

	Shipments from plant to terminal		Shipments to final domestic consumer				
			From plant to consumer		From terminal to consumer		Total shipments to consumer
	In bulk	In containers 2/	In bulk	In containers 2/	In bulk	In containers 2/	
2000:							
Railroad	11,865	42	1,529	2	479	1	2,010
Truck	4,211	308	56,482	2,464	41,066	737	100,749
Barge and boat	8,082	--	183	--	6	--	188
Other	--	--	--	--	--	--	--
Total 3/	24,158	350	58,193	2,466	41,550	737	102,947 4/
2001: 5/							
Railroad	11,610	140	1,940	--	420	(6/)	2,260
Truck	2,600	280	57,950	2,480	46,360	690	107,480
Barge and boat	9,880	--	130	--	50	--	180
Other	--	--	--	--	--	--	--
Total 3/	24,100	420	59,900	2,480	46,800	690	109,920

-- Zero.

1/ Includes Puerto Rico. Includes imported cement and cement made from imported clinker. Even where presented unrounded, data are believed to be accurate to no more than three significant digits.

2/ Includes bags and jumbo bags.

3/ Data may not add to totals shown because of independent rounding.

4/ Shipments calculated on the basis of an annual survey of plants and importers; may differ from tables 9 and 10, which are based on consolidated company monthly data.

5/ Data for 2001 are rounded because they include estimates from a number of nonrespondent plants.

6/ Less than 1/2 unit.

TABLE 12
PORTLAND CEMENT SHIPPED BY PRODUCERS AND IMPORTERS IN THE UNITED STATES, BY DISTRICT 1/

	2000			2001		
	Quantity	Value 2/		Quantity	Value 2/	
District 3/ 4/	(thousand metric tons)	Total (thousands)	Average per metric ton	(thousand metric tons)	Total (thousands)	Average per metric ton
Maine and New York	3,422	$267,991	$78.32	3,690 5/	$275,000 5/	$74.50 5/
Pennsylvania, eastern	4,832	335,078	69.34	5,602	387,855	69.24
Pennsylvania, western	1,412	112,338	79.55	1,630 5/	126,000 5/	77.50 5/
Illinois	2,868	218,777	76.27	3,095	230,612	74.50
Indiana	2,932	199,744	68.13	3,108	209,113	67.29
Michigan	5,766	448,703	77.81	7,270 5/	561,000 5/	77.00 5/
Ohio	1,174	94,503	80.53	1,116	86,508	77.49
Iowa, Nebraska, South Dakota	4,779	376,357	78.76	5,100	391,907	76.84
Kansas	1,693	132,298	78.13	1,850 5/	142,000 5/	76.50 5/
Missouri	5,988	455,724	76.11	5,918	433,764	73.30
Florida	7,325	549,569	75.02	7,120 5/	516,000 5/	72.50 5/
Georgia, Virginia, West Virginia	3,055	238,729	78.13	3,021	232,372	76.92
Maryland	1,675	118,776	70.93	1,986	143,220	72.12
South Carolina	2,661	192,178	72.21	3,113	200,476	64.40
Alabama	4,539	357,813	78.83	4,280 5/	336,000 5/	78.50 5/
Kentucky, Mississippi, Tennessee	2,544	197,836	77.77	2,720 5/	205,000 5/	75.50 5/
Arkansas and Oklahoma	2,659	209,528	78.80	2,700 5/	204,000 5/	75.50 5/
Texas, northern	5,282	410,079	77.64	6,735	510,215	75.75
Texas, southern	5,608	392,860	70.05	6,040 5/	407,000 5/	67.00 5/
Arizona and New Mexico	3,610	350,231	97.03	3,740 5/	346,000 5/	92.50 5/
Colorado and Wyoming	2,581	232,221	89.97	2,640 5/	207,000 5/	78.00 5/
Idaho, Montana, Nevada, Utah	2,965	245,179	82.70	2,984	237,462	79.57
Alaska and Hawaii	381	39,880	104.67	379	50,984	134.61
California, northern	3,749	303,316	80.90	3,546	289,400	81.62
California, southern	9,004	669,445	74.35	8,815	665,368	75.48
Oregon and Washington	2,225	177,615	79.83	2,010 5/	157,000 5/	78.00 5/
Independent importers, n.e.c. 6/	6,552	506,655	77.33	7,850 5/	568,000 5/	72.00 5/
Total or average 7/ 8/	101,282	7,833,425	77.34	108,050 5/	8,121,000 5/	75.00 5/

See footnotes at end of table.

TABLE 12--Continued
PORTLAND CEMENT SHIPPED BY PRODUCERS AND IMPORTERS IN THE UNITED STATES, BY DISTRICT 1/

District 3/ 4/	2000 Quantity (thousand metric tons)	2000 Value 2/ Total (thousands)	2000 Value 2/ Average per metric ton	2001 Quantity (thousand metric tons)	2001 Value 2/ Total (thousands)	2001 Value 2/ Average per metric ton
Puerto Rico	1,665	W	W	1,873	W	W
Grand total 7/ 8/	102,947	W	W	109,920 5/	W	W

W Withheld to avoid disclosing company proprietary data.
1/ Includes imported portland cement (gray and white) and cement produced from imported clinker. Even where presented unrounded, data are believed to be accurate to no more than three significant digits.
2/ Values represent ex-plant (free on board plant) valuations of total sales to final customers, including sales from plant distribution terminals. The data are ex-terminal for independent terminals. All varieties of portland cement, and both bag and bulk shipments, are included. Unless otherwise specified, data are presented unrounded, but may include cases where value data (only) were missing from survey forms and so were estimated. Accordingly, unrounded data should be viewed as cement value indicators, good to no better than the nearest $0.50 or even $1.00 per ton.
3/ The district location is that of the reporting facility. Shipments may include material sold into other districts.
4/ Includes shipments by independent importers where district assignation is possible.
5/ Data are rounded because they contain estimates for nonrespondent facilities.
6/ Importers for which district assignations were not possible.
7/ Shipments calculated on the basis of an annual survey of plants and importers; may differ from tables 9 and 10, which are based on consolidated company monthly data.
8/ Data may not add to totals shown because of independent rounding.

TABLE 13
MASONRY CEMENT SHIPPED BY PRODUCERS AND IMPORTERS IN THE UNITED STATES, BY DISTRICT 1/ 2/

District 4/ 5/	2000 Quantity (thousand metric tons)	2000 Value 3/ Total (thousands)	2000 Value 3/ Average per metric ton	2001 Quantity (thousand metric tons)	2001 Value 3/ Total (thousands)	2001 Value 3/ Average per metric ton
Maine and New York	104	$10,258	$98.95	140 6/	$13,000 6/	$95.00 6/
Pennsylvania, eastern	243	27,455	112.99	225	26,866	119.49
Pennsylvania, western	98	10,470	107.23	100 6/	11,000 6/	110.00 6/
Illinois, Indiana, Ohio	491	52,949	107.76	511	57,005	111.47
Michigan	293	28,686	97.75	290 6/	29,000 6/	100.00 6/
Iowa, Nebraska, South Dakota	40	3,750	93.69	35	3,789	108.58
Kansas and Missouri	141	11,957	85.07	137	12,202	88.84
Florida	519	61,952	119.43	559	62,905	112.55
Georgia, Virginia, West Virginia	306	40,029	130.72	304	41,787	137.50
Maryland	73	6,641	91.54	81	7,410	91.33
South Carolina	385	42,709	110.80	442	47,753	108.01
Alabama	442	50,166	113.61	430 6/	44,000 6/	102.00 6/
Kentucky, Mississippi, Tennessee	87	8,516	97.96	80 6/	9,000 6/	110.00 6/
Arkansas and Oklahoma	131	11,473	87.88	130 6/	13,000 6/	103.00 6/
Texas, northern	133	14,023	105.43	137	16,359	119.06
Texas, southern	117	12,763	109.46	140 6/	14,000 6/	106.00 6/
Arizona, Colorado, Idaho, Montana, New Mexico, Nevada, Utah, Wyoming	146	15,075	103.44	143	14,311	100.06
Alaska and Hawaii	4	772	214.95	4	841	223.76
California, Oregon, Washington	484	43,171	89.19	560	51,110	91.31
Independent importers, n.e.c. 7/	40	6,385	158.79	30 6/	4,000 6/	145.00 6/
Total or average 8/ 9/	4,275	459,200	107.42	4,460 6/	479,000 6/	107.00 6/

1/ Shipments are to final domestic customers and include shipments of imported cement and cement made from imported clinker. Excludes Puerto Rico, which did not record any masonry cement sales. Even where presented unrounded, data are believed to be accurate to no more than three significant digits.
2/ Includes gray, white, and colored varieties of masonry, portland-lime, and plastic cements.
3/ Values represent ex-plant (free on board plant) valuations of total sales to final customers, including sales from plant distribution terminals. The data are ex-terminal for independent terminals. All varieties of portland cement, and both bag and bulk shipments, are included. Unless otherwise specified, data are presented unrounded, but may include cases where value data (only) were missing from survey forms and so were estimated. Accordingly, unrounded data should be viewed as cement value indicators, good to no better than the nearest $0.50 or even $1.00 per ton.
4/ District location is that of the reporting facilities. Shipments may include material sold into other districts.
5/ Data are rounded because they contain estimates for nonrespondent facilities.
6/ Data are rounded because district contains at least one nonrespondent facility for which all data were estimated.
7/ Importers for which district assignations were not possible.
8/ Tonnages based on annual survey of plants and importers; may differ from tables 9 and 10, which are based on consolidated company monthly data.
9/ Data may not add to totals shown because of independent rounding.

TABLE 14
AVERAGE MILL NET VALUE OF CEMENT IN THE UNITED STATES 1/

(Dollars per metric ton)

Year	Gray portland cement	White portland cement	All portland cement	Prepared masonry cement	All classes of cement
2000 2/	76.61	159.45	77.34	107.42	78.56
2001 3/	74.50	155.00	75.00	107.00	76.50

1/ Excludes Puerto Rico. Mill net value is the actual value of sales to customers, free on board plant or import terminal, less all discounts and allowances, less any freight charges from U.S. producing plant to distribution terminal and to final customers.
2/ Although unrounded, the data incorporate estimates for some plants and are accurate to no better than two significant figures.
3/ Data are rounded because of an unusually large number of nonrespondents for which estimates for both sales tonnages and values were made.

TABLE 15
PORTLAND CEMENT SHIPMENTS IN 2001, BY DISTRICT AND TYPE OF CUSTOMER 1/

(Thousand metric tons)

District 2/ 3/	Ready-mixed concrete	Concrete product manufacturers 4/	Contractors 5/	Building material dealers	Oil well mining, waste 6/	Government and miscellaneous 7/	District total 8/
Maine and New York	2,835	561	26	182	--	87	3,690 9/
Pennsylvania, eastern	3,627	1,216	329	342	--	88	5,602
Pennsylvania, western	1,057	207	186	141	1	38	1,630
Illinois	2,353	371	102	3	212	55	3,095
Indiana	2,155	475	62	88	322	6	3,108
Michigan	5,407	748	766	322	18	4	7,270 9/
Ohio	890	132	52	42	--	--	1,116
Iowa, Nebraska, South Dakota	3,840	656	453	63	87	--	5,100
Kansas	1,456	127	217	31	20	2	1,850 9/
Missouri	4,638	565	607	84	--	24	5,918
Florida	5,183	1,476	93	278	--	91	7,120 9/
Georgia, Virginia, West Virginia	2,170	408	112	308	14	9	3,021
Maryland	1,503	372	57	25	--	29	1,986
South Carolina	2,345	543	97	110	--	18	3,113
Alabama	3,431	496	132	210	1	8	4,280 9/
Kentucky, Mississippi, Tennessee	2,293	244	132	18	7	21	2,720 9/
Arkansas and Oklahoma	2,012	212	403	31	36	2	2,700 9/
Texas, northern	4,554	445	1,017	209	498	11	6,735
Texas, southern	4,362	598	582	107	374	18	6,040 9/
Arizona and New Mexico	2,832	425	183	145	24	125	3,740 9/
Colorado and Wyoming	1,990	313	199	80	34	26	2,640 9/
Idaho, Montana, Nevada, Utah	2,324	222	133	86	162	57	2,984
Alaska and Hawaii	302	46	5	26	--	--	379
California, northern	2,892	330	166	147	1	9	3,546
California, southern	6,498	1,523	296	394	78	26	8,815
Oregon and Washington	1,614	202	89	79	--	28	2,010
Independent importers, n.e.c. 10/	6,220	1,138	270	155	17	50	7,850 9/
Total 8/	80,782	14,053	6,767	3,707	1,909	835	108,050 9/
Puerto Rico	1,015	247	95	514	--	2	1,873
Grand total 8/	81,797	14,300	6,862	4,220	1,909	837	109,920 9/

-- Zero.
1/ Includes shipments of imported cement and cement ground from imported clinker. Data other than district totals are presented unrounded but incorporate estimates for some plants and are likely accurate to only two significant figures. District totals are accurate to no more than three significant digits.
2/ District location is that of the reporting facility. Shipments may include material sold into other districts.
3/ Includes shipments by independent importers, where district assignations were possible.
4/ Grand total shipments to concrete product manufacturers include brick-block--6,627; precast-prestressed--3,295; pipe--1,542; and other or unspecified--2,836.
5/ Grand total shipments to contractors include airport--561; road paving--4,624; soil cement--828; and other or unspecified--799.
6/ Grand total shipments to oil well, mining, and waste include oil well drilling--1,386; mining--143; and waste stabilization--380.
7/ Includes shipments for which customer types were not specified.
8/ Data may not add to totals shown because of independent rounding.
9/ District totals are rounded as they include estimates for nonrespondent facilities.
10/ Shipments by independent importers for which district assignations were not possible.

TABLE 16
PORTLAND CEMENT SHIPPED FROM PLANTS IN THE UNITED STATES TO DOMESTIC CUSTOMERS, BY TYPE 1/

(Thousand metric tons)

Type	2000	2001
General use and moderate heat (Types I and II) (Gray)	90,644	96,970 2/
High early strength (Type III)	3,815	3,830
Sulfate resisting (Type V)	4,453	4,870
Block	636	550
Oil well	1,039	1,150
White 3/	894	870
Blended:		
Portland, natural pozzolans	194	192
Portland, granulated blast furnace slag	385	560 2/
Portland, fly ash	405	391
Other blended cement 4/	313	362
Total 5/	1,296	1,510 2/
Expansive and regulated fast setting	60	64
Miscellaneous 6/	111	110 2/
Grand total 5/ 7/	102,947	109,920

1/ Includes imported cement. Includes Puerto Rico. Even where presented unrounded, data are believed to be accurate to no more than three significant digits.
2/ Data are rounded because they contain estimates for nonrespondent facilities.
3/ Mostly Type I, II, but may include Types III-V and block varieties.
4/ Includes blends with other pozzolans, such as cement kiln dust and silica fume.
5/ Data may not add to totals shown because of independent rounding.
6/ Includes low heat (Type IV), waterproof, and other portland cements.
7/ Shipments are derived from an annual survey of plants and importers; may differ from tables 9 and 10, which are based on consolidated company monthly data.

TABLE 17
U.S. EXPORTS OF HYDRAULIC CEMENT AND CLINKER, BY COUNTRY 1/

(Thousand metric tons and thousand dollars)

	2000		2001	
Country of destination	Quantity	Value 2/	Quantity	Value 2/
Aruba	2	218	1	157
Bahamas, The	15	1,883	14	1,789
Belize	6	1,054	4	175
Brazil	5	452	2	237
Canada	581	41,161	614	41,553
China	2	105	8	367
Colombia	2	289	(3/)	17
Costa Rica	6	801	2	272
Czech Republic	7	308	1	34
Dominican Republic	1	158	2	342
Hong Kong	9	434	1	75
Jamaica	(3/)	58	6	296
Japan	1	176	2	192
Korea, Republic of	1	57	3	228
Lebanon	5	262	1	33
Mexico	51	10,347	43	6,335
Norway	1	39	3	158
Panama	3	263	1	138
Philippines	3	711	(3/)	23
Russia	3	128	4	194
Singapore	1	53	6	253
Taiwan	2	113	1	82
Trinidad and Tobago	2	103	(3/)	17
Turkey	--	--	3	126
United Kingdom	4	568	2	131
Venezuela	3	745	3	651
Other	20 r/	3,718 r/	19	2,116
Total 4/	738	64,204	746	55,991

See footnotes at end of table.

TABLE 17--Continued
U.S. EXPORTS OF HYDRAULIC CEMENT AND CLINKER, BY COUNTRY 1/

r/ Revised. -- Zero.
1/ Includes portland and masonry cements.
2/ Free alongside ship (f.a.s.) value. The value of exports at the U.S. seaport or border point of export is based on the transaction price, including inland freight, insurance, and other charges incurred in placing the merchandise alongside the carrier. The value excludes the cost of loading.
3/ Less than 1/2 unit.
4/ Data may not add to totals shown because of independent rounding.

Source: U.S. Census Bureau.

TABLE 18
U.S. IMPORTS FOR CONSUMPTION OF HYDRAULIC CEMENT AND CLINKER, BY COUNTRY 1/

(Thousand metric tons and thousand dollars)

	2000			2001		
		Value			Value	
Country of origin	Quantity	Customs 2/	C.i.f. 3/	Quantity	Customs 2/	C.i.f. 3/
Australia	180	4,305	7,384	146	3,294	6,018
Bahamas, The	206	7,506	9,485	32	989	1,335
Bulgaria	635	26,301	33,691	360	13,675	18,496
Canada	4,948	268,875	285,040	5,110	287,078	302,684
China	3,451	107,852	143,945	3,266	99,214	137,635
Colombia	1,524	59,173	75,694	1,705	64,675	85,278
Croatia	64	7,097	8,453	24	4,413	5,292
Denmark	554	27,934	38,105	527	21,700	32,624
France	79	15,223	16,513	71	13,041	13,635
Germany	24	1,765	1,875	(4/)	240	288
Greece	1,479	51,897	69,159	1,552	53,647	65,622
Indonesia	197	5,300	9,079	318	8,878	15,058
Italy	249	9,645	12,986	135	4,974	6,739
Korea, Republic of	1,823	49,742	75,578	1,326	32,646	53,572
Lebanon	108	4,167	4,935	--	--	--
Mexico	1,409	60,700	74,006	1,645	66,873	81,844
Morocco	22	974	1,331	--	--	--
Norway	263	10,257	12,626	413	17,992	18,973
Peru	26	796	1,191	247	7,524	10,624
Philippines	160	3,360	7,187	374	7,895	12,083
Spain	1,177	45,673	60,433	650	27,676	35,616
Sweden	903	28,879	37,694	989	31,311	40,698
Taiwan	82	2,417	3,745	551	16,256	25,375
Thailand	5,693	142,787	231,235	4,070	108,884	170,513
Turkey	1,453	47,868	69,273	767	27,285	36,988
United Arab Emirates	47	3,876	5,988	--	--	--
Venezuela	1,878	75,173	95,353	1,565	61,209	82,391
Other	49 r/	4,401 r/	5,557 r/	18	5,705	6,937
Total 5/	28,683	1,073,943	1,397,541	25,861	987,074	1,266,318

r/ Revised. -- Zero.
1/ Includes portland, masonry, and other hydraulic cements. Includes imports into Puerto Rico.
2/ Customs value. The price actually paid or payable for merchandise when sold for exportation to the United States, excluding U.S. import duties, freight, insurance, and other charges incurred in bringing the merchandise to the United States.
3/ Cost, insurance, and freight. The import value represents the customs value plus insurance, freight, and other delivery charges to the first port of entry.
4/ Less than 1/2 unit.
5/ Data may not add to totals shown because of independent rounding.

Source: U.S. Census Bureau.

TABLE 19
U.S. IMPORTS FOR CONSUMPTION OF HYDRAULIC CEMENT AND CLINKER, BY CUSTOMS DISTRICT AND COUNTRY

(Thousand metric tons and thousand dollars)

Customs district and country	2000			2001		
		Value			Value	
	Quantity	Customs 1/	C.i.f. 2/	Quantity	Customs 1/	C.i.f. 2/
Anchorage, AK:						
Canada	(3/)	12	14	1	51	113
China	94	2,875	4,197	--	--	--
Thailand	--	--	--	108	2,572	5,023
Total 4/	95	2,887	4,211	109	2,623	5,135
Baltimore, MD:						
Colombia	141	5,645	8,043	--	--	--
Denmark	(3/)	32	40	--	--	--
Germany	(3/)	291	336	--	--	--
Greece	199	7,273	10,334	305	11,626	14,598
Netherlands	(3/)	96	105	(3/)	349	371
Spain	15	474	834	--	--	--
Turkey	27	1,267	2,073	--	--	--
Venezuela	112	4,524	4,997	--	--	--
Total 4/	494	19,602	26,763	305	11,975	14,969
Boston, MA:						
Belgium	(3/)	69	72	--	--	--
Colombia	7	246	371	--	--	--
Netherlands	(3/)	53	62	(3/)	181	215
Norway	36	2,681	2,741	24	1,264	1,267
Spain	30	1,051	1,597	--	--	--
United Kingdom	(3/)	11	11	--	--	--
Venezuela	312	11,438	16,250	249	9,472	11,968
Total 4/	386	15,550	21,104	273	10,917	13,450
Buffalo, NY:						
Canada	546	29,548	31,133	646	35,435	37,363
Denmark	(3/)	10	10	--	--	--
France	--	--	--	(3/)	7	7
Norway	--	--	--	(3/)	8	8
United Kingdom	2	384	398	5	1,035	1,059
Total 4/	548	29,943	31,541	651	36,486	38,438
Charleston, SC:						
Australia	73	1,275	2,494	31	553	1,075
Canada	10	300	500	--	--	--
Colombia	101	3,932	5,337	368	13,298	19,363
Germany	(3/)	15	18	--	--	--
Greece	65	2,266	2,709	471	15,391	15,394
Korea, Republic of	36	1,075	1,558	--	--	--
Netherlands	(3/)	64	71	--	--	--
Spain	16	634	848	--	--	--
Thailand	408	9,786	19,796	--	--	--
Turkey	204	6,178	11,806	--	--	--
United Kingdom	1	370	463	3	1,012	1,183
Venezuela	--	--	--	335	11,825	17,416
Total 4/	915	25,895	45,601	1,207	42,079	54,431
Chicago, IL:						
Canada	34	1,902	1,992	18	1,021	1,095
India	(3/)	4	5	--	--	--
Japan	(3/)	43	48	(3/)	64	73
Netherlands	--	--	--	(3/)	34	39
United Kingdom	--	--	--	(3/)	15	22
Total 4/	35	1,949	2,046	18	1,133	1,229
Cleveland, OH:						
Belgium	--	--	--	(3/)	9	12
Canada	643	35,779	36,511	855	45,063	46,374
Denmark	--	--	--	(3/)	22	29
Netherlands	--	--	--	(3/)	46	56
Spain	(3/)	2	3	(3/)	3	4
United Kingdom	1	221	285	1	277	357
Total 4/	644	36,002	36,799	855	45,420	46,832

See footnotes at end of table.

TABLE 19--Continued
U.S. IMPORTS FOR CONSUMPTION OF HYDRAULIC CEMENT AND CLINKER, BY CUSTOMS DISTRICT AND COUNTRY

(Thousand metric tons and thousand dollars)

Customs district and country	2000			2001		
		Value			Value	
	Quantity	Customs 1/	C.i.f. 2/	Quantity	Customs 1/	C.i.f. 2/
Columbia-Snake, ID-OR-WA						
Canada	--	--	--	80	4,032	4,280
China	452	14,172	19,318	544	17,767	24,698
Total 4/	452	14,172	19,318	625	21,799	28,978
Detroit, MI:						
Canada	1,472	85,463	89,245	1,269	78,175	79,599
Germany	23	1,049	1,059	--	--	--
Korea, Republic of	102	4,509	4,549	--	--	--
Morocco	22	974	1,331	--	--	--
Total 4/	1,619	91,994	96,183	1,270	78,175	79,599
Duluth, MN, Canada	263	14,028	16,007	284	16,115	18,486
El Paso, TX, Mexico	489	19,295	24,414	562	20,264	25,464
Great Falls, MT:						
Belgium	(3/)	10	11	--	--	--
Canada	16	888	1,095	5	385	400
United Kingdom	--	--	--	(3/)	8	10
Total 4/	16	898	1,106	6	393	410
Honolulu, HI:						
China	122	2,201	3,216	160	3,475	5,325
Thailand	144	2,460	3,898	109	2,692	3,783
Total 4/	266	4,661	7,115	269	6,167	9,108
Houston-Galveston, TX:						
Belgium	(3/)	12	13	--	--	--
China	(3/)	37	45	--	--	--
Colombia	136	5,738	8,483	120	4,895	7,343
Croatia	18	612	965	--	--	--
Denmark	28	769	1,135	181	5,508	7,772
France	(3/)	269	295	(3/)	234	278
Germany	(3/)	75	86	(3/)	138	167
Greece	104	3,347	4,658	--	--	--
India	(3/)	3	4	(3/)	2	2
Indonesia	15	488	527	--	--	--
Japan	(3/)	16	22	(3/)	8	9
Korea, Republic of	1,609	41,700	66,232	1,286	31,944	52,220
Mexico	--	--	--	(3/)	2	4
Netherlands	--	--	--	(3/)	19	22
Peru	26	796	1,191	188	5,751	8,149
Philippines	--	--	--	374	7,895	12,083
Thailand	531	12,595	18,913	186	4,862	6,848
Turkey	513	14,827	21,440	161	5,512	7,736
United Arab Emirates	43	3,467	5,372	--	--	--
United Kingdom	(3/)	79	150	(3/)	42	46
Venezuela	18	755	873	18	684	903
Total 4/	3,043	85,584	130,405	2,515	67,497	103,584
Laredo, TX, Mexico	159	17,861	18,621	163	18,376	19,358
Los Angeles, CA:						
Australia	(3/)	4	5	(3/)	9	9
China	1,475	47,719	61,992	1,871	57,121	77,400
India	(3/)	4	5	--	--	--
Japan	33	1,001	1,324	--	--	--
Taiwan	(3/)	3	4	--	--	--
Thailand	85	2,386	3,541	447	12,192	18,077
United Kingdom	(3/)	13	16	(3/)	34	40
Total 4/	1,593	51,131	66,886	2,318	69,356	95,525
Miami, FL:						
Belgium	3	534	566	3	623	660
Colombia	3	318	403	22	1,056	1,349
Denmark	104	3,114	4,484	--	--	--
France	(3/)	5	6	--	--	--
Germany	--	--	--	(3/)	21	27
Greece	--	--	--	162	5,940	7,694

See footnotes at end of table.

TABLE 19--Continued
U.S. IMPORTS FOR CONSUMPTION OF HYDRAULIC CEMENT AND CLINKER, BY CUSTOMS DISTRICT AND COUNTRY

(Thousand metric tons and thousand dollars)

Customs district and country	2000			2001		
		Value			Value	
	Quantity	Customs 1/	C.i.f. 2/	Quantity	Customs 1/	C.i.f. 2/
Miami, FL--Continued:						
Indonesia	20	662	896	--	--	--
Korea, Republic of	43	1,392	1,829	--	--	--
Mexico	5	446	568	(3/)	47	51
Netherlands	--	--	--	(3/)	34	42
Spain	776	31,763	40,768	583	25,202	32,235
Sweden	849	27,148	35,378	810	25,259	33,462
Thailand	18	600	840	19	579	830
Turkey	--	--	--	37	1,181	1,606
United Kingdom	(3/)	137	177	(3/)	76	97
Venezuela	138	4,995	6,627	52	2,116	2,882
Total 4/	1,960	71,113	92,544	1,687	62,135	80,935
Milwaukee, WI:						
Canada	80	4,598	4,958	111	6,280	6,711
Croatia	18	468	468	--	--	--
Total 4/	99	5,066	5,426	111	6,280	6,711
Minneapolis, MN, Germany	-- r/	--	--	(3/)	5	8
Mobile, AL:						
Australia	--	--	--	33	578	1,188
Greece	32	1,020	1,339	--	--	--
Korea	--	--	--	40	702	1,352
Peru	--	--	--	33	895	1,279
Thailand	459	9,443	18,322	288	6,258	11,801
Turkey	66	1,522	2,346	--	--	--
Total 4/	557	11,985	22,006	394	8,432	15,620
New Orleans, LA:						
Bulgaria	344	12,530	17,489	130	5,013	7,123
China	2	155	204	9	968	1,148
Colombia	(3/)	9	11	197	8,100	9,939
Croatia	27	5,976	6,977	22	3,991	4,871
Denmark	--	--	--	(3/)	9	10
France	13	2,435	2,798	(3/)	4	5
Germany	--	--	--	(3/)	37	39
Greece	327	11,278	14,692	--	--	--
Italy	244	8,993	12,159	134	4,878	6,632
Lebanon	45	1,713	2,325	--	--	--
Netherlands	--	--	--	(3/)	17	20
Sweden	26	830	1,115	--	--	--
Thailand	2,524	64,692	100,247	1,520	43,250	69,412
Turkey	290	11,773	14,909	152	6,401	8,038
Venezuela	429	18,949	22,812	127	6,559	7,306
Total 4/	4,271	139,333	195,738	2,291	79,228	114,541
New York City, NY:						
Bahamas, The	206	7,506	9,485	32	989	1,335
Colombia	(3/)	11	17	--	--	--
Croatia	(3/)	40	42	2	421	421
Denmark	68	4,359	5,150	(3/)	43	54
France	--	--	--	(3/)	2	2
Germany	(3/)	16	17	--	--	--
Greece	350	12,402	16,791	281	9,395	12,711
India	(3/)	5	6	(3/)	2	3
Italy	--	--	--	(3/)	7	11
Lebanon	(3/)	3	4	--	--	--
Netherlands	(3/)	88	100	1	333	378
Norway	227	7,576	9,885	389	16,719	17,698
Peru	--	--	--	26	879	1,196
Sweden	28	901	1,201	167	5,681	6,676
Turkey	300	10,533	14,185	300	10,269	14,244
United Kingdom	(3/)	98	109	1	373	482
Venezuela	34	1,248	1,778	22	821	1,184
Total 4/	1,214	44,787	58,770	1,220	45,935	56,396

See footnotes at end of table.

TABLE 19--Continued
U.S. IMPORTS FOR CONSUMPTION OF HYDRAULIC CEMENT AND CLINKER, BY CUSTOMS DISTRICT AND COUNTRY

(Thousand metric tons and thousand dollars)

Customs district and country	2000			2001		
		Value			Value	
	Quantity	Customs 1/	C.i.f. 2/	Quantity	Customs 1/	C.i.f. 2/
Nogales, AZ:						
Mexico	718	21,418	28,124	911	27,198	35,806
Netherlands	(3/)	17	21	(3/)	30	39
Total 4/	718	21,434	28,145	911	27,228	35,845
Norfolk, VA:						
Bulgaria	291	13,771	16,202	230	8,661	11,373
China	(3/)	2	2	--	--	--
Denmark	(3/)	67	88	(3/)	14	20
France	65	12,471	13,361	71	12,781	13,327
Germany	(3/)	9	11	(3/)	25	32
Greece	402	14,311	18,636	260	8,951	11,925
Indonesia	38	1,098	1,695	197	5,427	8,545
Netherlands	(3/)	185	196	(3/)	39	45
United Kingdom	1	208	261	2	176	238
Total 4/	798	42,122	50,453	760	36,075	45,505
Ogdensburg, NY:						
Canada	192	7,355	7,720	210	10,851	11,162
France	--	--	--	(3/)	11	12
Ireland	--	--	--	(3/)	2	2
United Kingdom	--	--	--	(3/)	9	9
Total 4/	192	7,355	7,720	210	10,872	11,184
Pembina, ND, Canada	344	16,830	18,770	287	12,713	12,998
Philadelphia, PA:						
Belgium	--	--	--	(3/)	11	11
Germany	(3/)	310	348	--	--	--
Italy	4	560	700	--	--	--
Netherlands	--	--	--	(3/)	25	27
Thailand	499	9,840	14,342	358	8,146	8,838
United Kingdom	(3/)	7	8	(3/)	72	136
Total 4/	503	10,717	15,399	359	8,254	9,013
Portland, ME:						
Canada	68	6,445	6,812	90	8,187	8,970
Turkey	46	1,090	1,761	--	--	--
Total 4/	114	7,535	8,574	90	8,187	8,970
Providence, RI:						
Colombia	15	513	727	--	--	--
Philippines	143	2,984	6,501	--	--	--
Spain	268	9,465	13,724	30	1,051	1,597
Venezuela	137	4,945	7,146	489	18,461	25,371
Total 4/	562	17,907	28,098	519	19,512	26,968
San Diego, CA:						
China	709	21,724	28,464	144	4,532	6,054
Mexico	30	1,001	1,310	3	118	164
Thailand	1	98	127	401	12,698	18,014
Total 4/	739	22,823	29,902	548	17,348	24,232
San Francisco, CA:						
Canada	12	579	672	--	--	--
China	421	13,018	18,628	391	11,772	16,124
Taiwan	82	2,415	3,742	551	16,256	25,375
Thailand	321	14,385	20,427	78	3,050	4,172
United Kingdom	(3/)	3	6	(3/)	4	25
Total 4/	835	30,398	43,475	1,020	31,082	45,696
San Juan, PR:						
Belgium	5	415	710	5	327	602
China	134	4,685	6,111	112	2,445	5,029
Colombia	31	1,142	1,240	28	1,344	1,669
Denmark	202	8,105	11,512	235	7,313	12,538
Italy	(3/)	8	9	(3/)	28	31
Lebanon	63	2,451	2,606	--	--	--
Mexico	7	679	968	6	869	997

See footnotes at end of table.

TABLE 19--Continued
U.S. IMPORTS FOR CONSUMPTION OF HYDRAULIC CEMENT AND CLINKER, BY CUSTOMS DISTRICT AND COUNTRY

(Thousand metric tons and thousand dollars)

Customs district and country	2000			2001		
		Value			Value	
	Quantity	Customs 1/	C.i.f. 2/	Quantity	Customs 1/	C.i.f. 2/
San Juan, PR--Continued:						
Spain	7	204	214	(3/)	11	12
Total 4/	450	17,688	23,369	386	12,337	20,879
Savannah, GA:						
Colombia	24	1,295	1,351	--	--	--
Denmark	5	366	507	--	--	--
Germany	--	--	--	(3/)	13	16
Indonesia	82	1,484	3,642	76	1,448	3,373
Italy	(3/)	76	108	(3/)	61	66
Thailand	132	2,988	5,244	51	1,169	2,382
Turkey	6	679	754	4	281	281
United Kingdom	(3/)	45	61	(3/)	8	11
Venezuela	69	2,746	2,805	--	--	--
Total 4/	318	9,679	14,471	130	2,979	6,129
Seattle, WA:						
Australia	106	3,027	4,885	83	2,154	3,746
Canada	1,077	51,724	55,005	1,052	52,389	57,558
China	44	1,264	1,767	34	1,135	1,858
Japan	(3/)	33	48	1	344	500
Thailand	--	--	--	24	574	978
United Kingdom	--	--	--	(3/)	3	4
Total 4/	1,227	56,048	61,705	1,195	56,599	64,643
St. Albans, VT:						
Canada	178	13,084	14,018	201	16,383	17,577
France	(3/)	44	53	--	--	--
Total 4/	178	13,128	14,071	201	16,383	17,577
Tampa, FL:						
Canada	12	340	588	--	--	--
Colombia	1,054	39,767	48,961	968	35,915	45,529
Denmark	146	11,112	15,178	112	8,790	12,201
France	--	--	--	(3/)	2	3
Greece	--	--	--	73	2,343	3,299
India	(3/)	8	10	(3/)	7	9
Indonesia	20	650	880	--	--	--
Korea, Republic of	33	1,066	1,410	--	--	--
Philippines	16	376	687	--	--	--
Spain	64	2,081	2,444	38	1,409	1,767
Sweden	--	--	--	12	371	559
Thailand	551	12,400	23,866	483	10,842	20,356
Turkey	--	--	--	112	3,640	5,083
United Arab Emirates	5	409	617	--	--	--
Venezuela	558	21,423	27,154	213	8,165	11,240
Total 4/	2,458	89,632	121,795	2,009	71,484	100,047
U.S. Virgin Islands:						
Barbados	2	74	94	1	56	77
Colombia	--	--	--	2	67	87
Panama	3	92	117	--	--	--
Venezuela	71	4,149	4,911	61	3,106	4,122
Total 4/	75	4,315	5,122	64	3,229	4,285
Washington, DC, Italy	(3/)	5	6	(3/)	--	--
Wilmington, NC:						
Colombia	13	557	750	--	--	--
Indonesia	21	918	1,438	45	2,003	3,140
Italy	(3/)	4	4	--	--	--
Thailand	22	1,114	1,670	--	--	--
Total 4/	55	2,593	3,864	45	2,003	3,140
Grand total 4/	28,683	1,073,943	1,397,541	25,861	987,074	1,266,318

See footnotes at end of table.

TABLE 19--Continued
U.S. IMPORTS FOR CONSUMPTION OF HYDRAULIC CEMENT AND CLINKER, BY CUSTOMS DISTRICT AND COUNTRY

r/ Revised. -- Zero.
1/ Customs value. The price actually paid or payable for merchandise when sold for exportation to the United States, excluding U.S. import duties, freight, insurance, and other charges incurred in bringing the merchandise to the United States.
2/ Cost, insurance, and freight. The import value represents the customs value plus insurance, freight, and other delivery charges to the first port of entry.
3/ Less than 1/2 unit.
4/ Data may not add to totals shown because of independent rounding.

Source: U.S. Census Bureau.

TABLE 20
U.S. IMPORTS FOR CONSUMPTION OF GRAY PORTLAND CEMENT, BY COUNTRY 1/

(Thousand metric tons and thousand dollars)

	2000			2001		
		Value			Value	
Country	Quantity	Customs 2/	C.i.f. 3/	Quantity	Customs 2/	C.i.f. 3/
Australia	179	4,301	7,379	113	2,707	4,821
Bahamas, The	199	6,713	8,553	32	989	1,335
Bulgaria	635	26,301	33,691	360	13,675	18,496
Canada	3,916	202,885	216,312	4,148	220,077	234,274
China	3,301	104,103	138,811	3,160	96,173	133,303
Colombia	1,314	51,444	66,633	1,477	55,699	74,214
Croatia	18	612	965	--	--	--
Denmark	385	12,721	17,756	407	11,705	18,889
Germany	23	1,100	1,117	(4/)	78	92
Greece	1,392	48,417	64,535	1,414	48,354	58,529
Indonesia	161	3,894	7,113	273	6,875	11,918
Italy	248	9,557	12,863	135	4,885	6,643
Korea, Republic of	1,721	45,232	71,029	1,286	31,944	52,220
Lebanon	19	575	838	--	--	--
Mexico	1,174	34,282	45,756	1,404	39,864	53,052
Norway	226	7,576	9,885	367	14,906	15,801
Peru	26	796	1,191	214	6,630	9,346
Philippines	159	3,360	7,187	374	7,895	12,083
Spain	1,054	35,535	48,253	532	17,867	23,166
Sweden	903	28,879	37,694	989	31,311	40,698
Taiwan	81	2,417	3,745	551	16,256	25,375
Thailand	3,594	100,413	156,533	3,320	90,621	140,866
Turkey	1,225	40,632	59,230	738	25,093	34,316
Venezuela	1,851	73,376	93,495	1,417	55,971	76,722
Other	38 r/	1,234 r/	1,614 r/	1	120	154
Total 5/	23,842	846,355	1,112,178	22,711	799,695	1,046,313

r/ Revised. -- Zero.
1/ Includes imports into Puerto Rico.
2/ The price actually paid or payable for merchandise when sold for exportation to the United States, excluding U.S. import duties, freight, insurance, and other charges incurred in bringing the merchandise to the United States.
3/ Cost, insurance, and freight. The import value represents the customs value plus insurance, freight, and other delivery charges to the first port of entry.
4/ Less than 1/2 unit.
5/ Data may not add to totals shown because of independent rounding.

Source: U.S. Census Bureau.

TABLE 21
U.S. IMPORTS FOR CONSUMPTION OF WHITE CEMENT, BY COUNTRY 1/

(Thousand metric tons and thousand dollars)

Country	2000			2001		
		Value			Value	
	Quantity	Customs 2/	C.i.f. 3/	Quantity	Customs 2/	C.i.f. 3/
Bahamas, The	7	793	932	--	--	--
Belgium	8	949	1,276	7	950	1,263
Canada	181	21,118	21,892	213	25,674	26,323
China	26	1,359	1,674	--	--	--
Colombia	9	880	1,042	11	981	1,250
Denmark	170	15,211	20,343	120	9,995	13,736
Greece	6	614	728	14	1,173	1,497
Indonesia	36	1,406	1,966 4/	45	2,003	3,140 4/
Mexico	205	23,807	25,352	197	23,146	24,478
Norway	36	2,681	2,741 4/	45	3,077	3,164 4/
Spain	123	10,136	12,176	119	9,805	12,445
Thailand	23	1,212	1,798 4/	37	3,291	3,403
Turkey	24	1,976	2,340	28	2,192	2,671
United Arab Emirates	48	3,876	5,988	--	--	--
Venezuela	22	1,560	1,612 4/	100	3,807	3,849 4/
Other	(5/) r/	296 r/	319 r/	(5/)	391	421
Total 6/	923	87,872	102,178	936	86,486	97,641

r/ Revised. -- Zero.
1/ Includes imports into Puerto Rico.
2/ Customs value. The price actually paid or payable for merchandise when sold for exportation to the United States, excluding U.S. import duties, freight, insurance, and other charges incurred in bringing the merchandise to the United States.
3/ Cost, insurance, and freight. The import value represents the customs value plus insurance, freight, and other delivery charges to the first port of entry.
4/ Values of less than $90.00 (c.i.f.) per metric ton likely indicate the mistaken total or partial inclusion of gray portland or similar cement or clinker. This error occurs when the importer records the wrong tariff number with the U.S. Customs Service. Values exceeding $200 per ton likely indicate misidentified specialty cement, not white cement.
5/ Less than 1/2 unit.
6/ Data may not add to totals shown because of independent rounding.

Source: U.S. Census Bureau.

TABLE 22
U.S. IMPORTS FOR CONSUMPTION OF CLINKER, BY COUNTRY 1/

(Thousand metric tons and thousand dollars)

Country	2000			2001		
		Value			Value	
	Quantity	Customs 2/	C.i.f. 3/	Quantity	Customs 2/	C.i.f. 3/
Australia	--	--	--	33	578	1,188
Canada	847	43,552	45,459	661	35,622	36,013
China	122	2,282	3,321	105	3,024	4,310
Colombia	201	6,849	8,019	217	7,996	9,814
Croatia	18	468	468	--	--	--
France	76	13,177	14,312	69	11,730	12,258
Germany	(4/)	3	3	--	--	--
Korea, Republic of	102	4,509	4,549	40	702	1,352
Lebanon	90	3,593	4,097	--	--	--
Morocco	22	974	1,331	--	--	--
Peru	--	--	--	33	895	1,279
Thailand	2,077	41,163	72,904	710	14,428	25,278
Turkey	204	5,261	7,703	--	--	--
Venezuela	--	--	--	48	1,431	1,821
Other	-- r/	-- r/	-- r/		--	--
Total 5/	3,760	121,830	162,167	1,916	76,405	93,313

See footnotes at end of table.

TABLE 22--Continued
U.S. IMPORTS FOR CONSUMPTION OF CLINKER, BY COUNTRY 1/

r/ Revised. -- Zero.
1/ For all types of hydraulic cement. Includes imports into Puerto Rico.
2/ Customs value. The price actually paid or payable for merchandise when sold for exportation to the United States, excluding U.S. import duties, freight, insurance, and other charges incurred in bringing the merchandise to the United States.
3/ Cost, insurance, and freight. The import value represents the customs value plus insurance, freight, and other delivery charges to the first port of entry.
4/ Less than 1/2 unit.
5/ Data may not add to totals shown because of independent rounding.

Source: U.S. Census Bureau.

TABLE 23
HYDRAULIC CEMENT: WORLD PRODUCTION, BY COUNTRY 1/ 2/

(Thousand metric tons)

Country	1997	1998	1999	2000	2001 e/
Afghanistan e/	116	116	116	50 r/	50
Albania e/	100	84	106	110	110
Algeria e/	7,096 3/	7,500	7,500	8,300	8,300
Angola e/	301 3/	350	350	350	350
Argentina	6,858	7,091	7,187	7,150 e/	7,000
Armenia	297	300	287	219	300 3/
Australia e/	6,450	6,850	7,450	7,500	7,500
Austria	3,852	3,850 e/	3,817 r/	3,776 r/	3,802 p/ 3/
Azerbaijan	315	201	177 r/	200 e/	500 3/
Bahrain	172	230	156	89	89 3/
Bangladesh 4/	1,013 r/	1,240 r/	2,085 r/	3,580 r/	5,005 3/
Barbados	173	259	253	268	270
Belarus	1,876	2,035	2,100	1,847 r/	1,803 3/
Belgium	8,052	7,000 e/	7,277 r/	7,150 r/	7,500
Benin e/	200 r/	200 r/	200 r/	250 r/	250
Bhutan e/	160	150	150	150	160
Bolivia	1,035	1,169	1,201 r/	1,072 r/	1,100
Bosnia and Herzegovina e/	200	300	300	300	300
Brazil	38,096	39,942	40,270	39,208	39,500
Brunei	250 e/	216	208	232	250
Bulgaria	1,654 r/	1,742 r/	2,060 r/	2,209 r/	2,200
Burkina Faso e/	40	40	50	50	50
Burma	516	365	338	393	460
Cambodia e/	150 r/	150 r/	-- r/	-- r/	50
Cameroon	620 r/	740 r/	850 r/	890 r/	930
Canada	12,015	12,124	12,634	12,612	12,986 p/ 3/
Chile	3,735	3,888	3,036	3,491	3,500
China	511,730	536,000	573,000	597,000 r/	626,500 p/ 3/
Colombia	8,446	9,190	9,200 r/ e/	9,750 r/ e/	9,800
Congo (Brazzaville)	20	--	--	20 e/	20
Congo (Kinshasa)	125	134	158	96 e/	100
Costa Rica	940	1,085 r/	1,100 r/ e/	1,150 e/	1,100
Côte d'Ivoire e/	1,100	650	650	650	650
Croatia	2,134	2,295	2,712	2,852	3,247 p/ 3/
Cuba	1,707 r/	1,713 r/	1,785 r/	1,633 r/	1,700
Cyprus	910 e/	1,207 r/	1,157 r/	1,398 r/	1,369 3/
Czech Republic	4,877	4,604	4,241	4,093	3,550 p/
Denmark	2,683	2,528	1,926 r/	2,009 r/	2,010
Dominican Republic	1,835	1,885	2,000 e/	2,000 e/	2,000
Ecuador	2,900 e/	2,600	2,300	2,800 e/	2,800
Egypt	19,700	21,000 e/	23,313	24,143	24,500
El Salvador	1,020	1,065 r/	2,425 r/	2,504 r/	2,500
Eritrea e/	60	50	57 r/	45	47
Estonia	423	321	358	329	405 3/
Ethiopia	752 e/	750 r/	638	880	950
Fiji	96	90	95 e/	95 e/	95

See footnotes at end of table.

TABLE 23--Continued
HYDRAULIC CEMENT: WORLD PRODUCTION, BY COUNTRY 1/ 2/

(Thousand metric tons)

Country	1997	1998	1999	2000	2001 e/
Finland	905	1,098 r/	1,310	1,422 r/	1,325 3/
France	19,780	19,500 e/	20,219 r/	20,137 r/	19,839 3/
French Guiana e/	51 3/	50	50	50	50
Gabon e/	200	196 3/	200	210 r/ 3/	210
Georgia	91	200	342 r/	348 r/	300 3/
Germany	35,945	36,610	35,912 r/	34,727 r/	28,034 3/
Ghana	1,700 e/	1,630	1,870	1,950	1,900
Greece	14,982	15,000 e/	13,908 r/	14,530 r/	15,500
Guadeloupe e/	230	230	230	230	230
Guatemala	1,280	1,500 r/	1,600 r/	1,600 r/	1,600
Guinea	260 e/	277 r/	297 r/	300 r/	300
Honduras	1,041 r/	896 r/	980 r/	1,100 r/	1,100
Hong Kong	1,925	1,539	1,387	1,284	1,300
Hungary	2,811	2,999	2,979	3,351 r/	3,500
Iceland	101	118	131	144	155
India e/	80,000	85,000	90,000	95,000	100,000
Indonesia	27,505	22,341	23,925	27,789	31,300 3/
Iran	19,250	21,300 r/ e/	22,080 r/	23,880 r/	26,650 3/
Iraq e/	1,700	2,000	2,000	2,000	2,000
Ireland	2,100	2,000 e/	2,466 r/	2,620 r/	2,600
Israel	5,400 e/	6,476	6,354	6,600 e/	6,900
Italy	33,721	35,512	37,299 r/	38,925 r/	39,804 p/ 3/
Jamaica	588	558	504	521 r/	500
Japan	91,938	81,328	80,120	81,070 r/	76,550 3/
Jordan	3,251	2,650	2,687	2,640	3,159 3/
Kazakhstan	661 e/	600 e/	838	1,175	1,957 3/
Kenya	1,506	1,426 r/	1,204	1,146 r/	1,085 p/ 3/
Korea, North e/	7,000 r/	7,000 r/	6,000 r/	6,000 r/	5,160
Korea, Republic of	60,317	46,091	48,157	51,255	52,012 3/
Kuwait e/	2,000	2,000	2,000	2,000	2,000
Kyrgyzstan	658	709	386	500	500 3/
Laos e/	84	80	80	92 r/	92
Latvia	246	366 r/	W	W	500
Lebanon	2,703	3,316 r/	2,714 r/	2,808 r/	2,700
Liberia e/	7	10	15	15	15
Libya e/	2,524 3/	3,000	3,000	3,000	3,000
Lithuania	714	788	666	570	520
Luxembourg	683	699 r/	742 r/	749 r/	750
Macedonia	500 e/	461	520	585	600
Madagascar	36	44	46	51 r/	54
Malawi	176	134	187	156 r/	181 3/
Malaysia	12,668	10,397	10,104	11,445	13,820 3/
Mali e/	30 r/	40 r/	30 r/	30 r/	40
Martinique e/	220	220	220	220	220
Mauritania e/	80	100 r/	100 r/	110 r/	110
Mexico	27,548	27,744	29,413	31,677	29,966 3/
Moldova	122	74	50	222	200 3/
Mongolia	112	109	104	92	68 3/
Morocco	7,236	7,414 r/	7,530 r/	8,100 r/	8,450
Mozambique	220 e/	260	270	310 e/	380
Namibia e/	50	100	150 r/	150 r/	8,450
Nepal e/ 4/	225 3/	280	290	300	285
Netherlands	3,230	3,200 e/	3,480 r/	3,450 r/	3,450
New Caledonia e/	100	--	--	-- r/	285
New Zealand e/	976 3/	950	960	950	950
Nicaragua	377	377 r/	350 r/	360 r/	360
Niger e/	30	30	30	40 r/	40
Nigeria e/	2,520 3/	2,700	2,500	2,500	3,000
Norway	1,724	1,676	1,827 r/	1,851 r/	1,870
Oman	1,264	1,300 e/	1,300 e/	1,716	1,750
Pakistan	9,001	8,901	9,600 r/ e/	9,900 r/ e/	9,900
Panama	700	750	760 r/	760 r/ e/	760
Paraguay	675 e/	620	640	700 r/ e/	750

See footnotes at end of table.

TABLE 23--Continued
HYDRAULIC CEMENT: WORLD PRODUCTION, BY COUNTRY 1/ 2/

(Thousand metric tons)

Country	1997	1998	1999	2000	2001 e/
Peru	4,301	4,340	3,799	3,700 r/ e/	3,589 3/
Philippines	14,681	12,888	12,556	11,959 r/	8,653 3/
Poland	15,003	14,970	15,555 r/	15,046 r/	11,918 3/
Portugal	9,395	9,500 e/	10,147 r/	10,343 r/	10,300
Qatar	692	700 e/	1,025	1,050 e/	1,050
Réunion	299	277	300	300 e/	10,300
Romania	7,298	7,300	6,252	6,058 r/	5,668 3/
Russia	26,700	26,000	28,400	32,400	35,100 3/
Rwanda e/	61 r/	59 r/	66 r/	71 r/	75
Saudi Arabia	15,400	14,000 e/	16,313 r/	18,107 r/	20,608 3/
Senegal e/	854 3/	1,000	1,000	1,000	1,000
Serbia and Montenegro	2,011	2,253	1,575	2,117	2,418 3/
Sierra Leone e/	160	50	100	100	1,000
Singapore e/	3,300	3,300	3,250	3,250	3,200
Slovakia	3,136 r/	4,705 r/	4,718 r/	3,045 r/	3,123 3/
Slovenia	1,113	1,149	1,224	1,300 e/	1,300
South Africa (sales)	9,797 r/	9,581 r/	9,008 r/	8,991 r/	9,165 3/
Spain (including Canary Islands)	27,632	27,943	35,782 r/	38,115 r/	40,512 3/
Sri Lanka	965 e/	874	976	1,008	1,010
Sudan	276 r/	198 r/	231 r/	146 r/	146
Suriname e/	60 r/	60 r/	60 r/	60 r/	60
Sweden	2,253	2,252 r/	2,298 r/	2,651 r/	2,700
Switzerland	3,568	3,600 e/	3,548 r/	3,771 r/	3,950 p/ 3/
Syria	4,840	4,607	4,781	4,830 e/	4,840
Taiwan	21,522	19,652	18,283	17,572 r/	18,128 3/
Tajikistan	36	18	30	50	70 3/
Tanzania	621	778	833	833 e/	875
Thailand	37,115 r/	22,722 r/	25,354 r/	25,499 r/	27,913 3/
Togo	421	500 r/	600 r/	700 r/	800
Trinidad and Tobago	653	690	688	743	708 3/
Tunisia	4,424	4,588	4,864	5,657 r/	5,721 3/
Turkmenistan e/	450	450	450	450	450
Turkey	36,035	38,200	34,258	35,825	30,120 p/ 3/
Uganda	290 r/	321 r/	347 r/	368 r/	416
Ukraine	5,098	5,591	5,828	5,311	5,800 3/
United Arab Emirates e/	5,250	6,000	6,100 r/	6,100 r/	6,100
United Kingdom	12,638	12,409	12,697	12,452 r/	11,854 3/
United States (including Puerto Rico) 5/	84,255	85,522	87,777	89,510	90,450 3/ 6/
Uruguay	781	750	720	700 e/	700
Uzbekistan	3,300	3,400 e/	4,471 r/	3,521 r/	4,000
Venezuela	8,145	8,202	8,500 e/	8,600 e/	8,700
Vietnam	8,019	9,738 r/	10,489 r/	13,347 r/	14,000
Yemen	1,235	1,201	1,454	1,400 e/	1,400
Zambia	384	351	300 e/	380 e/	380
Zimbabwe e/	1,100	1,100	1,000	1,000	1,000
Total	1,540,000 r/	1,530,000 r/	1,600,000 r/	1,660,000 r/	1,700,000

e/ Estimated. p/ Preliminary. r/ Revised. W Withheld to avoid disclosing company proprietary data; not included in "Total." -- Zero.
1/ World totals and estimated data are rounded to no more than three significant digits; may not add to totals shown. Even where presented unrounded, reported data are believed to be accurate to no more than three significant digits.
2/ Table includes data available through August 17, 2002. Data may include clinker exports for some countries.
3/ Reported figure.
4/ Data for year ending June 30 of that stated.
5/ Portland and masonry cements only.
6/ Data are rounded to four significant digits.