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CEMENT

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Cement

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Portland and masonry cement production in the United States increased by 9.2% in 2012 to a total of 74.2 million metric tons (Mt) (table 1). The performance was the third consecutive annual increase but remained well below the record output of 99.3 Mt in 2005. In terms of sales to final domestic customers, U.S. consumption of portland and masonry cement increased by 8.7% to 78.6 Mt (table 9), likewise well below the 2005 record consumption level of 127.9 Mt and, except for 2009–11, the lowest level of consumption since 1992. On a rounded, ex-factory basis, the average unit value ("price") for cement was stagnant in 2012 but the higher volumes led to a 9.0% increase in overall value of sales to $7.0 billion (tables 1, 11–13); still low compared with the record value of sales of $12.9 billion in 2006. Portland and masonry cements are the binding agents in concrete and most mortars. On the basis of typical portland cement mixing ratios in concrete, the delivered value of concrete (excluding mortar) in the United States was estimated to be at least $41 billion in 2012. World production of cement in 2012 was about 3.8 billion metric tons (Gt), up by about 5% (table 22).

Percentage or other changes expressed in this report compare activity in 2012 with that of 2011 unless specified otherwise. Except where otherwise indicated, data and trends in this report exclude those in Puerto Rico. Cements covered in this report are limited to those hydraulic varieties broadly classified as portland cement (including blended cement and other varieties listed in table 15) and masonry cement (including portland-lime and plastic cements). A few other types of hydraulic cement (notably aluminous cement) and (or) clinker are included in some of the trade data (tables 16–18, 21) and within the world production data (table 22). This report's tables exclude supplementary cementitious materials (SCMs), such as fly ash, other pozzolans, and ground granulated blast furnace slag (GGBFS), except to the degree that the SCMs are incorporated within finished portland (blended) or masonry cements or are used as raw feed for clinker manufacture. Sales data for blended (also called composite) cements listed separately from portland cement are available in the monthly Mineral Industry Surveys reports of the U.S. Geological Survey (USGS).

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, including certain terminals that are independent of U.S. cement manufacturers. For 2012, questionnaires were received for 142 out of 146 sites canvassed, a response rate of 97%, which included all the active production facilities. Not all forms were returned fully completed, but the data received included 100% reporting for production of cement and clinker and all but 0.9% of the cement sales tonnages listed in the tables. Likewise, for 2011, questionnaires were received for 153 of 157 sites canvassed, including all the production sites and 100% of production data. Missing data were estimated on the basis of monthly data or past annual reporting. The apparent decline in the number of forms in 2012 reflects a combination of plant closures and consolidation of reporting by some companies for certain distribution terminals or accounting inventories that previously had been reported separately. For both years, the data exclude a few importers that did not participate in the surveys. To the degree that they were independent of the respondent companies, sales by the missing importers were estimated to be no more than an additional 0.4% of the total portland cement sales in 2012 and 0.2% of the total portland cement sales in 2011. General background information on cement and its manufacture and on the USGS cement canvasses can be found in van Oss (2005).

Government Programs and Environmental Issues

A large fraction of cement sales (within concrete) are to public sector construction projects, and these sales are thus dependent on various Government funding sources, especially for new construction rather than repairs. With reduced tax revenues available and disagreements on funding priorities, Government funding for public sector construction in recent years has been significantly constrained despite general agreement that the U.S. transportation infrastructure is in need of a great deal of repair and upgrading.

The issue of dumping of foreign cement into the U.S. market has declined in importance in recent years owing to the major recession-related downturn in cement consumption overall and a substantial collapse in cement imports. In August 2012, Texas Industries, Inc. filed an antidumping suit against imports of cement from Greece and the Republic of Korea into Texas (Houston-Galveston customs district; see table 18) claiming that these imports were being sold at less than fair value and were hurting Texas producers, most of whom were producing at levels well below capacity (Texas Industries, Inc., 2012). Large tonnages of cement from the Republic of Korea have come into Texas for many years, but no cement from Greece had come in between February 2006 and March 2012, when significant imports resumed. The cement from these two countries was being imported through a major terminal that is a joint venture among three major Texas cement producers.

Environmental issues pertaining to the cement industry mostly result from the manufacture of the intermediate product called clinker. In making clinker, the consumption of large amounts of carbonate raw materials and fuels leads to large emissions of carbon dioxide (CO_2), and can yield significant emissions (if not scrubbed out) of nitrogen oxides (NO_x), sulfur oxides (SO_x), mercury and some other metals, volatile organic carbon

compounds, and particulates. Increasingly, these emissions were regulated or were being considered for more stringent regulation.

The largest volume of emissions by far is of CO_2; the cement industry is one of the leading industrial emitters of this greenhouse gas (GHG). Overall, emissions of CO_2 by the U.S. cement industry in 2012 were calculated to be about 59.4 Mt, or about 0.88 metric ton (t) of CO_2 per ton of clinker produced. This calculation incorporates the average of two methodologies of estimating the emissions from the combustion of fuels, one using "standard" heat values for the fuel quantities consumed (table 7), and the other, which yields a lower result, incorporates heat values actually reported by the individual plants. For emissions from calcination of limestone, a standard emissions factor of 0.51 t of CO_2 per ton of clinker is included; this factor derives from the Intergovernmental Panel on Climate Change (IPCC) (Hanle and others, 2006), but excludes any correction for cement kiln dust (CKD) not recycled to the kiln (for which data are lacking). The calculation also does not include any deduction, within the calcination component of emissions, for calcium oxide contributed by noncarbonate alternative raw materials such as ferrous slags and coal combustion ashes. This deduction would allow a reduction of calcination-related emissions of about 2.8% (nearly 1 Mt) in 2012 and about 2.7% in 2011. This is equivalent to removing the total emissions (including from fuels and without adjustments) of 1.5 "average" U.S. cement plants for each year. Relative reductions can be significantly larger for the subset of individual plants that actually burn these alternative raw materials. Certain fuels, including alternative or waste fuels, can either directly reduce plant-level CO_2 emissions or may be allowed to be deducted from reported combustion emissions because they are lower in carbon content per unit heat, they are considered to be carbon-neutral (certain biofuels), or because credits may be allowed for their use (certain waste fuels). Fuel deductions have not been made in the averages noted above. Apart from substitution of alternative raw materials, plant-level emissions from combustion can be reduced through upgrading to more fuel-efficient kiln line technology. Unit emissions on a finished product basis can also be reduced by use of SCMs and crushed limestone or other fillers in finished cement and in concrete to reduce the clinker content of these products.

The U.S. Environmental Protection Agency (EPA) continues to apply emissions factors similar to those noted above to the USGS published data on clinker production (but including a 2% addition related to CKD not recycled to the kilns) to calculate and formally report GHG emissions associated with the U.S. cement industry. The USGS and EPA calculations, being based on the IPCC methodology for cement, have about a 5% uncertainty. To refine its GHG estimations, the EPA was comparing its calculations to the results of mandatory GHG reporting by major emitter industries; these data began for the 2010 (emissions) data year and are available for 2010−12 as summary spreadsheets for each year (U.S. Environmental Protection Agency, 2014). For 2012, the cement industry reported total CO_2 emissions of 59.9 Mt, equivalent to 0.89 t CO_2 per ton of clinker (as applied to the USGS clinker total), excluding reported but insignificantly small CO_2-equivalent emissions of methane and nitrous oxide (N_2O). Only 12 (14 including Puerto Rico) U.S. cement plants lacked a continuous emissions monitoring system (CEMS); for plants lacking a CEMS, the CO_2 emissions were reported separately for calcination and combustion, whereas for plants having a CEMS, the emissions were reported as a grand total.

Various other emissions from cement plants have come under stringent regulation in recent years. In 2010, the EPA issued "final" rules pertaining to the national emissions standards for hazardous air pollutants (NESHAP), in which new, very low limits on individual plant emissions of mercury, total hydrocarbons, particulate matter (as a surrogate for nonvolatile metal pollutants), and hydrochloric acid were established for cement plants that do not burn hazardous wastes, and, separately published performance standards and emissions guidelines for commercial and industrial waste incinerator (CISWI) units. In response to comments from the cement industry, CISWI operators, and the public, the NESHAP rules have been revised several times, with one such proposal being released in July 2012 (U.S. Environmental Protection Agency, 2012) that revised the particulate matter emissions limits, and, perhaps more significantly for the cement industry, proposed a delay in the overall compliance deadline to September 9, 2015. A final rule was expected in early 2013. A list of the various environmental rules pertaining to the cement industry is available from the EPA (U.S. Environmental Protection Agency, 2013).

Production

In response to increased sales, U.S. production of portland cement rose by 9.2% to 72.2 Mt in 2012 (table 3). Production increased in all districts except for Illinois and Oregon and Washington, and most districts recorded increases in excess of 10%. Illinois's decline was despite significant sales increases in its market region and likely reflected competition from producers in neighboring States; one Illinois plant continued to be idle all year. A nearly 1-Mt increase in Missouri's production in part reflected frequent monthly achievement of full capacity output levels by the country's highest capacity cement plant, first brought online in 2009, which serviced markets throughout the Mississippi River region. Notwithstanding the increases, district output levels remained well below full practicable capacity (considered to be 85% utilization or higher). Yearend stockpiles of portland cement increased by 9.2%. Although these stocks are incorporated into the calculation of apparent consumption (table 1), they are as much affected by yearend weather conditions as by construction contracts, and they include stock buildups ahead of scheduled kiln shutdowns for routine maintenance, commonly scheduled for early in the following year.

Cement production capacity is reported directly (as grinding capacity) by the individual plants and changes reported from year to year can reflect a variety of factors, such as shifts in demand for cements of various degrees of fineness, upgrades of grinding equipment, shifts of some capacity to other products (such as GGBFS), new plants, and plant closures. In 2012, the overall grinding capacity decreased by nearly 2 Mt, of which about 1.2 Mt was accounted for by the closure of a plant in southern California in mid-2011, and the formal closure of a plant, idle since mid-2009, in Mississippi; both facilities were

removed from the 2012 plant count. An idle plant in New York was closed officially in March 2012, but because it had been idle throughout 2011 as well, it was considered to be closed for both years and was removed from the 2011 plant count. The 2012 plant count remained inflated because of the inclusion of a few idle facilities for which no formal closures had been announced by yearend 2013. Plants closed during a given year are retained in that year's count if any production from them was recorded during the year. In a number of cases, closed and idle production facilities continue to be operated as cement distribution terminals.

A significant increase in housing construction during 2012 led to a 9.7% increase in masonry cement production to 1.9 Mt (table 4), but should be viewed in light of both factors in 2011 constituting a very low basis. The 2012 production of masonry cement was only about 36% of the record output in 2005, and annual outputs for 2009–12 were the lowest recorded since at least 1954 (data for 1954 and prior years are incomplete and thus not comparable).

With multiple subsidiaries of common parents combined under the larger subsidiary's name and with joint ventures apportioned, the 10 leading cement companies at yearend 2012 were, in descending order of portland cement production, Holcim (US) Inc., CEMEX, Inc., Lehigh Cement Co., Buzzi Unicem USA Inc. (including Alamo Cement Co.), Ash Grove Cement Co., Lafarge North America Inc., Eagle Materials, Inc., Texas Industries, Inc. (TXI), Essroc Cement Corp., and St. Marys Cement. The U.S. industry remained heavily consolidated, with the 5 leading cement companies, combined, contributing 62% of total U.S. portland cement production, and the 10 leading companies accounting for 79% of total production. Of the above named companies, all except Ash Grove, Eagle Materials, and TXI were foreign owned as of yearend. For the U.S. industry overall, about 82% of total cement output and capacity was by foreign-owned companies.

In line with portland cement, output of clinker in 2012 increased by 9.7% to 67.2 Mt (tables 1, 5), still well below the record 99.3 Mt in 2005 and, except for 2009–11, the lowest output since 1993. Monthly production (not tabulated in this report) showed gains in all months except November, and 5 months had gains in excess of 10%. Except for Maine and New York and Illinois, all districts registered clinker production increases, with especially large increases noted in California (up by 0.93 Mt), Florida (up by 0.66 Mt), Missouri (up by 0.94 Mt), and northern Texas (up by 0.65 Mt). Apparent annual capacity remained at 106 Mt overall, notwithstanding the official closure of the only plants in Mississippi and Idaho, but the statistic is heavily dependent on the characterization of the reported days of downtime for routine maintenance. As in 2011, many plants reported much longer downtimes for this purpose in 2012; where this was obvious, corrections were made in both years to remove the extra downtime (a result of slow sales) from the statistic. Capacity utilization (likewise dependent on the downtime reporting) was about 63% overall, and although this was higher than the 58% recorded in 2011, it continued to reflect a number of plants that were idle all year, a significant number of idle kilns among the plants that were in production, and longer-than-normal total amounts of downtime for many of the producing kilns. Although all districts were well below the 85% that is considered to represent full practicable capacity utilization, all but three districts showed significant increases in capacity utilization. In terms of plant (kiln) technology, the count for wet plants declined by two owing to closure of the long-idle plant in Mississippi and the announced closure by yearend of the only plant in Idaho; the latter's kiln had been idle since early 2009 but the plant continued to grind clinker (produced elsewhere) through 2012. The dry plant count was unchanged. The kiln count dropped by two overall, representing three kiln closures (Idaho, Mississippi) and one new kiln (southern Texas).

Nonfuel raw materials consumed to make clinker and cement are listed in table 6. Cement plants can be quite flexible regarding the raw materials that they burn to make clinker, and although the ratios among the groupings of raw materials, and between them and the amounts of clinker and cement produced, appear broadly similar for the 2 years shown, increases for some raw materials in 2012 significantly exceed the overall percentage increase in the production, especially, of clinker for the year. For materials that are used in comparatively small quantities, large relative increases may not be significant because they likely reflect activity at just a few plants. As an example, although steel slag as a partial substitute for limestone is generally useful as a way to reduce CO_2 emissions and total heat consumption in making clinker, much of the 50% increase in steel slag consumption in 2012 reflected a very large increase reported by a single plant among the several that used the material. In contrast, for large tonnage materials, large relative increases may be significant, at least where not due simply to respondent misidentification of the material (common, for example, among the ferrous slags). In this regard, there appears to have been a significant shift from fly ash (up by only 1%) to bottom ash (up by 38%) for clinker. These two coal combustion byproducts have similar compositions in terms of major oxides, but bottom ash is typically significantly lower in its trace contents of mercury. Several plants indicated that their switch to bottom ash was an attempt to reduce mercury emissions in light of the new NESHAP limits, and, in some cases, to avail themselves of a relatively abundant material in markets where fly ash shortages have arisen owing to the switch by some powerplants from coal to natural gas.

The 16% increase in consumption of fly ash for finished cement appears to reflect stronger market demand for blended cement incorporating this SCM and may further reflect a higher content of fly ash in these blends (table 15 indicates a 9% increase in overall sales of this type of blended cement). The modest increase in consumption of GGBFS for cement is in contrast to a 17.5% decline in sales of blended cement incorporating this SCM (table 15). One explanation for this apparent contradiction could be incorporation of GGBFS in some blended cements reported under other compositional labels. Other possibilities would be higher average slag contents within the slag blends, more frequent incorporation of GGBFS into general use portland type cements within ASTM standards C150 and C1157, and increased use of GGBFS in masonry cements (not included in table 15).

The consumption data in table 6 for fly ash and other ash (for clinker and cement combined) may be compared with data for sales of fly ash and bottom ash for use in blended cement or raw material for clinker published by the American Coal Ash Association (ACAA). For 2012, the ACAA reported sales of fly ash were about 23% lower than the tonnage reported in table 6, and bottom ash sales were about 5% lower than the tonnage reported in table 6 (American Coal Ash Association, 2013). It is unclear whether the differences represent the timing between actual sales and consumption (including from stockpiles) or if a significant component of material was misidentified within the USGS survey responses. The "Gypsum and anhydrite" data in table 6 for 2012 include 0.815 Mt of synthetic gypsum, but this likely underrepresents actual use of the synthetic material because the USGS canvass does not require that the two types of gypsum be differentiated; the ACAA reported 2012 sales of 1.59 Mt of flue gas desulfurization gypsum to the cement industry.

The quantities of fuel consumed by the U.S. cement industry are shown in table 7. As with nonfuel raw materials, data shifts can reflect activities at just a few plants. For wet kilns, an apparent shift by some plants from liquid wastes to fuel oil is indicated by the data, but this could simply reflect the classification of used oils. Consumption of solid waste fuels by wet kilns fell significantly. In both wet and dry plants, but particularly the dry, there was a reversal of the 2011 shift toward more coal and less petroleum coke. The relative decline in coal consumption in 2012 may reflect less favorable coal prices, but some plants reported a shift toward more petroleum coke in an attempt to reduce mercury emissions ahead of the new NESHAP limits. Nevertheless, the overall heat contribution for petroleum coke remained unchanged (see below), and it is thus evident that much of the 2012 decline in coal usage represented a shift to yet other fuels, likely natural gas. Natural gas consumption by dry plants increased significantly, largely related to continued low prices for this fuel.

Although not shown in table 7, overall unit heat consumption (gross heat basis) in 2012 was about 4.1 billion joules (GJ) per metric ton of clinker, virtually unchanged from the previous year. Wet kiln plants averaged 6.8 GJ per ton of clinker, down by about 3%, and dry kiln plants averaged 3.9 GJ in 2012, essentially unchanged. It remained unclear whether or not the industry overall was experiencing any heat efficiency penalties for the common practice in 2011 and 2012 of operating kilns on an intermittent basis and with longer overall downtimes than would be customary in busy years. Overall, coal continued to supply the largest share of total heat consumed (56%, down from 64% in 2011), followed by petroleum coke (unchanged at about 17%), and waste fuels (about 15%, up from about 10% in 2011).

Average unit consumption of electricity in 2012 continued to decline slightly both overall and for dry plants and significantly for the remaining wet plants (table 8). The improvements likely reflect higher grinding capacity utilization rates, noted earlier.

Industry Structure

In late September, Eagle Materials, Inc. announced that it was purchasing the 1.2-million-metric-ton-per-year (Mt/yr) Sugar Creek, MO, and the 0.9-Mt/yr Tulsa, OK, integrated cement plants from Lafarge North America, as well as certain distribution terminals, aggregates quarries, and ready-mixed concrete facilities associated with these cement plants (Eagle Materials, Inc., 2012). Eagle formed a subsidiary, Central Plains Cement Co., to operate these plants. The purchase was completed in early December. The divestiture followed Lafarge's sale in 2011 of its plants in Alabama, Georgia, and South Carolina, to Argos, USA.

No new plants opened in 2012, but a number of plants closed, most of which were already idled. All the closures were wet plants. In the first quarter, Holcim announced the closure of its Catskill, NY, wet integrated plant; the facility had been declared indefinitely idle in mid-2011, recorded no production for that year, and had been removed from the plant count for 2011. Holcim also formally closed its 0.5-Mt/yr Artesia, MS, wet integrated plant in 2012; the facility had been idle since March 2009. Following its October 2011 announcement, Lafarge closed its 0.46-Mt/yr Fredonia, KS, wet integrated plant at the end of March 2012. The facility continued to be operated as a terminal for cement produced elsewhere. In October, Ash Grove relinquished its operational permit for the kilns at its 0.4-Mt/yr wet integrated plant at Inkom, ID (Idaho Dept. of Environmental Quality, 2012). The kilns had been idle since early 2009 but the plant had continued to produce cement from clinker brought in from another facility. By yearend 2012, all such production ceased permanently and the facility became simply a distribution terminal. These plant closures left the country with just 10 wet plants at yearend.

A number of plant [upgrade including of environmental control and (or) monitoring systems] or expansion projects were underway during 2012, but the only major production line upgrade that was completed during the year was of a new 1.3-Mt/yr precalciner kiln in November at TXI's Hunter, TX, plant (Texas Industries, Inc., 2013). The new kiln was expected to be in full operation in early 2013, which would allow the plant to begin a year-long upgrade of its older kiln. In May, Ash Grove announced that, in an effort to reduce emissions, it would convert one of its three wet kilns to dry, preheater-precalciner technology at its 0.9-Mt/yr wet plant at Midlothian, TX (Ash Grove Cement Co., 2012). The capacity of the new kiln line was not announced, but given that wet kiln lines are increasingly proving to be uneconomic in terms of their high unit heat (and hence fuel) consumption and related emissions, it was likely that the new kiln could more than replace the entire existing wet capacity of the plant.

Consumption

Data on consumption are taken to be sales to final domestic customers and in this report are derived from both the USGS annual canvass (tables 1, 11, 12, and 14) and monthly surveys (table 9). Despite close agreement in the national totals between the annual and monthly data, only table 9 regional breakout tonnages represent State-level consumption. The regional breakouts in tables 11, 12, and 14 pertain to the locations of the reporting entities (chiefly the production sites), not the locations of consumption; it is very common for shipments to cross State lines. In both datasets, the sales include domestically produced

cement (made from domestic and imported clinker) as well as imported cement.

Portland cement sales increased in all months in 2012 relative to the same months in 2011, except for slight declines in September and December. This continued a monthly sales growth trend that began in March 2010. Portland cement sales for the year overall increased by 8.8% to 76.6 Mt (table 9), manifested as increases in all States except for Delaware, Idaho, Louisiana, Mississippi, Oregon, and Rhode Island. The top five consuming States, in descending order of consumption, were Texas, California, Florida, Illinois, and Ohio, for both 2011 and 2012. Despite the U.S. total increase in 2012, sales overall were 45.8 Mt less than those of the record sales year of 2005. Per capita consumption of portland cement was 244 kilograms (kg) in 2012, slightly higher than the 226 kg (revised) in 2011 and still well below the 413 kg per capita level for the record consumption year of 2005.

Masonry cement sales showed gains in all months except for March, June, and September, and were up by 5.9% to 1.9 Mt for the year overall (table 9). The annual consumption was the lowest since 1946 and was only 35% of the record sales level in 2005.

As noted earlier, a few importers do not participate in the USGS annual cement canvass, and their sales—to the degree that they were made to final customers and not to other (reporting) cement companies—are missing from the data in this report. An estimate of the missing sales volumes would include essentially all the gray cement imports into the Philadelphia customs district, and some of the white cement imports into various districts. Overall, it is estimated that the missing sales totaled only about 0.2 Mt (about 0.2%) in 2011 and about 0.3 Mt (0.4%) in 2012. On the other hand, the sales data do capture a significant tonnage of imported cement that appears to be absent from the official trade data (see "Foreign Trade" discussion below).

Table 10 lists sales of portland cement by mode of transportation. The dominant transportation method for sales to final customers continued to be by truck; rail shipments declined slightly, and waterborne shipments declined significantly. Some of the decline in the waterborne shipments may have been because of lower water levels during the year in the Mississippi River, a major artery of barge traffic.

Cement consumption levels broadly reflect construction spending but significant time lags may exist between the onset or cutoff of spending and changes in the consumption of cement, and the amount of cement (concrete) consumed, for example, per $1 million of spending (or "cement intensity") varies with the type of construction. Thus, single-family housing consumes less concrete on a unit basis (chiefly for foundations) than multifamily housing, nonresidential buildings, and roads and bridges. The Portland Cement Association (PCA) converts U.S. Census Bureau data on construction spending from current dollars to constant dollars, as a better indicator of cement consumption. The PCA recently switched from a 1996 constant dollar to a 2009 constant dollar basis. In terms of 2009 constant dollars, overall construction spending increased by 6.3% in 2012 to about $825 billion (Portland Cement Association, 2014). Whereas in 2011, public sector construction was the largest share of total construction spending, residential construction accounted for the largest share in 2012, at nearly $281 billion, up by 13.9%. Public sector construction spending fell by 5.7% to about $263 billion, and within this, spending for roads declined by 2.2% to nearly $75 billion, and sewer and waste disposal decreased by 6.1% to about $20 billion. Because the USGS data for 2012 on sales by type of customer (only crudely comparable), as well as for total cement (especially portland cement), generally showed larger relative increases than those for construction spending, an increase in cement intensity may have been manifest in 2012 in at least some construction sectors. Overall, the cement intensity in 2012 was about 95 t of cement consumed per $1 million compared with 93 t in 2011. In constant 1996 dollars, the intensities would be 154 t in 2012 and 151 t in 2011; both being significantly higher than the 146 t in the peak cement consumption year of 2005.

Portland cement sales in 2012 are broken out by type of customer in table 14. Ready-mixed concrete producers, as listed, accounted for 70% of total shipments, but the true percentage to this type of customer was larger (probably about 75%) because some sales were reported under other types, such as airport and road paving contractors, which also made use of ready-mixed concrete; likewise, sales to these contractors could be underreported. As listed in table 14, sales to ready-mixed customers increased by 9.4%, and sales to concrete product manufacturers increased by 3.2%. Within this category, sales to brick and block manufacturers increased by 6.2%, sales to precast and prestressed slab makers were up by 15.3%, and those to pipe manufacturers were up by 4.1%; however, these shifts could be partly due to better breakout reporting, as the subcategory "other or unspecified" fell by 13.3%. Sales to contractors overall were up by 10%, including a 59% increase to airport contractors, and a 15.3% increase to road pavers; again, the "other or unspecified" subcategory declined by 18.5%.

Sales to the smaller categories of customers may be underrepresented because some respondents seem to report only broad categories. As listed in table 14, sales into the mining sector increased by 40.5%, but represent reporting by relatively few respondents. Sales of cement for oil well (and gas well) drilling increased by 11%, although the average weekly drill rig count only increased by 2% (Baker Hughes Inc., 2014). Cement sales for waste stabilization fell by 25%, trending with the decline in spending for "sewer and waste disposal" noted above.

Table 15 lists the sales breakout of various cements included within "portland cement" in this report. As in past years, sales in 2012 were dominated by Types I and II cements and sulfate-resistant varieties of cement (Type V and Type II/V hybrids reported as Type V); these also included equivalent cements sold under the specifications of ASTM C1157. Assignment between "General use and moderate heat" cements and "Sulfate resisting" categories is somewhat artificial because some hybrid cements are listed as meeting the standards for both Type II (or I, II) and Type V (such as II, V) cements; these are supposed to be included under the more restrictive category "Sulfate resisting" cements but may not always be so reported. As listed, "Type V" sales increased by 10%. Oil well cement sales increased by 14%, which is a higher relative increase than the sales to oil (and gas) well drillers noted above and may imply an

increase in the proportion of deep wells requiring specialized oil well cements; shallower wells can make use of ordinary grades of portland cement.

Sales of blended cements fell by about 4%, following a decline of 15% in 2011. Monthly data for 2012, in contrast, show a nearly 6% increase in sales of blended cements, led by a nearly 16% increase in Florida. The discrepancy appears to reflect different reporting personnel and the choice of reporting category (portland vs. blended) for sales of portland cement containing ground limestone as the extender, or of ASTM-C1157-type cements in general; C1157 was at one time a performance standard just for blended cements but is now a performance standard for hydraulic cements in general.

Prices

Price data (as mill net values), broken out by district, are listed in tables 11 and 12; again, table 9 gives a better indication of State-level consumption tonnages. Because the mill nets represent ex-factory average values for all varieties of cement sold, represent a mix of bulk and bag sales, and exclude any onward transportation to terminals from where, in fact, much of the cement was sold, the mill net values should be viewed as price indexes rather than "shopping prices" for cement. They serve mainly to show general regional variations and trends over time; small unit price differences are of little statistical significance. Regional portland cement prices in table 11 reveal a mix of increases and decreases in 2012, but show a modest increase overall. With the exception of Illinois, unit price decreases were despite increases in sales tonnages in the respective market regions. Price changes commonly lag changes in sales volumes because of the common existence of long-term pricing contracts. The prices for portland cement reflect a strong dominance of bulk (as opposed to bag or package) sales (table 10). In contrast, masonry cement sales (table 12) are dominantly of packaged material, but because of the much smaller tonnages involved, even small shifts in the ratio of bulk to packaged sales (this split is not reported to the USGS) can cause significant shifts in the average pricing, which includes bagging or packaging charges and charges for palletizing. The average unit price for masonry cement was virtually unchanged in 2012. Likewise, the combined average price for portland and masonry cement was unchanged.

Foreign Trade

Trade data from the U.S. Census Bureau are listed in tables 16 through 21. Exports (table 16) increased in 2012 by 24% to about 1.75 Mt, the highest on record. However, cement exports remained a very small part of total sales by the U.S. industry and continued to be small compared with cement imports. Canada remained the main destination for U.S. exports, accounting for 68% of the 2012 total.

After 5 years of consecutive declines, overall imports of cement and clinker increased by 7.4% to 6.9 Mt in 2012 (tables 1, 17), but the 2012 total was still much lower than that of the record importation year of 2006 (35.6 Mt). About 75% of the imports were of gray portland cement (table 19). Most of the overall increase in imports was accounted for by material from Canada (again the largest source), Greece, and Sweden. Greece has long been a major supplier of cement to the United States but supplied none in 2011. Although Greece resumed exports to the United States in 2012 at more normal levels, the year was unusual in that about half of the material entered the Houston-Galveston, TX, customs district rather than solely into East Coast locations (table 18). Imports from Mexico in 2012, as listed, show a 15% decrease, but the data likely are incomplete by about 0.2 Mt regarding gray portland cement entering the El Paso, TX, customs district; this appears not to have been a significant problem in 2011. The missing material represented cement coming in by truck where each truckload had a customs value of less than $2,000; such shipments are considered to be "informal entries" by the U.S. Customs Service and the data on these entries are not sent to the U.S. Census Bureau under the cement tariff code. It was unclear from the data if any imports of cement from Canada are being similarly omitted.

White cement imports are listed in table 20. In many past years, and based on unexpectedly low unit values, the data appeared to have included some gray cement or clinker; the apparent errors likely were because of the use of the wrong tariff code by importers. However, no low unit valuations are evident in 2011–12 except for the 2012 material from Spain, which was actually miscoded white cement clinker. Excluding this clinker, white cement imports in 2012 increased by 16.3% overall. The increase reflected a higher level of white portland cement sales (table 15) and limited U.S. production capacity (two small plants only), but the imports plus U.S. production significantly exceeded the sales indicated in table 15. The apparent excess was qualitatively explained by the use of white cement in some finished gray and colored portland cement products being reported as gray portland cement sales and in some masonry cements (not included in table 15).

Imports of clinker increased by nearly 30% to 0.79 Mt (table 21), but the data are incomplete for both years shown with regard to overland imports from Canada; the tonnages listed were insufficient to have fully supplied grinding plants in Michigan and Washington that were dependent on clinker from Canada. The deficits, estimated at about 0.2 Mt in 2011 and 0.1 Mt in 2012, reflected sub-$2,000 truckloads that, as with cement from Mexico noted above, were being registered as "informal entries."

For cement and clinker combined, the 10 busiest customs districts of entry in 2012 were, in descending order of tonnage, Detroit, MI; Seattle, WA; Houston-Galveston, TX; Buffalo, NY; Cleveland, OH; Columbia-Snake, ID, OR, and WA; Pembina, ND; New York City, NY; Honolulu, HI; and Miami, FL (table 18). These leading districts accounted for about 80% of the total imports for the year.

World Review

The production of hydraulic cement, by country, is listed in table 22. The data for most countries include all forms of hydraulic cement; however, the data for the United States are for portland and masonry cement only and data for some other countries may be incomplete. For some countries, the production data may include exports of clinker.

Total world output of cement in 2012 was an estimated 3.8 Gt, up by 5%. Production was from more than 150 countries. China continued to be by far the world's leading producer, with an output of 2.2 Gt, up by about 5.3%, and, as in 2011, accounting for 58% of the world total.

The remaining top 20 producers in 2012 were, in descending order, India, the United States, Iran, Brazil, Turkey, Russia, Vietnam, Egypt, Japan, Saudi Arabia, Indonesia, the Republic of Korea, Thailand, Mexico, Italy, Pakistan, Germany, Malaysia, and France. Cumulatively, the top 5 countries accounted for 70% of total world output; the top 10 countries, about 78%; and the top 20 countries, about 87%; these broad ratios were unchanged from those of 2011.

Regionally, Asia and the Pacific accounted for 74.6% of world production, including 9 of the 20 leading producing countries, and had the highest rate of growth of all regions. As with the production in 2012 noted above, China has been the dominant contributor to the overall rate of growth for the region. Although typically a net exporter of cement, the net outflow is small by comparison to its production, thus China's cement consumption can be viewed as being equivalent to its production. By comparison to the United States, China's cement production for the years 2010–12 was approximately 150% of total U.S. production for 1900–99 and 120% of U.S. production for 1900–2012. Likewise, China's cement consumption for 2010–12 was about 140% of U.S. consumption for 1900–99, and about 7% more than U.S. consumption for 1900–2012.

The Middle East (including Turkey) was the next ranked producing region, with 6.6% of the 2012 total, and was followed by Africa, at 4.3%; Western Europe, at 4.0%; Central America and South America (including the Caribbean), 3.6%; North America (including Mexico), 3.2%; the Commonwealth of Independent States, 2.6%; and Eastern Europe, 1.1%.

Outlook

Although monthly cement sales had shown double digit percentage increases (on a year-over-year basis) through May 2012, increases were smaller for the rest of the year, and this helped to constrain forecasts for sales in 2013 to an overall increase within a range of 5% to 8%. Lackluster public construction spending levels were of concern, but significant increases in housing starts led to optimism that the housing sector would more than compensate. Regardless of the projections for 2013, it was recognized that a return to consumption levels similar to the record years of 2005 and 2006 was not expected for several more years. It was unclear to what extent a relatively rapid return to consumption levels of 100 Mt or more could be serviced by domestic plants, given that a number of plants have closed, idle plants would be expensive to restart, and the possibility that many of the presently long-idle extra kilns at the currently operating plants might not be able to be restarted quickly. Also it was expected that new, very stringent environmental regulations would constrain plans for construction of new plants. Although currently with a much reduced market share, imports supplied nearly 30% of the demand during the peak cement consumption years of 2005–06 (122 Mt/yr), and it seems likely that imports will supply an even larger share should consumption levels return to high levels.

Cement standards were being revised to allow for ternary blends (more than one type of SCM in the mix) and to formally recognize portland-limestone cements as a class of blended cements. These changes were expected to allow cement plants to boost their overall sales of cement without needing to increase their clinker production capacities, and thus allow for a lowering of unit emissions per ton of product. A long-term trend of electric power utilities away from coal to natural gas could lead to shortages of fly ash and bottom ash, both being significant raw materials for clinker production at a number of plants, and fly ash being an important SCM, especially for the concrete industry. It is unclear if other SCMs would be available to fully offset a fly ash shortage and this could mean a return to higher levels of portland cement in many concrete mixes.

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TABLE 1
SALIENT CEMENT STATISTICS FOR THE UNITED STATES[1, 2]

(Thousand metric tons unless otherwise specified)

		2008	2009	2010	2011	2012
Production:						
Cement[3]		86,310	63,907	66,447	67,895	74,151
Clinker		78,382	56,116	59,802	61,241	67,173
Shipments from mills and terminals:[3, 4, 5]						
Quantity		96,700	71,000	70,300	72,100	78,300
Value[6]	thousand dollars	9,990,000	7,020,000	6,490,000	6,440,000	7,020,000
Average value[6]	dollars per metric ton	103.50	99.00	92.00	89.50	89.50
Stocks, yearend:						
Cement		8,360	6,080	6,180	6,270	6,896
Clinker		7,070	5,130	4,760	4,620	4,869
Exports		823	884	1,178	1,414	1,749
Imports:[7]						
Cement		10,744	6,211	6,013	5,812	6,107
Clinker		621	556	613	606	786
Total[8]		11,365	6,767	6,626	6,418	6,893
Consumption, apparent[9]		96,760	71,510	71,180	72,200	77,880
World production[e, 10]		2,850,000	3,040,000 r	3,290,000 r	3,650,000 r	3,830,000

eEstimated. rRevised.

[1]Unless otherwise indicated, data are for portland (including blended) and masonry cements only. Even where presented unrounded, data are thought to be accurate to no more than three significant digits.

[2]Excludes Puerto Rico.

[3]Includes cement made from imported clinker. Includes a double-counted component (less than 0.5% per year) of portland cement subsequently converted at the plants to masonry cement; because of the involvement of stockpiles, the precise amount converted from actual production cannot be determined.

[4]Includes imported cement.

[5]Shipments to final domestic customers. Data are from an annual survey of plants and terminals and may differ from the totals in table 9, which are based on consolidated monthly surveys from companies.

[6]Free on board mill or independently reporting terminal.

[7]All forms of hydraulic cement or clinker.

[8]May not add to totals shown because of independent rounding.

[9]Production (including that from imported clinker) of cement plus imports of hydraulic cement minus exports of hydraulic cement minus the change in yearend cement stocks.

[10]Total hydraulic cement. May include 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.
Illinois, excluding Chicago	All counties other than those in metropolitan Chicago.
Illinois, metropolitan Chicago	Cook, DuPage, Kane, Kendall, Lake, McHenry, and Will Counties in Illinois.
New York, eastern	Delaware, Franklin, Hamilton, Herkimer, Otsego, and all counties farther east and south, except 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, Reagan, Reeves, 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 AND BLENDED CEMENT PRODUCTION, CAPACITY, AND STOCKS IN THE UNITED STATES, BY DISTRICT[1]

(Thousand metric tons unless otherwise specified)

	2011					2012				
District[2]	Number of plants	Production[3]	Grinding capacity[4]	Percentage utilized[5]	Yearend stocks[6]	Number of plants	Production[3]	Grinding capacity[4]	Percentage utilized[5]	Yearend stocks[6]
Maine and New York	4	1,981	3,604 r	55.0 r	203	4	2,004	3,604	55.6	224
Pennsylvania	8	3,270	6,020 7	54.3 7	311	8	3,360	6,010	55.9	328
Illinois	3 r	1,398	2,755 r	54.4 r	225	3	1,149	2,755	41.7	283
Indiana	4	2,292	3,745	61.2	190	4	2,393	3,745	63.9	208
Michigan	4	3,475	5,530	62.8	302	4	3,891	5,515	70.5	527
Ohio	2	636	1,166	54.6	26	2	797	1,188	67.1	47
Iowa, Nebraska, South Dakota	5	2,930	5,824	50.3 7	313	5	3,140	5,824	53.9	407
Kansas	3	1,568	3,572	43.9	237	3	1,732	3,348	51.7	236
Missouri	5	7,054	11,319	62.3	748 7	5	7,951	10,929	72.8	510 7
Florida	8	3,306 8	9,970 7	33.2 7	264	8	3,786 8	9,970 7	37.8 7	264
Georgia, Maryland, Virginia, West Virginia	6	4,786	8,225	58.2	322	6	5,280	8,216	64.3	413 7
South Carolina	3	2,482	5,085	48.8	100	3	2,766	5,085	54.4	133
Alabama, Kentucky, Mississippi, Tennessee	9	5,217	10,594	49.2	514	8	5,669	10,141	55.9	613
Arkansas and Oklahoma	4	1,933	3,655	52.9	148	4	2,057	3,655	56.3	179
Texas, northern	6	3,983	7,765	51.3	220	6	4,527	7,583	59.7	250
Texas, southern	6	5,220	6,334	82.4	257	6	5,472	6,529	83.8	261
Arizona and New Mexico	4	1,243	3,715	33.5	126	4	1,540	3,715	41.4	112
Colorado and Wyoming	4	2,437	4,517	54.0	166	4	2,875	4,517	63.6	191
Idaho, Montana, Nevada, Utah	6	2,184	3,728	58.6	136	6	2,439	3,729	65.4	228
Alaska and Hawaii	--	--	--	--	97	--	--	--	--	72
California	10	7,730	12,851	60.1	431 7	9	8,402	11,989	70.1	477
Oregon and Washington	4	1,012	2,435	41.5	235	4	993	2,399	41.4	238
Importers[9]	--	--	--	--	302 7	--	--	--	--	285 7
Total[10]	108 r	66,136	122,000 7	54.1 r, 7	5,860 7	106	72,222	120,000 7	59.9 7	6,400 7
Puerto Rico	2	744	1,780	41.8	23	2	783	1,780	44.0	29 7
Grand total[10]	110 r	66,880	124,000 7	53.9 r, 7	5,880 7	108	73,005	121,000 7	59.7 7	6,430 7

rRevised. -- Zero.

[1]Even where presented unrounded, data are thought to be accurate to no more than three significant digits. Includes data for white cement. Includes cement made from imported clinker.

[2]District assignation is the location of the reporting facilities. Specific districts include importers where district assignations were possible.

[3]Data include a small amount of portland cement subsequently consumed at the plant to make masonry cement; the amount thus double-counted cannot be determined precisely because of the involvement of cement stockpiles, but is less than 0.5% of the grand totals listed.

[4]Based on fineness needed to produce a plant's normal output mix, including masonry cement, and allowing for downtime for routine maintenance.

[5]Calculated relative to portland cement output; utilization would be higher if calculated to include output of masonry cement.

[6]Includes imported cement and stocks of domestic and imported cement at mills, and terminals, and in transit.

[7]Includes estimates for nonrespondents or facilities that provided incomplete information.

[8]Adjusted to avoid double-counting of portland cement supplied by one plant to another for the sole purpose of conversion to blended or masonry cement.

[9]Includes only those importers or terminals for which district assignations were not possible.

[10]May not add to totals shown because of independent rounding.

TABLE 4

MASONRY CEMENT PRODUCTION AND STOCKS IN THE UNITED STATES, BY DISTRICT[1]

(Thousand metric tons unless otherwise specified)

	2011			2012		
District[2]	Number of active plants	Production[3]	Yearend stocks[4]	Number of active plants	Production[3]	Yearend stocks[4]
Maine and New York	3	39	15	4	45	18
Pennsylvania	7	141	44	7	147	41
Indiana and Ohio	6	232	42	6	287	49
Michigan	3	61	22	3	73	25
Iowa, Nebraska, South Dakota	--	W	W	--	W	W
Kansas	2	W	W	2	W	W
Missouri	1	W	W	1	W	W
Florida	6	188	43	6	225	42
Georgia, Maryland, Virginia, West Virginia	6	233	43	5	215	46 [5]
South Carolina	3	143	15	3	158	16
Alabama, Kentucky, Mississippi, Tennessee	7	211	57	7	227	77
Arkansas and Oklahoma	3	82	15	4	90	14
Texas	7	187	20	7	215	20
Arizona and New Mexico	3	W	W	3	46	4
Colorado and Wyoming	1	W	W	1	W	W
Idaho, Montana, Nevada, Utah	1	W	W	1	W	W
California	6	170	36	6	152	26
Importers[6]	--	--	3 [5]	--	--	2 [5]
Total[7]	65	1,759	396 [5]	66	1,929	411 [5]
Puerto Rico	1	(8)	--	1	(8)	--
Grand total[7]	66	1,759	396 [5]	67	1,929	411 [5]

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

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

[2]District assignation is the location of the reporting facilities. Specific districts include importers where district assignations were possible.

[3]Includes cement produced from imported clinker.

[4]Includes imported cement.

[5]Includes estimates for nonrespondents or facilities that provided incomplete information.

[6]Includes only those importers or terminals for which district assignations were not possible.

[7]May not add to totals shown because of independent rounding.

[8]Less than 500 metric tons.

TABLE 5
CLINKER CAPACITY AND PRODUCTION IN THE UNITED STATES IN 2012, BY DISTRICT[1]

District	Number of active plants[2]				Number of kilns[4]	Daily capacity[4, 5] (thousand metric tons)	Average days of routine maintenance[6]	Apparent annual capacity[4, 7] (thousand metric tons)	Production (thousand metric tons)	Percentage of capacity utilized	Yearend stocks (thousand metric tons)
	Process used										
	Dry	Wet	Both[3]	Total							
Maine and New York	2	1	--	3	4	9.6	29.0 [8]	3,250 [8]	1,851	57.0 [8]	176
Pennsylvania	5	2	--	7	11	16.9	28.6 [8]	5,590 [8]	3,191	57.0 [8]	279
Illinois	3	--	--	3	6	7.7	13.8	2,648	1,043	39.4	166
Indiana	3 [9]	1	--	4	8	10.2	17.9	3,529	2,414	68.4	117
Michigan	2	--	--	2	6	11.2	31.8 [8]	3,690 [8]	2,891	78.4 [8]	167
Ohio	1	1	--	2	3	3.4	16.7 [8]	1,190 [8]	839	70.6 [8]	31
Iowa, Nebraska, South Dakota	4	--	1	5	9	14.1	13.9 [8]	3,830 [8]	2,925	60.0 [8]	158
Kansas	2	1	--	3	5	8.5	42.4	2,764	1,732	62.6	76
Missouri	5	--	--	5	5	29.5	36.0 [8]	9,600 [8]	7,386	76.9 [8]	239
Florida	7	--	--	7	10	25.9	17.0	9,037	3,685	40.8	365
Georgia, Maryland, Virginia, West Virginia	5	--	--	5	5	19.4	29.2 [8]	6,540 [8]	4,955	75.8 [8]	292
South Carolina	3	--	--	3	3	12.2	26.0 [8]	4,140 [8]	2,600	62.8 [8]	273
Alabama, Kentucky, Mississippi, Tennessee	8	--	--	8	8	26.6	26.6 [8]	8,980 [8]	5,354	59.6 [8]	354
Arkansas and Oklahoma	3	1	--	4	8	9.9	23.9 [8]	3,400 [8]	1,867	55.0 [8]	104
Texas, northern	4	2	--	6	12	19.1 [8]	17.1	6,670 [8]	4,234	63.5 [8]	235
Texas, southern	5	--	--	5	7	19.8	18.1 [8]	6,920 [8]	5,091	73.6 [8]	272
Arizona and New Mexico	4	--	--	4	8	10.4	8.1	3,659	1,440	39.4	193
Colorado and Wyoming	4	--	--	4	5	11.5	23.8 [8]	3,890 [8]	2,509	64.4 [8]	264
Idaho, Montana, Nevada, Oregon, Utah, Washington	5	2	--	7	8	12.6	32.8	4,221	3,049	72.2	315
California	8	--	--	8	9	34.8	23.7	11,915	8,118	68.1	633
Total[10]	83	11	1	95	140	313.3	22.9 [8]	106,000 [8]	67,173	63.1 [8]	4,708
Puerto Rico	2	--	--	2	2	5.0	42.5 [8]	1,650 [8]	615	37.2 [8]	89 [8]
Grand total[10]	85	11	1	97	142	318.4	23.2 [8]	108,000 [8]	67,788	62.7 [8]	4,797 [8]

-- Zero.

[1]Even where presented unrounded, data are thought to be accurate to no more than three significant digits.

[2]Includes white cement plants and all plants (gray or white) that produced clinker for at least 1 day during the year.

[3]Plants that can operate both wet and dry kilns, whether or not both types were active during the year.

[4]Includes kilns active for at least 1 day during the year. For kilns idle all year, excludes those that cannot be restarted, fully permitted, in less than 6 months.

[5]Sum of reported kiln capacities for all plants in a district.

[6]Total days of routine maintenance (summed for all kilns) divided by the number of kilns.

[7]Sum of apparent annual capacities for all kilns. For each kiln, the statistic is calculated as 366 days (leap year) minus days reported for routine maintenance and then multiplied by the unrounded daily capacity.

[8]Contains estimates for some facilities and have been rounded to no more than three significant digits.

[9]Includes one semiwet kiln.

[10]May not add to totals shown because of independent rounding.

TABLE 6
RAW MATERIALS USED TO PRODUCE CLINKER AND CEMENT IN THE UNITED STATES[1, 2]

(Thousand metric tons)

Material	2011		2012	
	Clinker	Cement[3]	Clinker	Cement[3]
Calcareous:				
Limestone (aragonite, chalk, coral, marble)	80,000	1,500	86,800	1,720
Cement rock (includes marl)	8,070	23	8,310	12
Cement kiln dust (CKD)[4]	391	131	10	137
Lime[4]	17	53	40	53
Other	86	8	80	9
Aluminous:				
Clay	2,820	--	3,310	--
Shale and schist	2,250	36	2,330	50
Other[5]	387	--	418	--
Ferrous:				
Iron ore	544	--	608	--
Mill scale	659	--	713	--
Other[6]	15	--	25	--
Siliceous:				
Sand, calcium silicates	2,850	--	3,170	--
Sandstone, quartzite, soils, nonpozzolanic rocks	481	--	563	--
Fly ash	2,380	118	2,410	137
Other ash, including bottom ash	891	--	1,230	--
Granulated blast furnace slag[7]	47	217	8	224
Other blast furnace slag	42	--	85	--
Steel slag	296	--	444	--
Other slag	47	5	84	--
Natural rock pozzolans[8]	--	33	--	40
Other pozzolans[9]	18	1	5	2
Other:				
Gypsum and anhydrite	(10)	3,640	(10)	3,920
Miscellaneous[11]	57	59	76	39
Total[12]	102,000	5,820	111,000	6,340
Clinker, imported, raw materials equivalent[13]	--	1,190	--	1,390
Grand total[12]	102,000	7,010	111,000	7,730

-- Zero.
[1]Excludes Puerto Rico.
[2]Data have been rounded to no more than three significant digits.
[3]Includes portland, blended, and masonry cements.
[4]Data are probably underreported.
[5]Includes alumina, aluminum dross, bauxite, spent catalysts, and other aluminous materials.
[6]Includes iron sludges, pyrite, and other ferrous materials.
[7]Includes both ground and unground material.
[8]Includes pozzolana and burned clays or shales (except where directly reported as clay or shale).
[9]Includes diatomite, silica fume, other microcrystalline silica, and other pozzolans, even if not used as such.
[10]Included with “Calcareous: Other.”
[11]Includes fluorspar and all other materials not listed earlier.
[12]May not add to totals shown because of independent rounding.
[13]Converted as 1.7 times the weight of foreign clinker consumed.

TABLE 7
CLINKER PRODUCED AND FUEL CONSUMED BY THE U.S. CEMENT INDUSTRY, BY KILN PROCESS[1]

	Production[2]			Conventional fuels[3]				Waste fuels[3]		
Kiln process	Number of plants	Quantity (thousand metric tons)	Percentage of total	Coal[4] (thousand metric tons)	Petcoke (thousand metric tons)	Oil[5] (thousand liters)	Natural gas[6] (thousand cubic meters)	Tires (thousand metric tons)	Solid (thousand metric tons)	Liquid (thousand liters)
2011:										
Wet	13	3,774	6.2	522	98	1,660	61,500	55	78	231,000
Dry[7, 8]	82	57,467	93.8	5,530	1,190	20,000	319,600	265	622	872,000
Both[8, 9]	1	W	W	W	W	W	W	W	W	W
Total[10]	96	61,241	100.0	6,050	1,290	53,900	381,000	320	699	1,100,000
2012:										
Wet	11	3,848	5.7	503	110	5,120	59,000	64	7	181,000
Dry[7, 8]	83	63,326	94.3	5,250	1,290	36,800	834,000	336	880	1,024,000
Both[8, 9]	1	W	W	W	W	W	W	W	W	W
Total[10]	95	67,173	100.0	5,750	1,400	41,900	893,000	400	887	1,210,000

W Withheld to avoid disclosing company proprietary data.

[1]Excludes Puerto Rico.

[2]Data are all reported. Although unrounded, data are thought to be accurate to no more than three significant digits.

[3]With the exception of natural gas (for better summation), all fuel data have been rounded to no more than three significant digits.

[4]All reported to be bituminous.

[5]Distillate and residual fuel oils. Excludes used oils that were reported under liquid wastes.

[6]Includes landfill gas and propane.

[7]Includes one semiwet plant.

[8]Data for the category "Both" have been included in those for "Dry" plants to protect company proprietary information.

[9]Plants that can operate both wet and dry kilns, whether or not both types were active during the year. Includes plants that converted from wet to dry technology during the year.

[10]May not add to totals shown because of independent rounding.

TABLE 8
ELECTRICITY CONSUMED BY U.S. CEMENT PLANTS, BY PLANT PROCESS[1]

Plant process	Electricity consumed[2]							Cement produced[4] (thousand metric tons)	Average consumption (kilowatthours per ton of cement produced)
	Generated		Purchased		Total[3]				
	Number of plants	Quantity (million kilowatthours)	Number of plants	Quantity (million kilowatthours)	Number of plants	Quantity (million kilowatthours)	Percentage of total		
2011:									
Integrated plants:									
Wet	--	--	13	586	13	586	6	4,227	139
Dry[5, 6]	2	238	84 [7]	8,760	84 [7]	9,000	94	62,643	144
Both[6, 8]	--	--	1	W	1	W	W	W	W
Total or average[3]	2	238	98 [7]	9,350	98 [7]	9,590	100	66,869	143
Grinding plants[9]	--	--	5	96	5	92	--	917	100
Exclusions[10]	--	--	3	XX	3	XX	--	109	XX
2012:									
Integrated plants:									
Wet	--	--	11	532	11	532	5	4,061	131
Dry[5, 6]	3	228	85 [7]	9,550	85 [7]	9,770	95	68,922	142
Both[6, 8]	--	--	1	W	1	W	W	W	W
Total or average[3]	3	228	97 [7]	10,100	97 [7]	10,300	100	72,983	141
Grinding plants[9]	--	--	7	118	7	118	--	1,092	108
Exclusions[10]	--	--	1	XX	1	XX	--	609	XX

W Withheld to avoid disclosing company proprietary data. XX Not applicable. -- Zero.

[1]Excludes Puerto Rico.

[2]Data are rounded to no more than three significant digits because they contain estimates.

[3]May not add to totals shown because of independent rounding.

[4]Portland and masonry cement. Data are all reported and are unrounded but are thought to be accurate to no more than three significant digits.

[5]Includes one semiwet plant.

[6]Data for the category "Both" have been included in those for "Dry" plants to protect company proprietary information.

[7]Includes two grinding plants whose data were included with the integrated plants.

[8]Plants that can operate both wet and dry kilns, whether or not both types were active during the year. Includes plants that converted from wet to dry technology during the year.

[9]Plants that did not produce clinker but ground clinker from outside sources. Excludes plants that only made masonry cement or just reground one type of portland cement into another, or which reported a substantial component of grinding of excess granulated blast furnace slag. Excludes two plants that were reported under "Dry" as noted in footnote 6.

[10]Plants at which production of portland cement was by regrinding of one type into another or which reported production only of masonry cement.

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

(Thousand metric tons)

Destination and origin	Portland cement		Masonry cement	
	2011	2012	2011	2012
Destination:				
Alabama	1,000	1,024	74	77
Alaska[3]	142	165	--	--
Arizona	1,476	1,672	20	21
Arkansas	736	787	34	39
California, northern	2,415	2,571	33	34
California, southern	4,475	4,836	131	132
Colorado	1,402	1,631	4	5
Connecticut[3]	477	507	10	10
Delaware[3]	172	143	4	4
District of Columbia[3]	178	237	(4)	(4)
Florida	3,403	3,883	220	255
Georgia	1,703	1,795	106	112
Hawaii[3]	260	282	2	2
Idaho	375	354	(4)	(4)
Illinois, excluding Chicago	1,402	1,412	8	7
Illinois, metropolitan Chicago[3]	1,034	1,171	15	17
Indiana	1,491	1,668	34	35
Iowa	1,597	1,782	1	2
Kansas	1,159	1,389	5	5
Kentucky	926	972	46	47
Louisiana[3]	2,348	2,053	49	46
Maine	183	183	1	1
Maryland	966	1,057	39	41
Massachusetts[3]	733	863	10	10
Michigan	1,470	1,570	42	46
Minnesota[3]	1,213	1,462	10	9
Mississippi[5]	758	733	35	32
Missouri	1,408	1,453	15	15
Montana	273	312	(4)	1
Nebraska	1,031	1,125	1	1
Nevada	927	1,035	5	6
New Hampshire[3]	193	196	7	7
New Jersey[3]	1,073	1,116	37	37
New Mexico	551	612	3	5
New York, eastern	437	468	9	8
New York, western[3]	706	729	14	13
New York, metropolitan[3]	1,175	1,194	47	47
North Carolina[3]	1,752	1,851	121	122
North Dakota[3]	595	804	1	1
Ohio	2,529	2,692	69	72
Oklahoma	1,512	1,629	38	41
Oregon	654	578	(4)	(4)
Pennsylvania, eastern	1,512	1,397	35	36
Pennsylvania, western	1,006	1,032	31	29
Rhode Island[3]	107	105	1	1
South Carolina	994	1,092	56	59
South Dakota	468	485	(4)	(4)
Tennessee	1,213	1,370	99	112
Texas, northern	4,811	5,489	68	82
Texas, southern	5,637	6,958	149	163
Utah	1,156	1,196	(4)	(4)
Vermont[3]	101	110	1	1
Virginia	1,449	1,614	71	73
Washington	1,356	1,378	(4)	(4)
West Virginia	487	496	13	13

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	
	2011	2012	2011	2012
Wisconsin[3]	1,526	1,606	8	11
Wyoming	300	315	--	--
Total[6]	70,434	76,637	1,836	1,945
Puerto Rico	838	861	(4)	(4)
Foreign countries[7]	1,132	1,367	1	2
Grand total[6]	72,404	78,866	1,837	1,947
Origin:				
United States	66,622	72,528	1,816	1,927
Puerto Rico	757	782	(4)	(4)
Foreign countries[8]	5,782	6,337	21	20
Total shipments[6]	72,404	78,866	1,837	1,947

-- 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, 10–12, and 14–15, which are from annual surveys of individual plants and importers. Although unrounded, data are thought to be accurate to no more than three significant digits.

[3]Has no cement plants.

[4]Less than ½ unit.

[5]The sole plant in Mississippi was closed in 2012 and had no production in either year.

[6]May not add to totals shown because of independent rounding.

[7]Includes shipments to U.S. possessions and territories.

[8]Imported cement sold to final customers in the United States as reported by domestic producers and other importers. Data do not match the imports in tables 17–20.

TABLE 10
SHIPMENTS OF PORTLAND CEMENT IN THE UNITED STATES, BY TYPE OF CARRIER[1, 2]

(Thousand metric tons)

Type of carrier	Plant to terminal		Plant to customer		Terminal to customer		Total to customers[4]
	In bulk	In bags[3]	In bulk	In bags[3]	In bulk	In bags[3]	
2011:							
Railroad	10,100	4	875	(5)	373	3	1,251
Truck	3,740	115	36,000	894	30,800	400	68,100
Barge and boat	8,800	--	96	--	806	--	902
Total[4]	22,600	119	37,000	894	32,000	403	70,300 [6]
2012:							
Railroad	12,100	3	1,060	--	107	6	1,170
Truck	3,540	170	39,200	811	34,600	432	75,000
Barge and boat	9,020	--	185	--	2	--	187
Total[4]	24,600	173	40,400	811	34,700	437	76,400 [6]

-- Zero.

[1]Includes imported cement and cement made from imported clinker. Excludes Puerto Rico.

[2]Data are rounded to no more than three significant digits.

[3]Includes packages, bags, and supersacks.

[4]May not add to totals shown because of independent rounding.

[5]Less than ½ unit.

[6]Shipments are based on an annual survey of plants and importers; may differ from totals in table 9, which are based on consolidated monthly data.

TABLE 11
PORTLAND CEMENT SHIPPED IN THE UNITED STATES, BY DISTRICT[1]

District[4]	2011			2012		
		Value[2]			Value[2]	
	Quantity[3] (thousand metric tons)	Total (thousands)	Average (per metric ton)	Quantity[3] (thousand metric tons)	Total (thousands)	Average (per metric ton)
Maine and New York	2,175	$202,409	$93.06	2,144	208,253	97.12
Pennsylvania	3,916	356,000 [5]	91.00 [5]	3,962	362,000 [5]	91.50 [5]
Illinois	1,870	167,569	89.62	1,528	127,317	83.35
Indiana	1,932	150,597	77.94	2,034	163,783	80.51
Michigan	3,894	384,806	98.81	4,121 [5]	367,000 [5]	89.00 [5]
Ohio	651	57,382	88.16	760	68,717	90.47
Iowa, Nebraska, South Dakota	3,303	325,836	98.65	3,709	375,373	101.20
Kansas	1,452	140,423	96.68	1,539	150,211	97.58
Missouri	6,500	514,834	79.20	7,478	597,056	79.84
Florida	3,143	280,971 [r]	89.41 [r]	3,650	301,404	82.58
Georgia, Maryland, Virginia, West Virginia	4,358	334,753	76.81	4,628	363,000 [5]	78.50 [5]
South Carolina	2,534	200,566	79.16	2,725	218,999	80.37
Alabama, Kentucky, Mississippi, Tennessee	4,683	400,624	85.55	5,021	419,360	83.52
Arkansas and Oklahoma	2,228	204,695	91.89	2,250	189,862	84.40
Texas, northern	4,732	452,000 [r, 5]	95.50 [r, 5]	5,133	506,000 [5]	98.50 [5]
Texas, southern	5,484	473,661	86.37	6,508	584,797	89.86
Arizona and New Mexico	1,704	171,136	100.40	2,008	209,383	104.26
Colorado and Wyoming	1,925	184,478	95.83	2,262	225,046	99.50
Idaho, Montana, Nevada, Utah	2,179	193,491	88.82	2,312	213,725	92.43
Alaska and Hawaii	359	54,045	150.47	394	59,185	150.25
California	7,414	558,000 [5]	75.50 [5]	7,904	584,379	73.93
Oregon and Washington	1,480 [5]	137,000 [5]	92.50 [5]	1,490 [5]	144,000 [5]	96.50 [5]
Importers[6]	2,360 [5]	257,000 [5]	109.00 [5]	2,800 [5]	313,000 [5]	111.50 [5]
Total or average[7]	70,300 [5]	6,200,000 [5]	88.00 [5]	76,400 [5]	6,750,000 [5]	88.50 [5]
Puerto Rico	839	W	W	862 [5]	W	W
Grand total[7]	71,100 [5]	W	W	77,200 [5]	W	W

[r]Revised. W Withheld to avoid disclosing company proprietary data.

[1]Includes gray and white portland cement. Includes cement made from imported clinker. Even where presented unrounded, data are thought to be accurate to no more than three significant digits.

[2]Values are mill net or ex-plant (free on board) valuations of total sales to final customers, including sales from plants' external distribution terminals. The data are ex-terminal for independently reporting terminals. Data include all varieties of portland cement and both bulk and bag shipments. Unless otherwise specified, data are presented unrounded. Unrounded or not, unit value data should be viewed as value indicators, accurate to no more than the nearest $0.50 or $1.00 per metric ton.

[3]Tonnages are those by reporting entities in the district but may include shipments into other districts. They differ from the data in table 9, which are the actual reported sales into the specific States.

[4]The location of the reporting entities, not necessarily the location of sales (see table 9 for sales data, by State). Specific districts include shipments by importers where district assignations were possible.

[5]Data are rounded to three significant digits (unit values to the nearest $0.50) because they include estimates.

[6]Importers for which district assignations were not possible.

[7]May not add to totals shown because of independent rounding.

TABLE 12
MASONRY CEMENT SHIPPED IN THE UNITED STATES, BY DISTRICT[1, 2]

District[5]	2011			2012		
		Value[3]			Value[3]	
	Quantity[4] (thousand metric tons)	Total (thousands)	Average (per metric ton)	Quantity[4] (thousand metric tons)	Total (thousands)	Average (per metric ton)
Maine and New York	46	$4,314	$94.58	55	$6,321	$115.46
Pennsylvania	159	22,200 [6]	140.00 [6]	167	24,000	143.00
Illinois, Indiana, Ohio	219	29,793	136.24	218	32,098	146.95
Michigan	67	9,088	135.45	70	9,143	131.50
Iowa, Nebraska, South Dakota	1	104	98.25	2	234	96.29
Kansas and Missouri	82 [6]	11,649	142.83	79	11,422	145.26
Florida	187	24,600 [6]	132.00 [6]	220	24,891	113.23
Georgia, Maryland, Virginia, West Virginia	191	32,378	169.50	182 [6]	27,800 [6]	153.00 [6]
South Carolina	151	19,382	128.22	166	21,875	132.11
Alabama, Kentucky, Mississippi, Tennessee	241	32,072	133.06	234	31,148	133.25
Arkansas and Oklahoma	82	9,571	116.71	92	10,595	114.93
Texas	178	23,800 [6]	134.00 [6]	218	32,300 [6]	148.50 [6]
Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, Wyoming	26	3,202	122.14	30	3,658	122.32
Alaska and Hawaii	2	692	308.70	2	559	313.99
California, Oregon, Washington	164	17,845	109.02	178	18,591	104.70
Importers[7]	11 [6]	2,090 [6]	193.50 [6]	41	6,160 [6]	200.50 [6]
Total or average[8]	1,810 [6]	243,000 [6]	134.50 [6]	1,950 [6]	263,000 [6]	134.50 [6]
Puerto Rico	(9)	W	W	(9)	W	W
Grand total or average[8]	1,810 [6]	W	W	1,950 [6]	W	W

W Withheld to avoid disclosing company proprietary data.

[1]Shipments are those by cement companies to final customers and include imported cement and cement made from imported clinker. Excludes sales of masonry cement by portland cement final customers who made masonry cement from purchased portland cement. Data exclude Puerto Rico. Even where presented unrounded, data are thought to be accurate to no more than three significant digits.

[2]Data include true masonry, plastic, portland-lime, and stucco cements.

[3]Values are mill net or ex-plant valuations of total sales to final customers, including sales from plants external distribution terminals. The data are ex-terminal for independently reporting terminals. Data include both bulk and bag shipments. Unless otherwise specified, data are presented unrounded. Unrounded or not, unit value data should be viewed as value indicators, accurate to no more than the nearest $0.50 or even $1.00 per metric ton.

[4]Tonnages are those by reporting entities in the district but may include shipments into other districts. They differ from the data in table 9, which are the actual reported sales into the specific States.

[5]District is the location of the reporting entities, not necessarily the location of sales (see table 9 for sales data, by State). Specific districts include shipments by importers where district assignations were possible.

[6]Data are rounded to no more than three significant digits (unit values to the nearest $0.50) because they include estimates.

[7]Importers for which district assignations were not possible.

[8]May not add to totals shown because of independent rounding.

[9]Less than 500 metric tons.

TABLE 13
AVERAGE MILL NET VALUE OF CEMENT SOLD IN THE UNITED STATES[1, 2]

(Dollars per metric ton)

Year	Portland cement			Masonry cement	All cement
	Gray	White[3]	All		
2011	87.50	194.00	88.00	134.50	89.50
2012	87.50	194.50	88.50	134.50	89.50

[1]Values are average of sales to final customers, free on board the plant or independently reporting terminal. Values include any bagging charges, but exclude delivery charges to customers or to external terminals. Data exclude Puerto Rico.

[2]Data are rounded to the nearest $0.50 per metric ton.

[3]Data for white cement include a component of resales showing significant price markups.

TABLE 14
PORTLAND CEMENT SHIPMENTS IN 2012, BY DISTRICT AND TYPE OF CUSTOMER[1]

(Thousand metric tons)

District[2]	Ready-mixed concrete	Concrete product manufacturers	Contractors	Building material dealers	Oil well, mining, waste stabilization	Government and other[3]	Total[4, 5]
Maine and New York	1,510	306	79	195	3	50	2,144
Pennsylvania	2,250	917	409	195	54	135	3,962
Illinois	892	93	121	9	321	92	1,528
Indiana	1,330	238	340	26	55	50	2,034
Michigan	3,080	377	492	151	15	7	4,121
Ohio	617	56	57	15	15	--	760
Iowa, Nebraska, South Dakota	2,740	355	402	27	185	(6)	3,709
Kansas	1,230	116	84	39	71	--	1,539
Missouri	5,670	503	727	428	55	94	7,478
Florida	2,590	562	103	344	8	49	3,650
Georgia, Maryland, Virginia, West Virginia	3,120	815	408	147	3	139	4,628
South Carolina	1,950	313	168	135	3	156	2,725
Alabama, Kentucky, Mississippi, Tennessee	3,820	592	344	194	34	36	5,021
Arkansas and Oklahoma	1,470	163	397	51	166	2	2,250
Texas, northern	2,940	391	665	65	1,020	48	5,133
Texas, southern	4,420	510	619	185	769	3	6,508
Arizona and New Mexico	1,490	342	84	42	21	27	2,008
Colorado and Wyoming	1,610	144	259	72	160	14	2,262
Idaho, Montana, Nevada, Utah	1,550	194	204	76	264	26	2,312
Alaska and Hawaii	387	7	--	--	--	--	394
California	5,780	848	568	578	113	22	7,904
Oregon and Washington	1,160	183	48	57	36	12	1,492 [7]
Importers[8]	2,070	274	206	43	104	112	2,804 [7]
Total[5]	53,700	8,300	6,780	3,070	3,480	1,070	76,400 [7]
Puerto Rico	457	75	8	322	--	--	862
Grand total[5]	54,100	8,370 [9]	6,790 [10]	3,400	3,480 [11]	1,070	77,200 [7]

-- Zero.

[1]Includes imported cement and cement made from imported clinker. Except for district totals, data have been rounded to three significant digits, but are likely accurate to only two significant digits. District totals are likely accurate to no more than three significant digits.

[2]The location of the reporting entity, not the location of sales (see table 9 for sales data, by State). Specific districts include shipments by importers where district assignations were possible.

[3]Includes shipments to miscellaneous customer types and for which customer types were not specified.

[4]District totals are unrounded but are thought to be accurate to no more than three significant digits.

[5]May not add to totals shown because of independent rounding.

[6]Less than ½ unit.

[7]Data are rounded to three significant digits because they contain estimates.

[8]Shipments by importers where district assignations were not possible.

[9]Includes brick and block—2,580; precast and prestressed—2,929; pipe—862; and other or unspecified—2,002.

[10]Includes airport—161; road paving—3,863; soil cement—1,856; and other or unspecified—913.

[11]Includes oil well drilling—2,996; mining—302; and waste stabilization—180.

TABLE 15

PORTLAND CEMENT SHIPMENTS IN THE UNITED STATES, BY TYPE OF CEMENT[1, 2, 3]

(Thousand metric tons)

Type of cement[4]	2011	2012
General use and moderate heat (Types I and II)[5, 6]	54,500	59,400
High early strength (Type III)	2,550	2,520
Sulfate resisting (Type V)[5]	9,340	10,300
Block	147	142
Oil well	1,750	2,000
White[7]	635	705
Blended:[8]		
Portland, natural pozzolans	63	76
Portland, ground granulated blast furnace slag	679	560
Portland, fly ash	373	408
Portland, other pozzolans[9]	220	235
Total blended[10]	1,330	1,280
Expansive and regulated fast setting	21	7
Miscellaneous[11]	26	3
Grand total[10]	70,300	76,400

[1]Includes sales of imported cement. Excludes Puerto Rico.

[2]Data are rounded to no more than three significant digits.

[3]Gray portland-type cements unless otherwise specified.

[4]Sold mostly under specifications ASTM C150, ASTM C595, and ASTM C1157.

[5]Type II/V and similar sulfate-resisting hybrids are included within Type V, as are HS and similar cements in ASTM C1157.

[6]Includes ASTM C1157 general use and moderate heat cements that contain no pozzolans.

[7]White or colored portland-type cements. Most are Types I or II but may include Types III and V and block cements.

[8]Cements sold under ASTM C595 and those under ASTM C1157 that contain pozzolans.

[9]Includes blends with cement kiln dust, silica fume, or other pozzolans, and blends containing multiple pozzolans.

[10]May not add to totals shown because of independent rounding.

[11]Includes low heat (Type IV), waterproof, and other portland-type cements.

TABLE 16
U.S. EXPORTS OF HYDRAULIC CEMENT AND CLINKER, BY COUNTRY[1]

(Thousand metric tons and thousand dollars)

Country	2011		2012	
	Quantity	Value[2]	Quantity	Value[2]
Aruba	1	231	5	979
Australia	2	518	1	667
Bahamas, The	112	9,137	144	12,032
Barbados	(3)	53	1	115
Belize	1	218	2	482
Bermuda	5	398	(3)	151
Brazil	2	1,960	15	1,913
Canada	1,010	133,997	1,195	155,050
Cayman Islands	(3)	139	2	204
Chile	2	309	4	549
China	(3)	125	1	198
Colombia	14	2,056	27	3,095
Costa Rica	2	121	(3)	26
Dominican Republic	10	1,478	12	1,621
Ecuador	1	366	(3)	97
France	(3)	34	1	45
Greece	8	355	5	216
Guyana	(3)	143	1	335
Haiti	53	3,805	32	2,691
Hong Kong	(3)	160	1	479
India	1	128	1	134
Israel	1	264	2	438
Italy	(3)	181	1	201
Jamaica	64	6,432	116	11,995
Japan	5	1,078	4	1,653
Kuwait	(3)	39	3	1,195
Liberia	(3)	193	1	1,036
Mexico	46	9,538	78	17,188
Netherlands	17	931	(3)	29
Netherlands Antilles	5	689	--	--
New Zealand	2	678	(3)	118
Pakistan	--	--	1	69
Panama	23	2,506	71	6,801
Russia	2	209	1	337
Saudi Arabia	1	3,348	(3)	36
Singapore	1	278	1	70
Sint Maarten	9	1,259	4	528
St. Christopher and Nevis	1	108	(3)	18
Taiwan	(3)	328	1	541
Turks and Caicos Islands	3	325	7	671
United Arab Emirates	2	396	1	200
United Kingdom	1	195	2	1,031
Venezuela	1	158	1	721
Other	4	2,038	7	3,356
Total[4]	1,414	186,902	1,749	229,310
Puerto Rico:				
British Virgin Islands	19	1,887	16	1,711
Curacao	5	361	9	1,105
Jamaica	13	849	--	--
Netherlands	2	185	(3)	10
Trinidad and Tobago	--	--	1	1,083
Other	(3)	3	(3)	16
Total[4]	39	3,285	26	3,925
Grand Total[4]	1,453	190,187	1,776	233,235

See footnotes at end of table.

TABLE 16—Continued
U.S. EXPORTS OF HYDRAULIC CEMENT AND CLINKER, BY COUNTRY[1]

-- Zero.
[1]Includes portland and masonry cements. Data are unrounded but are thought to be accurate to no more than three significant digits.
[2]Free alongside ship 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 the carrier.
[3]Less than ½ unit.
[4]May not add to totals shown because of independent rounding.

Source: U.S. Census Bureau.

TABLE 17
U.S. IMPORTS FOR CONSUMPTION OF HYDRAULIC CEMENT AND CLINKER, BY COUNTRY[1]

(Thousand metric tons and thousand dollars)

	2011			2012		
		Value			Value	
Country	Quantity	Customs[2]	C.i.f.[3]	Quantity	Customs[2]	C.i.f.[3]
Canada[4]	3,416	259,853	276,332	3,709	286,335	301,907
China	577	32,462	48,435	375	23,898	34,439
Colombia	224	12,620	18,674	84	4,837	7,274
Croatia	33	12,011	14,307	24	7,925	9,590
Denmark	74	7,534	9,582	96	12,166	15,607
Egypt	71	7,093	9,846	84	8,468	11,741
France	72	25,236	25,748	85	31,248	32,492
Germany	2	446	581	(5)	256	344
Greece	--	--	--	609	27,033	40,267
Jamaica	16	5,158	5,234	6	1,874	1,933
Japan	1	830	941	1	958	1,117
Korea, Republic of	1,402	54,563	86,100	1,280	55,134	85,126
Mexico[4]	354	38,455	43,271	300	35,410	38,690
Netherlands	3	3,402	3,605	7	3,518	3,714
Spain	(5)	190	258	38	2,808	3,283
Sweden	81	3,212	6,445	132	5,385	10,413
Taiwan	65	2,551	4,241	39	1,958	2,743
Thailand	11	1,607	2,379	13	1,925	2,825
Trinidad and Tobago	12	814	824	--	--	--
Turkey	1	280	335	9	1,467	2,269
United Kingdom	1	337	408	2	260	408
Other	1 r	281 r	351 r	(5)	424	520
Total[4, 6]	6,418	468,937	557,896	6,893	513,285	606,702
Puerto Rico:						
Colombia	5	657	851	4	431	541
Mexico	14	1,503	2,215	16	1,944	2,771
Spain	106	6,888	8,795	124	7,949	10,185
Other	(5)	56	83	(5)	60	80
Total[6]	125	9,104	11,944	144	10,384	13,576
Grand total[4, 6]	6,543	478,041	569,840	7,037	523,669	620,278

[r]Revised. -- Zero.
[1]Includes portland, masonry, and other hydraulic cements. Data are unrounded but are thought to be accurate to no more than three significant digits.
[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 value represents the customs value plus insurance, freight, and other delivery charges to the first port of entry, but excludes costs of offloading, other U.S. port handling charges, and demurrage.
[4]Data are underreported with respect to clinker from Canada, and cement from Mexico (2012 only), owing to additional material coming in as "informal entries."
[5]Less than ½ unit.
[6]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 CUSTOMS DISTRICT AND COUNTRY[1]

(Thousand metric tons and thousand dollars)

Customs district and country	2011			2012		
		Value			Value	
	Quantity	Customs[2]	C.i.f.[3]	Quantity	Customs[2]	C.i.f.[3]
Anchorage, AK:						
Canada	6	344	1,206	6	370	1,284
Germany	--	--	--	(5)	5	6
Korea, Republic of	100	4,159	7,874	105	4,805	8,607
Total[4]	106	4,502	9,081	111	5,180	9,896
Baltimore, MD:						
China	1	38	44	2	68	77
Other	(5)	135	142	(5)	296	310
Total[4]	1	172	185	2	363	386
Boston, MA:						
Canada	4	155	245	--	--	--
Other	--	--	--	(5)	18	18
Total[4]	4	155	245	(5)	18	18
Buffalo, NY:						
Canada	555	46,598	49,209	572	51,574	53,260
Other	(5)	17	17	(5)	54	54
Total[4]	555	46,616	49,227	572	51,627	53,313
Chicago, IL, Other	1	727	767	1	718	751
Cleveland, OH:						
Canada	486	34,368	36,974	536	37,437	39,628
China	1	141	225	1	234	404
Netherlands	1	768	826	(5)	616	665
Other	(5)	192	252	(5)	376	456
Total[4]	488	35,468	38,277	538	38,664	41,154
Columbia-Snake, OR, WA:						
Canada[6]	45	2,743	3,018	29	1,791	1,946
China	298	14,384	22,380	300	14,957	22,895
Korea, Republic of	--	--	--	6	286	466
Total[4]	343	17,127	25,398	335	17,034	25,307
Detroit, MI:						
Canada[6]	947	73,028	79,014	1,113	82,381	89,541
Other	(5)	329	346	(5)	206	215
Total[4, 6]	947	73,356	79,360	1,114	82,587	89,756
El Paso, TX:						
Canada	(5)	72	90	--	--	--
Mexico[6]	204	20,882	23,573	114	13,354	14,602
Total[4, 6]	205	20,954	23,662	114	13,354	14,602
Great Falls, MT:						
Canada	44	2,638	2,728	8	250	271
Other	(5)	77	89	(5)	90	94
Total[4]	45	2,715	2,817	8	341	365
Honolulu, HI:						
Korea, Republic of	290	12,753	18,673	229	10,067	15,277
Switzerland	(5)	2	3	--	--	--
Taiwan	--	--	--	39	1,958	2,743
Total[4]	290	12,756	18,676	267	12,024	18,021
Houston-Galveston, TX:						
China	3	503	530	2	164	167
Colombia	4	562	716	3	358	497
Egypt	32	3,236	4,386	40	4,073	5,407
Greece	--	--	--	337	14,679	23,115
Korea, Republic of	658	24,844	41,305	478	20,792	32,825
Other	1	445	580	(5)	204	260
Total[4]	699	29,590	47,516	861	40,270	62,271

See footnotes at end of table.

TABLE 18—Continued

U.S. IMPORTS FOR CONSUMPTION OF HYDRAULIC CEMENT AND CLINKER, BY CUSTOMS DISTRICT AND COUNTRY[1]

(Thousand metric tons and thousand dollars)

Customs district and country	2011			2012		
		Value			Value	
	Quantity	Customs[2]	C.i.f.[3]	Quantity	Customs[2]	C.i.f.[3]
Laredo, TX, Mexico	88	11,660	11,938	108	14,118	14,330
Los Angeles, CA:						
China	25	2,813	3,643	20	2,201	3,081
Croatia	3	176	275	2	141	224
Egypt	6	608	903	9	935	1,461
Thailand	7	1,047	1,523	8	1,121	1,636
Turkey	(5)	14	27	4	463	838
Other	(5)	67	90	(5)	32	40
Total[4]	42	4,724	6,460	44	4,892	7,279
Miami, FL:						
Colombia	4	525	693	2	276	357
Egypt	24	2,319	3,319	23	2,345	3,370
Germany	1	33	35	(5)	22	26
Greece	--	--	--	15	596	923
Sweden	80	2,685	5,831	131	4,750	9,653
Turkey	(5)	54	92	4	563	916
Other	62	5,911	7,771	74	7,391	9,167
Total[4]	170	11,529	17,740	248	15,943	24,411
Minneapolis, MN:						
Canada	103	12,810	12,822	133	16,160	16,172
United Kingdom	(5)	15	19	(5)	15	15
Total[4]	103	12,824	12,841	133	16,175	16,187
Mobile, AL, China	(5)	52	52	--	--	--
New Orleans, LA:						
China	6	1,353	1,528	15	3,659	4,051
Croatia	30	11,802	13,987	21	7,785	9,366
Korea, Republic of	139	4,741	7,182	--	--	--
Other	(5)	2	3	(5)	9	11
Total[4]	175	17,898	22,699	36	11,453	13,428
New York City, NY:						
Denmark	24	2,620	3,355	19	1,912	3,001
Greece	--	--	--	256	11,758	16,230
Other	1	473	580	1	480	547
Total[4]	25	3,093	3,935	276	14,150	19,777
Nogales, AZ, Mexico	(5)	5	5	--	--	--
Norfolk, VA:						
Egypt	3	297	395	2	230	300
France	72	25,143	25,627	85	31,024	31,889
Jamaica	13	4,946	5,019	6	1,874	1,933
Sweden	1	513	600	2	635	760
United Kingdom	(5)	199	219	--	--	--
Other	(5)	191	212	1	320	398
Total[4]	90	31,289	32,072	95	34,083	35,279
Ogdensburg, NY:						
Canada	184	16,972	17,445	205	18,340	18,731
Other	(5)	5	5	(5)	16	16
Total[4]	184	16,977	17,450	205	18,356	18,747
Pembina, ND:						
Canada	191	11,546	11,646	281	17,414	17,558
Germany	(5)	37	37	--	--	--
Total[4]	191	11,583	11,683	281	17,414	17,558

See footnotes at end of table.

TABLE 18—Continued

U.S. IMPORTS FOR CONSUMPTION OF HYDRAULIC CEMENT AND CLINKER, BY CUSTOMS DISTRICT AND COUNTRY[1]

(Thousand metric tons and thousand dollars)

Customs district and country	2011			2012		
		Value			Value	
	Quantity	Customs[2]	C.i.f.[3]	Quantity	Customs[2]	C.i.f.[3]
Philadelphia, PA:						
Korea, Republic of	157	5,477	6,992	173	6,271	7,432
Netherlands	1	646	690	(5)	525	567
Spain	--	--	--	16	1,279	1,749
Other	(5)	24	43	(5)	34	84
Total[4]	158	6,146	7,725	190	8,109	9,831
Portland, ME, Canada	28	2,808	3,138	25	2,713	3,036
Providence, RI, Canada	4	196	287	--	--	--
San Diego, CA, Mexico	(5)	23	25	6	570	627
San Francisco, CA:						
China	9	1,025	1,175	8	806	1,144
Egypt	1	68	90	2	198	330
Taiwan	65	2,551	4,241	--	--	--
Thailand	4	529	814	5	788	1,169
Other	(5)	43	63	(5)	19	22
Total[4]	79	4,216	6,383	15	1,811	2,666
Savannah, GA:						
Colombia	112	5,885	8,746	--	--	--
Egypt	6	565	753	7	686	873
Spain	--	--	--	22	1,529	1,534
Other	(5)	457	487	(5)	441	461
Total[4]	118	6,907	9,986	29	2,656	2,868
Seattle, WA:						
Canada[6]	761	49,043	51,629	717	48,797	50,750
China	234	12,071	18,755	27	1,343	2,063
Japan	1	432	498	1	607	733
Korea, Republic of	58	2,589	4,074	289	12,905	20,510
United Kingdom	--	--	--	2	149	286
Other	(5)	212	231	(5)	131	478
Total[4]	1,053	64,347	75,187	1,036	63,932	74,820
St. Albans, VT, Canada	59	6,532	6,881	83	9,108	9,731
St. Louis, MO, Other	(5)	403	425	(5)	411	432
Tampa, FL:						
Colombia	1	139	196	1	115	155
Denmark	50	4,914	6,227	77	10,251	12,604
Other	--	--	--	1	155	208
Total[4]	51	5,054	6,423	78	10,522	12,966
U.S. Virgin Islands:						
Colombia	1	106	113	--	--	--
Jamaica	3	212	215	--	--	--
Netherlands	--	--	--	5	519	537
Trinidad And Tobago	12	814	824	--	--	--
Total[4]	16	1,133	1,152	5	519	537
Wilmington, NC:						
Colombia	102	5,356	8,153	78	4,049	6,216
Other	(5)	43	45	(5)	120	135
Total[4]	102	5,400	8,198	78	4,169	6,351
U.S. total[4, 6]	6,418	468,937	557,896	6,893	513,285	606,702
San Juan, PR:						
Colombia	5	657	851	4	431	541
Mexico	14	1,503	2,215	16	1,944	2,771
Spain	106	6,888	8,795	124	7,949	10,185
Other	(5)	56	83	(5)	60	80
Total[4]	125	9,104	11,944	144	10,384	13,576
Grand total[4, 6]	6,543	478,041	569,840	7,037	523,669	620,278

See footnotes at end of table.

TABLE 18—Continued
U.S. IMPORTS FOR CONSUMPTION OF HYDRAULIC CEMENT AND CLINKER, BY CUSTOMS DISTRICT AND COUNTRY[1]

(Thousand metric tons and thousand dollars)

-- Zero.

[1]Includes all varieties of hydraulic cement and clicker. Data are unrounded but are thought to be accurate to no more than three significant digits.

[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 value represents the customs value plus insurance, freight, and other delivery charges to the first port of entry, but excludes costs of offloading, other U.S. port handling charges, and demurrage.

[4]May not add to totals shown because of independent rounding.

[5]Less than ½ unit.

[6]Data are underreported with respect to clinker from Canada, and cement from Mexico (2012 only), owing to additional material coming in as "informal entries."

Source: U.S. Census Bureau.

TABLE 19
U.S. IMPORTS FOR CONSUMPTION OF GRAY PORTLAND CEMENT, BY COUNTRY[1]

(Thousand metric tons and thousand dollars)

	2011			2012		
		Value			Value	
Country	Quantity	Customs[2]	C.i.f.[3]	Quantity	Customs[2]	C.i.f.[3]
Canada	2,601	193,840	209,122	2,718	208,397	222,397
China	532	26,446	41,127	327	16,327	24,989
Colombia	215	11,348	17,012	78	4,049	6,216
Germany	1	157	180	(4)	33	79
Greece	--	--	--	609	27,033	40,267
Jamaica	3	212	215	--	--	--
Korea, Republic of	1,402	54,539	86,072	1,276	55,023	84,874
Mexico	88	5,948	7,501	22 [5]	1,533 [5]	1,848 [5]
Netherlands	(4)	230	249	5	519	537
Sweden	80	2,685	5,831	131	4,750	9,653
Taiwan	65	2,551	4,241	39	1,958	2,743
Trinidad and Tobago	12	814	824	--	--	--
Other	(4)	67 [r]	81 [r]	(4)	95	442
Total[6, 7]	4,999	298,838	372,455	5,203 [5]	319,717 [5]	394,045 [5]
Puerto Rico:						
Guatemala	--	--	--	(4)	7	9
Spain	106	6,888	8,795	124	7,949	10,185
Total[6, 7]	106	6,888	8,795	124	7,956	10,194
Grand total[6, 7]	5,105	305,726	381,250	5,327 [5]	327,672 [5]	404,239 [5]

[r]Revised. -- Zero.

[1]Data are unrounded but are thought to be accurate to no more than three significant digits.

[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 value represents the customs value plus insurance, freight, and other delivery charges to the first port of entry, but excludes costs of offloading, other U.S. port handling charges, and demurrage.

[4]Less than ½ unit.

[5]Data are underreported with respect to imports into the El Paso, TX, customs district owing to additional material coming in as "informal entries."

[6]May not add to totals shown because of independent rounding.

[7]Total imports do not include gray portland cement that was misregistered by importers under the white cement tariff code; these quantities are included in table 20.

Source: U.S. Census Bureau.

TABLE 20
U.S. IMPORTS FOR CONSUMPTION OF WHITE CEMENT, BY COUNTRY[1]

(Thousand metric tons and thousand dollars)

Country	2011			2012		
		Value			Value	
	Quantity	Customs[2]	C.i.f.[3, 4]	Quantity	Customs[2]	C.i.f.[3, 4]
Canada	271	37,494	38,264	305	41,564	42,650
China	37	4,011	4,973	29	2,970	4,141
Colombia	9	1,272	1,662	6	787	1,057
Denmark	74	7,534	9,582	96	12,163	15,604
Egypt	71	7,093	9,846	84	8,468	11,741
Mexico	163	20,198	22,445	199	24,243	26,399
Spain	(5)	35	87	16 [6]	1,279	1,749
Thailand	11	1,591	2,359	13	1,911	2,809
Turkey	1	81	136	9	1,153	1,952
Other	1	220 [r]	294 [r]	2	254	403
Total[7]	639	79,529	89,648	759 [6]	94,792	108,506
Puerto Rico:						
Colombia	5	657	851	4	431	541
Guatemala	(5)	15	20	(5)	12	16
Mexico	14	1,503	2,215	16	1,944	2,771
Other	-- [r]	-- [r]	-- [r]	--	--	--
Total[7]	19	2,175	3,086	20	2,387	3,327
Grand total[7]	658	81,705	92,733	779 [6]	97,179	111,833

[r]Revised. -- Zero.

[1]Data are unrounded but are thought to be accurate to no more than three significant digits.

[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 value represents the customs value plus insurance, freight, and other delivery charges to the first port of entry, but excludes costs of offloading, other U.S. port handling charges, and demurrage.

[4]Values of less than $90.00 (c.i.f.) per metric ton likely indicate the mistaken total or partial inclusion of data for gray portland or similar cement or clinker. This error happens when the importer records the wrong tariff number with the U.S. Customs Service. Values that exceed $200 per ton likely indicate misidentified specialty cement, not white cement.

[5]Less than ½ unit.

[6]Includes 16,499 metric tons of white cement clinker from Spain that was misregistered as white cement by the importer.

[7]May not add to totals shown because of independent rounding.

Source: U.S. Census Bureau.

TABLE 21
U.S. IMPORTS FOR CONSUMPTION OF CLINKER, BY COUNTRY[1]

(Thousand metric tons and thousand dollars)

Country	2011			2012		
		Value			Value	
	Quantity	Customs[2]	C.i.f.[3]	Quantity	Customs[2]	C.i.f.[3]
Canada[4]	531	26,394	26,695	673	33,392	33,693
China	1	72	92	5	726	746
Croatia	3	152	235	2	106	167
France	70	23,369	23,728	84	30,580	31,416
Spain	--	--	--	22 [5]	1,529	1,534
Other	(6)	47	69	(6)	13	14
Total[4, 7]	606	50,034	50,819	786 [5]	66,346	67,570

-- Zero.

[1]For all types of hydraulic cement. Data are unrounded but are thought to be accurate to no more than three significant digits.

[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 value represents the customs value plus insurance, freight, and other delivery charges to the first port of entry, but excludes costs of offloading, other U.S. port handling charges, and demurrage.

[4]Data are underreported with respect to additional material coming in as "informal entries."

[5]Excludes 16,499 metric tons of white cement clinker that was misregistered by the importer as white cement and which has thus been included in table 20.

[6]Less than ½ unit.

[7]May not add to totals shown because of independent rounding.

Source: U.S. Census Bureau.

TABLE 22
HYDRAULIC CEMENT: WORLD PRODUCTION, BY COUNTRY[1, 2]

(Thousand metric tons)

Country	2008	2009	2010	2011	2012[e]
Afghanistan	37	32	36	38 [e]	37
Albania	918	1,108	1,300	1,800 [r]	2,000
Algeria	17,397 [r]	18,732 [r]	19,100	19,000 [r, e]	19,000
Angola[e]	1,780	1,800	1,500	1,500	1,600
Argentina	9,703	9,385	10,423	11,592	10,716 [3]
Armenia	770	467	488	422 [r]	438 [3]
Australia[e]	9,400	9,200	8,300 [r]	8,600 [r]	8,600
Austria	5,309	4,646	4,254	4,427	4,455 [3]
Azerbaijan	1,595	1,286	1,279	1,425 [r]	1,966 [3]
Bahrain[e]	438 [3]	700	900 [r]	1,200 [r]	1,300
Bangladesh[4]	10,000 [r, e]	12,000 [r, e]	13,770 [r]	14,690 [r]	15,000
Barbados	301 [r]	256 [r]	229 [r]	223 [r]	176 [3]
Belarus	4,219	4,350	4,531	4,604 [r]	4,906 [3]
Belgium	6,710 [r]	5,990 [r]	6,095 [r]	6,954 [r]	7,000
Benin	1,347 [r]	1,315 [r]	1,305 [r]	1,460 [r]	1,390 [3]
Bhutan[e]	180	180	200	544 [r]	521 [3]
Bolivia	1,985	2,292	2,414	2,658	2,714 [3]
Bosnia and Herzegovina	1,406	1,074	949	893	846 [3]
Brazil	51,884 [r]	51,748	59,118	64,093	68,787 [3]
Brunei[e]	240	220	270 [r]	290 [r]	300
Bulgaria	4,651 [r]	2,645 [r]	1,961 [r]	1,866 [r]	2,000
Burkina Faso	468 [r]	563 [r]	587 [r]	590 [r, e]	600
Burma[5]	676	670	534	538 [r]	600
Burundi	--	--	--	35	71 [3]
Cambodia	772	934	789	907 [r]	980 [3]
Cameroon[e]	1,000	1,000	890 [r]	730 [r]	900
Canada	13,672	10,985	12,431	12,001	12,465 [3]
Chile	4,622	3,876	3,871	4,406	4,722 [3]
China	1,400,000	1,644,000	1,822,000 [r]	2,099,000	2,210,000 [p]
Colombia[6]	10,456	9,232	9,488	10,777	10,925 [3]
Congo (Brazzaville)[e]	105	110	80	70 [r]	150
Congo (Kinshasa)	411	460	490	458 [r]	377 [3]
Costa Rica[e]	2,100 [r]	2,100 [r]	1,276 [3]	1,600	1,500
Côte d'Ivoire	360	283	189 [r]	99 [r]	78 [3]
Croatia	3,403 [r]	2,655 [r]	2,488 [r]	2,467 [r]	2,500
Cuba	1,707	1,626	1,631 [r]	1,736 [r]	1,833 [3]
Cyprus	1,914 [r]	1,484 [r]	1,329 [r]	1,207 [r]	1,300
Czech Republic	4,710	3,637	3,345	3,831 [r]	3,350
Denmark	2,494 [r]	1,575 [r]	1,553 [r]	1,811 [r]	1,798 [3]
Dominican Republic	4,207 [r]	3,852 [r]	4,106 [r]	3,997 [r]	4,130 [3]
Ecuador	5,493	4,990	5,287 [r]	5,706 [r]	5,700
Egypt	39,844	46,900	47,800	43,384 [r]	55,200 [3]
El Salvador[e]	1,300	1,212 [3]	1,290 [r]	1,320 [r]	1,400
Eritrea[e]	45	45	45	230 [r]	230
Estonia	808	326	375	449 [r]	450
Ethiopia[e]	1,834 [3]	2,100	2,900	3,300 [r]	3,000
Fiji[e]	143	110	130 [r]	120	120
Finland	1,633 [r]	1,052	1,200 [r]	1,514 [r]	1,500
France	20,895 [r]	17,974 [r]	17,733 [r]	19,270 [r]	19,500
French Guiana[e]	62	62	89 [r, 3]	62	60
Gabon[e]	230	250	200	200	220
Georgia[e]	450	870 [4]	857 [4]	860 [r]	860
Germany	32,461 [r]	29,974 [r]	29,203 [r]	32,779 [r]	32,432 [3]
Ghanae	1,800	1,800	2,100 [r]	2,550 [r]	3,000
Greece	12,801 [r]	10,069 [r]	8,526 [r]	7,418 [r]	7,500
Guadeloupe[e, 7]	300 [r]	300 [r]	300 [r]	300 [r]	300
Guatemala[e]	2,500	1,500 [r]	2,650 [r]	2,820 [r]	2,900

See footnotes at end of table.

TABLE 22—Continued
HYDRAULIC CEMENT: WORLD PRODUCTION, BY COUNTRY[1, 2]

(Thousand metric tons)

Country	2008	2009	2010	2011	2012[e]
Guinea	381	298	237	365	317 [3]
Haiti[e]	300 [r]	300 [r]	300 [r]	300 [r]	300
Honduras[e]	1,784 [3]	1,800 [r]	1,800	1,710 [3]	1,700
Hong Kong	1,426 [r]	1,124 [r]	1,420 [r]	1,560 [r, e]	1,600
Hungary	3,544	2,807 [r]	2,136 [r]	1,694 [r]	2,000
Iceland[e]	138	138	140 [r]	140	140
India[e]	185,000	205,000	220,000	250,000 [r]	270,000
Indonesia	38,530 [r]	36,910 [r]	39,480 [r]	45,240 [r]	51,000
Iran[e]	44,400 [3]	50,000	61,000	66,000 [r]	70,000
Iraq[e]	6,453 [3]	7,000 [r]	8,000 [r]	10,000 [r]	10,000
Ireland	4,493 [r]	2,797 [r]	2,379 [r]	2,103 [r]	2,600
Israel	4,819	4,759	5,139	5,480 [r]	5,500
Italy	43,030	36,317	34,408	33,120	33,000
Jamaica	725	737	723	766 [r]	760 [3]
Japan	62,810	54,800	51,526	51,291	54,737 [3]
Jordan	4,375	3,876	3,929	4,000 [e]	4,900 [3]
Kazakhstan	5,837	5,694	6,686	7,642	6,392 [3]
Kenya	2,829	3,320	3,710	4,478 [r]	4,640 [3]
Korea, North[e]	6,415 [3]	6,400	6,400	6,400	6,400
Korea, Republic of	51,653	50,126 [r]	47,420	48,249 [r]	47,087 [3]
Kosovo[e, 8]	590 [3]	500 [r]	360 [r]	370 [r]	400
Kuwait[e]	2,600	2,000	2,000	2,250	2,250
Kyrgyzstan	1,218	579	760 [r]	1,015 [r]	1,050
Laos[e]	400	400	400	400	400
Latvia[e]	310	650	1,100	1,100	1,100
Lebanon	4,250	4,900	5,227	5,500 [e]	5,500
Liberia	94	71	72	81 [r]	109 [3]
Libya[e]	5,509 [3]	6,500	7,000 [r]	3,500 [r]	2,000
Lithuania	1,076	583	843 [r]	996 [r]	1,000
Luxembourg	1,091	1,000	1,078	1,319 [r]	1,217 [3]
Macedonia	916	909	820	981	683 [3]
Madagascar[e]	160 [r]	140 [r]	160 [r]	150 [r]	150
Malawi	237 [r]	232	188	203	180
Malaysia	19,629	19,457	19,762	21,198 [r]	21,726 [3]
Martinique[e, 7]	150 [r]	150 [r]	150 [r]	150 [r]	150
Mauritania	322	324 [r]	552 [r]	565 [r]	570
Mexico	37,139	35,160	34,502 [r]	35,400	36,184 [3]
Moldova[e]	750	700	930 [r]	1,070 [r]	1,230
Mongolia	269	235	323	426 [r]	349
Morocco	14,047	14,519	14,700 [r]	16,300 [r]	16,500 [3]
Mozambique[9]	744	777	884	976	1,184 [3]
Namibia	--	--	5 [e]	390 [r]	501 [3]
Nepal[e, 6]	295	300 [r]	300 [r]	300 [r]	300
Netherlands	3,097 [r]	2,342 [r]	2,138 [r]	2,318 [r]	2,500
New Caledonia	137	138	160	145 [r]	124 [3]
New Zealand[e]	1,200 [r]	1,200 [r]	1,100 [r]	1,200 [r]	1,200
Nicaragua	530	650	600	700 [r]	700
Niger	56 [r]	42 [r]	32 [r]	73 [r]	73 [3]
Nigeria[e]	10,000 [r]	10,000 [r]	11,000 [r]	12,800 [r]	16,400
Norway	1,747 [r]	1,093 [r]	1,298 [r]	1,387 [r]	1,500
Oman[e]	3,991 [3]	4,000	4,500	5,000 [r]	5,200 [3]
Pakistan[e]	30,800 [3]	32,800 [3]	30,000 [r]	32,000	33,000
Panama	1,843	1,679	1,400 [r, e]	897	1,000
Paraguay[e]	800 [r]	800 [r]	1,100 [r]	820 [r]	800
Peru	6,922	6,862	8,396	8,500 [r, e]	9,000
Philippines	13,369	14,865	15,900	16,063 [r]	18,907 [3]
Poland	17,207	15,422	15,812	18,993 [r]	15,919 [3]

See footnotes at end of table.

TABLE 22—Continued
HYDRAULIC CEMENT: WORLD PRODUCTION, BY COUNTRY[1, 2]

(Thousand metric tons)

Country	2008	2009	2010	2011	2012[e]
Portugal	6,629 [r]	5,318 [r]	4,587 [r]	5,069 [r]	6,000
Qatar	3,800	4,095	5,280 [r]	5,000 [r]	5,500
Reunion[e]	400	380 [r]	300 [r]	250 [r]	350
Romania	10,659 [r]	7,902	7,008	7,846 [r]	7,500
Russia	53,548	44,266	50,400	56,200 [r]	61,700 [3]
Rwanda	103	92	95	94	100 [3]
Saudi Arabia	31,823	36,500	42,970 [r]	48,358 [r]	53,000
Senegal	3,084	3,320	4,066	4,677 [r]	4,689 [3]
Serbia[10]	2,843	2,232	2,130	2,095	1,831 [3]
Sierra Leone	254	236	301	311	335 [3]
Slovakia	4,157	3,011	2,888	3,219 [r]	2,915 [3]
Slovenia	1,525 [r]	1,082 [r]	799 [r]	620 [r]	1,000
South Africa, sales	13,473	11,784	10,870	11,234	11,560 [3]
Spain, including Canary Islands	42,088 [r]	29,505	26,217 [r]	22,178	15,939 [3]
Sri Lanka[e]	1,800	1,900	2,600 [r]	2,200	2,400
Sudan	247	622	1,930 [r]	3,002 [r]	3,477 [3]
Suriname	65 [e]	49 [r]	45 [r]	74 [r]	114 [3]
Sweden	2,934 [r]	1,586 [r]	1,796 [r]	2,064 [r]	2,500
Switzerland	4,102 [r]	4,163 [r]	4,527 [r]	4,577 [r]	4,467 [3]
Syria	5,336	5,605	6,000	4,000 [r, e]	4,000
Taiwan	17,330	15,918	16,301	16,852	15,806 [3]
Tajikistan	190	195	288	299 [r]	232 [3]
Tanzania	1,756	1,941	2,312	2,409 [r]	2,581 [3]
Thailand	31,651	33,562	36,496	36,602 [r]	41,047 [3]
Togo[11]	1,265 [r]	1,179 [r]	1,185 [r]	1,160 [r]	1,605 [3]
Trinidad and Tobago	958	870	791 [r]	827 [r]	654 [3]
Tunisia	7,559	7,514 [r]	8,070	7,055 [r]	7,241 [3]
Turkey	51,432 [r]	53,973	62,737	63,405	63,879 [3]
Turkmenistan	1,025 [r]	1,100	1,140 [r]	1,500 [r]	1,900
Uganda	1,193 [r]	1,162 [r]	1,347 [r]	1,666 [r]	1,600
Ukraine	14,918	9,496	9,457	10,515	9,801 [3]
United Arab Emirates[e]	21,885 [3]	18,997 [3]	18,000	18,000 [r]	17,000
United Kingdom	10,071	7,623	7,882	8,529	8,500
United States, including Puerto Rico[12]	87,610	64,843	67,202	68,639	74,934 [3]
Uruguay[e]	620	620 [r]	620 [r]	620 [r]	620
Uzbekistan[e]	6,600	6,850	6,872 [3]	6,698 [r, 3]	6,800
Venezuela	8,044 [r]	7,900 [r]	7,120 [r]	7,760 [r]	7,700
Vietnam	40,009	48,810	55,801 [r]	58,271 [r]	55,531 [3]
Yemen	2,111	2,118	1,864 [r]	951 [r]	2,000
Zambia[e]	560	880	1,127 [3]	1,200 [r]	1,200
Zimbabwe[e]	400	700	800	1,000 [r]	1,000
Total[e]	2,850,000	3,040,000 [r]	3,290,000 [r]	3,650,000 [r]	3,830,000

[e]Estimated. [p]Preliminary. [r]Revised. -- 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 thought to be accurate to no more than three significant digits. Data are from a variety of sources, including the European Cement Association.

[2]Includes data available through May 22, 2014. Data may include clinker exports for some countries.

[3]Reported figure.

[4]Data are for fiscal year ending June 30 of the following year.

[5]Data are for fiscal year ending March 31 of the following year.

[6]Gray cement data only for 2008; white cement output was likely to have been an additional 50,000 to 100,000 tons per year.

[7]Estimates for Guadelope and Martinique are apportioned based on the islands' grinding plant capacities.

[8]Not included in Serbia data.

[9]Cement sales from Cimentos de Moçambique SARL (Sociedade Anónima de Responsabilidade Limitada) only.

[10]Excludes Kosovo data.

[11]Calculated based on reported production of clinker and imports and exports of cement and clinker.

[12]Portland and masonry cements only. Includes a small (less than 0.3% per year) component of double-counting where portland cement (not clinker) is consumed to make masonry cement; the precise amount of double-counting can not be determined because of the involvement of portland cement stockpiles.