

**SAND AND GRAVEL (INDUSTRIAL)<sup>1</sup>**

(Data in thousand metric tons unless otherwise noted)

**Domestic Production and Use:** Industrial sand and gravel valued at about \$2.2 billion was produced by 87 companies from 159 operations in 33 States. Leading States, in order of tonnage produced, were Texas, Illinois, Wisconsin, Minnesota, Arkansas, Missouri, Michigan, and Oklahoma. Combined production from these States represented 73% of the domestic total. About 57% of the U.S. tonnage was used as hydraulic fracturing sand and well-packing and cementing sand, 17% as glassmaking sand, 11% as foundry sand, 4% as whole-grain fillers and building products, 2% as other whole-grain silica, 2% as ground and unground sand for chemicals, 1% as golf course sand, 1% for abrasive sand for sandblasting, and 5% for other uses.

<b>Salient Statistics—United States:</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012<sup>e</sup></b>
Production	30,400	27,500	32,300	43,700	49,500
Imports for consumption	355	95	132	316	280
Exports	3,100	2,150	3,950	4,330	4,700
Consumption, apparent	27,700	25,500	28,500	39,700	45,100
Price, average value, dollars per ton	30.82	34.25	35.60	45.76	44.78
Employment, quarry and mill, number <sup>e</sup>	1,400	1,400	1,400	1,400	1,400
Net import reliance <sup>2</sup> as a percentage of apparent consumption	E	E	E	E	E

**Recycling:** There is some recycling of foundry sand, and recycled cullet (pieces of glass) represents a significant proportion of reused silica.

**Import Sources (2008–11):** Canada, 55%; Mexico, 40%; and other, 5%.

<b>Tariff: Item</b>	<b>Number</b>	<b>Normal Trade Relations 12–31–12</b>
95% or more silica and not more than 0.6% iron oxide	2505.10.1000	Free.

**Depletion Allowance:** Industrial sand or pebbles, 14% (Domestic and foreign).

**Government Stockpile:** None.

**Events, Trends, and Issues:** Domestic sales of industrial sand and gravel increased in 2012 compared with those of 2011. Mined output was sufficient to accommodate many uses, which included ceramics, chemicals, fillers (ground and whole-grain), container, filtration, flat and specialty glass, foundry, and recreational uses. Increased demand for hydraulic fracturing sand in support of production of natural gas from shale gas deposits has led to production capacity upgrades and ongoing permitting and opening of numerous new mines. U.S. apparent consumption was about 45.1 million tons in 2012, up 14% from that of the previous year. Imports of industrial sand and gravel in 2012 decreased to about 280,000 tons from 316,000 tons in 2011. Imports of silica are generally of two types—small shipments of very high-purity silica or a few large shipments of lower grade silica shipped only under special circumstances (for example, very low freight rates). Exports of industrial sand and gravel in 2012 increased to 4.7 million tons from 4.33 million tons in 2011.

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The United States was the world's leading producer and consumer of industrial sand and gravel based on estimated world production figures. It was difficult to collect definitive data on silica sand and gravel production in most nations because of the wide range of terminology and specifications from country to country. The United States remained a major exporter of silica sand and gravel, shipping it to almost every region of the world. The high level of exports was attributed to the high-quality and advanced processing techniques used in the United States for a large variety of grades of silica sand and gravel, meeting virtually every specification.

The industrial sand and gravel industry continued to be concerned with safety and health regulations and environmental restrictions in 2012. Local shortages of industrial sand and gravel were expected to continue to increase owing to local zoning regulations and land development alternatives, including ongoing development and permitting of operations producing hydraulic fracturing sand. Operations that use hydraulic fracturing sand to produce hydrocarbons may also undergo increased scrutiny. These situations are expected to cause future sand and gravel operations to be located farther from high-population centers.

### **World Mine Production and Reserves:**

	Mine production <sup>e</sup>		Reserves <sup>3</sup>
	<u>2011</u>	<u>2012</u>	
United States	43,700	49,500	Large. Industrial sand and gravel deposits are widespread.
Australia	5,600	5,600	
Belgium	1,800	1,800	
Canada	1,430	1,300	
Chile	1,240	1,300	
Czech Republic	1,350	1,400	
Egypt	1,800	1,800	
Finland	2,250	2,250	
France	5,000	5,000	
French Guyana	1,500	1,500	
Germany	7,770	7,500	
India	1,800	1,800	
Iran	1,500	1,500	
Italy	19,800	19,800	
Japan	2,900	3,000	
Latvia	1,360	1,360	
Mexico	2,570	2,600	
Norway	1,200	1,200	
Poland	2,460	2,600	
South Africa	2,900	2,900	
Spain	5,000	5,000	
Turkey	5,000	4,000	
United Kingdom	3,760	3,800	
Other countries	<u>14,000</u>	<u>14,000</u>	
World total (rounded)	138,000	140,000	

**World Resources:** Sand and gravel resources of the world are large. However, because of their geographic distribution, environmental restrictions, and quality requirements for some uses, extraction of these resources is sometimes uneconomic. Quartz-rich sand and sandstones, the main sources of industrial silica sand, occur throughout the world.

**Substitutes:** Alternative materials that can be used for glassmaking and for foundry and molding sands are chromite, olivine, staurolite, and zircon sands.

<sup>e</sup>Estimated. E Net exporter.

<sup>1</sup>See also Sand and Gravel (Construction).

<sup>2</sup>Defined as imports – exports + adjustments for Government and industry stock changes.

<sup>3</sup>[See Appendix C for resource/reserve definitions and information concerning data sources.](#)