SAND AND GRAVEL (INDUSTRIAL)[1]

(Data in thousand metric tons unless otherwise noted)

Domestic Production and Use: In 2021, industrial sand and gravel valued at an estimated $2.3 billion was produced by 167 companies from 248 operations in 33 States. The value of production of industrial sand and gravel in 2021 increased slightly compared with that in the previous year. The leading producing States were, in descending order of production, Texas, Wisconsin, Illinois, Missouri, Oklahoma, Louisiana, North Carolina, Alabama, California, Tennessee, New Jersey, and Minnesota. Combined production from these States accounted for about 86% of total domestic sales and use. Approximately 64% of the U.S. tonnage was used as hydraulic-fracturing sand and well-packing and cementing sand; 11% as other whole-grain silica; and 10% as glassmaking sand. Other uses were, in decreasing quantity of use, foundry sand, whole-grain fillers for building products, recreational sand, other ground silica sand, and silica gravel, which accounted for 12%, combined. Other minor uses were, in decreasing quantity of use, chemicals, abrasives, filtration sand, ceramics, roofing granules, fillers, traction, and metallurgic flux, combined, accounted for the remaining 3% of industrial sand and gravel end uses.

Salient Statistics—United States:	2017	2018	2019	2020	2021[e]
Sold or used	104,000	126,000	108,000	70,000	72,000
Imports for consumption	366	392	389	417	360
Exports	4,600	6,440	5,540	4,030	5,600
Consumption, apparent[2]	99,800	120,000	103,000	66,400	67,000
Price, average value, dollars per ton	52.10	56.10	46.10	30.70	33.00
Employment, quarry and mill, number[e]	4,000	4,000	3,500	2,000	2,500
Net import reliance[3] as a percentage of apparent consumption	E	E	E	E	E

Recycling: Some foundry sand is recycled, and recycled cullet (pieces of glass) represents a significant proportion of reused silica. About 33% of glass containers are recycled.

Import Sources (2017–20): Canada, 85%; Vietnam, 5%; Brazil and Taiwan, 2% each; and other, 6%.

Tariff: Item	Number	Normal Trade Relations 12–31–21
Sand containing 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: U.S. apparent consumption of industrial sand and gravel was estimated to be 67 million tons in 2021, a slight increase from that of the previous year. The most important driving force in the industrial sand and gravel industry remained the production and sale of hydraulic-fracturing sand (frac sand). For several years, the consumption of frac sand increased as hydrocarbon exploration in the United States transitioned to natural gas and petroleum extracted from shale deposits. However, industrial sand and gravel consumption decreased in recent years, primarily as a result of decreased natural-gas- and petroleum-well drilling in North America and oil well completion activity. These decreases were exacerbated by restrictions imposed as the result of the global COVID-19 pandemic, which resulted in a significant decline in consumption of petroleum products, which in turn prompted a decrease in demand for hydraulic-fracturing sand. Imports of industrial sand and gravel in 2021 were an estimated 360,000 tons, a 14% decrease from those of the previous year. 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). The United States remained a net exporter of industrial sand and gravel; U.S. exports of industrial sand and gravel increased by 39% in 2021 compared with those of the previous year.

The United States was the world's leading producer and consumer of industrial sand and gravel based on estimated world production figures. Collecting definitive data on industrial sand and gravel production in most nations is difficult because of the wide range of terminology and specifications used by different countries. The United States remained a major exporter of industrial sand and gravel, shipping it to almost every region of the world. High global demand for U.S. industrial sand and gravel can be attributed to the high quality and advanced processing techniques used in the United States for many grades of industrial sand and gravel, meeting specifications for virtually any use.

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SAND AND GRAVEL (INDUSTRIAL)

The duration and outcome of the global COVID-19 pandemic remains uncertain; however, measures previously instituted to mitigate the spread of the global COVID-19 pandemic are expected to continue to be eased or lifted in the United States and around the world. The pandemic is likely to have less of a negative effect on the economies of the United States and the world going forward, which could result in increased production and consumption of industrial sand and gravel.

Additionally, the industrial sand and gravel industry continued to be concerned with safety and health regulations and environmental restrictions in 2021, especially those concerning crystalline silica exposure. In 2016, the Occupational Safety and Health Administration (OSHA) finalized regulations to further restrict exposure to crystalline silica at quarry sites and in other industries that use materials containing it. Phased implementation of the new regulations took effect through 2021, affecting various industries that use materials containing silica. Local shortages of industrial sand and gravel were expected to continue to increase owing to land development priorities, local zoning regulations, and logistical issues, including ongoing development and permitting of operations producing hydraulic-fracturing sand. These factors may result in future sand and gravel operations being located farther from high-population centers.

World Mine Production and Reserves:

	Mine production		Reserves[4]
	2020	2021[e]	
United States	70,000	72,000	Large. Industrial sand and gravel deposits are widespread.
Argentina	2,500	3,500	
Australia	3,000	3,500	
Austria	1,570	1,600	
Bulgaria	8,350	8,400	
Canada	4,700	5,000	
France	11,000	11,000	
Guatemala	1,900	1,900	
India	11,900	12,000	
Indonesia	2,640	2,600	
Italy	10,000	10,000	
Japan	1,920	1,900	
Malaysia	3,700	4,000	
Mexico	2,700	3,000	
Netherlands	54,000	54,000	
Poland	5,490	5,500	
South Africa	2,300	2,200	
Spain	5,700	5,700	
Turkey	10,300	12,000	
United Kingdom	4,400	4,400	
Other countries	16,900	18,000	
World total (rounded)	235,000	240,000	

World Resources:[4] 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 uneconomical. Quartz-rich sand and sandstone, 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. Although costlier and mostly used in deeper wells, alternative materials that can be used as proppants are sintered bauxite and kaolin-based ceramic proppants.

[e]Estimated. E Net exporter.

[1]See also Sand and Gravel (Construction).

[2]Defined as production (sold or used) + imports – exports.

[3]Defined as imports – exports.

[4]See Appendix C for resource and reserve definitions and information concerning data sources.