SAND AND GRAVEL (INDUSTRIAL)[1]

(Data in thousand metric tons unless otherwise specified)

Domestic Production and Use: In 2024, industrial sand and gravel sold or used was an estimated 130 million tons valued at an estimated $5.1 billion. The quantity of industrial sand and gravel sold or used decreased slightly, and the value decreased by 12% compared with that in 2023. Industrial sand and gravel was produced by 133 companies from 216 operations in 33 States. The leading producing States were, in descending order of production, Texas, Wisconsin, Illinois, and Oklahoma. Combined production from these States accounted for 78% of total domestic sales and use. Approximately 83% of the U.S. tonnage was used as hydraulic-fracturing sand (frac sand) and well-packing and cementing sand, and 7% as glassmaking sand. Other common uses were, in decreasing quantity of use, foundry sand, whole grain fillers for building products, filtration sand, and recreational sand, which accounted for 6% combined. Other minor uses were, in decreasing quantity of use, roofing granules, chemicals, abrasives, silicon and ferrosilicon, ceramics, well packing and cementing sand, fillers, traction, filtration gravel, metallurgic flux, and other unspecified uses accounted for 4% combined.

Salient Statistics—United States:	2020	2021	2022	2023	2024[e]
Sold or used	75,800	91,200	121,000	133,000	130,000
Imports for consumption	417	350	338	211	300
Exports	4,090	5,440	6,390	7,160	8,300
Consumption, apparent[2]	72,100	86,200	115,000	126,000	120,000
Price, average value, dollars per metric ton	29.50	40.80	45.40	43.40	39
Employment, quarry and mill, number[e]	4,500	5,300	6,000	6,100	6,200
Net import reliance[3] as a percentage of apparent consumption	E	E	E	E	E

Recycling: Recycled cullet (pieces of glass) represents a significant proportion of reused silica. About 33% of glass containers are recycled. Some abrasive and foundry sands are recycled or reclaimed.

Import Sources (2020–23): Canada, 85%; Vietnam, 4%; Brazil, 3%; Taiwan, 3%; and other, 5%.

Tariff: Item	Number	Normal Trade Relations 12–31–24
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 120 million tons in 2024, a 5% decrease from that in 2023. The most important driving force in the industrial sand and gravel industry remained the production and sale of frac sand. In recent years, the consumption of frac sand increased as hydrocarbon extraction from shale deposits increased and the quantity of frac sand used per well increased in the United States. In 2024, industrial sand and gravel consumption decreased as an oversupply of frac sand led to lower prices, which caused many operations to decrease production or idle operations. Imports of industrial sand and gravel in 2024 were an estimated 300,000 tons, a 42% increase from those in 2023. U.S. exports of industrial sand and gravel were an estimated 8,300,000 tons, a 16% increase from those in 2023. The United States remained a net exporter of industrial sand and gravel. The weekly average active rig count[4] decreased by 15% in the first 9 months in 2024 compared with that in the same period in 2023 and remained 39% lower than that in the same period in 2019 before the global coronavirus disease 2019 (COVID-19) pandemic in 2020.

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 for 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 is attributed to its high quality and to the advanced processing techniques used in the United States for many grades of industrial sand and gravel, meeting specifications for virtually any use.

The industrial sand and gravel industry continued to be concerned with safety and health regulations and environmental restrictions in 2024, especially those concerning crystalline silica exposure. In April 2024, the Mine Safety and Health Administration published a final rule which amended its existing standards to protect miners against exposure to respirable crystalline silica.[5]

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SAND AND GRAVEL (INDUSTRIAL)

Local shortages of industrial sand and gravel were expected to continue to increase owing to land development priorities, local zoning regulations, and logistical issues. These factors may result in future sand and gravel operations being located farther from high-population centers. Increased efforts to reduce cost, emissions, and the risk of exposure to crystalline silica have led to an increase of in-basin “dry sand” and undried “wet sand” being sold or used as frac sand instead of conventional “dry sand” from out-of-basin sources.

In 2024, multiple companies that were top producers of industrial sand and gravel were acquired by or merged with other companies.

World Mine Production and Reserves:

	Mine production[e]		Reserves[6]
	2023	2024	
United States	[7]133,000	130,000	Large. Industrial sand and gravel deposits are widespread.
Argentina	4,000	4,000	
Australia	5,500	5,600	
Bulgaria	8,050	8,200	
Canada	4,100	4,100	
China	88,100	89,000	
France	[7]11,900	12,000	
Germany	11,100	11,000	
India	11,900	12,000	
Indonesia	3,540	3,500	
Italy	33,000	33,000	
Malaysia	7,000	7,000	
Mexico	2,700	2,700	
Netherlands	60,000	60,000	
Poland	5,930	5,900	
Russia	7,300	7,300	
Saudi Arabia	2,100	2,100	
Spain	6,600	6,000	
Turkey	[7]13,000	13,000	
United Kingdom	4,900	4,900	
Other countries	22,700	23,000	
World total (rounded)	446,000	440,000	

World Resources:[6] 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, foundry, and molding sands are chromite, olivine, staurolite, and zircon sands. Alternative materials that can be used for abrasive sands are garnet, olivine, and slags. 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 the Sand and Gravel (Construction) chapter.

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

[3]Defined as imports – exports.

[4]Source: Baker Hughes Co., 2024, Rig count overview & summary count: Baker Hughes Co. (Accessed October 17, 2024, at https://rigcount.bakerhughes.com/na-rig-count.)

[5]Source: Mine Safety and Health Administration, 2024, Lowering miner’s exposure to respirable crystalline silica and improving respiratory protection: Federal Register, v. 89, no. 76, April 18, p. 28218–28485. (Accessed November 21, 2024, at https://www.govinfo.gov/content/pkg/FR-2024-04-18/pdf/2024-06920.pdf.)

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

[7]Reported.