

WOLLASTONITE

(Data in metric tons unless otherwise noted)

Domestic Production and Use: Wollastonite was mined by two companies in New York. Domestic deposits of wollastonite have been identified in Arizona, California, Idaho, Nevada, New Mexico, New York, and Utah, but New York is the only State where long-term continuous mining has taken place.

The USGS does not collect consumption statistics for wollastonite. Plastics and rubber products, however, were estimated to account for 30% to 35% of U.S. consumption, followed by ceramics with 20% to 25%; metallurgical applications, 10% to 20%; and paint, friction products, and miscellaneous, 10% to 15%, each. In ceramics, wollastonite decreases shrinkage and gas evolution during firing; increases green and fired strength; maintains brightness during firing; permits fast firing; and reduces crazing, cracking, and glaze defects. In metallurgical applications, wollastonite serves as a flux for welding, a source for calcium oxide, a slag conditioner, and to protect the surface of molten metal during the continuous casting of steel. As an additive in paint, it improves the durability of the paint film, acts as a pH buffer, improves its resistance to weathering, reduces gloss, reduces pigment consumption, and acts as a flattening and suspending agent. In plastics, wollastonite improves tensile and flexural strength, reduces resin consumption, and improves thermal and dimensional stability at elevated temperatures. Surface treatments are used to improve the adhesion between the wollastonite and the polymers to which it is added. As a substitute for asbestos in floor tiles, friction products, insulating board and panels, paint, plastics, and roofing products, wollastonite is resistant to chemical attack, inert, stable at high temperatures, and improves flexural and tensile strength.

Salient Statistics—United States: U.S. production was withheld to protect company proprietary data. In 2013, U.S. production and apparent consumption were estimated to have increased slightly compared with those in 2012. Comprehensive trade data are not available (the United States was a net exporter of wollastonite). Exports were estimated to be less than 10,000 tons and imports probably remained less than 4,500 tons in 2013. Prices for wollastonite were reported in trade literature to range from \$80 to \$400 per metric ton. Products with finer grain sizes and acicular (highly elongated) particles sold for higher prices. Surface treatment, when necessary, also increased the selling price.

Recycling: None.

Import Sources (2009–12): Comprehensive trade data are not available, but wollastonite was imported from China, Finland, India, and Mexico.

Tariff: Item	Number	Normal Trade Relations 12–31–13
Mineral substances not elsewhere specified or included	2530.90.8050	Free.

Depletion Allowance: 10% (Domestic and foreign).

Government Stockpile: None.

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Events, Trends, and Issues: U.S. production and consumption of wollastonite increased slightly in 2013. Exports probably increased slightly and imports were likely to have remained unchanged in 2013.

In September 2012, one of the domestic wollastonite producers was acquired by a Greek mining company. During 2013, the company was engaged in arranging a land swap with the State of New York to acquire additional wollastonite reserves located on State land.

In December 2012, a Canadian mining company received approval for a proposed wollastonite mine in Ontario, Canada. The approval covered only part of the company's land holdings; however, the company planned to seek a zoning amendment in 2013 to allow it to mine the remaining portions of the wollastonite deposit on land owned by a nearby city.

The wollastonite industry is strongly dependent on sales to the ceramics, metallurgical, paint, and plastic industries, all of which declined during the global recession. U.S. sales of products in industries on which wollastonite sales are dependent increased slightly in 2013 compared with sales in 2012. Sales to construction-related markets, such as adhesives, caulks, ceramic tile, and paints, increased slightly in 2013 because of growth in residential and commercial construction. In Western Europe, demand for wollastonite continued to stagnate because of economic uncertainties. Consumption in China continued to increase, although at a slower pace than prior to 2011.

World Mine Production and Reserves: World production data for wollastonite are not available for many countries.

	Mine production		Reserves¹
	<u>2012</u>	<u>2013^e</u>	
United States	W	W	World reserves of wollastonite were estimated to exceed 90 million tons. Many deposits, however, have not been surveyed, making accurate reserve estimates unavailable.
Finland	11,500	12,000	
India	^e 150,000	160,000	
Mexico	55,200	55,000	
Other countries	^e 8,000	<u>5,000</u>	
World total (rounded) ²	<u>225,000</u>	<u>230,000</u>	

World Resources: World resources have not been estimated for wollastonite. Large deposits of wollastonite were in China, Finland, India, Mexico, and the United States. Smaller, but significant, deposits were in Canada, Chile, Kenya, Namibia, South Africa, Spain, Sudan, Tajikistan, Turkey, and Uzbekistan.

Substitutes: The acicular nature of many wollastonite products allows it to compete with other acicular materials, such as ceramic fiber, glass fiber, steel fiber, and several organic fibers, such as aramid, polyethylene, polypropylene, and polytetrafluoroethylene in products where improvements in dimensional stability, flexural modulus, and heat deflection are sought. Wollastonite also competes with several nonfibrous minerals or rocks, such as kaolin, mica, and talc, which are added to plastics to increase flexural strength, and such minerals as barite, calcium carbonate, gypsum, and talc, which impart dimensional stability to plastics. In ceramics, wollastonite competes with carbonates, feldspar, lime, and silica as a source of calcium and silica. Its use in ceramics depends on the formulation of the ceramic body and the firing method.

^eEstimated. W Withheld to avoid disclosing company proprietary data.

¹See Appendix C for resource/reserve definitions and information concerning data sources.

²Excludes U.S. production; China produced wollastonite, but information was inadequate to estimate output.