

WOLLASTONITE

(Data in metric tons unless otherwise noted)

Domestic Production and Use: Wollastonite was mined by two companies in New York in 2015. U.S. production of wollastonite (sold or used) was withheld to protect company proprietary data but was estimated to have increased slightly from that of 2014. 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 U.S. Geological Survey does not collect consumption statistics for wollastonite, but consumption was estimated to have increased in 2015 compared to the previous year. Plastics and rubber markets (thermoplastic and thermoset resins and elastomer compounds) were estimated to have accounted for more than 25% of U.S. usage of wollastonite, followed by ceramics (frits, sanitaryware, and tile), paint (architectural and industrial paints), metallurgical applications (flux and conditioner), friction products (primarily brake linings), and miscellaneous uses (including adhesives, concrete, glass, and sealants). Globally, ceramics were estimated to account for more than 30% of wollastonite sales, followed by polymers and paint. Lesser global uses for wollastonite included miscellaneous construction products, friction materials, and metallurgical applications.

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 protects 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 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, stable at high temperatures, and improves flexural and tensile strength.

Salient Statistics—United States: The United States was thought to be a net exporter of wollastonite in 2015. Exports were estimated to be less than 10,000 tons and imports were probably less than 4,000 tons. Comprehensive trade data were not available. Prices for wollastonite were reported in the trade literature to range from \$80 to \$445 per ton. Products with finer grain sizes and acicular (highly elongated) particles sold for higher prices. Surface treatment, when necessary, also increased the selling price. Approximately 110 people were employed at wollastonite mines and mills in 2015.

Recycling: None.

Import Sources (2011–14): Comprehensive trade data were not available, but wollastonite was primarily imported from China, Finland, India, and Mexico.

Tariff: Item	Number	Normal Trade Relations 12–31–15
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: Sales to domestic construction-related markets, such as adhesives, caulks, cement board, ceramic tile, paints, stucco, and wallboard, were likely to have increased in 2015 owing to growth in residential and commercial construction. With increased domestic manufacturing, sales of wollastonite to the manufacturing industries, such as metal casting and processing, paint, plastics, and rubber, probably also increased. In Western Europe and Asia, demand for wollastonite likely remained unchanged or increased just slightly because of the effect of economic uncertainties on construction and manufacturing.

Environmental groups that had been challenging the leading U.S. wollastonite producer's proposed exploratory drilling program within the Adirondack Forest Preserve in New York decided not to pursue any further legal action. The 81-hectare property contains an estimated 1.2 to 1.5 million tons of wollastonite reserves, sufficient to extend the company's mining operations in the area by an additional 10 years.

World Mine Production and Reserves: United States production of wollastonite ranks third globally. Production data were not available for many countries.

	Mine production ^e		Reserves ¹
	<u>2014</u>	<u>2015</u>	
United States	W	W	World reserves of wollastonite were estimated to exceed 90 million tons. Many deposits, however, have not been surveyed, precluding accurate reserves estimates.
China	300,000	300,000	
Finland	10,000	10,000	
India	180,000	180,000	
Mexico	² 54,600	55,500	
Other countries	<u>6,000</u>	<u>6,000</u>	
World total (rounded) ^{3, 4}	550,000	550,000	

World Resources: Reliable estimates of wollastonite resources do not exist for most countries. Large deposits of wollastonite have been identified in China, Finland, India, Mexico, and the United States. Smaller, but significant, deposits have been identified 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.

²Reported figure.

³Excludes U.S. production.

⁴Refined concentrate production.