

VERMICULITE

(Data in thousand metric tons unless otherwise noted)

Domestic Production and Use: Two companies with mining and processing facilities in South Carolina and Virginia produced vermiculite concentrate and reported production of approximately 100,000 tons. Flakes of raw vermiculite concentrate are micaceous in appearance and contain interlayer water in their structure. When the flakes are heated rapidly at a temperature above 870° C, the water flashes into steam, and the flakes expand into accordionlike particles. This process is called exfoliation, or expansion, and the resulting lightweight material is chemically inert, fire resistant, and odorless. Most of the vermiculite concentrate produced in the United States was shipped to 18 exfoliating plants in 11 States. The end uses for exfoliated vermiculite were estimated to be agriculture/horticulture, 50%; lightweight concrete aggregates (including cement premixes, concrete, and plaster), 10%; insulation, 5%; and other, 35%.

Salient Statistics—United States:	2012	2013	2014	2015	2016^e
Production ^{e, 1}	100	100	100	100	100
Imports for consumption ^{e, 2}	57	36	43	21	40
Exports ^e	2	2	3	2	1
Consumption, apparent, concentrate ³	160	130	140	120	140
Consumption, reported, exfoliated	59	64	63	65	70
Price, range of value, concentrate, dollars per ton, ex-plant ⁴	115–460	145–525	145–565	140–575	140–575
Employment, number ^e	75	65	68	68	70
Net import reliance ⁵ as a percentage of apparent consumption	35	25	30	20	30

Recycling: Insignificant.

Import Sources (2012–15): Brazil, 46%; South Africa, 31%; China, 19%; Zimbabwe, 2%; and other, 2%.

Tariff: Item	Number	Normal Trade Relations 12–31–16
Vermiculite, perlite and chlorites, unexpanded	2530.10.0000	Free.
Exfoliated vermiculite, expanded clays, foamed slag, and similar expanded materials	6806.20.0000	Free.

Depletion Allowance: 14% (Domestic and foreign).

Government Stockpile: None.

Events, Trends, and Issues: U.S. exports and imports of vermiculite are not collected as a separate category by the U.S. Census Bureau. However, according to an independent industry trade information source, U.S. exports decreased by 45% in the first 8 months of 2016 compared with those of the same period in 2015. U.S. imports, excluding any material from Canada and Mexico, were estimated to be about 40,000 tons in 2016, significantly higher than those of 2015, mostly resulting from significantly increased imports from China and South Africa. Coarse-grade vermiculite remained in short supply, and prices were unchanged in 2016.

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An Australian company executed an agreement to purchase the East African Namekara vermiculite mine in Uganda. The mine had intermittent production and limited sales of vermiculite during the second half of 2015 through 2016. The Namekara deposit has sufficient resources for more than 50 years of production and is a portion of the larger East African vermiculite project, which has about 55 million tons of inferred resources and is considered to be one of the world's largest deposits.

A company in Turkey continued development of the country's first vermiculite mine in Sivas in central Turkey. Sales of the vermiculite were to be processed through the sales network of a major company based in France that was a partner in the project. Although the date of full production was not yet determined, first year production is expected to be about 5,000 tons from a total reserve of 7 million tons, of which more than one-half was considered high quality.

A company in Russia mined vermiculite in the Murmansk Region of northwest Russia and marketed its vermiculite concentrate and exfoliated vermiculite mostly in Russia, but also in Eastern Europe and Western Europe. A company in Brazil continued to expand production capacity at its vermiculite mine in central Brazil and to develop another deposit near Brasilia with the goal of bringing the company's total production capacity to 200,000 tons per year.

World Mine Production and Reserves:

	Mine production		Reserves ⁶
	2015	2016 ^e	
United States ^{e, 1}	100	100	25,000
Brazil	68	70	6,300
Bulgaria	19	20	NA
India	10	10	1,700
Russia	21	20	NA
South Africa	158	170	14,000
Zimbabwe	29	10	NA
Other countries	5	5	NA
World total	410	405	NA

World Resources: Marginal reserves of vermiculite in Colorado, Nevada, North Carolina, Texas, and Wyoming are estimated to be 2 million to 3 million tons. Reserves have been reported in Australia, China, Russia, Uganda, and some other countries, but reserves and resource information comes from many sources and, in most cases, it is not clear whether the numbers refer to vermiculite alone or vermiculite plus host rock and overburden.

Substitutes: Expanded perlite is a substitute for vermiculite in lightweight concrete and plaster. Other denser but less costly substitutes in these applications are expanded clay, shale, slag, and slate. Alternate materials for loose-fill fireproofing insulation include fiberglass, perlite, and slag wool. In agriculture, substitutes include bark and other plant materials, peat, perlite, sawdust, and synthetic soil conditioners.

^eEstimated. NA Not available.

¹Concentrate sold and used by producers. Data are rounded to one significant digit to avoid disclosing company proprietary data.

²Excludes Canada and Mexico.

³Rounded to two significant digits to avoid disclosing company proprietary data.

⁴Source: Mining Engineering.

⁵Defined as imports – exports.

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