

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 17 exfoliating plants in 11 States. The end uses for exfoliated vermiculite were estimated to be agriculture and horticulture, 46%; lightweight concrete aggregates (including cement premixes, concrete, and plaster), 19%; insulation, 8%; and other, 27%.

Salient Statistics—United States:	2014	2015	2016	2017	2018^e
Production ^{e, 1}	100	100	100	100	100
Imports for consumption ^{e, 2}	52	33	46	53	50
Exports ^e	3	2	2	2	2
Consumption, apparent, concentrate ³	150	130	140	150	150
Consumption, reported, exfoliated	63	65	68	72	70
Price, range of value, concentrate, dollars per ton, ex-plant	145–565	140–575	140–575	140–575	140–575
Employment, number ^e	68	69	69	70	70
Net import reliance ⁴ as a percentage of apparent consumption	30	20	30	30	30

Recycling: Insignificant.

Import Sources (2014–17): South Africa, 36%; Brazil, 34%; China, 24%; Zimbabwe, 4%; and other, 2%.

Tariff: Item	Number	Normal Trade Relations 12–31–18
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, United States imports, excluding any material from Canada and Mexico, were estimated to be about 50,000 tons in 2018, slightly less than those of 2017. Coarse-grade vermiculite remained in short supply; however, prices were unchanged in 2018. Most imports, excluding any material from Canada and Mexico, came from China, South Africa, and Zimbabwe in 2018.

A company based in Australia withdrew from its joint venture in developing the Namekara vermiculite mine in Uganda, citing inconsistent sales of vermiculite that resulted in reduced cash flow and the company's inability to service its debt obligations. A local mining company, which became the 100% owner of the project, continued mining operations and honored existing contracts to supply vermiculite concentrate to customers in Japan, the United Kingdom, and other countries in Europe. The deposit was considered to be one of the world's largest vermiculite deposits with significant portions of medium- and coarse-grade material. Capacity at the 30,000-ton-per-year mine may be expanded to 80,000 tons per year during the next several years. The Namekara deposit has sufficient resources for more than 50 years of production at previously announced rates.

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A company based in France, in cooperation with the Government of Zimbabwe and local governments, produced vermiculite concentrate, including a significant portion of coarse-grade vermiculite, at the Shawa deposit in Zimbabwe. The mine had an expected life of more than 30 years. The deposit also was considered to be one of the world's largest vermiculite deposits with significant portions of medium- and coarse-grade material. A company in Brazil expanded production capacity at its vermiculite mine in central Brazil and continued with the development of another deposit near Brasilia with the goal of bringing the company's total production capacity to 200,000 tons per year. Companies in China with significant vermiculite resources also were ramping up production, although processing operations continued to be somewhat constrained by increased enforcement of environmental regulations. Specific production data were not available for China.

World Mine Production and Reserves: Reserves data for Brazil and India were revised based on Government information.

	Mine production		Reserves ⁵
	2017 ¹	2018 ²	
United States ³	1100	1100	25,000
Brazil	55	50	6,200
Bulgaria	10	10	NA
China	NA	NA	NA
Egypt	8	8	NA
India	5	10	1,600
Russia	13	10	NA
South Africa	176	180	14,000
Uganda	5	20	NA
Zimbabwe	30	30	NA
Other countries	2	12	NA
World total	400	430	NA

World Resources: Vermiculite occurrences in Colorado, Nevada, North Carolina, Texas, and Wyoming contain estimated resources of 2 million to 3 million tons. Significant deposits 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 other minerals and host rock and overburden.

Substitutes: Expanded perlite is a substitute for exfoliated 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.

³Estimated. NA Not available.

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

²Excludes Canada and Mexico.

³Defined as concentrate sold or used by producers + imports – exports.

⁴Defined as imports – exports. Data are rounded to one significant digit to avoid disclosing company proprietary data.

⁵See Appendix C for resource and reserve definitions and information concerning data sources.