



2019 Minerals Yearbook

PUMICE AND PUMICITE [ADVANCE RELEASE]

PUMICE AND PUMICITE

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In 2019, U.S. pumice and pumicite production was 565,000 metric tons (t), 14% more than 496,000 t in 2018. The overall value of pumice production in 2019 was \$15.9 million, slightly more than that in 2018. Apparent consumption of pumice and pumicite in the United States in 2019 was 690,000 t, 7% more than that in 2018. Imports decreased by 14% to 136,000 t, and exports remained unchanged at 11,000 t. The domestic pumice mining industry is relatively small. Consequently, pumice production, imports, and exports can be highly variable from year to year and are subject to large annual fluctuations in terms of percentage. Since 2015, average unit value, apparent consumption, and quantity of pumice that was sold or used has fluctuated between annual increases of up to 17% and annual decreases of 18%. World production of pumice and related material was estimated to have increased slightly to 19.7 million metric tons (Mt) in 2019 (tables 1, 3).

Pumice is an extrusive igneous volcanic rock formed through the cooling of air-pocketed lava, which results in a highly porous, low-density rock (Presley, 2006). Its low density allows some pumice to float on water. Large pumice rafts that consist of clusters of floating pieces of pumice, a unique geologic phenomenon, have been documented to be as long as 30 kilometers (km) and to drift for several years in oceanic waters (Wood-Jones, 1910, p. 290–291; Bryan and others, 2004, p. 136). Pumicite is defined as grains, flakes, threads, and (or) shards of volcanic glass finer than 4 millimeters in diameter (Harben and Bates, 1984, p. 64). Pumicite and volcanic ash are descriptive terms that are often interchangeably used.

The porous, lightweight properties of pumice are well suited for its main use as an aggregate in lightweight building blocks and assorted building products. In 2019, other major applications included abrasives, horticulture (including landscaping), and roofing. Minor applications used pumice as an absorbent, a concrete aggregate and admixture, a filter aid, and a traction enhancer for tires. A small percentage of pumice was used in abrasive-type products, including pencil erasers, a polishing agent for circuit boards and television monitors, an exfoliant in cosmetics, a henna tattoo removal product, and a variety of heavy-duty hand cleaners. Imports were primarily used as raw material for construction block and as a lightweight aggregate.

Production

Domestic production data for pumice and pumicite were developed by the U.S. Geological Survey from an annual voluntary survey of U.S. pumice- and pumicite-producing sites and company operations. The 2019 canvass included 11 companies with 11 active operations that produced, used, or sold pumice and pumicite in the United States. All 11 companies responded to the canvass. Data were rounded to no more than

three significant digits. All percentages in this report were calculated using unrounded data.

U.S. pumice and pumicite production of 565,000 t was valued at \$15.9 million in 2019. States that produced pumice or pumicite were California, Idaho, Kansas, New Mexico, and Oregon.

Pumice is usually extracted by simple open pit methods using rippers, bulldozers, and (or) front-end loaders. Processing is typically limited to drying, crushing, and screening, although some abrasive grades may require fine grinding and classification. Pumice blocks may be sawn into a variety of shapes and sizes.

Consumption

Owing to the limited size of the domestic pumice-mining industry, sales and value data regarding the end-use categories of abrasives, building block, concrete admixture and aggregate, horticulture and landscaping, and “other” (chinchilla chew stones, cosmetics, diluents, engineered fill, filter aids, geotechnical aids, highway snow control, oil absorbent, pet litter, pottery clays, road construction, and other unspecified uses) were withheld to avoid disclosing company proprietary data. Several substitutes exist for pumice as an aggregate, in agriculture, as a concrete additive, in horticulture, and in other end-use products.

Prices

The average prices reported for pumice and pumicite in 2019 varied widely by use. The overall average value reported for all pumice and pumicite products decreased by 11% to \$28.18 per metric ton in 2019 from \$31.52 per metric ton in 2018 (table 1). As with the sales data regarding end-use products, value information pertaining to the categories of abrasives, building block, concrete admixture and aggregate, horticulture and landscaping, and others were withheld to avoid disclosing company proprietary data.

Foreign Trade

Export and import data were reported by the U.S. Census Bureau. The trade data were published under subheading 2513.10 of the Harmonized Tariff Schedule of the United States (HTS), described as applying to pumice stone. Industry sources, however, indicated that pumice may also be included under the general heading 2513, which included corundum garnet and other natural abrasives.

Exports of pumice, mostly specialty products, remained unchanged at 11,000 t, with a value of \$4.19 million in 2019, compared with 11,000 t valued at \$8.36 million in 2018. Canada received 42% of 2019 U.S. exports, followed by Italy (8%), Japan (7%), and the United Kingdom and China (6% each).

Smaller quantities of pumice and pumice products were exported to 41 other countries.

Imports of crude or unmanufactured pumice and pumicite in 2019 decreased by 14% to 136,000 t compared with 159,000 t in 2018 (tables 1, 2). Most imports of pumice and pumicite were raw materials for blocks and lightweight aggregate in construction-related uses, with smaller quantities used in a range of abrasives and for stonewashing denim. Of these imports, 91% originated from Greece (table 2), which supplied 124,000 t of crude pumice to the United States in 2019 and remained the leading source of pumice imports. Nine other countries supplied most of the remainder of pumice and pumicite imports in 2019. Of those, only five supplied crude pumice, which accounted for the majority of those imports. Those five countries were Iceland (8,930 t), Mexico (3,110 t), Turkey (197 t), Japan (40 t), and China (17 t) (table 2).

World Review

World production of pumice and related material was 19.7 Mt in 2019, a slight increase from the revised amount in 2018. Pumice was used more extensively as a building material outside the United States, which explained the large global production of pumice relative to that of the United States. The top five global producers of pumice in 2019 were Turkey (7.8 Mt), Ethiopia (2.4 Mt), Greece (1.02 Mt), and Algeria and Jordan (each with 900,000 t). Those five countries accounted for an estimated 67% of the 2019 total global production of pumice.

In Europe, basic home construction uses significantly less gypsum wallboard because stone and concrete are the preferred building materials. Prefabricated lightweight concrete walls, which may contain pumice as lightweight aggregate, are often produced and shipped to construction locations. Because of their light weight, strength, and cementitious properties, pumice and pumicite perform well in European-style construction. In 2019, Turkey was the leading exporter of pumice to Asia and Europe.

Outlook

U.S. consumption of pumice and pumicite in 2020 may decrease compared with that in 2019 if the U.S. residential housing sector, a major user of pumice- and pumicite-related products, experiences a decrease in construction activity.

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- Harben, P.W., and Bates, R.L., 1984, *Geology of the nonmetallies*: New York, NY, Metal Bulletin Inc., 392 p.
- Presley, G.C., 2006, Pumice, pumicite, and volcanic cinder, in Kogel, J.E., Trivedi, N.C., Barker, J.M., and Krukowski, S.T., eds., *Industrial minerals and rocks* (7th ed.): Littleton, CO, Society for Mining, Metallurgy, and Exploration, Inc., p. 743–754.
- Wood-Jones, Frederick, 1910, *Coral and atolls—A history and description of the Keeling-Cocos Islands, with an account of their fauna and flora, and a discussion of the method of development and transformation of coral structures in general*: London, United Kingdom, Lovell Reeve & Co. Ltd., 392 p.

GENERAL SOURCES OF INFORMATION

U.S. Geological Survey Publications

- Historical Statistics for Mineral and Material Commodities in the United States. Data Series 140.
- Lightweight Aggregates. Ch. in *United States Mineral Resources*, Professional Paper 820, 1973.
- Pumice and Pumicite. Ch. in *Mineral Commodity Summaries*, annual.

Other

- Geology of the Industrial Rocks and Minerals*. Dover Publications Inc., 1969.
- Industrial Minerals and Rocks* (7th ed.). Society for Mining, Metallurgy, and Exploration Inc., 2006.
- Pumice. Ch. in *Common Minerals and Their Uses*, Mineral Information Institute, 2006.
- Pumice and Pumicite. Ch. in *Mineral Facts and Problems*, U.S. Bureau of Mines Bulletin 675, 1985.

TABLE 1
SALIENT PUMICE AND PUMICITE STATISTICS¹

(Thousand metric tons unless otherwise specified)

	2015	2016	2017	2018	2019	
United States:						
Sold or used by producers:						
Quantity	310	374	383	496	565	
Value ²	thousand dollars	10,100	14,300	14,800	15,600	15,900
Average unit value	dollars per metric ton	32.66	38.23	38.59 ^r	31.52	28.18
Exports ³		12 ^r	10 ^r	12 ^r	11	11
Imports for consumption ³		64	170	166	159	136
Apparent consumption ⁴		362 ^r	534 ^r	537 ^r	644	690
World, production, pumice and related volcanic materials		14,200 ^r	15,400 ^r	17,500 ^r	19,400 ^r	19,700

^rRevised.

¹Table includes data available through May 7, 2020. Data are rounded to no more than three significant digits, except average unit value.

²Free on board mine and (or) mill.

³Source: U.S. Census Bureau.

⁴Defined as quantity sold or used plus imports minus exports.

TABLE 2
U.S. IMPORTS FOR CONSUMPTION OF PUMICE,
BY CLASS AND COUNTRY OR LOCALITY¹

Country or locality	Crude or unmanufactured		Wholly or partly manufactured	
	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)
2018:				
China	264	\$51	59	\$409
Greece	148,000	3,820	--	--
Iceland	6,750	720	--	--
Indonesia	--	--	16	42
Italy	3	3	--	--
Japan	47	42	41	25
Mexico	3,490	1,110	20	3
Pakistan	--	--	8	15
Poland	(2)	3	2	42
Spain	--	--	10	175
Other	1	3	4	36
Total	159,000	5,760	161	745
2019:				
China	17	13	64	410
Georgia	--	--	1	11
Greece	124,000	3,560	--	--
Iceland	8,930	924	--	--
Indonesia	--	--	18	26
Japan	40	45	63	34
Mexico	3,110	1,190	20	3
Pakistan	--	--	3	3
Spain	--	--	9	178
Turkey	197	57	351	106
Other	--	--	1	14
Total	136,000	5,790	529	785

-- Zero.

¹Table includes data available through May 7, 2020. Data are rounded to no more than three significant digits; may not add to totals shown.

²Less than ½ unit.

Source: U.S. Census Bureau.

TABLE 3
PUMICE AND RELATED MATERIALS: WORLD PRODUCTION, BY COUNTRY OR LOCALITY¹

(Metric tons)

Country or locality ²	2015	2016	2017	2018	2019
Algeria, pozzolan	420,000	833,000	900,000 ^e	900,000 ^e	900,000 ^e
Argentina, pumice	7,110	7,000	7,000 ^e	2,310 ^r	2,300 ^e
Cameroon, pozzolan	304,676	272,405	300,000 ^e	300,000 ^e	300,000 ^e
Chile, pumice and pozzolan	804,121	840,976	838,890	803,916 ^r	800,000 ^e
Ecuador, pumice	1,008,000	832,332	757,094 ^r	800,000 ^{r,e}	800,000 ^e
Eritrea, pumice ^e	5,100	5,100	5,400	7,200	7,200
Ethiopia ³	720,000 ^e	672,133 ^r	958,707 ^r	2,435,518 ^r	2,400,000 ^e
France, pozzolan, including lapilli	276,000	280,000 ^e	280,000 ^e	280,000 ^e	280,000 ^e
Greece, pumice and pozzolan	734,030	776,010	954,000 ^r	934,355 ^r	1,020,000
Guadeloupe, pumice ^e	200,000	200,000	200,000	200,000	200,000
Guatemala, pumice	387,976	569,476	570,000 ^e	570,000 ^e	570,000 ^e
Iceland, pumice ^e	100,000	100,000	100,000	100,000	100,000
Indonesia, pumice	49,000 ^r	650,000 ^e	200,000 ^r	200,000 ^r	200,000 ^e
Italy, pumice and pozzolan ^c	73,300	73,900	85,500	89,500	90,000
Jamaica, pozzolan	130,000	130,000 ^e	130,000 ^e	130,000 ^e	130,000 ^e
Jordan, pozzolan	850,000 ^e	876,906	913,422	900,000 ^e	900,000 ^e
North Macedonia, volcanic tuff	70,148	76,796	70,305 ^r	96,963 ^r	89,815
New Zealand	42,037	17,653	91,861	223,888 ^r	220,000 ^e
Pakistan, pumice ^e	1,200	2,700	3,200	2,700 ^r	1,800
Philippines, pumice and volcanic tuff	47,036	56,272	56,179 ^r	56,200 ^{r,e}	56,200 ^e
Rwanda, pozzolan	48,955	120,000 ^e	140,000 ^e	140,000 ^e	165,000 ^e
Saudi Arabia, pozzolan	480,000	504,000	509,000 ^r	555,000 ^r	560,000 ^e
Slovenia, volcanic tuff	9,116	8,840	9,144 ^r	8,633 ^r	8,600 ^e
Spain ^e	195,000	200,000	200,000	200,000	200,000
Syria, volcanic tuff ^e	200,000	200,000	200,000	200,000	200,000
Tanzania, pozzolan, materials	342,628	230,045	79,085	91,645 ^r	263,064
Turkey	5,660,190	5,637,494	7,773,957	7,800,000 ^e	7,800,000 ^e
Uganda, pozzolan, materials	762,768	846,604	792,564	880,000 ^{r,e}	880,000 ^e
United States, pumice, sold and used by producers	310,000	374,000	383,000	496,000	565,000
Total	14,200,000 ^r	15,400,000 ^r	17,500,000 ^r	19,400,000 ^r	19,700,000

^eEstimated. ^rRevised.

¹Table includes data available through September 30, 2020. All data are reported unless otherwise noted. Totals, U.S. data, and estimated data are rounded to no more than three significant digits; may not add to totals shown.

²In addition to the countries and (or) localities listed, a number of other countries, including Iran, Martinique, and Mexico, may have produced limited quantities of pumice and related materials, but available information was inadequate to make reliable estimates of output.

³Production is based on fiscal year, with a starting date of July 8 of the year shown.