



2013 Minerals Yearbook

PUMICE AND PUMICITE [ADVANCE RELEASE]

PUMICE AND PUMICITE

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In 2013, U.S. pumice and pumicite production was 269,000 metric tons (t). This was 20% less than that of 2012, when the United States produced 338,000 t. The overall value of pumice production in 2013 was \$9.3 million, a decrease of 13% from that in 2012. The production decrease in 2013 primarily resulted from the closing of Sierra Cascade LLC, a pumice mining operation based in Chemult, OR, which declared bankruptcy in 2012 following several years of unsuccessful mineral rights litigation and other legal challenges. The apparent consumption of pumice and pumicite in the United States in 2013 was 329,000 t, a decrease of 16% compared with that of 2012. Imports increased by 8% to 72,000 t. Exports of 12,000 t remained unchanged from that of 2012. Pumice imports and exports represent relatively small amounts of U.S. apparent consumption and are subject to large annual fluctuations in terms of percentage. World production of pumice and related material was 18.6 million metric tons (Mt) in 2013 (tables 1, 4).

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 2013, other major applications included abrasives, horticulture (including landscaping), and roofing. Minor applications incorporated the use of 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 remover, and a variety of heavy-duty hand cleaners. Imports were primarily used as raw material for construction block and as lightweight aggregate.

Production

Domestic production data for pumice and pumicite were developed by the U.S. Geological Survey (USGS) from an annual voluntary review of U.S. pumice- and pumicite-producing sites and company operations. The canvass for 2013 included 10 companies with 10 active operations that produced, used, or sold pumice and pumicite in the United States. Nine

of the 10 companies responded to the canvass. Data from the single nonrespondent producer were estimated from reported prior-year information adjusted to current employment and consumption trends, coupled with Mine Safety and Health Administration employment records. Data were rounded to no more than three significant digits. All percentages in this report were computed based on unrounded data.

U.S. pumice and pumicite production of 269,000 t was valued at \$9.3 million. States that produced pumice or pumicite were, in order of decreasing production, Idaho, Oregon, California, New Mexico, Kansas, and Oklahoma.

Pumice is usually extracted by simple open pit methods using rippers, bulldozers, and 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

In 2013, 152,000 t, or 57% of the pumice and pumicite produced in the United States, was used for building and decorative blocks (table 2). This was a 63% increase from that of 2012. Pumice used for horticultural and landscaping purposes in 2013 was 18% of the total 2013 pumice production. As a result of relatively small production totals, variations in pumice-use categories are subject to large annual fluctuations in terms of percentage. Owing to the limited size of the domestic pumice-producing community, production and value data regarding the end-use categories of concrete admixture and aggregate, abrasives, and “other” (oil absorbent, pet litter, chinchilla chew stones, cosmetics, diluents, engineered fill, filter aids, geotechnical aids, pottery clays, highway snow control, road construction, and other unspecified uses) are withheld in order to prevent the disclosure of company proprietary information. Several substitutes exist for pumice in agriculture, in horticulture, as an aggregate, as a concrete additive, and in other end-use products.

Prices

The average prices reported for pumice and pumicite in 2013 varied greatly by use compared with the average price for all uses in 2012. The overall average value reported for all pumice and pumicite products increased by 9% to \$34.64 per metric ton in 2013 from \$31.88 per ton in 2012 (table 1). The unit value for building and decorative blocks decreased 29% in 2013 to \$13.36 per ton from the 2012 value of \$18.73 per ton (table 2). The price for horticulture and landscaping pumice was reported to be \$26.86 per ton in 2013. As with the production data regarding end-use products, value information pertaining to the

categories of abrasives, concrete admixture and aggregate, and other are withheld in order to prevent the disclosure of company proprietary information.

Foreign Trade

Export and import data are from the U.S. Census Bureau. The trade data were published under subheading 2513.10 of the Harmonized Tariff Schedule, described as applying to pumice stone. Industry sources, however, indicated that pumice may be included under the general heading 2513, which included corundum, garnets, and other natural abrasives.

Exports of pumice, mostly specialty products, remained virtually unchanged at approximately 12,000 t, with a value of \$8.12 million in 2013, or about \$627 per ton. Canada accounted for 34% of 2013 exports, followed by Hong Kong with 11%, Italy with 8%, and the United Kingdom and Japan, with 6% each. Smaller quantities of pumice and pumice products were exported to 45 other countries.

Imports of crude or unmanufactured pumice and pumicite in 2013 increased by 8% to 71,800 t compared with 66,700 t reported in 2012. By weight, 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, 98% came from Greece (table 3), which supplied 70,600 t of crude pumice to the United States in 2013 and remained the leading source of pumice imports. Seven other countries supplied the remainder of pumice and pumicite imports in 2013.

World Review

World production of pumice and related material was 18.6 Mt in 2013, essentially unchanged from 18.4 Mt in 2012. Pumice is used more extensively as a building material outside the United States, which explains the large global production of pumice relative to that of the United States. 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 lightweight, strength, and cementitious properties, pumice and pumicite

perform well in European-style construction. In 2013, Turkey was the leading exporter of pumice to Asia and Europe.

Outlook

U.S. consumption of pumice and pumicite in 2014 may increase compared with that of 2013 if the U.S. residential housing sector, a major user of pumice- and pumicite-related products, experiences a corresponding rise in construction activity.

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- Harben, P.W., and Bates, R.L., 1984, *Geology of the nonmetallics*: 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.

TABLE 1
SALIENT PUMICE AND PUMICITE STATISTICS¹

(Thousand metric tons and thousand dollars unless otherwise specified)

	2009	2010	2011	2012	2013	
United States:						
Sold and used by producers:						
Quantity	366 ^r	241 ^r	343 ^r	338 ^r	269	
Value ²	11,800 ^r	6,760 ^r	10,500 ^r	10,800 ^r	9,320	
Average value	dollars per metric ton	32.23 ^r	28.03 ^r	30.63 ^r	31.88 ^r	34.64
Exports ³	11	13	14	12	12	
Imports for consumption ³	26	34	23	67	72	
Apparent consumption ⁴	381 ^r	262 ^r	352 ^r	393 ^r	329	
World production, pumice and related volcanic materials ^e						
	17,100 ^r	16,600 ^r	19,200 ^r	18,400 ^r	18,600	

^eEstimated. ^rRevised.

¹Data are rounded to no more than three significant digits, except average value.

²Free on board mine and (or) mill.

³Source: U.S. Census Bureau.

⁴Production plus imports minus exports plus adjustments for Government and industry stock changes.

TABLE 2
PUMICE AND PUMICITE SOLD AND USED BY PRODUCERS IN THE UNITED STATES, BY USE¹

Use	2012			2013		
	Quantity (thousand metric tons)	Value (thousands)	Average unit value	Quantity (thousand metric tons)	Value (thousands)	Average unit value
Abrasives ²	W	W	W	W	W	W
Building block, includes decorative block	93 ^r	\$1,740 ^r	\$18.73 ^r	152	\$2,470	\$13.36
Concrete admixture and aggregate	60	2,110	35.46	W	W	W
Horticulture and landscaping	W	W	W	47	1,380	26.86
Other ³	W	W	W	W	W	W
Total or average	338 ^r	10,800 ^r	31.88 ^r	269	9,320	34.64

¹Revised. W Withheld to avoid disclosing company proprietary data.

²Data are rounded to no more than three significant digits, except average unit value; may not add to totals shown.

³Includes cleaning and scouring compounds.

⁴Includes absorbent, diluents, fill, filter aids, laundries, pottery, road use, roofing, and other unspecified uses.

TABLE 3
U.S. IMPORTS FOR CONSUMPTION OF PUMICE,
BY CLASS AND COUNTRY¹

Country	Crude or unmanufactured		Wholly or partly manufactured	
	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)
2012:				
Australia	--	--	3	\$31
China	1	\$4	215	165
Germany	20	14	78	81
Greece	66,000	1,070	--	--
Iceland	--	--	7,910	349
Japan	57	34	14	7
Mexico	641	110	164	43
Other	--	--	2	35
Total	66,700	1,230	8,390	711
2013:				
China	141	44	78	184
Germany	--	--	55	75
Greece	70,600	1,140	--	--
Iceland	--	--	351	351
Italy	8	8	--	--
Japan	44	26	54	25
Mexico	994	188	268	64
Other	--	--	(2)	14
Total	71,800	1,410	806	713

-- Zero.

¹Data 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 4
PUMICE AND RELATED MATERIALS: WORLD PRODUCTION, BY COUNTRY^{1,2}

(Metric tons)

Country ³	2009	2010	2011	2012	2013 ^c
Algeria, pozzolan	328,000	236,961	141,000 ^r	325,000 ^r	388,000 ⁴
Argentina, pumice	7,020	7,582	6,445	6,252 ^r	7,000
Burkina Faso	-- ^r	-- ^r	-- ^r	-- ^r	--
Cameroon, pozzolan ^c	600,000	600,000	600,000	500,000	500,000
Chile, pumice and pozzolan	919,249	824,049	816,565	826,779 ^r	830,000
Croatia, volcanic tuff ^c	15,000	15,000	15,000	20,000 ^r	20,000
Dominica, pumice and volcanic tuff ^c	100,000	100,000	100,000	100,000	100,000
Ecuador: ^c					
Pumice	44,171 ⁴	718,908 ^{r,4}	791,581 ^{r,4}	500,000 ^r	500,000
Pozzolan	884,774 ⁴	640,620 ⁴	600,000	550,000	550,000
Eritrea, pumice ^c	60	65 ^r	70 ^r	75 ^r	75
Ethiopia ^{e,5}	250,000	128,106 ^{r,4}	254,152 ^{r,4}	320,000 ^r	420,000
France, pozzolan and lapilli ^c	276,000	276,000	276,000	276,000	276,000
Greece: ^c					
Pumice	381,000	380,000	375,000	375,000	420,000
Pozzolan, Santorin earth	830,000	900,000	850,000	800,000	800,000
Guadeloupe, pumice ^c	200,000	200,000	210,000	200,000	200,000
Guatemala, pumice	480,480 ^r	25,568 ^r	945,618 ^r	1,416,236 ^r	1,416,000 ⁴
Iceland: ^c					
Pumice	100,000	100,000	100,000	100,000	100,000
Scoria	1,000	1,000	1,000	1,000	1,000
Italy: ^c					
Pumice and pumiceous lapilli	30,000 ^r	30,000 ^r	30,000 ^r	30,000 ^r	28,000
Pozzolan	4,000,000 ^r	4,000,000 ^r	4,000,000 ^r	4,000,000 ^r	4,000,000
Jamaica, pozzolan	132,470	140,000 ^r	130,000 ^r	107,000 ^r	112,000 ⁴
Kosovo, volcanic tuff ^{c,6}	58,788 ⁴	60,000	60,000	-- ^r	--
Macedonia, volcanic tuff	113,064	113,323	57,356	52,911 ^r	53,000
Martinique, pumice	NA ^r	NA ^r	NA ^r	NA ^r	NA
New Zealand	159,357	118,249	229,268	77,414 ^r	100,000
Philippines:					
Pumice	2,064	2,274	2,797	2,800	2,800
Volcanic tuff	18,830	19,166	22,106	22,200	22,200
Saudi Arabia, pozzolan and scoria	802,000	915,000	1,010,000 ^{r,e}	1,061,000 ^r	1,000,000
Slovenia, volcanic tuff	40,000	40,000	40,000	35,000	35,000
Spain, including Canary Islands	436,542 ^r	432,364 ^r	303,462 ^r	194,655 ^r	195,000
Syria, volcanic tuff	957,639	910,000 ^r	809,000 ^r	485,000 ^r	324,000 ⁴
Tanzania, pozzolanic materials	61,501 ^r	60,230 ^r	113,489 ^r	75,193 ^r	75,000
Turkey	4,322,543	4,198,751	5,822,501	5,500,000 ^{r,e}	5,700,000
Uganda, pozzolanic materials ^c	140,000	140,000	140,000	125,000	125,000
United States, pumice, sold and used by producers ⁴	366,000 ^r	241,000 ^r	343,000 ^r	338,000 ^r	269,000
Grand total	17,100,000 ^r	16,600,000 ^r	19,200,000 ^r	18,400,000 ^r	18,600,000
Of which:					
Pumice	1,610,000 ^r	1,710,000 ^r	2,800,000 ^r	2,970,000 ^r	2,940,000
Pozzolan	6,980,000 ^r	6,720,000 ^r	6,570,000 ^r	6,480,000 ^r	6,550,000
Scoria	1,000	1,000	1,000	1,000	1,000
Volcanic tuff	1,200,000	1,160,000 ^r	1,000,000 ^r	615,000 ^r	454,000
Unspecified	7,270,000 ^r	6,990,000 ^r	8,810,000 ^r	8,360,000 ^r	8,620,000

^cEstimated. ^rRevised. NA Not available. -- Zero.

¹World totals, U.S. data, and estimated data are rounded to no more than three significant digits; may not add to totals shown.

²Includes data available through March 26, 2015.

³Pumice and related materials also are produced in a number of other countries, including China, Honduras, Iran, Japan, and Mexico, but available information is inadequate for the formulation of reliable estimates of output levels.

⁴Reported figure.

⁵Data are for year ending July 7 of that stated.

⁶On February 17, 2008, the Kosovo Assembly declared independence from Serbia.