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2007 Minerals Yearbook

PUMICE AND PUMICITE [ADVANCE RELEASE]

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PUMICE AND PUMICITE

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In 2007, U.S. pumice and pumicite production was 1.27 million metric tons (Mt). This was a decrease of 18% compared with that of 2006, when the United States produced a record high of 1.54 Mt. The overall value of pumice production in 2007 was $28.9 million, a decrease of 35% from that in 2006. The observed decreases in total production and value came as a result of the declining U.S. housing industry, where pumice is used in building blocks, concrete, and landscaping. The apparent consumption of pumice and pumicite in the United States in 2007 was 1.29 Mt, a decrease of 20% compared with that of 2006. Imports decreased by 66% to 37,000 metric tons (t). Exports of 9,000 t represented a decrease of approximately 50% compared with 18,000 t of exported pumice and pumicite in 2006 (table 1).

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). The low density allows some pumice to float on water. Large pumice rafts, 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 0.10 inch [4 millimeters (mm)] 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. Other major applications included abrasives, horticulture (including landscaping), and stonewashing of denim. Minor applications incorporated its use as an absorbent, as a concrete aggregate and admixture, as a filter aid, and as a traction enhancer for tires. A small percentage of pumice was used in abrasive-type products, including pencil erasers, an exfoliant in cosmetics, and a variety of heavy-duty hand cleaners. Imports were primarily used as raw material for blocks and as a 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 2007 included 22 companies with 24 active operations that produced, used, or sold pumice and pumicite in the United States. All 22 companies responded, accounting for 100% of the 1.27 Mt produced in 2007. 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 1.27 Mt was valued at $28.9 million. Pumice and pumicite were produced in seven States in 2007, with 29% of production from California, followed by Arizona with 20%. Other States that produced pumice, in order of decreasing production, were New Mexico, Idaho, Oregon, Nevada, and Kansas.

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 2007, more than 739,000 t, or 58% of the pumice and pumicite produced in the United States, was used for building and decorative blocks (table 2). This was a 44% decrease from that of 2006. Pumice used for horticultural and landscaping purposes increased by 131% to 173,000 t in 2007, from the 2006 reported total of 75,000 t. Horticultural and landscaping applications accounted for 14% of total consumption in 2007. Pumice used as an abrasive in 2007 nearly doubled to a total of 88,000 t, which accounted for 7% of consumption. Pumice and pumicite for concrete admixture and aggregate more than tripled, to 87,000 t in 2007, from 27,000 t in 2006, and accounted for 7% of consumption. The amount of pumice reported sold or used by several low-volume markets or for unreported uses grouped in the “other” category increased by 9% in 2007 to 83,000 t, from 76,000 t in 2006, and accounted for 7% of consumption. “Other” uses nominally included absorbent (including pet litter), cosmetics, diluents, engineered fill, filter aids, geotechnical aids, pottery clays, and other unspecified uses. There are several substitutes for pumice in agriculture, horticulture, as an aggregate, as a concrete additive, and other end products. The significant data changes between 2006 and 2007 are likely a result of improved data collection in 2007. Interpretive deductions between these years should be made within this context.

Prices

The average prices reported for pumice and pumicite varied greatly by use compared with the average price for all uses in 2007. The overall average prices reported for all pumice and pumicite products decreased by 21% to $22.85 per metric ton in 2007, compared with $28.85 per ton in 2006. The price change reflected the decreases in unit values of pumice building blocks and abrasives. Increases in the unit values of pumice as a soil additive, for horticultural, landscaping, and in other uses

were not enough to offset the decreases. The unit value of the building block and decorative use category decreased by 44% to $13.35 per ton in 2007, from $23.86 per ton in 2006. The average price for pumice and pumicite used for horticultural and landscaping increased by 29% to $27.31 per ton in 2007, from $21.14 per ton in 2006. The average price in 2007 for pumice and pumicite used as an abrasive was $65.51 per ton, a drop of 69% from the reported amount of $208.69 per ton in 2006, another likely effect of the improved data reliability in 2007. For concrete admixture and aggregates, $17.36 per ton was reported for 2007, a decrease of 38% from the 2006 value of $28.19 per ton. Lastly, for other uses, the 2007 unit value of $74.53 per ton was more than quadruple the reported 2006 value of $16.46 per ton (table 2).

Foreign Trade

Export and import data presented here, which are from the U.S. Census Bureau, are of limited accuracy. This is a result of inconsistencies in producer reporting, coupled with a lack of detail for materials specified in the 2007 Harmonized Tariff Schedule of the United States (HTS), as issued by the U.S. International Trade Commission. The trade data were published under heading/subheading 2513.10 of the HTS, 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, decreased to approximately 9,100 t with a value of $4.4 million in 2007, or about $490 per ton. This was a 50% tonnage decrease from the 18,000 t valued at $5.94 million in 2006. Mexico accounted for 22% of 2007 exports, followed by Canada with 17%, Hong Kong with 15%, China with 11%, and Brazil with 5%. Small amounts of pumice and pumice products were exported to 35 other countries.

Imports of crude or unmanufactured pumice and pumicite in 2007 decreased by 66% to 37,000 t, compared with 108,000 t reported in 2006. By volume, most imports of pumice and pumicite were raw materials for blocks and lightweight aggregate in construction-related uses, with smaller amounts used in a range of abrasives and for stonewashing denim. Ninety-seven percent of total imported pumice came from Greece (table 3), which supplied 34,000 t to the United States in 2007, and remained the leading source of pumice imports. Thirteen other countries supplied small amounts of pumice and pumicite in 2007.

World Review

Pumice is used more extensively as a building material outside the United States, which helps to explain the large global production and sales of pumice as compared with that domestically. In Europe, basic home construction uses significantly less gypsum wallboard because stone and concrete are the preferred building materials. Prefabricated lightweight concrete walls 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.

Greece.—In 2007, Lava Mining and Quarrying S.A. was the sole Greek pumice producer, and the largest exporter of pumice in the world (Hatzilazaridou and Marantos, 2007, p. 39).

Italy.—Although pumice imports from Italy were less than 500 t in 2007, they totaled 47,000 t in 2006, or approximately 44% of total 2006 imports. In December 2006, Pumex S.p.A., which had been the world's leading producer of pumice and pumice products, reportedly ceased mining operations. According to Pumex, mining facilities located in Lipari, an island off the northwest coast of Sicily, have been closed until inconsistencies between environmental and commercial policies are resolved (Industrial Minerals, 2007, p. 13).

Outlook

U.S. consumption of pumice and pumicite in 2008 is expected to remain static or could continue to decrease, largely owing to the status of the U.S. residential housing sector, a major user of pumice- and pumicite-related products. Imports and exports are likewise expected to remain about the same or decrease in 2008 for similar reasons. If the economies in China and India continue to expand, worldwide consumption of pumice may increase in 2008.

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TABLE 1
SALIENT PUMICE AND PUMICITE STATISTICS[1]

(Thousand metric tons and thousand dollars unless otherwise specified)

	2003	2004	2005	2006	2007
United States:					
Sold and used by producers:					
Quantity	870	1,490	1,270	1,540	1,270
Value[2]	21,900	25,000	39,300	44,300	28,900
Average value dollars per metric ton	25.20	16.79 r	31.00	28.85	22.85
Exports[3]	25 r	20 r	15 r	18 r	9
Imports for consumption[3]	367	402	240	109 r	37
Apparent consumption[4]	1,210	1,870	1,490	1,630 r	1,290
World, production, pumice and related volcanic materials	15,800	17,700	17,300	17,200	16,700 e

eEstimated. rRevised.

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

[2]Free on board mine and/or mill.

[3]Source: U.S. Census Bureau.

[4]Production 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 USE[1]

	2006			2007		
Use	Quantity (thousand metric tons)	Value (thousands)	Average unit value	Quantity (thousand metric tons)	Value (thousands)	Average unit value
Abrasives[2]	45	$9,390	$208.69	88	$5,750	$65.51
Building block, includes decorative block	1,310	31,300	23.86	739	9,870	13.35
Concrete admixture and aggregate	27	761	28.19	87	1,510	17.36
Horticulture and landscaping	75	1,590	21.14	173	4,720	27.31
Other[3]	76 r	1,250	16.46 r	83	6,180	74.53
Total or average	1,540	44,300	28.85	1,270	28,900	22.85

rRevised.

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

[2]Includes cleaning and scouring compounds.

[3]Includes absorbent, diluents, fill, filter aids, laundries, pottery, and other unspecified uses.

TABLE 3
U.S. IMPORTS FOR CONSUMPTION OF PUMICE,
BY CLASS AND COUNTRY[1]

(Thousand metric tons and thousand dollars)

	Crude or unmanufactured		Wholly or partly manufactured	
Country	Quantity	Value	Quantity	Value
2006:				
Greece	60 r	1,570 r	(2)	1,040
Italy	47 r	1,980 r	(2)	274 r
Other	1 r	264 r	(2)	1,490 r
Total	108 r	3,810 r	1	2,800 r
2007:				
Greece	34	1,930	(2)	629
Italy	(2)	79	(2)	81
Other	2	476	1	1,440
Total	35	2,490	2	2,150

rRevised.

[1]Data are rounded to no more than three significant digits; may not add to totals shown.

[2]Less than ½ unit.

Source: U.S. Census Bureau.

TABLE 4
PUMICE AND RELATED MATERIALS: WORLD PRODUCTION, BY COUNTRY[1, 2]

(Metric tons)

Country[3]	2003	2004	2005	2006	2007[e]
Algeria, pozzolan[e]	500,000	508,000	494,000 [4]	433,190 [r, 4]	450,000
Argentina, pumice	3,531	9,188	15,361 [r]	17,665 [r]	17,500
Austria, trass[e]	5,000	5,000	5,000	5,000	5,000
Burkina Faso[e]	10,000	10,000	10,000	10,000	10,000
Cameroon, pozzolan[e]	600,000	600,000	600,000	600,000	600,000
Chile, pumice and pozzolan	1,242,094	1,535,228	1,620,099	1,423,144 [r]	1,400,000
Costa Rica[e]	8,000	8,000	8,000	8,000	8,000
Croatia, volcanic tuff	31,281 [r]	23,000 [r]	36,970 [r]	29,589 [r]	30,000
Dominica, pumice and volcanic ash[e]	100,000	100,000	100,000	100,000	100,000
Ecuador:					
Pozzolan	190,747	612,256	540,318	700,007 [r]	700,000
Pumice	88,830	183,119	107,178	8,730 [r]	10,000
El Salvador, pozzolan	294,871	222,826	230,000	230,000 [e]	220,000
Eritrea, pumice	50	439	440	450 [e]	450
Ethiopia[5]	218,676	270,994	255,334	255,622	260,000
France, pozzolan and lapilli[e]	400,000 [r]	400,000 [r]	400,000 [r]	272,000 [r]	250,000
Greece:[e]					
Pozzolan	1,383,546 [4]	1,400,000	1,400,000	1,400,000	1,400,000
Pumice	850,000	850,000	850,000	850,000	850,000
Guadeloupe, pumice[e]	210,000	210,000	210,000	210,000	210,000
Guatemala, pumice	273,933	226,459	-- [r]	-- [r]	--
Honduras, pozzolan	116,724 [r]	-- [r]	100,000 [r, e]	100,000 [r, e]	100,000
Iceland:					
Pumice	50,193	50,000 [e]	50,000 [e]	105,000	100,000
Scoria[e]	1,000	1,000	1,000	1,000	1,000
Iran	1,228,388	1,536,448	1,500,000	1,400,000 [r, e]	1,500,000
Italy:[e]					
Pozzolan	4,000,000	4,000,000	4,000,000	4,000,000	4,000,000
Pumice and pumiceous lapilli	25,000 [r]	27,000 [r]	28,000 [r]	20,000 [r]	20,000
Macedonia, volcanic tuff[e]	50,000	50,000	50,000	50,000	50,000
Martinique, pumice[e]	130,000	130,000	130,000	130,000	130,000
New Zealand	173,400	280,950	245,080	303,659 [r]	300,000
Saudi Arabia, pozzolan[e]	162,000	320,000	372,000	400,000	400,000
Serbia, volcanic tuff[e]	100,000 [6]	100,000 [6]	100,000 [6]	100,000	100,000
Slovenia, volcanic tuff[e]	40,000	40,000	40,000	40,000	40,000
Spain, including Canary Islands	711,898	553,210 [r]	600,000 [r, e]	600,000 [r, e]	600,000
Syria, volcanic tuff[e]	650,000	650,000	650,000	650,000	650,000
Tanzania, pozzolanic materials	105,910	152,679	163,499	129,295 [r]	130,000
Turkey	895,616	1,035,975	1,000,000 [e]	900,000 [e]	700,000
Uganda, pozzolanic materials	65,587	134,644	140,000 [e]	140,000 [e]	140,000
United States, pumice, sold and used by producers	870,000	1,490,000	1,270,000	1,540,000	1,270,000 [4]
Grand total	15,800,000 [r]	17,700,000 [r]	17,300,000 [r]	17,200,000 [r]	16,700,000
Of which:					
Pumice	2,480,000	3,150,000	2,630,000 [r]	2,860,000 [r]	2,580,000
Pozzolan	7,420,000 [r]	7,950,000 [r]	8,040,000 [r]	8,130,000 [r]	8,140,000
Trass and scoria	6,000	6,000	6,000	6,000	6,000
Volcanic tuff	871,000 [r]	863,000 [r]	877,000 [r]	870,000 [r]	870,000
Unspecified	5,010,000 [r]	5,760,000 [r]	5,770,000 [r]	5,290,000 [r]	5,150,000

[e]Estimated. [r]Revised. -- Zero.

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

TABLE 4—Continued

PUMICE AND RELATED MATERIALS: WORLD PRODUCTION, BY COUNTRY[1, 2]

[2]Table includes data available through May 1, 2008.

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

[4]Reported figure.

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

[6]Montenegro and Serbia formally declared independence in June 2006 from each other and dissolved their union.