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PUMICE AND PUMICITE

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Pumice and Pumicite

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In 2010, U.S. pumice and pumicite production was 390,000 metric tons (t). This was a decrease of 5% compared with that of 2009, when the United States produced 410,000 t. The overall value of pumice production in 2010 was $7.81 million, a decrease of 37% from that in 2009. The observed decrease in total production, and particularly in value, came as a result of the stagnant U.S. housing and construction industries, where pumice is used in building blocks, concrete, and landscaping. The apparent consumption of pumice and pumicite in the United States in 2010 was 411,000 t, a decrease of 3% compared with that of 2009. Imports increased by 35% to 34,000 t. Exports of 13,000 t represented an increase of approximately 19% compared with 11,000 t of exported pumice and pumicite in 2009 (table 1). Pumice imports and exports represent relatively small amounts of U.S. apparent consumption and are subject to large annual fluctuations in terms of percentage.

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 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 2010, other major applications included abrasives, horticulture (including landscaping), and stonewashing of denim. Minor applications incorporated the use of pumice 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, a polishing agent for circuit boards and television monitors, 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 2010 included 11 companies with 14 active operations that produced, used, or sold pumice and pumicite in the United States. Ten of the 11 companies responded to the canvass. Data from the single nonrespondent producer was 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 390,000 t was valued at $7.81 million. States that produced pumice and pumicite, in order of decreasing production, were Nevada, Oregon, Idaho, Arizona, California, New Mexico, 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 2010, more than 270,000 t, or 69% of the pumice and pumicite produced in the United States, was used for building and decorative blocks (table 2). This was a 13% increase from that of 2009. Pumice used for horticultural and landscaping purposes in 2010 decreased by 41% to 60,000 t from the 2009 reported total of 101,000 t. Horticultural and landscaping applications accounted for 15% of total consumption in 2010. Pumice and pumicite for concrete admixture and aggregate decreased by 41% to 16,000 t in 2010 from 28,000 t in 2009 and accounted for 4% of consumption. Pumice used as an abrasive in 2010 increased by 181% to a total of 23,000 t, which accounted for 6% of consumption. The large increase in 2010 was a result of changes in relatively small tonnages, which are subject to large annual variations. The amount of pumice reported sold or used by several low-volume markets or for unreported uses grouped in the “other” category decreased by 39% to 20,000 t in 2010 from 34,000 t in 2009 and accounted for 5% of consumption. “Other” uses nominally included absorbent (including pet litter), cosmetics, diluents, engineered fill, filter aids, geotechnical aids, pottery clays, highway snow control, road construction, and other unspecified uses. There are several substitutes for pumice in agriculture, horticulture, as an aggregate, as a concrete additive, and other end products.

Prices

As a result of the small number of pumice producers, coupled with producer-specific end-use products, the average prices reported for pumice and pumicite in 2010 varied greatly by use compared with the average price for all uses in 2009. The overall average prices reported for all pumice and pumicite products decreased by 33% to $20.00 per metric ton in 2010 from $29.97 per ton in 2009. The price change reflected the decreases in unit values of building block, concrete admixture and aggregate, and horticulture and landscaping products. The unit value of the

building block and decorative use category decreased by 48% to $12.05 per ton in 2010 from $23.13 per ton in 2009. This decrease in value was likely the result of an overall production increase coupled with a weaker market compared with that in 2009. The average price for pumice and pumicite used for horticultural and landscaping decreased by 52% to $14.11 per ton in 2010 from $29.57 per ton in 2009. The average price in 2010 for pumice and pumicite used in nonspecialty abrasive applications was $10.25 per ton, an increase of 9% from the reported amount of $9.38 per ton in 2009. For concrete admixture and aggregates, $29.12 per ton was reported for 2010, a decrease of 3% from the 2009 value of $29.93 per ton. For other uses, the 2010 unit value of $146.36 per ton was 72% more than the $84.97 unit value reported in 2009 (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 2010 Harmonized Tariff Schedule of the United States (HTS), as issued by the U.S. International Trade Commission. The trade data were published under 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, increased to approximately 13,000 t, with a value of $5.97 million in 2010, or about $456 per ton. This was an 18% decrease in tonnage from the 11,000 t valued at $5.1 million in 2009. Canada accounted for 29% of 2010 exports, followed by Hong Kong with 13%, China with 11%, Italy with 8%, and the United Kingdom with 7%. Small amounts of pumice and pumice products were exported to 62 other countries.

Imports of crude or unmanufactured pumice and pumicite in 2010 increased by 34% to 35,000 t compared with 26,000 t reported in 2009. 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-five percent of imported crude pumice came from Greece (table 3), which supplied 33,200 t of crude pumice to the United States in 2010 and remained the leading source of pumice imports. Pumice from Mexico totaled 1,300 t, or 4% of total imported pumice, in 2010. Sixteen other countries supplied small amounts of pumice and pumicite in 2010.

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. 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. In 2010, Greece was the leading exporter of pumice to Asia, Europe, and the United States.

Outlook

U.S. consumption of pumice and pumicite in 2011 was expected to remain static compared with that of 2010, largely owing to the status of the U.S. residential housing sector, a major user of pumice- and pumicite-related products.

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TABLE 1

SALIENT PUMICE AND PUMICITE STATISTICS[1]

(Thousand metric tons and thousand dollars unless otherwise specified)

	2006	2007	2008	2009	2010
United States:					
Sold and used by producers:					
Quantity	1,540	1,270	791	410	390
Value[2]	44,300	28,900	15,900	12,300	7,810
Average value dollars per metric ton	28.85	22.85	20.13	29.97	20.00
Exports[3]	18	9	15	11	13
Imports for consumption[3]	109	37	65	26	35
Apparent consumption[4]	1,630	1,290	841	425	412
World, production, pumice and related volcanic materials	19,900 r	20,700	18,400 r	17,800 r	17,300 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]

	2009			2010		
Use	Quantity (thousand metric tons)	Value (thousands)	Average unit value	Quantity (thousand metric tons)	Value (thousands)	Average unit value
Abrasives[2]	8	$78	$9.38	23	$239	$10.25
Building block, includes decorative block	239	5,540	23.13	270	3,260	12.05
Concrete admixture and aggregate	28	826	29.93	16	476	29.12
Horticulture and landscaping	101	2,980	29.57	60	842	14.11
Other[3]	34	2,870	84.97	20	2,990	146.36
Total or average	410	12,300	29.97	390	7,810	20.00

[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]

	Crude or unmanufactured		Wholly or partly manufactured	
Country	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)
2009:				
Austria	--	--	(2)	$11
China	9	$49	74	307
Germany	--	--	68	70
Greece	21,000	367	20	289
Italy	--	--	(2)	3
Mexico	1,360	209	86	19
Montserrat	3,600	130	--	--
Poland	--	--	6	98
Other	68	29	4	35
Total	26,000	784	258	832
2010:				
Austria	--	--	(2)	8
China	9	40	54	278
Germany	--	--	231	131
Greece	33,200	556	41	569
Iceland	--	--	236	236
Japan	28	16	35	37
Mexico	818	146	516	118
Turkey	--	--	19	19
Other	--	--	5	33
Total	34,100	758	1,140	1,430

-- Zero.

[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]	2006	2007	2008	2009	2010[e]
Algeria, pozzolan	433,190	570,000	490,567	328,000 [r]	450,000 [4]
Argentina, pumice	17,665	16,200	6,500	7,020 [4]	7,000
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	1,423,144	1,135,771	1,063,176	919,249 [r]	915,000
Costa Rica[e]	8,000	--	--	--	--
Croatia, volcanic tuff	17,157	15,085	15,000 [e]	15,000 [e]	15,000
Dominica, pumice and volcanic ash[e]	100,000	100,000	100,000	100,000	100,000
Ecuador:					
Pozzolan	700,007	582,560	580,000 [r, e]	580,000 [r, e]	580,000
Pumice	8,730	153,500	100,000 [r, e]	100,000 [e]	100,000
El Salvador, pozzolan[e]	223,000	223,000	223,000	200,000	NA
Eritrea, pumice	1,072	55	60 [e]	60 [e]	60
Ethiopia[5]	255,622	22,000	35,000	58,000 [r]	60,000
France, pozzolan and lapilli[e]	272,000	250,000	276,000	276,000	276,000
Greece:[e]					
Pozzolan, Santorin earth	1,400,000	1,400,000	1,059,000 [4]	830,000	900,000
Pumice	850,000	850,000	828,000 [4]	381,000	380,000
Guadeloupe, pumice[e]	210,000	210,000	210,000	200,000	200,000
Guatemala, pumice	-- [r]	220,389	393,779 [r]	394,955	400,000
Honduras, pozzolan[e]	100,000	100,000	100,000	100,000	--
Iceland:[e]					
Pumice	105,000 [4]	100,000	100,000	100,000	100,000
Scoria	1,000	1,000	1,000	1,000	1,000
Iran[e]	1,400,000	1,500,000	1,500,000	1,500,000	1,500,000
Italy:[e]					
Pozzolan	4,000,000	4,000,000	3,000,000	3,000,000	3,000,000
Pumice and pumiceous lapilli	20,000	20,000	20,000	20,000	20,000
Jamaica, pozzolan	149,279	114,482	124,304	132,470	125,000
Kosovo, volcanic tuff	-- [6]	-- [6]	45,005 [r, 7]	58,788 [r, 7]	60,000
Macedonia, volcanic tuff	60,000 [e]	80,910	103,476	113,064	113,000
Martinique, pumice[e]	130,000	130,000	130,000	130,000	130,000
New Zealand	303,659	354,903	174,729	159,357 [r]	160,000
Philippines:					
Pumice	1,917	1,912	2,063	2,064	2,100
Volcanic tuff	17,590	16,490	17,570	18,830	20,000
Saudi Arabia, pozzolan[e]	400,000	784,000 [4]	810,000	800,000	800,000
Serbia, volcanic tuff[e]	100,000	100,000	100,000	100,000	100,000
Slovenia, volcanic tuff[e]	40,000	40,000	40,000	40,000	40,000
Spain, including Canary Islands[e]	600,000	600,000	600,000	600,000	600,000
Syria, volcanic tuff[e]	650,000	810,000	901,000 [4]	957,639 [4]	950,000
Tanzania, pozzolanic materials	129,295	184,070	260,403 [r]	61,501 [r]	70,000
Turkey	3,515,644	3,995,423	3,449,773 [r]	4,322,543 [r]	4,000,000
Uganda, pozzolanic materials[e]	140,000	140,000	140,000	140,000	140,000

See footnotes at end of table.

TABLE 4—Continued

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

(Metric tons)

Country[3]	2006	2007	2008	2009	2010[e]
United States, pumice, sold and used by producers	1,540,000	1,270,000	791,000	410,000	390,000 [4]
Grand total	19,900,000 [r]	20,700,000	18,400,000 [r]	17,800,000 [r]	17,300,000
Of which:					
Pumice	2,860,000 [r]	2,950,000	2,560,000 [r]	1,720,000	1,710,000
Pozzolan	8,270,000	8,700,000	7,390,000 [r]	6,770,000 [r]	6,670,000
Trass and scoria	1,000	1,000	1,000	1,000	1,000
Volcanic tuff	885,000	1,060,000	1,220,000 [r]	1,300,000 [r]	1,300,000
Unspecified	7,910,000	7,990,000	7,230,000 [r]	7,970,000 [r]	7,640,000

[e]Estimated. [r]Revised. NA Not available. -- 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.

[2]Table includes data available through May 5, 2011.

[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]On February 17, 2008, the Kosovo Assembly declared independence from Serbia. Kosovo's data for 1999–2007 are not included in Serbian statistics.

[7]Converted from reported data, in cubic meters, as follows: 2008—45,005 and 2009—58,788.