PUMICE AND PUMICITE

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In 2004, U.S. pumice and pumicite production was almost 1.5 million metric tons (Mt). This was an increase of 70% compared with 2003 and represented a record U.S. production year for pumice. The increased production resulted from the growth in popularity of cultured stone made from pumice for building and decorative uses. The apparent consumption of pumice and pumicite in the United States in 2004 was 1.87 Mt, an increase of 54% compared with that of 2003, which was also a record. Imports increased by 10% to 402,000 metric tons (t). Exports of 27,000 t represented an increase of about 4% compared with exports of 26,000 t during 2003 (table 1).

The main use for pumice continued to be as an aggregate in lightweight building blocks and assorted building products. Other major applications for pumice and pumicite included abrasives, absorbents, concrete aggregate and admixture, filter aids, horticulture (including landscaping), the stonewashing of denim, and as a traction enhancer for tires. Imports were used primarily as a lightweight aggregate, but a small percentage of pumice imports was used in abrasive applications.

Domestic Data Coverage

Domestic production data for pumice and pumicite were developed by the U.S. Geological Survey (USGS) from an annual voluntary survey of U.S. pumice- and pumicite-producing sites and company operations. The canvass for 2004 covered 16 companies with 17 active operations that produced and sold or used all the domestic pumice and pumicite in the United States. The 11 companies that responded represented about 82% of the 1.5 Mt produced. Sold and used data for the five companies that did not respond to the 2004 survey were estimated. Data are rounded to no more than three significant figures. All percentages in this report were computed based on unrounded data.

Description and Terminology

Pumice is a low density, porous, vesicular, glassy volcanic rock that forms during explosive eruptions. It resembles a sponge because it consists of a network of gas bubbles frozen amidst fragile volcanic glass and minerals. Pumicite is a term for material made entirely of pumice, but the term is commonly used for loose material with smaller particle size (typically less than 4 millimeters) (Peterson and Mason, 1975). All types of magma, including andesite, basalt, dacite, and rhyolite, will form pumice. Scoria is another term used for vesicular glassy lava rock, though it usually refers to rock of basaltic to andesitic composition. Rocks called scoria are typically dark gray to black in color and denser than those termed pumice, and the term scoria has been used for dark pumice from basaltic rocks. In the past (and still locally) the terms pumice, pumicite, volcanic ash, and scoria are used interchangeably. Pumice is the preferred term. Pumice and pumicite production in this report includes all material reported and sold as pumice or pumicite and may include some volcanic ash. Scoria used as aggregate is reported in the crushed stone reports and has not been included here.

Production

U.S. pumice and pumicite production increased to 1.49 Mt and was valued at $25 million. Oregon was the leading source of pumice and pumicite followed, in descending order, by Arizona, Idaho, New Mexico, California, Nevada, and Kansas. Domestic producers, listed alphabetically by State, were Oldcastle, Inc. with its subsidiaries Superlite Block, Inc., Flagstaff, AZ, and Amcor Precast, Inc., Idaho Falls, ID; Arizona Tufflite Corporation, Phoenix, AZ; California Lightweight Pumice, Inc., San Clemente, CA; Glass Mountain Pumice, Inc., Tulelake, CA; TXI, Inc. through its subsidiary Pacific Custom Materials, Inc, Olancha, CA; U.S. Pumice Co., Chatsworth, CA; Hess Pumice Products, Inc., Malad City, ID; Producers Pumice, Idaho Falls, ID; Calvert Corp., Norton, KS; Kansas Minerals, Inc., Mankato, KS; Copar Pumice Co., Inc., Espanola, NM; CR Minerals Corp., Santa Fe, NM; Utility Block Co., Albuquerque, NM; Cascade Pumice Co., Bend, OR; and Sierra Cascade LLC, Chemult, OR.

Consumption

The increase in the quantity of pumice and pumicite consumption in the U.S. in 2004 owing to increased demand from the building block, horticultural, landscaping, and abrasives industries (table 2). The increased demand for pumice for the manufacture of artificial stone caused the building block and decorative use category to increase by about 80% to 1.18 Mt from 654,000 t. Pumice used for horticultural and landscaping purposes also increased dramatically by nearly 111% to 236,000 t in 2004 from a total of 112,000 t in 2003. This market sector's increase resulted from greater demand for pumice used as a soil conditioner. Pumice use as an abrasive was also up to 40,000 t in 2004 from 28,000 t in 2003, an increase of 43%. The only major pumice and pumicite market that had decreased sales in 2004 was for concrete admixture and aggregate, which fell to 29,000 t from 42,000 t in 2003. There are many substitutes for pumice as a concrete additive or aggregate. The amount of the pumice sold or used by several low-volume markets or for unreported uses grouped in the "other" category also fell in 2004 to 6,000 t from 34,000 t in 2003. This may have been due to producers being more precise in categorizing sales on the survey forms rather than to a real decrease in consumption for "other" uses.

The most important market for pumice remained building blocks, which consumed 79.1% of the total domestically produced pumice sold or used in the United States. That was up from 75.2% used for building blocks in 2003. Other important uses, in descending order, were for horticulture and landscaping (15.8%), abrasives (2.7%), and concrete admixture and aggregate (1.9%). Less than 1% of the pumice and pumicite consumed was used as absorbent (including pet litter), diluent, engineered fill, filter aids, in geotechnical uses, in laundries (stone-washing), in pottery clays, and for other unspecified uses.

Prices

The average prices reported for pumice and pumicite varied greatly by use compared with the average price for all uses in 2004. The overall average price was $16.80 per metric ton in 2004, a decrease of $8.72 per ton from $25.52 per ton in 2003. The price change was the result of a significant increase in the use of pumice for building blocks and soil additive, which command a much lower per ton price than did the grades of pumice used in abrasives, landscaping, and some other uses. Average prices for pumice and pumicite by use were $216.83 per ton for abrasive, $53.32 per ton for miscellaneous uses, $43.05 per ton for concrete admixture and aggregate, $14.23 per ton for horticulture and landscaping, and $9.75 per ton for building block (table 2).

Foreign Trade

Exports of pumice increased to about 27,000 t in 2004 with a value of $7 million. Importing countries, in descending order, were Canada (38%), Mexico (20%), Germany (7%), the United Kingdom (7%), Japan (6%), Brazil (4%), Thailand (3%), Malaysia (2%), Panama (2%), Hong Kong (2%), and Taiwan (2%). The remaining 7% of exports went to 29 other countries in Asia, Central America, Europe, the Middle East, Oceania, and South America.

Imports in 2004 increased by 10% to 402,000 t compared with 367,000 t in 2003. By volume, most imports of pumice and pumicite were for lightweight aggregate in construction-related uses with smaller amounts used in a range of abrasives and for the stonewashing of denim. Ninety-eight percent of imported pumice was from Greece and Italy. All imports from Greece and the majority of imports from Italy were thought to have been shipped to the United States by a single company. Greece supplied 247,000 t, accounting for 61% of pumice imports in 2004 (table 3). Greece remained the leading source of pumice imports even though Greek sources supplied 17% less than in 2003. Imports from Italy accounted for 37% of total imports, and almost tripled in 2004 to 147,000 t from 53,000 t in 2003. Most of the remaining 2% of pumice imports was supplied by Turkey, although 15 other countries also exported small amounts of pumice and pumicite to the United States in 2004.

World Review

The USGS estimated world pozzolan and pumice (and related materials) production to be 16.1 Mt in 2004, about 4% more than in 2003 (table 4). Most of the data published were provided by official government agencies in each country. Significant revisions of data are sometimes reported by these agencies, usually without supporting explanations. Italy remained the dominant producer of pumice and pozzolan with production estimated to be 4.6 Mt. Strictly defined, pozzolans are volcanic tuffs of the type found near Pozzuoli in southern Italy. However, internationally, the term pozzolan is commonly applied to any of the many silicious materials, such as diatomaceous earth, fly ash, opaline shale, pumicite, tuff, and volcanic ash, which when added to the cement in concrete improve the strength or other properties of the concrete. The United States, with 1.5 Mt, was the second leading producer in 2004, up from fourth leading in 2003. Other leading countries in the production of pozzolan, pumice, and related materials were Algeria, Cameroon, Chile, Ecuador, France, Germany, Greece, Guatemala, Iran, Spain, and Turkey. In addition, 22 other countries were known to have produced pumice.

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, for example, basic home construction uses significantly less gypsum sheetrock because stone and concrete are the preferred building materials. Prefabricated lightweight concrete walls often are produced and shipped to construction locations. Because of their lightweight, strength, and cementitious properties, pumice and pozzolan perform very well in European-style construction.

Outlook

U.S. consumption of pumice and pumicite in 2005 is expected to rise slightly along with the popularity and use of artificial stone made with pumice for construction and decoration. Imports and exports are also expected to rise slightly in 2005. Worldwide consumption of pumice is expected to be about the same as in 2004.

Reference Cited

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TABLE 1
SALIENT PUMICE AND PUMICITE STATISTICS[1]

(Thousand metric tons and thousand dollars unless otherwise specified)

		2000	2001	2002	2003	2004
United States:						
Sold and used by producers:						
Quantity		1,050	919	956	870	1,490
Value[2]		18,900	19,700	19,800	21,900	25,000
Average value	dollars per metric ton	17.96	21.41	20.69	25.20	16.80
Exports[3]		27	27	30	26	27
Imports for consumption		385	379	360	367	402
Apparent consumption[4]		1,410	1,270	1,290	1,210	1,870
World, production, pumice and related volcanic materials		13,700 r	14,400 r	15,100 r	15,600 r	16,100 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]

	2003			2004		
Use	Quantity (thousand metric tons)	Value (thousands)	Average unit value	Quantity (thousand metric tons)	Value (thousands)	Average unit value
Abrasives[2]	28	$8,750	$312.36	40	$8,590	$216.83
Building block, includes decorative	654	7,940	12.14	1,180	11,500	9.75
Concrete admixture and aggregate	42	1,130	26.88	29	1,240	43.05
Horticulture and landscaping	112	2,770	24.73	236	3,360	14.23
Other[3]	34	1,340	39.38	6	338	53.32
Total or average	870	21,900	25.20	1,490	25,000	16.80

[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			
	2003		2004		2003		2004	
Country	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Greece[2]	296	12,000	247	7,530	(3)	639	(3)	617
Italy[2]	53	17,600	147	22,000	(3)	811	(3)	39
Turkey	17	3,020	7	1,510	(3)	173	--	--
Other[4]	(3)	184	(3)	355	(3)	1,840	(3)	3,000
Total	366	32,800	401	31,400	1	3,460	1	3,660

-- Zero.

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

[2]Quantity of crude or unmanufactured pumice derived from the Journal of Commerce Port Import/Export Reporting Service data.

[3]Less than ½ unit.

[4]Includes Argentina (2004), Austria, Canada (2003), China, Ecuador, France (2003), Germany, Hong Kong (2004), Iceland (2003), India (2003), Indonesia, Japan, the Republic of Korea, Mexico, Malaysia, New Zealand (2003), Poland, Russia (2004), South Africa (2003), Taiwan, Thailand (2004), and the United Kingdom.

Source: U.S. Census Bureau.

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

(Metric tons)

Country[3]	2000	2001	2002	2003	2004[e]
Algeria, pozzolan[e]	360,000 [r]	421,238 [4]	451,000 [r]	500,000 [r]	400,000
Argentina, pumice	15,512 [r]	2,097 [r]	3,070 [r]	3,531 [r]	3,500
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]	604,960 [4]	600,000	620,000 [r]	600,000	600,000
Cape Verde, pozzolan[e]	1,000	1,000	1,000	1,000	1,000
Chile:					
Pumice	--	--	354	417,023	420,000
Pozzolan	830,000	785,000	826,000	825,000 [r]	825,000
Costa Rica[e]	8,000	8,000	8,000	8,000	8,000
Croatia, volcanic tuff[e]	38,000 [4]	42,000	41,000 [r]	29,000 [r]	30,000
Dominica, pumice and volcanic ash[e]	100,000	100,000	100,000	100,000	100,000
Ecuador:					
Pumice	344,850	373,023	130,000 [r]	144,000 [r, e]	140,000
Pozzolan	27,687	373,000 [r, e]	519,090 [r]	571,000 [r, e]	570,000
Eritrea, pumice	41	195	212	220 [e]	220
Ethiopia[e, 5]	156,466 [4]	169,000	170,000	170,000	170,000
France, pozzolan and lapilli[e]	450,000	450,000	450,000	450,000	450,000
Germany, pumice, marketable[e]	500,000	500,000	500,000	500,000	500,000
Greece:[e]					
Pumice	850,000	850,000	850,000	850,000	850,000
Pozzolan	750,000	750,000	750,000	750,000	750,000
Guadeloupe, pumice[e]	210,000	210,000	210,000	210,000	210,000
Guatemala, pumice	261,947	264,322 [r]	377,403 [r]	273,933 [r]	270,000
Honduras, pozzolan	186,948	189,999	190,000 [e]	190,000 [e]	190,000
Iceland:[e]					
Pumice	25,000	25,000	25,000	25,000	50,000
Scoria	500	500	500	500	1,000
Iran	150,000 [e]	843,912	1,181,543	1,200,000 [e]	1,200,000
Italy:[e]					
Pumice and pumiceous lapilli	600,000	600,000	600,000	600,000	600,000
Pozzolan	4,000,000	4,000,000	4,000,000	4,000,000	4,000,000
Macedonia, volcanic tuff[e]	150,000	50,000	50,000	50,000	50,000
Martinique, pumice[e]	130,000	130,000	130,000	130,000	130,000
New Zealand	68,000	68,000 [e]	203,700	204,000 [e]	200,000
Saudi Arabia, pozzolan[e]	150,000	150,000	150,000	160,000	160,000
Serbia and Montenegro, volcanic tuff[e]	120,000	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]	507 [4]	550	550	550	550
Tanzania, pozzolanic materials	57,014	41,468	52,000 [r]	24,460 [r]	25,000
Turkey	787,081	754,052	820,347	895,616 [r]	900,000
Uganda, pozzolanic materials	35,603	22,782	12,388	65,587 [r]	66,000
United States, pumice, sold and used by producers	1,050,000	919,000	956,000	870,000	1,490,000
Grand total	13,700,000	14,400,000 [r]	15,100,000 [r]	15,600,000 [r]	16,100,000
Of which:					
Pumice	3,390,000	3,270,000 [r]	3,180,000 [r]	3,420,000 [r]	4,060,000
Pozzolan	7,000,000 [r]	7,330,000 [r]	5,750,000 [r]	7,690,000 [r]	7,590,000
Trass and scoria	5,500	5,500	5,500	5,500	6,000
Volcanic tuff	349,000	233,000	232,000 [r]	220,000 [r]	221,000
Unspecified	2,930,000 [r]	3,600,000 [r]	4,140,000 [r]	4,240,000 [r]	4,240,000 [4]

See footnotes at end of table.

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

[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.
[2]Table includes data available through April 22, 2005.
[3]Pumice and related materials also are produced in a number of other countries, including 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 the year stated.

FIGURE 1
U.S. PUMICE AND PUMICITE STATISTICS

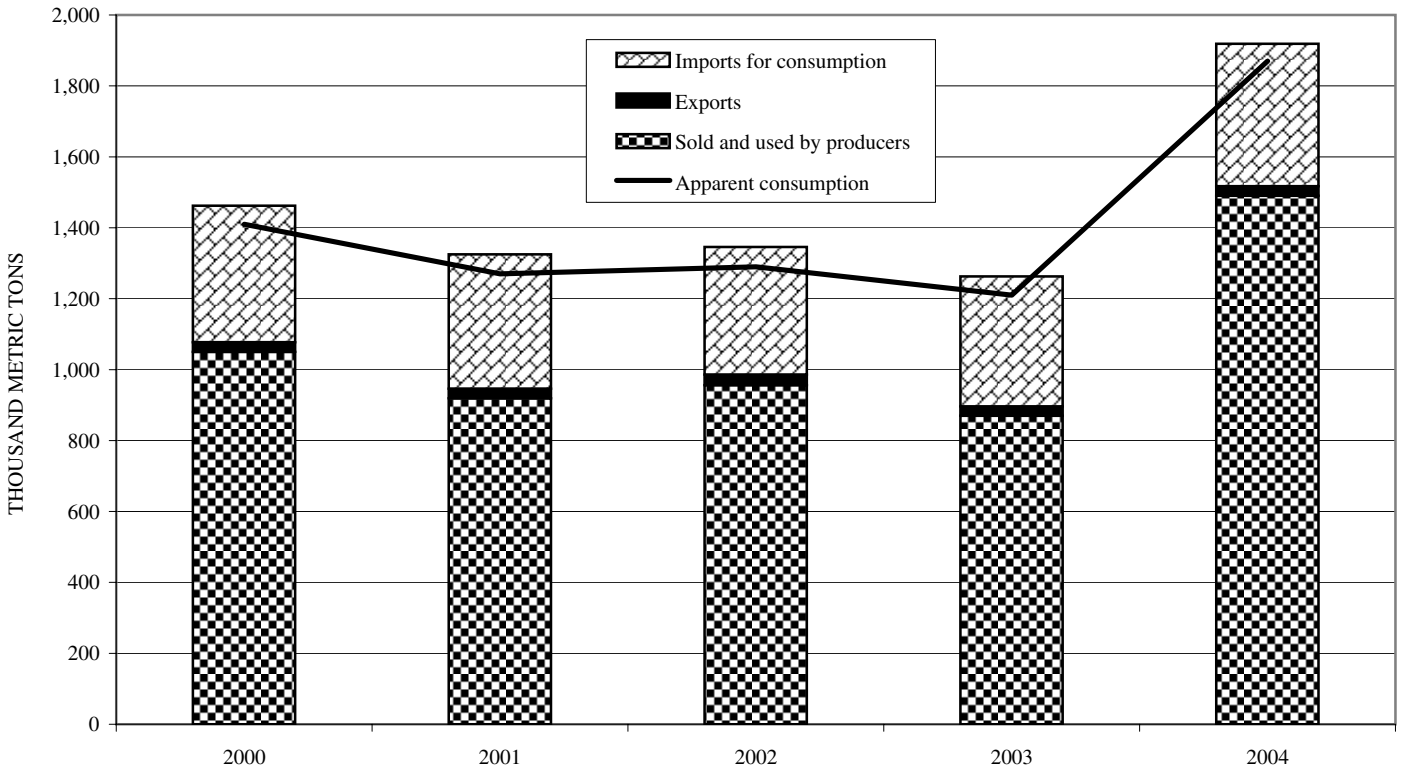
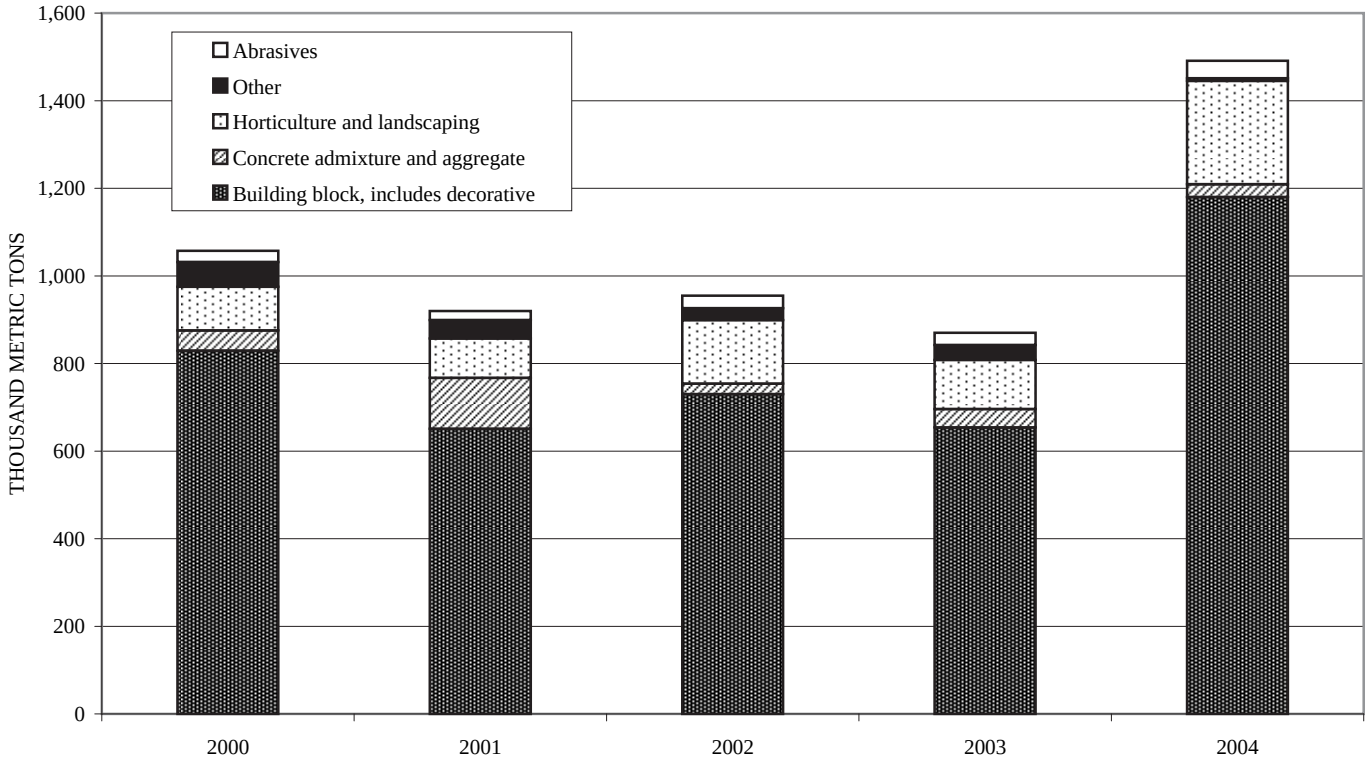


FIGURE 2
PUMICE AND PUMICITE CONSUMED IN THE UNITED STATES, BY USE[1]



[1]Total is "Sold and used by producers" from Figure 1; does not include "Imports for consumption" or "Exports."

FIGURE 3
PUMICE AND PUMICITE OPERATIONS IN THE UNITED STATES