

Pumice and Volcanic Cinder

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Although U.S. output of pumiceous materials declined in quantity by 3% in 1977, value of production rose 14% to a record high of \$12 million compared with that of 1976. The combined quantity from 197 operations in four States (Arizona, California, Nevada, and Oregon) was equal to 3 million tons, or 75% of total domestic output sold or used by producers. The quantity of volcanic cinder and scoria produced in 1977 was 12% less than that in 1976, but the output of pumice and pumicite sold or used established record levels of 1.18 million tons and \$4.6 million.

Combined use of pumiceous materials for road construction and maintenance and

concrete admixtures and aggregate continued as the principal end uses and comprised 84% of total domestic consumption (excluding imports) compared with 79% in 1976.

Average values for all end-use categories increased over those of 1976, and the weighted average of domestic pumiceous materials output was \$2.98 per ton, compared with \$2.53 per ton the previous year.

Both imports and exports of pumice and pumicite increased significantly in tonnage and value. Canada, Israel, and France were the principal export destinations, and Greece continued to be the major source for imported pumice and pumicite.

DOMESTIC PRODUCTION

Domestic production of pumiceous materials in 1977 totaled 4.0 million tons valued at a record \$12 million (previous record high was \$11.2 million in 1975). Compared with 1976 output, the quantity of pumiceous materials produced in 1977 decreased 3% but the value increased 14%.

Domestic output came from 92 individuals, firms, and governmental agencies producing from 253 operations in 12 States, compared with 93 producers and 259 operations in 11 States in 1976. California led all producing States in number of active operations with 101, followed by Oregon with 67, and Arizona with 22. The combined output of pumiceous materials from four States (Arizona, California, Nevada, and Oregon) was nearly 3 million tons, or 75% of the national total. Other States with significant output levels in 1977 were Hawaii and New Mexico.

Although volcanic cinder, including scoria, was produced in 10 of the 12 States and in American Samoa, and comprised 71% of

the total domestic output of pumiceous materials in 1977, the quantity sold or used (2.8 million tons) was under 3 million tons for the first time since 1971. The 12% decline in the quantity of volcanic cinder mined in 1977 was attributed primarily to a 23% and 34% decrease in output from Arizona and Hawaii operations, respectively. Domestic output of pumice and pumicite in 1977, however, increased significantly for the second straight year (table 1) and established record levels in quantity (1.18 million tons) and value (\$4.6 million). The previous record highs were 1.16 million tons in 1964 and \$4.2 million in 1961. The 30% increase in domestic output of pumice and pumicite over that in 1976 (49% over that of 1975) mainly reflected the response of domestic producers to the increased demand for pumice and pumicite in abrasive applications, building block, and construction aggregate, and the smallest quantities of competitive grades imported in recent years.

CONSUMPTION AND USES

Total consumption (quantity sold or used) of domestically produced pumiceous materials declined only 3% from that of 1976. The combined quantity of pumice, pumicite, volcanic cinder, and scoria used for road construction and concrete admixtures and aggregate in 1977 increased from 3.27 million tons in 1976 to 3.38 million tons, and accounted for 84% of total U.S. consumption. End uses for the remaining 16% were landscaping (8%), other uses including abrasives (about 6%), and railroad ballast, (2%). Pumiceous materials used as roofing granules accounted for 54% of the total quantity and 55% of the total value of

"Other uses" shown in table 3.

The quantity of pumiceous materials used in concrete admixtures and aggregate and in landscaping increased 28% and 6%, respectively, over that of 1976, but the quantity used for abrasive applications decreased 10%; that used in road construction and maintenance, 13%; in railroad ballast, 70%; and for "Other uses", 15%. The very significant decrease in railroad ballast use in 1977 was attributed primarily to the closing of the Atchison, Topeka, and Santa Fe Railway Co. volcanic cinder pit in Arizona during the year.

Table 1.—Pumice, pumicite, and volcanic cinder sold or used in the United States¹

(Thousand short tons and thousand dollars)

Year	Pumice and pumicite		Volcanic cinder		Total	
	Quantity	Value	Quantity	Value	Quantity	Value
1973	824	3,612	3,113	5,269	3,937	8,881
1974	873	3,669	3,064	5,452	3,937	9,121
1975	790	3,498	3,102	7,710	3,892	11,208
1976	906	3,830	3,228	6,636	4,134	10,466
1977	1,178	4,625	2,831	7,340	4,009	11,965

¹Values f.o.b. mine or mill.

Table 2.—Pumice, pumicite, and volcanic cinder sold or used by producers in the United States, by State

(Thousand short tons and thousand dollars)

State	1976		1977	
	Quantity	Value	Quantity	Value
Arizona	802	1,240	621	1,226
California	705	3,245	636	3,838
Hawaii	330	636	260	574
Montana	5	8	5	7
Nevada	388	763	656	1,154
New Mexico	486	1,569	457	1,835
Oklahoma	1	W	1	W
Oregon	1,125	2,311	1,083	2,429
Utah	164	264	W	W
Washington	--	--	W	W
Other States ¹	128	439	290	902
Total	4,134	10,466	4,009	11,965
American Samoa	47	30	1	10

W Withheld to avoid disclosing individual company confidential data. Included with "Other States."

¹Colorado, Idaho, Oklahoma (value only), Utah (1977), and Washington (1977).

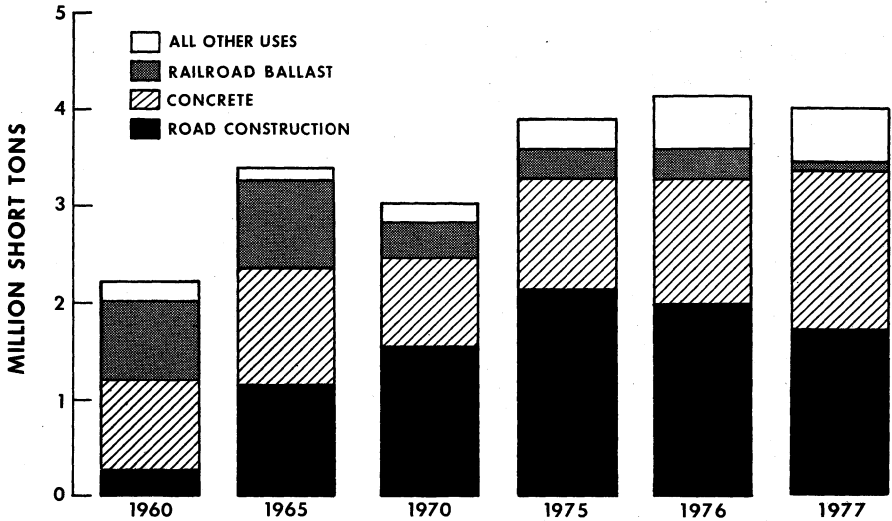


Figure 1.—Pumice and volcanic cinder sold or used by producers in the United States, by use.

Table 3.—Pumice, pumicite, and volcanic cinder sold and used by producers in the United States, by use

(Thousand short tons and thousand dollars)

Use	1976		1977	
	Quantity	Value	Quantity	Value
Abrasives (includes cleaning and scouring compounds) -----	29	706	26	749
Concrete admixture and concrete aggregate -----	1,293	3,397	1,659	4,487
Landscaping -----	302	1,340	320	1,853
Railroad ballast -----	310	422	94	192
Road construction (includes ice control and maintenance) -----	1,980	3,119	1,722	2,990
Other uses ¹ -----	220	1,482	188	1,694
Total -----	4,134	10,466	4,009	11,965

¹Includes absorbents, heat-or-cold insulating medium, roofing granules, soil conditioners, and miscellaneous uses.

PRICES

The weighted average value of pumiceous materials produced domestically in 1977 was \$2.98 per ton, an 18% increase compared with that of 1976. The average value for crude material increased from \$1.20 per ton to \$1.43 per ton, and that for prepared material increased from \$4.15 per ton to \$4.38 per ton.

Average prices per ton for pumiceous materials in all major uses were higher in 1977 compared with those of 1976. The average price of pumiceous materials used for abrasives (including cleaning and scouring compounds) was \$28.81 per ton, a \$4.47 increase; for concrete admixtures and

aggregate, \$2.70, a \$0.07 increase; for landscaping, \$5.79, a \$1.35 increase; for railroad ballast, \$2.04, a \$0.68 increase; for road construction material, \$1.74, a \$0.16 increase; and for all other reported uses, \$9.01, a \$2.27 increase.

Quoted prices for pumice and pumicite in trade publications in 1977 were as follows: Quoted prices at yearend in the American Paint and Coatings Journal, per pound, bagged, f.o.b. New York or Chicago, were \$0.0445 to \$0.02 (\$0.0445 to \$0.08 at yearend 1976) for powdered pumice, and \$0.0665 to \$0.09 for lump pumice (unchanged from 1976). Quoted prices at yearend in Chemical

Marketing Reporter for domestic grades, bagged in 1-ton lots were for fine, \$0.0765 to \$0.1140 per pound; medium, \$0.1160 per pound; and coarse, \$0.094 per pound. Prices for imported (Italian) silk-screened pumice,

bagged in 1-ton lots were for fine, \$138 per ton; medium, \$150 per ton; and coarse, \$140 per ton. The price of imported small-lump and large-lump pumice was quoted at \$275 per ton.

FOREIGN TRADE

The 3-year decline in exports of pumice and pumicite ended in 1977. Producers shipped nearly 1,800 tons to foreign countries during the year, or 78% more than the quantity exported in 1976. Average value of 1977 exports were \$287 per ton compared with \$268 per ton the previous year, Canada received most of the exported material (1,428 tons), followed by Israel (116 tons), and France (91 tons).

A substantial increase in imports of pumice and pumicite during the year reversed the rapid 2-year decline that had resulted in 1976 in the lowest quantity imported since 1962. Compared with that in 1976, imports increased over 200% to 253,463 tons. Of the

total quantity of pumice imported, Greece supplied 85% and Italy contributed 15%. The bulk of the pumice imported (97%) was used in the manufacture of concrete masonry products, and the quantity was 220% greater than that of 1976.

Table 4.—U.S. exports of pumice

Year	Quantity (short tons)	Value (thousands)
1974	2,911	\$1,211
1975	1,252	1,027
1976	1,011	271
1977	1,797	516

Table 5.—U.S. imports for consumption of pumice, by class and country

Country	Crude or unmanufactured		Wholly or partly manufactured		Used in the manufacture of concrete masonry products		Manufactured, n.s.p.f. value (thousands)
	Quantity (short tons)	Value (thousands)	Quantity (short tons)	Value (thousands)	Quantity (short tons)	Value (thousands)	
1976:							
Austria	---	---	---	---	---	---	\$7
Canada	229	\$46	---	---	---	---	10
China, People's Republic of	---	---	---	---	---	---	10
Greece	---	---	1	(¹)	25,794	\$46	1
Italy	3,115	102	1,108	\$86	51,154	217	19
Netherlands	---	---	---	---	---	---	9
Other ²	---	---	(¹)	(¹)	---	---	14
Total	3,844	148	1,109	86	76,948	263	70
1977:							
Austria	---	---	---	---	---	---	11
Canada	---	---	---	---	---	---	10
Germany, Federal Republic of	1	(¹)	(¹)	2	---	---	18
Greece	938	8	---	---	215,453	733	1
Italy	5,352	197	964	79	30,755	129	80
Other ³	---	---	---	---	---	---	13
Total	6,291	205	964	81	246,208	912	133

¹Less than 1/2 unit.

²The Federal Republic of Germany, Japan, Mexico, the United Kingdom, Taiwan.

³Japan, Mexico, Switzerland, the United Kingdom.

WORLD REVIEW

Portugal.—Development of pumice deposits on the Island of São Miguel in the Azores was reported to be underway in early 1977.^a Mining and processing operations were being handled through a joint

venture of Francis Concrete, Ltd., of the United Kingdom and PEPON-Sociedade Industrial de Pedra-Pones Dos Açores Lda. Processing installations were completed in January at Ponta Delgada, about 12 miles

from the deposit area. Initial washing and screening operations at the plant are rated at 150 tons per hour. Plans to increase capacity to 250 tons per hour by mid-1978

were reportedly being considered.

¹Industry economist, Division of Nonmetallic Minerals.
²Industrial Minerals (London). Pumice—a Dual Role in Industry. No. 120, September 1977, p. 20.

Table 6.—Pumice and related volcanic materials: World production by country

(Thousand short tons)

Country ¹	1975	1976	1977 ²
Argentina ²	75	63	70
Austria:Pozzolan	14	13	10
Cape Verde Islands: Pozzolan ³	17	17	17
Chile: Pozzolan	⁴ 165	109	110
Costa Rica ⁴	2	1	1
Dominica: Pumice and volcanic ash	117	⁵ 120	⁶ 120
Egypt	⁷ (⁸)	⁹ (⁸)	⁹ (⁸)
France: pozzolan and volcanic ash	¹⁰ 765	790	¹¹ 780
Germany, West:			
Pumice (marketable)			
Pozzolan	2,111	2,551	¹² 1,875
Greece:	144	110	¹³ 120
Pumice	580	441	626
Pozzolan	¹⁴ 938	1,081	1,385
Guadeloupe: Pozzolan	220	¹⁵ 220	¹⁶ 220
Guatemala: Volcanic ash (for cement)	17	26	¹⁷ 27
Iceland	¹⁸ 4	42	8
Italy:			
Pumice and pumiceous lapilli	744	¹⁹ 750	²⁰ 770
Pozzolan	6,128	²¹ 6,600	²² 6,600
Martinique: Pumice	86	²³ 90	²⁴ 90
New Zealand	42	55	²⁵ 55
Spain ⁵	153	²⁶ 155	²⁷ 165
United States (sold or used by producers):			
Pumice and pumicite	790	906	1,178
Volcanic cinder ⁸	3,117	3,275	2,883
Total	²⁸ 16,229	17,375	17,060

⁰Estimate. ¹Preliminary. ²Revised.

³Pumice is also produced in a number of other countries, including (but not limited to) Iran, Japan, Mexico, Turkey, and the U.S.S.R. (sizeable quantity), but output is not reported quantitatively and available general information is inadequate for the formulation of reliable estimates of output levels.

⁴Unspecified volcanic materials produced mainly for use in construction products.

⁵Less than 1/2 unit.

⁶Exports.

⁷Includes Canary Islands.

⁸Includes American Samoa.

