

GARNET (INDUSTRIAL)¹

(Data in metric tons of garnet, unless otherwise noted)

Domestic Production and Use: Garnet for industrial use was mined in 1997 by six firms, three in New York, two in Montana, and one in Idaho. Output of crude garnet was valued at \$8 million, while refined material sold or used was valued at \$13 million. Major end uses for garnet were abrasive blasting media, 45%; water filtration, 15%; waterjet cutting, 10%; and abrasive powders, 10%.

Salient Statistics—United States:	1993	1994	1995	1996	1997^e
Production (crude)	55,800	51,000	53,000	68,200	71,000
Sold by producers	44,000	51,000	46,100	58,500	68,000
Imports for consumption ^e	12,200	6,000	6,000	8,000	8,000
Exports ^e	11,400	10,000	8,500	13,000	13,000
Consumption, apparent	44,800	47,000	45,600	51,500	59,000
Price, range of value, dollars per ton ²	100-2,000	100-2,000	85-1,500	50-2,000	50-2,000
Stocks, producer ^e	10,000	10,000	8,000	10,000	14,000
Employment, mine and mill, number	150	160	180	210	250
Net import reliance ³ as a percent of apparent consumption	2	E	E	E	E

Recycling: Relatively small amounts of garnet reportedly are recycled.

Import Sources (1993-96^e): Australia, 85%; India, 10%; and China, 5%.

Tariff:	Item	Number	Most favored nation (MFN) 12/31/97	Non-MFN⁴ 12/31/97
	Emery, natural corundum, natural garnet, and other natural abrasives, crude	2513.20.1000	Free	Free.
	Emery, natural corundum, natural garnet, and other natural abrasives, other than crude	2513.20.9000	0.3¢/kg.	2.2¢/kg.
	Natural abrasives on woven textile	6805.10.0000	1% ad val.	20% ad val.
	Natural abrasives on paper or paperboard	6805.20.0000	1% ad val.	20% ad val.
	Natural abrasives sheets, strips, disks, belts, sleeves, or similar form	6805.30.1000	1% ad val.	20% ad val.

Depletion Allowance: 14% (Domestic), 14% (Foreign).

Government Stockpile: None.

GARNET (INDUSTRIAL)

Events, Trends, and Issues: A new garnet company, the second in two years, began reporting production in Montana. Production capacity in the United States and abroad is expanding in response to anticipated increases in demand. Some forecasts indicate that global markets for industrial garnet may grow beyond 300,000 tons within 5 years. Markets for blasting media and water jet cutting are expected to lead demand. Additional capacity planned in the United States and worldwide would help to restrain price increases.

World Mine Production, Reserves, and Reserve Base:

	Mine production		Reserves ⁵	Reserve base ⁵
	1996	1997 ^e		
United States	68,200	73,000	5,000,000	25,000,000
Australia	40,000	40,000	1,000,000	7,000,000
China	15,000	15,000	Moderate to Large	Moderate to Large
India	15,000	15,000	500,000	20,000,000
Other countries	<u>17,000</u>	<u>17,000</u>	<u>6,500,000</u>	<u>20,000,000</u>
World total (rounded)	155,000	160,000	Moderate	Large

World Resources: World resources of garnet are large and occur in a wide variety of rocks, particularly gneisses and schists. Garnet also occurs as contact-metamorphic deposits in crystalline limestones, pegmatites, and serpentinites, and in high-temperature intrusive contacts and vein deposits. In addition, alluvial garnet is a coproduct with many heavy mineral sand and gravel deposits throughout the world. Large domestic resources of garnet are concentrated in coarsely crystalline gneiss near North Creek, NY. Significant domestic resources of garnet also occur in Idaho, Maine, Montana, New Hampshire, North Carolina, and Oregon. In addition to the United States, major garnet deposits exist in Australia, China, and India, where they are mined for foreign and domestic markets; deposits in Russia and Turkey also have been mined in recent years, primarily for internal markets.

Substitutes: Other natural and manufactured abrasives could serve as substitutes to some extent for all major end uses of garnet. In many cases, however, the substitutes would entail sacrifices in quality or cost. Fused aluminum oxide and staurolite compete with garnet as a sandblasting material. Ilmenite, magnetite, and plastics compete as filtration media. Diamond, corundum, and fused aluminum oxide compete for lens grinding and for many lapping operations. Emery is a substitute in nonskid surfaces. Finally, quartz sand, silicon carbide, and fused aluminum oxide compete for the finishing of plastics, wood furniture, and other products.

^eEstimated. E Net exporter.

¹Excludes gem and synthetic garnet.

²Includes both crude and refined garnet. Most prices range from \$160 to \$350 per ton.

³Defined as imports - exports + adjustments for industry stock changes.

⁴See Appendix B.

⁵See Appendix D for definitions.