## **GARNET (INDUSTRIAL)**<sup>1</sup>

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

<u>Domestic Production and Use</u>: Garnet for industrial use was mined in 2002 by six firms, three in New York, two in Montana, and one in Idaho. The estimated value of crude garnet production was about \$5.3 million, while refined material sold or used had an estimated value of \$12.5 million. Major end uses for garnet were waterjet cutting, 35%; abrasive blasting media, 30%; water filtration, 15%; abrasive powders, 10%; and other end uses, 10%.

Salient Statistics—United States:	1998	1999	2000	2001	2002 <sup>e</sup>
Production (crude)	74,000	60,700	60,200	52,700	46,900
Sold by producers	51,900	43,900	51,300	46,200	42,200
Imports for consumption <sup>e</sup>	20,000	12,000	23,000	23,000	23,000
Exports <sup>e</sup>	12,000	10,000	10,000	10,000	10,400
Consumption, apparent <sup>e</sup>	39,900	33,700	66,300	59,300	58,900
Price, range of value, dollars per ton <sup>2</sup>	50-2,000	55-2,000	50-2,000	50-2,000	50-2,000
Stocks, producer <sup>e</sup>	39,900	52,100	50,100	50,000	45,900
Employment, mine and mill, number	230	220	220	220	220
Net import reliance <sup>3</sup> as a percentage					
of apparent consumption	E	Е	23	22	28

**Recycling:** Small amounts of garnet reportedly are recycled.

Import Sources (1998-2001): Australia, 53%; India, 37%; China, 9%; and other, 1%.

<u>Tariff</u> : Item	Number	Normal Trade Relations 12/31/02
Emery, natural corundum, natural garnet, and other natural abrasives, crude	2513.20.1000	Free.
Emery, natural corundum, natural garnet, and other natural abrasives,		
other than crude	2513.20.9000	Free.
Natural abrasives on woven textile Natural abrasives on paper	6805.10.0000	Free.
or paperboard Natural abrasives sheets, strips,	6805.20.0000	Free.
disks, belts, sleeves, or similar form	6805.30.1000	Free.

**Depletion Allowance:** 14% (Domestic and foreign).

Government Stockpile: None.

## **GARNET (INDUSTRIAL)**

**Events, Trends, and Issues:** During 2002, U.S. garnet consumption decreased slightly, while domestic production of crude garnet concentrates declined by 11% from that of 2001. In 2002, imports were estimated to have remained about the same as those of 2001, and exports were estimated to have increased slightly from those of 2001. The 2002 domestic sales of garnet declined slightly from the 2001 level. Since 1999, the United States has moved from being a net exporter to being a net importer. Garnet imports have displaced U.S. production in the domestic market, with India becoming a major garnet supplier.

**World Mine Production, Reserves, and Reserve Base:** 

	Mine production		Reserves⁴	Reserve base⁴	
	<u>2001</u>	2002 <sup>e</sup>			
United States	52,700	46,900	5,000,000	25,000,000	
Australia	125,000	127,000	1,000,000	7,000,000	
China	25,000	27,000	Moderate to Large	Moderate to Large	
India	60,000	63,000	90,000	5,400,000	
Other countries	20,000	21,000	<u>6,500,000</u>	20,000,000	
World total (rounded)	283,000	285,000	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, serpentinites, and vein deposits. In addition, alluvial garnet is present in many heavy mineral sand and gravel deposits throughout the world. Large domestic resources of garnet also are concentrated in coarsely crystalline gneiss near North Creek, NY, and other significant domestic resources of garnet 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. Additional garnet resources are located in Canada, Chile, Czech Republic, Pakistan, South Africa, Spain, Thailand, and Ukraine; small mining operations have been reported in most of these areas.

<u>Substitutes</u>: Other natural and manufactured abrasives can substitute 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.

<sup>&</sup>lt;sup>e</sup>Estimated. E Net exporter.

<sup>&</sup>lt;sup>1</sup>Excludes gem and synthetic garnet.

<sup>&</sup>lt;sup>2</sup>Includes both crude and refined garnet; most crude concentrate is \$50 to \$150 per ton, and most refined material is \$150 to \$450 per ton.

<sup>&</sup>lt;sup>3</sup>Defined as imports - exports + adjustments for industry stock changes.

<sup>&</sup>lt;sup>4</sup>See Appendix C for definitions.