

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

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

**Domestic Production and Use:** Garnet for industrial use was mined in 2001 by six firms, three in New York, two in Montana, and one in Idaho. Output of crude garnet was valued at more than \$6.2 million, while refined material sold or used was valued at \$13.4 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%.

<b>Salient Statistics—United States:</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>2001<sup>e</sup></b>
Production (crude)	64,900	74,000	60,700	60,200	52,500
Sold by producers	53,600	51,900	43,900	51,300	47,400
Imports for consumption <sup>e</sup>	10,000	20,000	12,000	23,000	25,000
Exports <sup>e</sup>	12,000	12,000	10,000	10,000	10,000
Consumption, apparent <sup>e</sup>	46,300	39,900	39,100	63,800	59,600
Price, range of value, dollars per ton <sup>2</sup>	50-2,000	50-2,000	55-2,000	50-2,000	50-2,000
Stocks, producer <sup>e 3</sup>	19,900	39,900	46,700	47,200	50,000
Employment, mine and mill, number	250	230	220	220	220
Net import reliance <sup>4</sup> as a percentage of apparent consumption	E	E	E	20	20

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

**Import Sources (1997-2000)<sup>e</sup>:** Australia, 60%; India, 30%; and China, 10%.

<b>Tariff:</b>	<b>Item</b>	<b>Number</b>	<b>Normal Trade Relations 12/31/01</b>
	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	6805.10.0000	Free.
	Natural abrasives on paper or paperboard	6805.20.0000	Free.
	Natural abrasives sheets, strips, disks, belts, sleeves, or similar form	6805.30.1000	Free.

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

**Government Stockpile:** None.

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**Events, Trends, and Issues:** During 2001, U.S. garnet consumption decreased 7%, while domestic production of crude garnet concentrates declined by 18% from that of 2000. In 2001, imports were estimated to have increased 9% over 2000, and exports were estimated to be the same as 2000. The 2001 domestic sales of garnet declined by 8% from their 2000 level. Markets for waterjet cutting continue to grow, while blasting media markets have decreased and water filtration and abrasive powder markets have remained stable. Sweetwater Garnet, Inc., near Dillon, MT, was purchased in July 2000 by Stansbury Holdings Corp. Sweetwater processed accumulated stocks through the end of 2000, and began mining again in 2001. Australia and India continue to grow as important garnet exporters.

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

	Mine production		Reserves <sup>5</sup>	Reserve base <sup>5</sup>
	2000	2001 <sup>e</sup>		
United States	60,200	52,500	5,000,000	25,000,000
Australia	125,000	125,000	1,000,000	7,000,000
China	25,000	25,000	Moderate to Large	Moderate to Large
India	60,000	62,500	100,000	10,000,000
Other countries	<u>20,300</u>	<u>27,000</u>	<u>6,500,000</u>	<u>20,000,000</u>
World total (may be rounded)	291,000	292,000	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, the Czech Republic, Pakistan, South Africa, Spain, Thailand, and Ukraine; small mining operations have been reported in most of these areas.

**Substitutes:** 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>e</sup>Estimated. E Net exporter.

<sup>1</sup>Excludes gem and synthetic garnet.

<sup>2</sup>Includes both crude and refined garnet; most crude concentrate is \$50 to \$100 per ton, and most refined material is \$150 to \$400 per ton.

<sup>3</sup>The large increase shown for producer stocks between 1997 and 1998 is based on improved, more accurate stock-estimating methods. Estimates were revised only back to 1998.

<sup>4</sup>Defined as imports - exports + adjustments for industry stock changes.

<sup>5</sup>See Appendix C for definitions.