

GARNET (INDUSTRIAL)¹

(Data in metric tons of garnet unless otherwise noted)

Domestic Production and Use: Garnet for industrial use was mined in 2013 by four firms—one in Idaho, one in Montana, and two in New York. The estimated value of crude garnet production was about \$8.6 million, while refined material sold or used had an estimated value of \$7.1 million. Major end uses for garnet were waterjet cutting, 35%; abrasive blasting media, 30%; water filtration, 20%; abrasive powders, 10%; and other end uses, 5%.

Salient Statistics—United States:	2009	2010	2011	2012	2013^e
Production (crude)	45,600	52,600	56,400	46,900	47,000
Production (refined, sold or used)	22,100	28,900	33,700	25,800	26,000
Imports for consumption ^e	71,100	79,700	116,000	166,000	160,000
Exports ^e	13,200	11,700	14,500	14,600	15,000
Consumption, apparent ^{e, 2}	104,000	121,000	158,000	199,000	192,000
Price, range of value, dollars per ton ³	50–2,000	50–2,000	50–2,000	50–2,000	50–2,000
Employment, mine and mill, number ^e	160	160	160	160	160
Net import reliance ⁴ as a percentage of apparent consumption	56	56	64	76	76

Recycling: Small amounts of garnet reportedly are recycled.

Import Sources (2009–12):^e Australia, 45%; India, 43%; China, 10%; and other, 2%.

Tariff:	Item	Number	Normal Trade Relations 12–31–13
	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 2013, domestic U.S. production of crude garnet concentrates was essentially the same as the production in 2012. U.S. garnet consumption decreased slightly compared with that of 2012. The United States consumed about 11% of global garnet production. In 2013, imports were estimated to have decreased by 4% compared with those of 2012, and exports were estimated to have increased slightly from those of 2012. The 2013 estimated domestic sales or use of refined garnet was essentially the same as the sales in 2012. In 2013, the United States remained a net importer. Garnet imports have supplemented U.S. production in the domestic market; Australia, Canada, China, and India were major garnet suppliers.

The garnet market is very competitive. To increase profitability and remain competitive with foreign imported material, production may be restricted to only high-grade garnet ores or other salable mineral products that occur with garnet, such as kyanite, marble, mica minerals, sillimanite, staurolite, wollastonite, or metallic ores.

World Mine Production and Reserves:

	Mine production		Reserves ⁵
	2012	2013 ^e	
United States	46,900	47,000	5,000,000
Australia	263,000	260,000	Moderate to Large
China	510,000	510,000	Moderate to Large
India	800,000	800,000	6,700,000
Other countries	50,000	83,000	6,500,000
World total (rounded)	1,670,000	1,700,000	Moderate to Large

World Resources: World resources of garnet are large and occur in a wide variety of rocks, particularly gneisses and schists. Garnet also occurs in 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; other significant domestic resources of garnet occur in Idaho, Maine, Montana, New Hampshire, North Carolina, and Oregon. In addition to those in the United States, major garnet deposits exist in Australia, Canada, 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 in Chile, Czech Republic, Pakistan, South Africa, Spain, Thailand, and Ukraine; small mining operations have been reported in most of these countries.

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. Quartz sand, silicon carbide, and fused aluminum oxide compete for the finishing of plastics, wood furniture, and other products.

^eEstimated.

¹Excludes gem and synthetic garnet.

²Defined as crude production – exports + imports.

³Includes crude and refined garnet; most crude concentrate is \$75 to \$210 per ton, and most refined material is \$75 to \$290 per ton.

⁴Defined as imports – exports.

⁵[See Appendix C for resource/reserve definitions and information concerning data sources.](#)