

GARNET (INDUSTRIAL)¹

(Data in metric tons of garnet unless otherwise noted)

Domestic Production and Use: Garnet for industrial use was mined in 2016 by four firms—one in Idaho, one in Montana, and two in New York. The estimated value of crude garnet production was about \$7.7 million, and refined material sold or used had an estimated value of \$11 million. Major end uses for garnet were: waterjet cutting, abrasive blasting media, water filtration, abrasive powders, and other end uses. Domestic industries that consume garnet include aircraft and motor vehicle manufacturers, ceramics and glass producers, electronic component manufacturers, filtration plants, glass polishing, the petroleum industry, shipbuilders, textile stonewashing, and wood-furniture-finishing operations.

Salient Statistics—United States:	2012	2013	2014	2015	2016^e
Production (crude)	38,700	51,600	44,200	55,600	52,300
Production (refined, sold or used)	29,100	40,200	34,700	38,000	38,000
Imports for consumption ^e	166,000	148,000	213,000	238,000	209,000
Exports ^e	14,600	14,400	15,400	14,700	14,000
Consumption, apparent ^{e, 2}	190,000	185,000	242,000	279,000	248,000
Employment, mine and mill, number ^e	80	110	105	110	105
Net import reliance ³ as a percentage of apparent consumption	80	72	82	80	79

Recycling: Small quantities of garnet reportedly are recycled.

Import Sources (2012–15):^e Australia, 40%; India, 31%; South Africa, 9%; China, 6%; and other, 14%.

Tariff:	Item	Number	Normal Trade Relations 12–31–16
	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 2016, estimated domestic production of crude garnet concentrates decreased by 6% compared with production of 2015. U.S. garnet production was 3% of total global garnet production. Estimated 2016 U.S. garnet consumption decreased by 11% compared with that of 2015. The United States consumed about 15% of global garnet production. In 2016, imports were estimated to have decreased by 12% compared with those of 2015, and exports were estimated to have decreased slightly from those of 2015. The 2016 estimated domestic sales or use of refined garnet remained stable compared with sales in 2015. In 2016, the United States remained a net importer. Garnet imports have supplemented U.S. production in the domestic market; Australia, India, South Africa, and China, in decreasing order of tonnage, were major garnet suppliers.

Garnet prices during 2016 varied over a wide range per ton, depending on the amount of processing and refining, degree of fracturing, garnet mineral type, quality, and quantity purchased. Most crude garnet concentrate was priced from \$100 to \$225 per ton, and most refined material was \$100 to \$400 per ton. The average value of garnet imports was \$204 per ton, which was a slight decrease compared to the average value in 2015.

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, metallic ores, mica minerals, sillimanite, staurolite, or wollastonite.

World Mine Production and Reserves:

	Mine production		Reserves ⁴
	<u>2015</u>	<u>2016^e</u>	
United States	55,600	52,300	5,000,000
Australia	260,000	260,000	Moderate to Large
China	520,000	520,000	Moderate to Large
India	800,000	800,000	19,000,000
Other countries	<u>50,000</u>	<u>50,000</u>	<u>6,500,000</u>
World total (rounded)	1,690,000	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, the 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, using 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. Corundum, diamond, and fused aluminum oxide compete for lens grinding and for many lapping operations. Emery is a substitute in nonskid surfaces. Fused aluminum oxide, quartz sand, and silicon carbide compete for the finishing of plastics, wood furniture, and other products.

^eEstimated.

¹Excludes gem and synthetic garnet.

²Defined as crude production + imports – exports.

³Defined as imports – exports.

⁴See [Appendix C](#) for resource and reserve definitions and information concerning data sources.