

GARNET (INDUSTRIAL)¹

(Data in metric tons of garnet unless otherwise noted)

Domestic Production and Use: Garnet for industrial use was mined in 2015 by four firms—one in Idaho, one in Montana, and two in New York. The estimated value of crude garnet production was about \$5.79 million, and refined material sold or used had an estimated value of \$9.33 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%. 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:	2011	2012	2013	2014	2015^e
Production (crude)	56,400	46,900	33,900	32,200	34,000
Production (refined, sold or used)	33,700	25,800	32,600	30,900	32,700
Imports for consumption ^e	154,000	222,000	197,000	213,000	266,000
Exports ^e	14,500	14,600	14,400	15,500	15,200
Consumption, apparent ^{e, 2}	196,000	254,000	216,000	230,000	285,000
Employment, mine and mill, number ^e	160	160	160	150	150
Net import reliance ³ as a percentage of apparent consumption	71	82	84	86	88

Recycling: Small quantities of garnet reportedly are recycled.

Import Sources (2011–14):^e Australia, 46%; India, 38%; China, 8%; and other, 8%.

Tariff:	Item	Number	Normal Trade Relations 12–31–15
	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 2015, estimated domestic U.S. production of crude garnet concentrates increased by 6% compared with production of 2014. U.S. garnet production was 2% of total global garnet production. U.S. garnet consumption increased by 24% compared with that of 2014. The United States consumed about 17% of global garnet production. In 2015, imports were estimated to have increased by 25% compared with those of 2014, and exports were estimated to have decreased slightly from those of 2014. The 2015 estimated domestic sales or use of refined garnet increased by 6% compared with sales in 2014. In 2015, 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.

Garnet prices during 2015 varied over a wide range per metric ton, depending on the amount of processing and refining, degree of fracturing, garnet mineral type, quality, and quantity purchased. Most crude garnet concentrate is priced from \$75 to \$210 per ton, and most refined material is \$200 to \$335 per ton. The average value of garnet imports was \$213 per ton, which was a slight increase compared to the average value in 2014.

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: The reserves data for India were revised based on information reported by the Government of India.

	Mine production		Reserves ⁴
	<u>2014</u>	<u>2015^e</u>	
United States	32,200	34,000	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)	1,660,000	1,660,000	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 – exports + imports.

³Defined as imports – exports.

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