GARNET (INDUSTRIAL)[1]

(Data in metric tons of garnet unless otherwise noted)

Domestic Production and Use: In 2019, garnet for industrial use was mined by four firms—one in Idaho, one in Montana, and two in New York. One processing facility operated in Pennsylvania and another opened in Oregon in June. The estimated value of crude garnet production was about $21 million, and refined material sold or used had an estimated value of $62 million. The major end uses of garnet were, in descending percentage of consumption, for abrasive blasting, water-filtration media, water-jet-assisted cutting, and other end uses, such as in abrasive powders, nonslip coatings, and sandpaper. 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:	2015	2016	2017	2018	2019[e]
Production (crude)	77,200	81,300	92,900	101,000	93,000
Production (refined, sold or used)	47,200	46,600	84,100	166,000	140,000
Imports for consumption[e, 2]	212,000	156,000	54,200	254,000	180,000
Exports[e]	11,000	10,100	17,700	14,200	12,000
Consumption, apparent[e, 3]	278,000	227,000	129,000	341,000	260,000
Price, average value, dollars per ton, import	230	200	300	210	250
Stocks, yearend	NA	NA	NA	NA	NA
Employment, mine and mill, number[e]	110	110	140	170	160
Net import reliance[4] as a percentage of apparent consumption	72	64	28	70	64

Recycling: Garnet was recycled in Pennsylvania at a plant with a recycling capacity of 25,000 tons per year and at a new plant in Oregon, with a recycling capacity of 16,000 tons per year, that opened in June 2019. Garnet can be recycled multiple times without degradation of its quality. Most recycled garnet is from blast cleaning and water-jet-assisted cutting operations.

Import Sources (2015–18):[e] Australia, 30%; India, 30%; South Africa, 26%; China, 10%; and other, 4%.

Tariff: Item	Number	Normal Trade Relations 12–31–19
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.

Depletion Allowance: 14% (Domestic and foreign).

Government Stockpile: None.

Events, Trends, and Issues: During 2019, estimated domestic production of crude garnet concentrates decreased by 8% compared with production in 2018. U.S. garnet production was estimated to be about 8% of total global garnet production. The 2019 estimated domestic sales or use of refined garnet decreased by 12% compared with sales in 2018. This decrease was thought to have taken place because of high quantities of industry stocks of garnet and decreased crude garnet production and imports into the United States.

Prepared by **Kenneth C. Curry [(703) 648–7793, kcurry@usgs.gov]**

GARNET (INDUSTRIAL)

Garnet imports in 2019 were estimated to have decreased by 29% compared with those in 2018. Most of the decrease was attributed to a lack of imports of garnet from South Africa, owing to the Pennsylvania processing facility reaching its storage capacity. Imports from India remained steady and continued to recover from previous export restrictions. Imports from China increased and somewhat offset the decrease from South Africa. In 2019, the average unit value of garnet imports was $250 per ton, an increase of 19% compared with the average unit value in 2018. In the United States, most domestically produced crude garnet concentrate was priced at about $230 per ton. U.S. exports in 2019 were estimated to have decreased by 15%.

The United States consumed about 22% of global garnet production and world production of garnet decreased by 4% in 2019. Garnet production increased in Australia and China; garnet production decreased in India and South Africa.

The garnet market is very competitive. To increase profitability and remain competitive with imported material, production may be restricted to only high-grade garnet ores or as a byproduct of 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: Data for China were revised based on a new data source, which nearly tripled estimated production compared with previously published data.

	Mine production		Reserves[5]
	2018	2019[e]	
United States	101,000	93,000	5,000,000
Australia	360,000	400,000	Moderate to Large
China	290,000	310,000	Moderate to Large
India	162,000	150,000	13,000,000
South Africa	278,000	190,000	NA
Other countries	60,000	60,000	6,500,000
World total (rounded)	1,250,000	1,200,000	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, India, and South Africa, 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, Czechia, Pakistan, 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.

[e]Estimated. NA Not available.

[1]Excludes gem and synthetic garnet.

[2]Source: U.S. Census Bureau and Trade Mining, LLC; adjusted by U.S. Geological Survey.

[3]Defined as crude production + imports – exports.

[4]Defined as imports – exports.

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