GRAPHITE (NATURAL)

(Data in metric tons unless otherwise specified)

Domestic Production and Use: In 2024, natural graphite was not produced in the United States; however, approximately 100 companies, primarily in the Great Lakes and Northeast regions, consumed 52,000 tons valued at an estimated $115 million. The major uses of natural graphite were batteries, brake linings, lubricants, powdered metals, refractory applications, and steelmaking. During 2024, U.S. natural graphite imports were an estimated 60,000 tons, consisting of 87.7% flake and high-purity, 11.8% amorphous, and 0.5% lump and chip graphite.

Salient Statistics—United States:	2020	2021	2022	2023	2024[e]
Production, mine	—	—	—	—	—
Imports for consumption	36,000	53,000	89,200	73,500	60,000
Exports	5,920	8,660	9,500	7,780	8,400
Consumption, apparent[1]	30,000	44,300	79,700	65,700	52,000
Price, average unit value of imports, dollars per metric ton at foreign ports:					
Flake	1,340	1,330	1,200	1,080	1,070
Lump and chip (Sri Lanka)	2,940	2,010	2,590	2,380	2,900
Amorphous	567	629	563	607	640
Net import reliance[1] as a percentage of apparent consumption	100	100	100	100	100

Recycling: Refractory brick and linings, alumina-graphite refractories for continuous metal castings, magnesia-graphite refractory brick for basic oxygen and electric arc furnaces, and insulation brick was increasing, with material being recycled into products such as brake linings and thermal insulation. The abundance of graphite in the world market inhibits increased recycling efforts. Information on the quantity and value of recycled graphite is not available.

Import Sources (2020–23): China,[2] 43%; Canada, 13%; Mexico, 13%; Mozambique, 13%; and other, 18%.

Tariff: Item	Number	Normal Trade Relations 12–31–24
Crystalline flake (not including flake dust)	2504.10.1000	Free.
Powder	2504.10.5000	Free.
Other	2504.90.0000	Free.

Depletion Allowance: Lump and amorphous, 22% (domestic) and flake, 14% (domestic); 14% (foreign).

Government Stockpile: None.

Events, Trends, and Issues: U.S. natural graphite imports, by tonnage, were 20% lower during the first 8 months of 2024 compared with those in the same period in 2023. Apparent consumption decreased by an estimated 21%, attributed to decreased demand from the battery industry and increased availability of synthetic graphite battery material from China. Prices for fine flake graphite have decreased by 20% through the first 10 months of 2024.[3] Prices for medium flake and larger have increased by about 10% through the first 10 months of 2024.

In 2024, China was the world's leading graphite producer, producing an estimated 78% of total world production. Approximately 15% of graphite produced in China was amorphous and about 85% was flake. During the first 8 months of the year, China exported 38,200 tons of flake graphite concentrate, 25% less than the 50,700 tons exported in the same period in 2023. Exports during the first 2 months of 2024 were 78% less compared with those in 2023, but 4% less from March to October. During the first 8 months of 2024, China exported 25,500 tons of spherical graphite, 28% less than the 35,600 tons exported in 2023. Exports during the first 2 months of 2024 were 65% less compared with those in 2023 and were 19% less in the next 6 months. The decrease early in the year was likely due to licensing delays related to the export restrictions that took effect in December 2023. The leading recipients of natural flake graphite from China in 2024 were the Republic of Korea (21%), Japan (20%), Germany (17%), and the United States (6%). The leading recipients of spherical graphite from China in the first 8 months of 2024 were the Republic of Korea (49%), Japan (29%), and the United States (19%).

In 2024, three companies were awarded grants through U.S. Government programs. A company was awarded $8.3 million through the Defense Production Act, Title III, for the development of a natural flake graphite mine in Canada. The other two projects were awarded $125 million each, through the Bipartisan Infrastructure Law of 2021. One was for the development of battery-grade graphite recycling facilities in Kentucky and Louisiana, and the other was to develop a coated spherical graphite production facility in Alabama.

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GRAPHITE (NATURAL)

In May, the U.S. Department of the Treasury announced temporary extensions for rules regarding graphite imports from China. The rules had originally barred graphite from China, among other countries, for the electric vehicle tax credit eligibility. The temporary graphite exemption lasts until 2027. In May, the President announced an increase of the tariff rate on natural graphite sourced from China from 0% to 25% beginning in 2026.

Five companies were exploring or developing graphite-mining projects in the United States: two in Alabama, one in Alaska, one in Montana, and one in New York. In October, a company in Alabama released the results of a preliminary economic assessment. The company planned to produce 47,000 tons per year of graphite concentrate.

In February, a company began commercial production of spherical graphite in Vidalia, LA. The facility had an initial capacity of 11,300 tons per year. The company also continued work on a definitive feasibility study to expand capacity to 45,000 tons per year. An additional company continued construction of a spherical graphite facility in Kellyton, AL. Five other companies were developing or considering spherical graphite facilities in the United States.

Two flake graphite mines, located in Brazil and Tanzania, began production in 2024. Phase 1 production capacity at the Santa Cruz Mine in Brazil was 12,000 tons per year of graphite concentrate, potentially expanding up to 50,000 tons per year in later phases. At the Lindi Jumbo Mine in Tanzania, capacity was 40,000 tons per year of graphite concentrate. A Russian company continued to construct a graphite mine in Russia, with production scheduled to begin in late 2024. Capacity was an estimated 40,000 tons per year of flake graphite concentrate.

World Mine Production and Reserves: Reserves for Canada, China, Madagascar, and Vietnam were revised based on company and Government reports.

	Mine production		Reserves[4]
	2023	2024[e]	
United States	—	—	([5])
Austria	500	500	([5])
Brazil	66,300	68,000	74,000,000
Canada	5,470	20,000	5,900,000
China	1,210,000	1,270,000	81,000,000
Germany	180	170	([5])
India	25,600	27,800	8,600,000
Korea, North	[e]8,100	8,100	2,000,000
Korea, Republic of	9,620	9,600	1,800,000
Madagascar	[e]63,000	89,000	27,000,000
Mexico	1,300	900	3,100,000
Mozambique	[e]98,000	75,000	25,000,000
Norway	6,480	7,000	600,000
Russia	[e]15,000	20,000	14,000,000
Sri Lanka	3,000	3,300	1,500,000
Tanzania	[e]13,200	25,000	18,000,000
Turkey	2,800	3,100	6,900,000
Ukraine	1,670	1,200	([5])
Vietnam	2,500	2,000	9,700,000
World total (rounded)	1,530,000	1,600,000	290,000,000

World Resources:[4] Domestic resources of graphite are relatively small, but the rest of the world's resources exceed 800 million tons of recoverable graphite.

Substitutes: Synthetic graphite powder, scrap from discarded machined shapes, and calcined petroleum coke compete for use in iron and steel production. Synthetic graphite powder and secondary synthetic graphite from machining graphite shapes compete for use in battery applications. Finely ground coke with olivine is a potential competitor in foundry-facing applications. Molybdenum disulfide competes as a dry lubricant but is more sensitive to oxidizing conditions.

[e]Estimated. — Zero.

[1]Defined as imports – exports.

[2]Includes Hong Kong.

[3]Source: Fastmarkets IM.

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

[5]Included in "World total."