GRAPHITE (NATURAL)

(Data in thousand metric tons unless otherwise noted)

Domestic Production and Use: Although natural graphite was not produced in the United States in 2007, approximately 100 U.S. firms, primarily in the Northeastern and Great Lakes regions, used it for a wide variety of applications. The major uses of natural graphite in 2007 were refractory applications, 36%; brake linings, 15%; and batteries, foundry operations, and lubricants, 8%.

Salient Statistics—United States:	2003	2004	2005	2006	2007[e]
Production, mine	—	—	—	—	—
Imports for consumption	52	64	65	53	55
Exports	22	46	22	22	23
Consumption, apparent[1]	30	18	43	30	32
Price, imports (average dollars per ton at foreign ports):					
Flake	619	485	512	528	598
Lump and chip (Sri Lankan)	2,270	2,420	2,550	2,320	2,460
Amorphous	152	177	170	188	194
Stocks, yearend	NA	NA	NA	NA	NA
Net import reliance[2] 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 led the way in recycling of graphite products. The market for recycled refractory graphite material is growing with material being recycled into products, such as brake linings and thermal insulation.

Recovering high-quality flake graphite from steelmaking kish is technically feasible, but not practiced at the present time. Abundance of graphite in the world market and continuing low prices inhibit increased recycling efforts. Information on the quantity and value of recycled graphite is not available.

Import Sources (2003-06): China, 46%; Mexico, 23%; Canada, 18%; Brazil, 6%; and other, 7%.

Tariff: Item	Number	Normal Trade Relations 12-31-07
Crystalline flake (not including flake dust)	2504.10.1000	Free.
Other	2504.90.0000	Free.

Depletion Allowance: 22% (Domestic lump and amorphous), 14% (Domestic flake), and 14% (Foreign).

Government Stockpile: All stockpiled graphite inventories have been sold, and as of December 31, 2006, the National Defense Stockpile contained no graphite inventories.

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GRAPHITE (NATURAL)

Events, Trends, and Issues: Graphite was in near supply-demand balance worldwide in 2007. Leading sources for graphite imports were: flake graphite from China, Canada, Brazil, and Madagascar (in descending order of tonnage), graphite lump and chip from Sri Lanka; and amorphous graphite from Mexico and China (in descending order of tonnage). Advances in thermal technology and acid-leaching techniques that enable the production of higher purity graphite powders are likely to lead to development of new applications for graphite in high-technology fields. Such innovative refining techniques have enabled the use of improved graphite in carbon-graphite composites, electronics, foils, friction materials, and special lubricant applications. Flexible graphite product lines, such as graphoil (a thin graphite cloth), probably will be the fastest growing market. Large-scale fuel-cell applications are being developed that could consume as much graphite as all other uses combined.

World Mine Production, Reserves, and Reserve Base:

	Mine production		Reserves[3]	Reserve base[3]
	2006	2007[e]		
United States	—	—	—	1,000
Brazil	76	76	360	1,000
Canada	28	28	([4])	([4])
China	720	720	74,000	140,000
Czech Republic	3	3	1,300	14,000
Germany	3	—	([4])	([4])
India	120	120	800	3,800
Korea, North	32	32	([4])	([4])
Madagascar	15	15	940	960
Mexico	13	11	3,100	3,100
Norway	2	2	([4])	([4])
Sri Lanka	3	3	([4])	([4])
Turkey	1	1	([4])	([4])
Ukraine	8	8	([4])	([4])
Other countries	6	6	5,100	44,000
World total (rounded)	1,030	1,030	86,000	210,000

World Resources: Domestic resources of graphite are relatively small, but the rest of the world's inferred reserve base exceeds 800 million tons of recoverable graphite.

Substitutes: Manufactured graphite powder, scrap from discarded machined shapes, and calcined petroleum coke compete for use in iron and steel production. 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. NA Not available. — Zero.
[1]Defined as imports – exports.
[2]Defined as imports – exports + adjustments for Government and industry stock changes. Data on changes in stocks were not available and were assumed to be zero in the calculations.
[3]See Appendix C for definitions.
[4]Included with "Other countries."