BERYLLIUM

(Data in metric tons of contained beryllium, unless otherwise noted)

Domestic Production and Use: One company in Utah mined bertrandite ore and recovered beryllium hydroxide from this ore and from imported beryl. Beryllium hydroxide was shipped to a plant in Ohio, where it was converted into beryllium metal, alloys, and oxide. Another company in Pennsylvania purchased beryllium oxide and converted this material into beryllium alloys. Beryllium consumption of 240 tons was valued at about $80 million, based on the quoted producer price for beryllium-copper master alloy. The use of beryllium (as an alloy, metal, and oxide) in electronic and electrical components and aerospace and defense applications accounted for about 80% of consumption.

Salient Statistics—United States:	1995	1996	1997	1998	1999[e]
Production, mine shipments	202	211	231	243	235
Imports for consumption, ore and metal	32	20	20	50	20
Exports, metal	61	57	40	60	35
Shipments from Government stockpile excesses[1]	[2](19)	—	—	—	NA
Consumption: Apparent	198	197	240	260	240
Reported	227	234	259	270	NA
Price, dollars:					
Domestic, metal, vacuum-cast ingot, per pound	308	327	327	327	327
Domestic, metal, powder blend, per pound	385	385	385	385	385
Domestic, beryllium-copper master alloy, per pound of contained beryllium	160	160	160	160	160
Domestic, beryllium oxide, powder, per pound	70.50	77.00	77.00	77.00	77.00
Stocks, consumer, yearend	162	139	110	80	NA
Employment, number:					
Mine, full-time equivalent employees[e]	25	25	25	NA	NA
Primary refineries[e]	400	400	400	NA	NA
Net import reliance[3] as a percent of apparent consumption	E	E	4	8	2

Recycling: Quantities of new scrap generated in the processing of beryllium-copper alloys and quantities of obsolete military equipment containing metallic beryllium were recycled. Data on beryllium recycled in this manner are not available.

Import Sources (1995-98): Ore, metal, scrap, and master alloy: Kazakhstan, 25%; Russia, 21%; Canada, 17%; Germany, 9%; and other, 28%.

Tariff: Item	Number	Normal Trade Relations 12/31/99
Beryllium ore and concentrates	2617.90.0030	Free.
Beryllium oxide or hydroxide	2825.90.1000	3.7% ad val.
Beryllium-copper master alloy	7405.00.6030	Free.
Beryllium unwrought:		
Waste and scrap	8112.11.3000	Free.
Other	8112.11.6000	8.5% ad val.
Beryllium, wrought	8112.19.0000	5.5% ad val.

Depletion Allowance: 23% (Domestic), 15% (Foreign).

Government Stockpile:

Stockpile Status—9-30-99[4]

Material	Uncommitted inventory	Committed inventory	Authorized for disposal	Disposal plan FY 1999	Disposals FY 1999
Beryl ore (11% BeO)	387	124	387	73	73
Beryllium-copper master alloy	166	32	166	45	45
Beryllium metal	345	18	73	18	18

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BERYLLIUM

Events, Trends, and Issues: For the first one-half year, sales of beryllium products decreased compared with those of the previous year, affected most by delays in defense spending and a slowdown in the aerospace industry. Additionally, demand for copper beryllium alloys from the aerospace, oil and gas, and undersea cable system markets was weak. Imports for consumption of ore and metal decreased, with Canada providing all of the ore imports and Russia as the leading supplier of metal imports. Metal exports were down; the United Kingdom, Japan, Canada, and the Netherlands were the major recipients. Beryllium price quotations remained unchanged.

For fiscal year (FY) 1999, ending September 30, 1999, the Defense National Stockpile Center (DNSC) sold about 1,810 tons of beryl ore (about 73 tons of contained beryllium) valued at about $158,000, about 1,130 tons of beryllium copper master alloy (BCMA) (about 45 tons of contained beryllium) valued at about $6.3 million, and about 18 tons of beryllium metal valued at about $2.4 million from the National Defense Stockpile. The DNSC also proposed maximum disposal limits in FY 2000 of about 3,630 tons of beryl ore (about 145 tons of contained beryllium), about 1,360 tons of BCMA (about 54 tons of contained beryllium), and about 36 tons of beryllium metal.

Because of the toxic nature of beryllium, the industry must maintain careful control over the quantity of beryllium dust and fumes in the workplace. Under the Clean Air Act, the Environmental Protection Agency issues standards for certain hazardous air pollutants, including beryllium, and the Occupational Safety and Health Administration issues standards for airborne beryllium particles. In order to comply with these standards, plants are required to install and maintain pollution control equipment. In beryllium-processing plants, harmful effects are prevented by maintaining clean workplaces; requiring the use of safety equipment such as personal respirators; collection of dust, fumes, and mists at the source of deposition in dust collectors; medical programs; and other procedures to provide safe working conditions.

World Mine Production, Reserves, and Reserve Base:

	Mine production		Reserves and reserve base[5]
	1998	1999[e]	
United States	243	235	The United States has very little beryl that can be economically handsorted from pegmatites. The Spor Mountain area, Utah, contains a large reserve base of bertrandite, which was being mined. Proven bertrandite reserves in Utah total about 18,000 tons of beryllium. The world reserves and reserve base are not sufficiently well delineated to report consistent figures for all countries.
China[e]	55	55	
Kazakhstan[e]	4	4	
Russia[e]	40	40	
Other countries	2	2	
World total	344	336	

World Resources: No quantitative information is available on foreign resources of beryllium-bearing minerals and rocks.

Substitutes: Although the cost of beryllium is high compared with that of other materials, it is used in applications in which its properties are crucial. Graphite, steel, and titanium may be substituted for beryllium metal in some applications, and phosphor bronze may be substituted for beryllium-copper alloys, but these substitutions can result in substantial loss in performance. In some applications, aluminum nitride may be substituted for beryllium oxide.

[e]Estimated. E Net exporter. NA Not available.

[1]Data in parentheses denote stockpile acquisitions.

[2]Data represent the difference between the estimated beryllium content of beryl shipped for upgrading and stockpile receipts of beryllium metal. These data are not included in net import reliance calculations.

[3]Defined as imports - exports + adjustments for Government and industry stock changes.

[4]See Appendix B for definitions.

[5]See Appendix C for definitions.