BERYLLIUM

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

Domestic Production and Use: A company in Utah mined bertrandite ore and recovered beryllium hydroxide from this ore and from imported beryl. The beryllium hydroxide was shipped to a plant in Ohio, where it was converted into beryllium metal, alloys, and oxide. Beryllium consumption of 390 tons was valued at about $140 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 an estimated 80% of total consumption.

Salient Statistics—United States:	1996	1997	1998	1999	2000[e]
Production, mine shipments	211	231	243	200	255
Imports for consumption, ore and metal	20	20	50	20	15
Exports, metal	57	40	60	40	30
Government stockpile releases[e 1]	—	76	57	145	140
Consumption: Apparent	197	316	320	385	390
Reported, ore	234	259	270	260	260
Price, dollars:					
Domestic, metal, vacuum-cast ingot, per pound	327	327	327	327	421
Domestic, metal, powder blend, per pound	385	385	385	385	492
Domestic, beryllium-copper master alloy, per pound of contained beryllium	160	160	160	160	160
Domestic, beryllium oxide, powder, per pound	77	77	77	77	100
Stocks, consumer, yearend	139	110	80	20	10
Employment, number:					
Mine, full-time equivalent employees[e]	25	25	NA	NA	NA
Primary refineries[e]	400	400	NA	NA	NA
Net import reliance[2] as a percent of apparent consumption	E	27	24	48	35

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 (1996-99): Ore, metal, scrap, and master alloy: Russia, 31%; Canada, 20%; Kazakhstan, 12%; Germany, 10%; and other, 27%.

Tariff: Item	Number	Normal Trade Relations 12/31/00
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: 22% (Domestic), 14% (Foreign).

Government Stockpile:

Stockpile Status—9-30-00[3]

Material	Uncommitted inventory	Committed inventory	Authorized for disposal	Disposal plan FY 2000	Disposals FY 2000
Beryl ore (11% BeO)	351	122	351	145	73
Beryllium-copper master alloy	81	44	81	54	82
Beryllium metal	322	29	277	36	23

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BERYLLIUM

Events, Trends, and Issues: For the first one-half year, sales of alloy products increased compared with those of the previous year, owing to strong demand for copper beryllium alloys from the telecommunications, computer, automotive electronics, aerospace, and oil and gas markets. Imports for consumption of beryllium ore and metal decreased; Germany, Russia, and the United Kingdom were the leading suppliers. Metal exports were down; France, Japan, the Netherlands, and the United Kingdom were the major recipients.

For fiscal year 2000, ending September 30, 2000, the Defense National Stockpile Center (DNSC) sold about 1,810 tons of beryl ore (about 73 tons of beryllium content) valued at about $158,000, about 2,040 tons beryllium copper master alloy (BCMA) (about 82 tons of beryllium content) valued at about $12 million, and about 23 tons of beryllium metal valued at about $4.15 million (multiyear awards) from the National Defense Stockpile. The DNSC also proposed maximum disposal limits in fiscal year 2001 of about 3,630 tons of beryl ore (about 145 tons of beryllium content), about 2,000 tons of BCMA (about 80 tons of beryllium content), 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. The Environmental Protection Agency issues standards for certain hazardous air pollutants, including beryllium, under the Clean Air Act, and the Occupational Safety and Health Administration issues standards for airborne beryllium particles. 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; collecting dust, fumes, and mists at the source of deposition in dust collectors; offering medical programs; and promoting other procedures to provide safe working conditions.

World Mine Production, Reserves, and Reserve Base:

	Mine production		Reserves and reserve base[4]
	1999	2000[e]	
United States	200	255	The United States has very little beryl that can be economically handsorted from pegmatite deposits. The Spor Mountain area, Utah, an epithermal deposit, contains a large reserve base of bertrandite, which was being mined. Proven bertrandite reserves in Utah total about 19,000 tons of beryllium. The world reserves and reserve base are not sufficiently well delineated to report consistent figures for all countries.
China	55	55	
Kazakhstan	4	4	
Russia	40	40	
Other countries	2	2	
World total	301	356	

World Resources: World resources of beryllium have been estimated to be more than 80,000 tons (contained mostly in known nonpegmatite deposits). About 65% of the beryllium resources is concentrated in the United States; the Spor Mountain and Gold Hill areas in Utah and the Seward Peninsula area in Alaska account for most of the total.

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]Net quantity (uncommitted inventory).

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

[3]See Appendix B for definitions.

[4]See Appendix C for definitions.