

KYANITE AND RELATED MINERALS

(Data in thousand metric tons unless otherwise noted)

Domestic Production and Use: One firm in Virginia with integrated mining and processing operations produced kyanite from hard-rock open pit mines. Another company produced synthetic mullite in Georgia. Of the kyanite-mullite output, 90% was estimated to have been used in refractories and 10% in other uses. Of the refractory usage, an estimated 60% to 65% was used in ironmaking and steelmaking and the remainder in the manufacture of chemicals, glass, nonferrous metals, and other materials.

Salient Statistics—United States:	2000	2001	2002	2003	2004^e
Production:					
Mine ^e	90	90	90	90	90
Synthetic mullite ^e	40	40	40	40	40
Imports for consumption (andalusite)	6	3	5	4	5
Exports ^e	35	35	35	35	35
Shipments from Government stockpile excesses	—	—	—	—	0.1
Consumption, apparent ^e	101	100	100	99	100
Price, average, dollars per metric ton:					
U.S. kyanite, raw	165	165	165	165	165
U.S. kyanite, calcined	279	279	279	279	279
Andalusite, Transvaal, South Africa	175	186	191	220	238
Stocks, producer	NA	NA	NA	NA	NA
Employment, kyanite mine and plant, number ^e	150	150	150	150	150
Net import reliance ¹ as a percentage of apparent consumption	E	E	E	E	E

Recycling: Insignificant.

Import Sources (2000-03): South Africa, 100%.

Tariff:	Item	Number	Normal Trade Relations 12-31-04
	Andalusite, kyanite, and sillimanite	2508.50.0000	Free.
	Mullite	2508.60.0000	Free.

Depletion Allowance: 22% (Domestic), 14% (Foreign).

Government Stockpile:

Material	Stockpile Status—9-30-04² (Metric tons)				
	Uncommitted inventory	Committed inventory	Authorized for disposal	Disposal plan FY 2004	Disposals FY 2004
Kyanite, lump	1	—	1	50	139

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Events, Trends, and Issues: A new andalusite source in western China came onstream in March 2004. Xinjiang Bazhou Yilong Andalusite Mineral Co. commissioned its 50,000-ton-per-year andalusite plant in Xinjiang Province. Pilot plant production of andalusite at the facility had reached 10,000 tons per year in 2002. Besides export markets, the andalusite will supply the domestic refractories market, which is currently being driven by increasing steel and nonferrous metal production in China.³

The leading consumer of refractories has been the steel industry. According to the American Iron and Steel Institute, U.S. steel shipments for the first 7 months of 2004 were about 10% higher than in the same period in 2003. According to the International Iron and Steel Institute, world crude steel production was about 8% higher in the first 8 months of 2004 than in the first 8 months of 2003. However, according to an industry analyst, the refractories industry continued to face a number of issues and concerns, including consolidation and downsizing; government regulations on the environment, health, and safety; intense global and local competition; and resistance to refractory price increases from buyers of refractories.⁴

World Mine Production, Reserves, and Reserve Base:

	Mine production		Reserves and reserve base ⁵
	2003	2004 ^e	
United States ^e	90	90	Large in the United States. South Africa reports reserve base of about 51 million tons of aluminosilicates ore (andalusite and sillimanite).
France	65	65	
India	20	21	
South Africa	220	250	
Zimbabwe	4	—	
Other countries	8	5	
World total (rounded)	410	430	

World Resources: Large resources of kyanite and related minerals are known to exist in the United States. The chief resources are in deposits of micaceous schist and gneiss mostly in the Appalachian Mountains area and in Idaho. Other resources are in aluminous gneiss in southern California. These resources are not economical to mine at present. The characteristics of kyanite resources in the rest of the world are thought to be similar to those in the United States.

Substitutes: Two types of synthetic mullite (fused and sintered), superduty fire clays, and high-alumina materials are substitutes for kyanite in refractories. Principal raw materials for synthetic mullite are bauxite, kaolin and other clays, and silica sand.

^eEstimated. E Net exporter. NA Not available. — Zero.

¹Defined as imports – exports + adjustments for Government and industry stock changes.

²See [Appendix B](#) for definitions.

³Industrial Minerals, 2004, New andalusite source in Xinjiang: Industrial Minerals, no. 439, April, p. 17.

⁴Industrial Minerals, 2004, Refractory industry still in transition: Industrial Minerals, no. 440, May, p. 23-24.

⁵See [Appendix C](#) for definitions.