

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. Two companies produced synthetic mullite at one operation each; one was in Georgia and the other in Kentucky. It was estimated that 90% of the kyanite/mullite output was used in refractories: 55% for smelting and processing ferrous metals, 20% for nonferrous metals, and 15% for glassmaking and ceramics. Nonrefractory uses accounted for the remainder.

Salient Statistics—United States:	1993	1994	1995	1996	1997^e
Production: Mine	W	W	W	W	W
Synthetic mullite	W	W	W	W	W
Imports for consumption (andalusite)	12	8	3	11	8
Exports ^e	33	35	35	35	35
Shipments from Government stockpile excesses	—	—	—	—	1
Consumption, apparent	W	W	W	W	W
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 percent of apparent consumption	W	W	W	W	W

Price: U.S. kyanite, 54% to 60% Al₂O₃, 35-325 Tyler mesh, 18-ton lots, explant, raw, \$140 to \$168 per ton; calcined, \$248 to \$276 per ton. Andalusite, Transvaal, South Africa, 57.5% Al₂O₃, 2,000 ton bulk, f.o.b., \$180 to \$200; 59.5% Al₂O₃, 2,000 ton bulk, f.o.b., \$220 to \$240.

Recycling: Insignificant.

Import Sources (1993-96): South Africa, 97%; and other, 3%.

Tariff:	Item	Number	Most favored nation (MFN) 12/31/97	Non-MFN² 12/31/97
	Andalusite, kyanite, and sillimanite	2508.50.0000	Free	Free.
	Mullite	2508.60.0000	2% ad val.	30% ad val.

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

Government Stockpile:

Stockpile Status—9-30-97³

Material	Uncommitted inventory	Committed inventory	Authorized for disposal	Disposal plan FY 1997	Disposals FY 1997
Kyanite, lump	0.1	—	0.1	1.1	1.0

KYANITE AND RELATED MATERIALS

Events, Trends, and Issues: Kyanite, andalusite, sillimanite, mullite, synthetic mullite, and other alumina-containing materials are used in low, medium and high-alumina refractories. These provide a wide range of versatile brick and monolithic products. High alumina bricks and monolithics are growing in demand for most high temperature applications, according to a nongovernment source.

The steel industry has been the largest user of refractories in general. However, other industries, such as glass, non-ferrous metals, petrochemicals, incineration, and others, are also consumers of refractories. In all of these consuming industries, changes are being made in operation, lining design, refractory selection, etc., which has resulted in reduced refractory consumption. There is a trend toward higher quality, longer life and higher value refractories, according to another nongovernment source.

World Mine Production, Reserves, and Reserve Base:

	Mine production		Reserves and reserve base ⁴
	1996	1997 ^e	
United States	W	W	Large in the United States and South Africa; may be large in other countries.
France	45	50	
India	17	15	
South Africa ⁵	210	210	
Other countries	8	5	
World total ⁶	280	280	

World Resources: Immense 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 area and in Idaho. Other resources are in aluminous gneiss in southern California. These resources are not economical to mine at present, but some may be eventually. 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. NA Not available. W Withheld to avoid disclosing company proprietary data.

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

²See Appendix B.

³See Appendix C for definitions.

⁴See Appendix D for definitions.

⁵Production is mostly andalusite.

⁶Excludes the United States and countries for which information is not available.