

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:	1994	1995	1996	1997	1998^e
Production: Mine	W	W	W	W	W
Synthetic mullite	W	W	W	W	W
Imports for consumption (andalusite)	8	3	11	8	11
Exports ^e	35	35	35	35	35
Shipments from Government stockpile excesses	—	—	—	1	—
Consumption, apparent	W	W	W	W	W
Price, average, dollars per metric ton:					
U.S. kyanite, raw	138	144	154	154	157
U.S. kyanite, calcined	239	248	262	262	267
Andalusite, Transvaal, South Africa, 57.5% Al ₂ O ₃	170	190	190	190	190
Andalusite, Transvaal, South Africa, 59.5% Al ₂ O ₃	190	210	230	230	230
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	E	E	E	E	E

Recycling: Insignificant.

Import Sources (1994-97): South Africa, 100%.

Tariff:	Item	Number	Normal Trade Relations (NTR) 12/31/98	Non-NTR² 12/31/98
	Andalusite, kyanite, and sillimanite	2508.50.0000	Free	Free.
	Mullite	2508.60.0000	1% ad val.	30% ad val.

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

Government Stockpile:

Material	Stockpile Status—9-30-98³				
	Uncommitted inventory	Committed inventory	Authorized for disposal	Disposal plan FY 1998	Disposals FY 1998
Kyanite, lump	0.1	—	0.1	—	—

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Events, Trends, and Issues: Refractories continue to be the largest end use of kyanite and mullite. Based on recent years' data, overall refractory market value has increased at a higher rate than refractory tonnage, according to a non-Government source. Refractories are being developed that are higher quality and longer lasting.

A major growth area of refractories in general is projected to be monolithic refractories (those that are made or formed in one piece) and preformed shapes. The technology of refractories has continued to advance in response to the increasingly stringent requirements of the customers.

Over-capacity in refractories is said to still exist in the industrialized countries of Europe, Japan, and North America, according to another non-Government source. Corporate mergers and buyouts in the refractories industry have occurred and may continue. Major refractory companies are producing and selling more overseas and are establishing joint ventures in developing countries.

World Mine Production, Reserves, and Reserve Base:

	Mine production		Reserves and reserve base⁴
	1997	1998^e	
United States	W	W	Large in the United States and South Africa; may be large in other countries.
France	45	45	
India	14	15	
South Africa ⁵	220	220	
Other countries	<u>8</u>	<u>10</u>	
World total ⁶	287	290	

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. E Net exporter. 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.