

QUARTZ CRYSTAL (INDUSTRIAL)

(Data in metric tons, unless otherwise noted)

Domestic Production and Use: Domestic production of cultured quartz crystal has been relatively stable for the past few years. Lascas¹ mining continued in Arkansas, and four U.S. firms produced cultured quartz crystal by using lascas as feed material. Electronic applications accounted for most industrial uses of quartz crystal; other uses included special optical applications. Virtually all quartz crystal used for electronics was cultured rather than natural crystal. Electronic-grade quartz crystal was essential for making filters, frequency controls, and timers in electronic circuits employed for a wide range of products, such as communications equipment, computers, and many consumer goods (e.g., television receivers and electronic games).

Salient Statistics—United States:	1993	1994	1995	1996	1997^e
Production: Mine ²	454	544	435	435	450
Plant, cultured (as grown)	394	294	351	327	340
Imports for consumption:					
Lascas	NA	NA	NA	NA	NA
Cultured	8	19	47	42	40
Exports:					
Lascas	—	—	90	90	90
Natural electronic	NA	NA	NA	NA	NA
Cultured (mostly lumbered)	24	38	35	89	90
Consumption, apparent:					
Natural electronic	(3)	(3)	(3)	(3)	(3)
Cultured	378	275	363	280	290
Price, average value, dollars per kilogram:					
Lascas	1.23	1.20	1.20	1.20	1.20
Cultured (lumbered)	251.69	300.00	300.00	300.00	300.00
Stocks, producer, yearend:					
Lascas (for cultured crystal only)	150	190	190	190	190
Natural electronic	(3)	(3)	(3)	(3)	(3)
Cultured	200	200	200	200	200
Employment, mine, processing plant, number ^e	10	15	15	15	15
Net import reliance ⁴ as a percent of apparent consumption, lascas	NA	NA	NA	NA	NA

Recycling: None.

Import Sources (1993-96): This information is no longer available.

Tariff: Item	Number	Most favored nation (MFN) 12/31/97	Non-MFN⁵ 12/31/97
Sands:			
Other than natural	2506.10.0010	Free	Free.
Other	2506.10.0050	Free	Free.
Quartzite	2506.21.0000	Free	Free.

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

Government Stockpile:

Stockpile Status—9-30-97⁶

Material	Uncommitted inventory	Committed inventory	Authorized for disposal	Disposal plan FY 1997	Disposals FY 1997
Quartz crystal	107	23	107	NA	—

Events, Trends, and Issues: Trends indicate that demand for quartz crystal devices should continue to grow, and consequently, quartz crystal production should remain strong well into the future. Growth of the consumer electronics market (e.g., personal computers, electronic games, and cellular telephones), particularly in the United States, will continue to promote domestic production. The growing global electronics market may require additional production capacity worldwide.

World Mine Production, Reserves, and Reserve Base:

	Mine production		Reserves ⁷	Reserve base ⁷
	1996	1997 ^e		
United States ^{e 2}	435	450	Moderate	Moderate
Brazil	NA	NA	Large	Large
Other countries	NA	NA	NA	NA
World total	NA	NA	Large	Large

World Resources: Limited resources of natural quartz crystal suitable for direct electronic or optical use are available throughout the world. World dependence on these resources will continue to decline because of increased acceptance of cultured quartz crystal as an alternative material; however, use of cultured quartz crystal will mean an increased dependence on lascas for growing cultured quartz.

Substitutes: Quartz crystal is the best material for frequency-control oscillators and frequency filters in electronic circuits. Other materials, such as dipotassium tartrate, are usable only in specific applications as oscillators and filters.

^eEstimated. NA Not available.

¹Lascas is a nonelectronic-grade quartz used as a feedstock for growing cultured quartz crystal and for production of fused quartz.

²Lascas only; specimen and jewelry material excluded.

³Less than ½ unit.

⁴Defined as imports - exports + adjustments for Government and industry stock changes.

⁵See Appendix B.

⁶See Appendix C for definitions.

⁷See Appendix D for definitions.