

QUARTZ CRYSTAL (INDUSTRIAL)

(Data in metric tons, unless noted)

Domestic Production and Use: Domestic production of cultured quartz crystal has been relatively steady for the past 5 years. Lascas¹ production continued in Arkansas. Virtually all quartz crystal consumed in electronic applications was synthetic. Four companies produced cultured quartz crystal using lascas as feed material. Quartz crystal was essential for making piezoelectric filter devices that separated portions of the frequency spectrum and oscillators to a single frequency signal source. Filters and oscillators were used for a wide variety of communication and instrumentation purposes.

Salient Statistics—United States:	1991	1992	1993	1994	1995^e
Production: Mine ²	454	778	454	544	500
Plant, cultured (as grown)	441	407	394	294	300
Imports for consumption:					
Lascas	NA	NA	NA	NA	NA
Natural electronic	NA	NA	NA	NA	NA
Exports:					
Lascas	—	—	—	—	—
Natural electronic	NA	NA	NA	NA	NA
Cultured (mostly lumbered) ³	53	15	24	38	30
Shipments from Government stockpile excesses, natural electronic	44	89	134	96	—
Consumption, reported:					
Lascas ⁴	556	494	407	500	400
Natural electronic	1	(5)	(5)	(5)	(5)
Cultured ⁶	365	286	306	360	350
Price, average value, dollars per kilogram:					
Lascas	0.85	0.90	1.23	1.20	1.20
Cultured (lumbered)	66.37	105.67	251.69	300.00	300.00
Stocks, industry, yearend:					
Lascas (for cultured crystal only)	283	99	150	190	190
Natural electronic (fabricator)	(5)	1	1	1	1
Cultured (fabricator)	99	104	100	100	100
Employment, mine, processing plant ^e	10	10	10	10	10
Net import reliance ⁷ as a percent of apparent consumption, lascas	NA	NA	NA	NA	NA

Recycling: None.

Import Sources (1991-94): This information is no longer available.

Tariff:	Item	Number	Most favored nation (MFN) 12/31/95	Non-MFN⁸ 12/31/95
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—9-30-95

Material	Uncommitted inventory	Committed inventory	Authorized for disposal	Disposals Jan.-Sept. 95
Quartz crystal	237	258	237	—

Events, Trends, and Issues: Japan remained both the leading producer and consumer of cultured quartz crystal because of its lower cost per unit and its prominence as a producer of electronic components in which these crystals are used. Specially grown cultured seed crystals have nearly replaced natural seed in most domestic operations. The Former Soviet Union and China are major producers, also. Very small quantities of Brazilian natural quartz are used as seed for growing cultured quartz and for a few direct applications such as deep-well pressure transducers.

World Mine Production, Reserves, and Reserve Base:

	Mine production		Reserves ⁹	Reserve base ⁹
	1994	1995 ^e		
United States ^{e 2}	544	500	Moderate	Moderate
Brazil	NA	NA	Large	Large
Other countries	NA	NA	NA	NA
World total	NA	NA	Large	Large

World Resources: Limited resources of 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. Other materials, such as dipotassium tartrate, are usable only in specific applications as oscillators and frequency 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.

³Quantities calculated from pricing information.

⁴Excluding quartz crystal used by the fused quartz industry.

⁵Less than ½ unit.

⁶Reported consumption of cultured quartz includes cultured quartz consumed by growers as well as by manufacturers of intermediate products and finished crystal units.

⁷Defined as imports - exports + adjustments for Government and industry stock changes.

⁸See Appendix B.

⁹See Appendix C for definitions.