

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: | 1992 | 1993 | 1994 | 1995 | 1996^e |
|--|-------------|-------------|-------------|-------------|-------------------------|
| Production: Mine ² | 778 | 454 | 544 | 435 | 440 |
| Plant, cultured (as grown) | 407 | 394 | 294 | 360 | 370 |
| Imports for consumption: | | | | | |
| Lascas | NA | NA | NA | NA | NA |
| Cultured | 6 | 8 | 19 | 47 | 50 |
| Exports: | | | | | |
| Lascas | — | — | — | 90 | 90 |
| Natural electronic | NA | NA | NA | NA | NA |
| Cultured (mostly lumbered) | 15 | 24 | 38 | 35 | 40 |
| Consumption, apparent: | | | | | |
| Natural electronic | (3) | (3) | (3) | (3) | (3) |
| Cultured | 398 | 378 | 275 | 368 | 380 |
| Price, average value, dollars per kilogram: | | | | | |
| Lascas | 0.90 | 1.23 | 1.20 | 1.20 | 1.20 |
| Cultured (lumbered) | 105.67 | 251.69 | 300.00 | 300.00 | 300.00 |
| Stocks, producer, yearend: | | | | | |
| Lascas (for cultured crystal only) | 100 | 150 | 190 | 190 | 190 |
| Natural electronic | (3) | (3) | (3) | (3) | (3) |
| Cultured | 200 | 200 | 200 | 200 | 200 |
| Employment, mine, processing plant ^e , number | 10 | 10 | 15 | 15 | 15 |
| Net import reliance ⁴ as a percent of apparent consumption, lascas | NA | NA | NA | NA | NA |

Recycling: None.

Import Sources (1992-95): This information is no longer available.

| Tariff: Item | Number | Most favored nation (MFN) 12/31/96 | Non-MFN⁵ 12/31/96 |
|---------------------|---------------|---|---|
| Sands: | | | |
| Other than natural | 2506.10.0010 | Free | Free. |
| Other | 2506.10.0050 | Free | Free. |
| Quartzite | 2506.21.0000 | Free | Free. |

QUARTZ CRYSTAL (INDUSTRIAL)

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

Government Stockpile:

Stockpile Status—9-30-96

| Material | Uncommitted inventory | Committed inventory | Authorized for disposal | Disposals Jan.-Sept. 96 |
|----------------|--------------------------|------------------------|----------------------------|----------------------------|
| Quartz crystal | 214 | 120 | 214 | — |

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 ⁶ | Reserve base ⁶ |
|------------------------------|-----------------|-------------------|-----------------------|---------------------------|
| | 1995 | 1996 ^e | | |
| United States ^{e 2} | 435 | 440 | 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 1/2 unit.

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

⁵See Appendix B.

⁶See Appendix C for definitions.