

STRONTIUM

(Data in metric tons of strontium content¹ unless otherwise noted)

Domestic Production and Use: No strontium minerals have been produced in the United States since 1959. The most common strontium mineral, celestite, which consists primarily of strontium sulfate, was imported exclusively from Mexico. A company in Georgia was the only major U.S. producer of strontium compounds, and analysis of celestite import data indicates that production at this operation has decreased substantially since 2001. Primary strontium compounds were used in the faceplate glass of color television picture tubes, 68%; ferrite ceramic magnets, 11%; pyrotechnics and signals, 14%; and other applications, 7%.

| Salient Statistics—United States: | 2001 | 2002 | 2003 | 2004 | 2005^e |
|--|-------------|-------------|-------------|-------------|-------------------------|
| Production | — | — | — | — | — |
| Imports for consumption: | | | | | |
| Strontium minerals | 5,640 | 1,150 | 1,020 | 2,760 | 700 |
| Strontium compounds | 26,500 | 25,400 | 23,300 | 14,500 | 13,000 |
| Exports, compounds | 929 | 340 | 693 | 552 | 300 |
| Shipments from Government stockpile excesses | — | — | — | — | — |
| Consumption, apparent, celestite and compounds | 31,200 | 26,500 | 23,600 | 16,700 | 13,400 |
| Price, average value of mineral imports | | | | | |
| at port of exportation, dollars per ton | 63 | 60 | 58 | 53 | 57 |
| Net import reliance ² as a percentage of apparent consumption | 100 | 100 | 100 | 100 | 100 |

Recycling: None.

Import Sources (2001-04): Strontium minerals: Mexico, 100%. Strontium compounds: Mexico, 89%; Germany, 5%; and other, 6%. Total imports: Mexico, 92%; Germany, 5%; and other, 3%.

| Tariff: | Item | Number | Normal Trade Relations |
|----------------|--------------------------------------|---------------|-------------------------------|
| | | | 12-31-05 |
| | Celestite | 2530.90.8010 | Free. |
| | Strontium metal | 2805.19.1000 | 3.7% ad val. |
| | Compounds: | | |
| | Strontium carbonate | 2836.92.0000 | 4.2% ad val. |
| | Strontium nitrate | 2834.29.2000 | 4.2% ad val. |
| | Strontium oxide, hydroxide, peroxide | 2816.40.1000 | 4.2% ad val. |

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

Government Stockpile: About 11,600 tons of nonstockpile-grade celestite containing about 5,100 tons of strontium is in the National Defense Stockpile. Its total value is listed as zero. The stockpile goal for celestite was reduced to zero in 1969, and at that time, the stockpile contained stockpile- and nonstockpile-grade material. Since then, all the stockpile-grade celestite has been sold. Although the nonstockpile-grade celestite has been offered for sale, none has been sold since 1979. The fiscal year 2006 Annual Materials Plan, announced in October 2005 by the Defense National Stockpile Center, listed 5,440 tons of stockpiled celestite as available for disposal. Because the remaining material does not meet the quality specifications of celestite purchasers, the material will be difficult to dispose of in the traditional markets. It might be attractive as a low-cost replacement for barite in drilling mud applications.

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Events, Trends, and Issues: China is the world's leading producer of strontium carbonate with the plant capacity to produce 200,000 tons per year, followed by Germany and Mexico with 70,000 and 127,000 tons per year, respectively. China uses domestic and imported celestite to supply its plants, the German producer uses imported celestite, and Mexican producers use domestic ore to supply their plants. The Chinese strontium carbonate is marketed in Asia and Europe, causing decreases in celestite and strontium carbonate prices in those regions. Chinese celestite reserves are smaller and of lower quality than the ores in major producing countries including Mexico, Spain, and Turkey, raising the question of whether Chinese producers will be able to maintain high production levels to meet the demand at strontium carbonate plants for an extended period of time.

The demand for strontium carbonate for television faceplate glass continues, but appears to be decreasing as the popularity of flat panel television monitors grows. Domestic consumption of strontium carbonate decreased in the past 5 years as a result of a shift in production facilities for color televisions to other countries that has resulted in the closure of all but one television glass plant in the United States. China, Europe, and North America are the most important markets for televisions. Southeast Asia and Latin America have higher growth rates, potentially representing huge markets for television manufacturers and thus the strontium carbonate industry. Flat-screen technology, which does not require strontium carbonate, likely will continue to diminish the demand for strontium carbonate for television displays as the technology becomes more affordable and commonplace.

World Mine Production, Reserves, and Reserve Base:³

| | Mine production | | Reserves ⁴ | Reserve base ⁴ |
|-----------------------|----------------------|----------------------|-----------------------|---------------------------|
| | 2004 | 2005 ^e | | |
| United States | — | — | — | 1,400,000 |
| Argentina | 3,400 | 6,700 | All other: | All other: |
| China ^e | 130,000 | 140,000 | 6,800,000 | 11,000,000 |
| Iran | 2,000 | 7,000 | | |
| Mexico | 181,000 | 143,000 | | |
| Morocco | 2,700 | 2,700 | | |
| Pakistan | 2,000 | 2,000 | | |
| Spain | 160,000 | 160,000 | | |
| Tajikistan | NA | NA | | |
| Turkey | 70,000 | 60,000 | | |
| World total (rounded) | ⁵ 551,000 | ⁵ 520,000 | 6,800,000 | 12,000,000 |

World Resources: Resources in the United States are several times the reserve base. Although not thoroughly evaluated, world resources are thought to exceed 1 billion tons.

Substitutes: Although it is possible to substitute other materials for strontium in some of its applications, such a change would adversely affect product performance and/or cost. For example, barium could replace strontium in color television picture tube glass only after extensive circuit redesign to reduce operating voltages that produce harmful secondary X-rays. Barium replacement of strontium in ferrite ceramic magnets would decrease the maximum energy and temperature characteristics of the magnets. Substituting for strontium in pyrotechnics would be impractical because the desired brilliance and visibility are imparted only by strontium and its compounds.

^eEstimated. NA Not available. — Zero.

¹The strontium content of celestite is 43.88%; this factor was used to convert units of celestite.

²Defined as imports – exports + adjustments for Government and industry stock changes.

³Metric tons of strontium minerals.

⁴See Appendix C for definitions.

⁵Excludes Tajikistan.