

STRONTIUM

(Data in metric tons of strontium content,¹ 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. Primary strontium compounds were used in the faceplate glass of color television picture tubes, 75%; ferrite ceramic magnets, 9%; pyrotechnics and signals, 9%; and other applications, 7%.

Salient Statistics—United States:	1999	2000	2001	2002	2003^e
Production	—	—	—	—	—
Imports for consumption:					
Strontium minerals	13,700	7,460	5,640	1,150	1,100
Strontium compounds	26,800	29,900	26,500	25,400	22,000
Exports, compounds	2,890	4,520	929	340	950
Shipments from Government stockpile excesses	—	—	—	—	—
Consumption, apparent, celestite and compounds	37,600	32,800	31,200	26,200	22,200
Price, average value of mineral imports					
at port of exportation, dollars per ton	73	62	62	60	57
Net import reliance ² as a percentage of					
apparent consumption	100	100	100	100	100

Recycling: None.

Import Sources (1999-2002): Strontium minerals: Mexico, 100%. Strontium compounds: Mexico, 91%; Germany, 5%; and other, 4%. Total imports: Mexico, 93%; Germany, 4%; and other, 3%.

Tariff:	Item	Number	Normal Trade Relations
			12/31/03
	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: Although 11,600 tons of celestite containing about 5,100 tons of strontium is in the National Defense Stockpile, none of it is stockpile grade; 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 2004 Annual Materials Plan, announced in October 2003 by the Defense National Stockpile Center, listed all the stockpiled celestite to be offered 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: With the plant capacity to produce 95,000 and 103,000 tons per year, respectively, Germany and Mexico have been the largest producers of strontium carbonate for many years. The German producer uses imported celestite, and Mexican producers use domestic ore to supply their plants. In recent years, Chinese strontium carbonate capacity has expanded tremendously to about 140,000 tons per year, although actual plant production is believed to be much less than that. 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 and increases as the popularity of larger screen sizes increases worldwide. Domestic consumption of strontium carbonate has decreased in the past 3 years, probably as a result of a shift in production facilities for color televisions to other countries and a slow economy. China, Europe, and North America are the most important markets for televisions. Southeast Asia and Latin America have higher growth rates, representing potentially huge markets for television manufacturers and thus the strontium carbonate industry. Flat screen technology, which does not require strontium carbonate, likely will 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
	2002	2003 ^e		
United States	—	—	—	1,400,000
Argentina	1,474	1,500	All other:	All other:
China	^e 50,000	60,000	6,800,000	11,000,000
Iran	2,000	2,000		
Mexico	140,000	100,000		
Morocco	4,000	4,000		
Pakistan	2,000	900		
Spain	125,000	130,000		
Tajikistan	NA	NA		
Turkey	<u>70,000</u>	<u>70,000</u>		
World total (rounded)	⁵ 390,000	⁵ 370,000	<u>6,800,000</u>	<u>12,000,000</u>

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 amount 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.