

STRONTIUM

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

Domestic Production and Use: Although deposits of strontium minerals occur widely throughout the United States, strontium minerals have not been mined in the United States since 1959. Domestic production of strontium carbonate, the principal strontium compound, ceased in 2006. A few domestic companies produce small quantities of downstream strontium chemicals from imported strontium carbonate. Estimates for end uses of primary strontium compounds in the United States were pyrotechnics and signals, 30%; ceramic ferrite magnets, 30%; master alloys, 10%; pigments and fillers, 10%; electrolytic production of zinc, 10%; and other applications, including glass, 10%. It is thought that virtually all of the strontium minerals consumed in the United States since 2006 was used in drilling fluids for oil and natural gas wells. Imports of the strontium mineral celestite have increased steadily since 2007, except in 2010. Imports of strontium minerals more than doubled in 2013 compared with those of 2012.

Salient Statistics—United States:	2009	2010	2011	2012	2013^e
Production	—	—	—	—	—
Imports for consumption:					
Strontium minerals	6,420	2,370	7,320	8,660	21,500
Strontium compounds	5,860	8,640	10,000	8,150	7,140
Exports, compounds	94	72	18	71	43
Consumption, apparent, minerals and compounds	12,200	10,900	17,300	16,700	28,600
Price, average value of mineral imports at port of exportation, dollars per ton	47	45	46	67	50
Net import reliance ² as a percentage of apparent consumption	100	100	100	100	100

Recycling: None.

Import Sources (2009–12): Strontium minerals: Mexico, 100%. Strontium compounds: Mexico, 80%; Germany, 12%; China, 7%; and other, 1%. Total imports: Mexico, 87%; Germany, 8%; China, 4%; and other, 1%.

Tariff:	Item	Number	Normal Trade Relations 12–31–13
	Celestite	2530.90.8010	Free.
	Strontium metal	2805.19.1000	3.7% ad val.
	Compounds:		
	Strontium oxide, hydroxide, peroxide	2816.40.1000	4.2% ad val.
	Strontium nitrate	2834.29.2000	4.2% ad val.
	Strontium carbonate	2836.92.0000	4.2% ad val.

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

Government Stockpile: None.

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Events, Trends, and Issues: Imports of celestite, the most commonly used strontium mineral, have increased every year since 2010 and increased dramatically in 2013, with virtually all of the material coming from Mexico. Celestite is typically used as the raw material for the production of strontium compounds; however, these imports are thought to be used in drilling fluids for oil and natural gas exploration and production. As such, celestite is ground, but undergoes no chemical processing.

Consumption of strontium compounds was thought to be approximately equal in the production of ceramic ferrite magnets and pyrotechnics and signals. Strontium carbonate is sintered with iron oxide to produce permanent ceramic ferrite magnets. Strontium nitrate contributes a brilliant red color to fireworks and signal flares. Smaller quantities of strontium compounds were consumed in several other applications, including glass production, electrolytic production of zinc, master alloys, and pigments and fillers.

With expected improvements to global economic conditions, consumption of strontium compounds is expected to increase. Little information is available about the potential for celestite consumption in drilling fluids.

In descending order of production, China, Spain, and Mexico are the world's leading producers of celestite. China also is a major importer of celestite.

World Mine Production and Reserves:³

	Mine production		Reserves ⁴
	2012	2013 ^e	
United States	—	—	—
Argentina	5,000	5,000	All other:
China	100,000	95,000	6,800,000
Mexico	40,900	45,000	
Morocco	2,500	2,500	
Spain	80,000	97,000	
World total (rounded)	228,000	245,000	6,800,000

World Resources: World resources of strontium are thought to exceed 1 billion tons.

Substitutes: Barium can be substituted for strontium in ferrite ceramic magnets; however, the resulting barium composite will have reduced maximum operating temperature when compared with that of strontium composites. Substituting for strontium in pyrotechnics is hindered by difficulty in obtaining the desired brilliance and visibility imparted by strontium and its compounds.

^eEstimated. — Zero.

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

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

³Gross weight of strontium minerals in metric tons.

⁴[See Appendix C for resource/reserve definitions and information concerning data sources.](#)