

## STRONTIUM

(Data in metric tons of contained strontium,<sup>1</sup> 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, 8%; pyrotechnics and signals, 7%; and other, 10%.

| <b>Salient Statistics—United States:</b>                                 | <b>1992</b> | <b>1993</b> | <b>1994</b> | <b>1995</b> | <b>1996<sup>e</sup></b> |
|--|-------------|-------------|-------------|-------------|-------------------------|
| Production, strontium minerals   | —           | —           | —           | —           | —                       |
| Imports for consumption:   |             |             |             |             |                         |
| Strontium minerals   | 19,700      | 11,600      | 16,000      | 12,700      | 14,000                  |
| Strontium compounds  | 13,000      | 15,300      | 20,000      | 20,800      | 21,000                  |
| Exports, compounds   | 650         | 260         | 1,120       | 1,160       | 1,200                   |
| Shipments from Government stockpile excesses                             | —           | —           | —           | —           | —                       |
| Consumption, apparent, celestite and compounds                           | W           | W           | W           | W           | W                       |
| Price, average value of mineral imports                                  |             |             |             |             |                         |
| at port of exportation, dollars per ton                                  | 68          | 73          | 68          | 71          | 70                      |
| Stocks, consumer, yearend, celestite only                                | W           | W           | W           | W           | W                       |
| Net import reliance <sup>2</sup> as a percent of<br>apparent consumption | 100         | 100         | 100         | 100         | 100                     |

**Recycling:** None.

**Import Sources (1992-95):** Strontium minerals: Mexico, 100%. Strontium compounds: Mexico, 86%; and Germany, 14%. Total imports: Mexico, 93%, and Germany, 7%.

| <b>Tariff:</b> | <b>Item</b>                                     | <b>Number</b> | <b>Most favored nation (MFN)<br/>12/31/96</b> | <b>Mexico<br/>12/31/96</b> | <b>Non-MFN<sup>3</sup><br/>12/31/96</b> |
|----------------|---|---------------|---|----------------------------|---|
|                | Celestite                                       | 2530.90.0010  | Free  | Free                       | 0.3¢/kg.                                |
|                | Alkaline earth metals<br>(strontium and barium) | 2805.22.1000  | 3.7% ad val.                                  | Free                       | 25% ad val.                             |
|                | Compounds:                                      |               |   |                            |   |
|                | Strontium nitrate                               | 2834.29.2000  | 4.2% ad val.                                  | Free                       | 25% ad val.                             |
|                | Strontium carbonate                             | 2836.92.0000  | 4.2% ad val.                                  | Free                       | 25% ad val.                             |
|                | Strontium oxide,<br>hydroxide, peroxide         | 2816.20.0000  | 4.2% ad val.                                  | Free                       | 25% ad val.                             |

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

### **Government Stockpile:**

#### Stockpile Status—9-30-96

| <b>Material</b>        | <b>Uncommitted<br/>inventory</b> | <b>Committed<br/>inventory</b> | <b>Authorized for<br/>disposal</b> | <b>Disposals<br/>Jan.-Sept. 96</b> |
|------------------------|----------------------------------|--------------------------------|------------------------------------|------------------------------------|
| Celestite <sup>1</sup> | 5,100                            | —                              | 5,100                              | —                                  |

## STRONTIUM

**Events, Trends, and Issues:** Although there is celestite in the National Defense Stockpile, none of it is stockpile grade; its total value is listed as zero. The stockpile goal was reduced to zero in 1969, and at that time the stockpile contained both 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 1997 Annual Materials Plan, announced at the end of September 1996 by the Defense National Stockpile Center, identified 3,300 tons of celestite to be offered for disposal.

### World Mine Production, Reserves, and Reserve Base:<sup>4</sup>

|                              | Mine production            |                            | Reserves <sup>5</sup> | Reserve base <sup>5</sup> |
|------------------------------|----------------------------|----------------------------|-----------------------|---------------------------|
|                              | <u>1995</u>                | <u>1996<sup>e</sup></u>    |                       |                           |
| United States                | —                          | —                          | —                     | 1,360,000                 |
| Algeria                      | 5,400                      | 5,400                      |                       |                           |
| China                        | 35,000                     | 35,000                     |                       |                           |
| Iran                         | 20,000                     | 20,000                     |                       |                           |
| Mexico                       | 71,500                     | 75,000                     | Other:                | Other:                    |
| Pakistan                     | 1,500                      | 1,500                      | 6,800,000             | 10,600,000                |
| Spain                        | 12,000                     | 12,000                     |                       |                           |
| Tajikistan                   | NA                         | NA                         |                       |                           |
| Turkey                       | 25,000                     | 25,000                     |                       |                           |
| United Kingdom               | —                          | —                          |                       |                           |
| World total (may be rounded) | <u><sup>6</sup>170,000</u> | <u><sup>6</sup>170,000</u> | <u>6,800,000</u>      | <u>12,000,000</u>         |

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

**Substitutes:** Although it is possible to substitute 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.

<sup>e</sup>Estimated. NA Not available. W Withheld to avoid disclosing company proprietary data.

<sup>1</sup>The strontium content of celestite is 43.88%; this amount was used to convert units of celestite.

<sup>2</sup>Defined as imports - exports + adjustments for Government and industry stock changes.

<sup>3</sup>See Appendix B.

<sup>4</sup>Metric tons of strontium minerals.

<sup>5</sup>See Appendix C for definitions.

<sup>6</sup>Excludes Tajikistan.