

## BARITE

(Data in thousand metric tons, unless otherwise noted)

**Domestic Production and Use:** Barite sales by domestic producers increased slightly to 400,000 tons in 2001 and was valued at about \$14 million. Sales were from three States, with the preponderance coming from Nevada, followed by Georgia and Tennessee. In 2001, an estimated 2.9 million tons of ground barite was sold from six States from domestic production and imports by domestic crushers and grinders. Nearly 95% of the barite sold in the United States was used as a weighting agent in gas- and oil-well-drilling fluids. Shipments went mostly to the gas drilling industry in the Gulf of Mexico and onshore in Louisiana and Texas, which had a little less than 70% of gas production in the conterminous United States. Smaller amounts were used in the Western United States, which had about 20% of gas production in the conterminous United States, in western Canada, and in Alaska. Industrial end uses for barite include an additive to cement, rubber, and urethane foam as a weighing material. Barite is also used in automobile paint primer for metal protection and gloss, "leaded" glass, and as the raw material for barium chemicals. In the metal casting industry, barite forms part of the mold-release compounds. Barite also has become part of friction products (brake and clutch pads) for transportation vehicles. Because barite blocks x rays and gamma rays, it is used in cement vessels that contain radioactive materials, gastrointestinal x-ray "milkshakes," and the faceplate and funnelglass of cathode-ray tubes used for television sets and computer monitors to protect against radiation.

| <b>Salient Statistics—United States:</b>                                 | <b>1997</b> | <b>1998</b> | <b>1999</b> | <b>2000</b> | <b>2001<sup>e</sup></b> |
|--|-------------|-------------|-------------|-------------|-------------------------|
| Sold or used, mine   | 692         | 476         | 434         | 392         | 400                     |
| Imports for consumption:   |             |             |             |             |                         |
| Crude barite   | 2,210       | 1,850       | 836         | 2,070       | 2,670                   |
| Ground barite  | 31          | 20          | 17          | 16          | 20                      |
| Other  | 12          | 13          | 18          | 15          | 10                      |
| Exports  | 22          | 15          | 22          | 36          | 40                      |
| Consumption, apparent <sup>1</sup> (crude barite)                        | 2,920       | 2,340       | 1,280       | 2,460       | 2,960                   |
| Consumption <sup>2</sup> (ground and crushed)                            | 2,180       | 1,890       | 1,370       | 2,100       | 2,600                   |
| Price, average value, dollars per ton, mine                              | 22.45       | 22.70       | 25.60       | 25.10       | 25.00                   |
| Employment, mine and mill, number <sup>e</sup>                           | 380         | 410         | 300         | 330         | 340                     |
| Net import reliance <sup>3</sup> as a percentage of apparent consumption | 76          | 80          | 66          | 84          | 87                      |

**Recycling:** None.

**Import Sources (1997-2000):** China, 88%; India, 9%; Canada, 1%; Mexico, 1%; and other, 1%.

| <b>Tariff: Item</b>            | <b>Number</b> | <b>Normal Trade Relations<br/>12/31/01</b> |
|--------------------------------|---------------|--|
| Crude barite                   | 2511.10.5000  | \$1.25/t.                                  |
| Ground barite                  | 2511.10.1000  | Free.                                      |
| Oxide, hydroxide, and peroxide | 2816.30.0000  | 2% ad val.                                 |
| Other chlorides                | 2827.38.0000  | 4.2% ad val.                               |
| Other sulfates                 | 2833.27.0000  | 0.6% ad val.                               |
| Other nitrates                 | 2834.29.5000  | 3.5% ad val.                               |
| Carbonate                      | 2836.60.0000  | 2.3% ad val.                               |

**Depletion Allowance:** 14% (Domestic and foreign).

**Government Stockpile:** None.

**Events, Trends, and Issues:** Imports for consumption of lower cost foreign barite increased by about 78% compared with 2000 levels and was about 770% of U.S. production. The major sources of imported barite have high-grade deposits with relatively low labor costs, and relatively low (per ton-mile) ocean transportation (compared to land transportation) cost to U.S. Gulf Coast grinding plants. The Nevada miners, crushers, and grinders were competitive in the California market, the Great Plains, and the Canadian markets and will probably continue to utilize local mines for several years. The barite mines in Nevada are nearing exhaustion and there has not been much discussion of replacement reserves. It may be that the producers eventually will choose to import rather than mine. This may be difficult for the California, Great Plains, and Canadian well drilling markets, in that they will have to pay more for the barite portion of their mud if barite production in that area disappears.

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Imports of barite totaled about 400,000 tons per 6 months for both halves of 1999, then rose to nearly 1 million tons in the first and second halves of 2000, and to about 1.2 million tons in the first half of 2001 and 1.4 million tons in the second half of the year.

Historically, oil drilling has long been a driving force in the demand for barite, but in recent years rising natural gas prices have become more influential. Natural gas prices rose from \$1.79 per million Btu in March 1999 to a peak of about \$8.20 per million Btu in mid-December 2000. Accordingly, the number of gas-directed rigs in the United States increased from about 360 rigs in March 1999 to about 800 rigs in September 2000, and peaked in the latter half of June 2001 at about 1,065 rigs. As domestic oil discoveries became profitable after 1999, both gas and oil well drill rig counts increased greatly, leading to increased barite consumption in 2000 and 2001. The ratio of gas-directed rigs to total U.S. rigs increased from about 60% in January 1998 (with about 640 gas-directed rigs) to 82% in June 2001, with about 1,035 rigs in a total of 1,270 rigs.

### **World Mine Production, Reserves, and Reserve Base:**

|                       | Mine production |                   | Reserves <sup>4</sup> | Reserve base <sup>4</sup> |
|-----------------------|-----------------|-------------------|-----------------------|---------------------------|
|                       | 2000            | 2001 <sup>e</sup> |                       |                           |
| United States         | 392             | 400               | 6,000                 | 60,000                    |
| Algeria               | 50              | 50                | 9,000                 | 15,000                    |
| Bulgaria              | 120             | 120               | 10,000                | 20,000                    |
| China                 | 3,500           | 3,800             | 30,000                | 150,000                   |
| France                | 75              | 75                | 2,000                 | 2,500                     |
| Germany               | 120             | 120               | 1,000                 | 1,500                     |
| India                 | 550             | 650               | 53,000                | 80,000                    |
| Iran                  | 185             | 190               | NA                    | NA                        |
| Korea, North          | 70              | 70                | NA                    | NA                        |
| Mexico                | 127             | 120               | 7,000                 | 8,500                     |
| Morocco               | 350             | 320               | 10,000                | 11,000                    |
| Russia                | 60              | 60                | 2,000                 | 3,000                     |
| Thailand              | 50              | 50                | 9,000                 | 15,000                    |
| Turkey                | 130             | 120               | 4,000                 | 20,000                    |
| United Kingdom        | 70              | 70                | 100                   | 600                       |
| Other countries       | 350             | 250               | 12,000                | 160,000                   |
| World total (rounded) | 6,200           | 6,600             | 160,000               | 550,000                   |

**World Resources:** In the United States, identified resources of barite are estimated to be 150 million tons, and hypothetical resources include an additional 150 million tons. The world's barite resources in all categories are about 2 billion tons, but only about 550 million tons are identified.

**Substitutes:** In the drilling mud market, alternatives to barite include celestite, ilmenite, iron ore, and the synthetic hematite that is manufactured in Germany. None of these substitutes, however, has had a major impact on the barite drilling mud industry.

<sup>e</sup>Estimated. NA Not available.

<sup>1</sup>Sold or used by domestic mines - exports + imports.

<sup>2</sup>Domestic and imported crude barite sold or used by domestic grinding establishments.

<sup>3</sup>Defined as imports - exports + adjustments for Government and industry stock changes.

<sup>4</sup>See Appendix C for definitions.