

## BARITE

(Data in thousand metric tons, unless otherwise noted)

**Domestic Production and Use:** Barite sales by domestic producers in 1999 decreased significantly from the 1998 level of 476,000 tons to about 375,000 tons; however, the value decreased to a lesser extent, to about \$10 million, since higher valued product was sold by the producers' beneficiation plants. Sales came from three States, with the preponderance coming from Nevada. Georgia was the second largest seller. In 1999 an estimated 1.4 million tons of ground barite was sold from six States from both domestic production and imports by domestic crushers and grinders. Nearly 85% of the barite sold in the United States was used as a weighting agent in oil- and gas-well-drilling fluids, mostly in the Gulf of Mexico region with smaller amounts used in the Pacific coast, western Canada, and Alaska areas. 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 is part of the mold-release compounds. Barite has become part of the friction products (brake and clutch pads) for transportation vehicles. Because barite strongly reduces X-rays and gamma rays, it is used in cement vessels that contain radioactive materials, gastrointestinal X-ray "milkshakes," and the faceplates and funnelglass of cathode-ray tubes used for television sets and computer monitors. Non-oil-well-drilling end uses tend to track the general U.S. economy rather than energy prices.

<b>Salient Statistics—United States:</b>	<b>1995</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>	<b>1999<sup>e</sup></b>
Sold or used, mine	543	662	692	476	375
Imports for consumption: Crude barite	965	1,470	2,210	1,850	750
Ground barite	80	70	31	20	25
Other	10	14	12	13	14
Exports	16	31	22	15	10
Consumption, apparent <sup>1</sup> (crude barite)	1,570	2,170	2,920	2,340	1,140
Consumption <sup>2</sup> (ground and crushed)	1,370	1,870	2,180	1,890	1,500
Price, average value, dollars per ton, mine	19.15	22.21	22.45	22.70	40.00
Employment, mine and mill, number <sup>e</sup>	400	350	380	410	300
Net import reliance <sup>3</sup> as a percent of apparent consumption	65	70	76	80	67

**Recycling:** None.

**Import Sources (1995-98):** China, 80%; India, 13%; Mexico, 3%; Morocco, 2%; and other, 2%.

<b>Tariff:</b>	<b>Item</b>	<b>Number</b>	<b>Normal Trade Relations</b>
			<b>12/31/99</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:** 15% (Domestic and foreign).

**Government Stockpile:** None.

**Events, Trends, and Issues:** Barite is used primarily in petroleum well drilling and, historically, has had a positive relationship to petroleum price trends and drill rig usage. The domestic demand for barite collapsed in early 1998 and has continued at a lower level through 1999. Starting in early 1998, the number of onshore oil rigs and gas rigs in the United States has taken a 1½-year slide following the decline in crude oil prices. Onshore oil rigs in the United States declined from about 396 rigs in February 1998 to about 122 rigs in February 1999, then stayed at or below 140 through November. Onshore gas rigs in the United States declined steadily from about 645 rigs in January 1998 to about 360 rigs in April 1999 then increased again, reaching 580 in September 1999. Drill rigs in Canada, a market for western U.S. barite grinders, declined from about 510 in February 1998 to a seasonal low of about 100 in May 1998, rising to between 140 and 230 rig count through the yearend. Canadian 1999 counts of drill rigs followed the same monthly pattern but did not rise above 1998 counts until September 1999. In February 1999, an Organization of Petroleum Exporting Countries meeting had concluded with an agreement to withhold production. Mexico and Norway joined the agreement. Average "light, sweet crude" oil futures prices rose steadily from \$11.68 for March 1 to \$24.50 per barrel for quoted as of October 4.

## BARITE

Onshore oil rigs did not respond to the average futures oil price increases in 1999, while onshore gas rigs increased without a significant average futures gas price increase. Canadian rig count after July 1999 rose further than the count rose over the same time period in 1998, and U.S. gas rig count rose to about 580 rigs from about 360 in May 1999. It is not clear why the gas directed rig count responded to rising oil prices. Perhaps American exploration oil companies do not trust the stability of the capacity withholding agreement, or American gas suppliers and drillers hoped to substitute for increasingly expensive oil supplies with relatively stable gas prices in certain consuming industries. An alternative explanation was put forward that the small drillers were hurt by the recent drilling recession, and the large drillers were too busy with the legal and bookkeeping problems of large consolidations.<sup>4</sup>

In the United States, estimated weighted average barite prices at the mine for the changed product mix sold by the domestic producers rose as the Western production sites switched to selling more ground (API grade) product for the Great Plains and Canadian drilling industry.

Imports for consumption of lower cost foreign barite was at about a 40% of 1998 levels and only twice the U.S. production rate. The major sources of imported barite have high-grade deposits, relatively low labor costs, and relatively low-cost (per ton-mile) ocean transportation (relative to land) to the U.S. Gulf Coast grinding plants. However, the Gulf of Mexico market was relatively steady at a relatively low rate of consumption. With a relatively large stockpile of unground ore in place at the beginning of the year, the Gulf grinders were not large buyers of imported ore. Meanwhile, the increased drilling took place inland, a nontraditional market for Gulf of Mexico grinders, which was better served by the inland grinders at mill sites near the mines. The high cost of overland shipping protected those grinders from imported barite ore. Nevada mines, crushers, and grinders are competitive in the California market, the Great Plains, and Canadian markets.

The principal environmental impact of chemically inert barite is the land disturbance normally associated with mining. Mud pits at petroleum well drilling sites, which contain some barite, are treated according to the chemical content exclusive of barite. The mud in the pits may be dewatered and covered, dewatered and spread over the ground, or transported to special waste handling facilities according to the base drilling fluid (water, oil, or synthetic).

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

	Mine production		Reserves <sup>5</sup>	Reserve base <sup>5</sup>
	1998	1999 <sup>e</sup>		
United States	476	375	27,000	60,000
Canada	80	50	11,000	15,000
China	3,000	1,500	35,000	150,000
France	75	50	2,000	2,500
Germany	120	100	1,000	1,500
India	430	250	28,000	32,000
Iran	180	180	NA	NA
Kazakhstan	9	10	NA	NA
Mexico	162	150	7,000	8,500
Morocco	353	300	10,000	11,000
Thailand	110	80	9,000	15,000
Turkey	130	150	4,000	20,000
United Kingdom	75	50	100	600
Other countries	690	500	20,000	160,000
World total (may be rounded)	5,890	3,750	150,000	480,000

**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. However, none of these substitutes 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>Gaddy, Dean E., 1999, Rig activity fails to bounce back despite \$20/bbl oil: Oil & Gas Journal, v. 97, no. 38, September 20, p. 44.

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