

BARITE

(Data in thousand metric tons, unless otherwise noted)

Domestic Production and Use: Barite sales by domestic producers increased significantly to about 600,000 tons in 2000 from 434,000 tons in 1999; the value increased to a lesser extent, to about \$14 million. Sales came from three States, with the preponderance coming from Nevada, followed by Georgia and Tennessee. In 2000, an estimated 2.0 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, and "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 faceplate and funnelglass of cathode-ray tubes used for television sets and computer monitors to block radiation towards the viewer.

Salient Statistics—United States:	1996	1997	1998	1999	2000^e
Sold or used, mine	662	692	476	434	600
Imports for consumption:					
Crude barite	1,470	2,210	1,850	836	1,460
Ground barite	70	31	20	17	22
Other	14	12	13	18	13
Exports	31	22	15	22	20
Consumption, apparent ¹ (crude barite)	2,170	2,920	2,340	1,280	2,080
Consumption ² (ground and crushed)	1,870	2,180	1,890	1,370	2,000
Price, average value, dollars per ton, mine	22.21	22.45	22.70	25.60	24.00
Employment, mine and mill, number ^e	350	380	410	300	300
Net import reliance ³ as a percent of apparent consumption	70	76	80	66	71

Recycling: None.

Import Sources (1996-99): China, 82%; India, 12%; Mexico, 2%; Morocco, 1%; Canada, 1%; and other, 2%.

Tariff:	Item	Number	Normal Trade Relations
			12/31/00
	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: The domestic demand for barite collapsed in mid-1998 as world oil prices dropped owing to over-production of oil. Imports of barite decreased from about 1.5 million tons for the first half of 1998 to about 400,000 tons for the second half of 1998 and both halves of 1999, rising to nearly 1 million tons in the first half of 2000. Starting in early 1998, the number of oil-directed rigs in the United States decreased from about 400 rigs to about 110 rigs in March-April 1999 as light sweet crude oil price futures declined from about \$18.30 to about \$11.70 per barrel. As oil prices rose from March 1999 to about \$35.50 per barrel in September 2000, the oil-directed rig count rose to about 135 rigs in June and fell to about 100 rigs in August 1999, then rose to about 200 rigs in the period between May and October 2000. Gas prices rose from \$1.79 per million BTU in March 1999 to \$5.28 per million BTU in September 2000. The number of gas-directed rigs in the United States declined steadily from about 600 rigs in January 1998 to about 360 rigs in March 1999 and then increased unevenly, reaching about 800 rigs in September 2000. The ratio of gas-directed rigs to total U.S. rigs went from about 60% in January 1998 with about 640 rigs to about 80% in January 1999 with about 530 total rigs and stayed at about 80% into October 2000 with about 850 rigs.

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A possible explanation for the lack of drilling for oil comes from an industry analysis that claimed that the Finding and Development Cost and the Reserve and Replacement Cost in the United States were significantly higher in 1998 than between 1988 and 1995 in the United States, and for the world average in 1998.⁴ The result indicates that oil companies expended less effort to search for oil to replace produced reserves in the United States but instead purchased proven reserves, which led to the lack of response of barite consumption to the oil price increase in 1999 and 2000. The industry analysis also noted that oil reserves were cheaper to find by the large, integrated oil firms in the "frontier" areas of the world (e.g., Africa/Middle East, Latin America, and Asia Pacific) than by the smaller firms searching in the "mature" areas (most parts of the United States). This analysis, for which individual company financial data were used, reported that the Reserve and Replacement Cost in the United States was about \$4 per barrel of oil equivalent greater than the average "frontier" cost during the 5 years to 1999. It also reported that the Reserve and Replacement Cost in Canada was about \$2 per barrel of oil equivalent less than the U.S. cost. This appears to explain the lack of oil well drilling in the United States following the rise in oil prices in 1999 and 2000.

Imports for consumption of lower cost foreign barite increased by about 75% compared with 1999 levels and was more than double the U.S. production rate. The major sources of imported barite have high-grade deposits, relatively low labor costs, and relatively low (per ton-mile) ocean transportation (compared to land transportation) cost to the U.S. Gulf Coast grinding plants. There was a relatively large stockpile of unground ore in place at the beginning of 1999, and the Gulf grinders worked down that stockpile while importing at a low rate. When demand returned to higher levels, the companies increased their rates of imports again. The Nevada mines, crushers, and grinders were competitive in the California market, the Great Plains, and the Canadian markets.

The principal environmental impact of chemically inert barite is the land disturbance normally associated with mining. Mud pits at well drilling sites, which contain barite, are treated according to the content of the base drilling fluid, not the 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 whether the base drilling fluid was water, oil, or synthetic.

World Mine Production, Reserves, and Reserve Base:

	Mine production		Reserves ⁵	Reserve base ⁵
	1999	2000 ^e		
United States	434	600	26,000	60,000
Bulgaria	100	120	10,000	20,000
Canada	126	130	11,000	15,000
China	2,800	2,500	30,000	150,000
France	60	60	2,000	2,500
Germany	120	120	1,000	1,500
India	600	650	28,000	32,000
Iran	170	180	NA	NA
Mexico	137	150	7,000	8,500
Morocco	330	310	10,000	11,000
Peru	75	75	2,000	3,000
Thailand	80	80	9,000	15,000
Turkey	130	150	4,000	20,000
United Kingdom	55	50	100	600
Other countries	440	520	10,000	160,000
World total (rounded)	5,660	5,700	150,000	490,000

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.

^eEstimated. NA Not available.

¹Sold or used by domestic mines - exports + imports.

²Domestic and imported crude barite sold or used by domestic grinding establishments.

³Defined as imports - exports + adjustments for Government and industry stock changes.

⁴Cacchione, N.D., and Teittinen, Matti, September 1, 2000, Herold 33^d Annual Reserve Replacement Cost Analysis: 2000 Final Report, accessed November 1, 2000, via URL <http://www.herold.com/research/>.

⁵See Appendix C for definitions.