

BARITE

(Data in thousand metric tons, unless otherwise noted)

Domestic Production and Use: Barite sales in 1997 increased significantly from the 1996 level of 662,000 tons to about 700,000 tons, and the value increased accordingly to about \$18 million. Sales came from six States, with slightly less than 80% of the total coming from Nevada. The second largest producing State was Georgia. About 2.1 million tons of ground barite from both domestic production and imports was sold in 1997 as reported by the domestic grinders and crushers. Nearly 90% of the barite sold in the United States was used as a weighing agent in oil- and gas-well-drilling fluids, mostly in the Gulf of Mexico region with much 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 γ 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.

Salient Statistics—United States:	1993	1994	1995	1996	1997^e
Sold or used, mine	315	583	543	662	700
Imports for consumption:					
Crude barite	766	1,010	965	1,470	1,700
Ground barite	38	58	80	70	70
Other	11	13	10	14	15
Exports	18	14	16	31	35
Consumption, apparent ¹ (crude barite)	1,100	1,640	1,570	2,170	2,435
Consumption ² (ground and crushed)	1,090	1,250	1,370	1,870	2,100
Price, average value, dollars per ton, mine	61.16	32.76	19.15	22.21	25.00
Employment, mine and mill, number ^e	330	350	400	350	380
Net import reliance ³ as a percent of apparent consumption	72	64	65	70	71

Recycling: None.

Import Sources (1993-96): China, 48%; India, 21%; Mexico, 6%; Morocco, 2%; and other, 23%.

Tariff:	Item	Number	Most favored nation (MFN)	Non-MFN⁴
			12/31/97	12/31/97
	Crude barite	2511.10.5000	\$1.25/t	\$3.94/t.
	Ground barite	2511.10.1000	\$1.28/t	\$7.38/t.
	Witherite	2511.20.0000	1.2% ad val.	30% ad val.
	Oxide, hydroxide, and peroxide	2816.30.0000	2% ad val.	10.5% ad val.
	Other sulfates	2833.27.0000	0.6% ad val.	4.2% ad val.
	Other chlorides	2827.38.0000	4.2% ad val.	28.5% ad val.
	Other nitrates	2834.29.5000	3.5% ad val.	10% ad val.
	Carbonate	2836.60.0000	2.3% ad val.	8.4% ad val.

Depletion Allowance: 14% (Domestic), 14% (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 increased strongly following expansions in the exploration and development activities both onshore and offshore along the Gulf Coast of the United States. Worldwide barite consumption grew modestly as there was an overcapacity in the oil-producing countries, centered in the Organization of Petroleum Exporting Countries (OPEC). Several of the OPEC countries withheld petroleum production to maintain stable prices in petroleum and gas markets, and drilled only for required development. Other, non-OPEC oil producing countries have had medium growth, which required both exploratory and development drilling, which also needed barite. Due to relatively long lead times in the petroleum industry, it was rational to explore and develop while in overcapacity.

Exploration/production drilling in the Gulf of Mexico for deeper natural gas deposits in Louisiana, Texas, and onshore Oklahoma continued unabated. The average futures price for light sweet crude was \$25.64 per barrel during the week

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of January 3, 1997, decreasing 22% to \$19.96 per barrel, by the week of July 4, 1997. The futures price average for November 10, 1997, was \$22.06 per barrel. The week average futures natural gas price were \$2.86 per million British thermal unit average during the week of January 3, 1997, but that dropped to \$2.11 per million British thermal unit average during the week of July 4, 1997. The quoted price was up to \$2.96 per million British thermal unit for the week of November 10, 1997. The rotary rig count in the United States rose from 845 for the week of January 3, 1997, to 965 in the week of July 19, 1996. The rig count continued to climb through the rest of the year, reaching 974 rigs in the week of November 10, 1997.

In the United States, estimated barite prices at the mine rose slightly, following demand increases. That is, more ground barite was sold through the mine-located and independent mills relative to the amount of crude and jigged ore sold directly from the mines.

Imports for consumption of lower cost foreign barite were nearly triple domestic production. The major sources of imported barite have high-grade deposits, relatively low labor costs, and relatively low cost (per ton-mile) of ocean transportation to the U.S. Gulf Coast grinding plants. Often the cost of ocean transportation from other continents is lower per ton than the cost of rail transportation from Georgia and Missouri to the end-use regions. Nevada mines, crushers, and grinders are competitive in the California market and are trying to reenter the Gulf of Mexico market through negotiated railroad tariff reductions. Over the past several years, China and India have had flooding and quality problems trying to supply low-cost barite into the gulf coast, but not enough to encourage domestic owners of Missouri mines to reopen any of those mines. The last, active Missouri barite mine and mill commenced shut-down procedures during the year.

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 other than 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 ⁵	Reserve base ⁵
	1996	1997 ^e		
United States	662	700	28,000	60,000
Canada	61	70	11,000	14,600
China	1,500	1,500	35,000	150,000
France	75	80	2,000	2,500
Germany	150	160	1,000	1,500
India	500	550	28,000	32,000
Iran	150	150	NA	NA
Kazakstan	250	270	NA	NA
Mexico	250	260	7,000	8,500
Morocco	265	270	10,000	11,000
Thailand	59	60	9,000	15,000
Turkey	144	160	4,000	20,000
United Kingdom	102	110	100	600
Other countries	<u>292</u>	<u>260</u>	<u>20,000</u>	<u>161,000</u>
World total (may be rounded)	4,460	4,600	170,000	500,000

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.

^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.

⁴See Appendix B.

⁵See Appendix D for definitions.