

FLUORSPAR

(Data in thousand metric tons, unless otherwise noted)

Domestic Production and Use: There was a small quantity of metallurgical-grade fluorspar mined and some byproduct calcium fluoride was recovered from industrial waste streams, although data are not available on exact quantities. Material purchased from the National Defense Stockpile or imported was screened and dried for resale to customers. Domestically, about 80% of reported fluorspar consumption went into the production of hydrofluoric acid (HF) in Louisiana and Texas and aluminum fluoride in Texas. HF is the primary feedstock for the manufacture of virtually all organic and inorganic fluorine-bearing chemicals, and is also a key ingredient in the processing of aluminum and uranium. The remaining estimated 20% of the reported fluorspar consumption was consumed as a flux in steelmaking, in iron and steel foundries, primary aluminum production, glass manufacture, enamels, welding rod coatings, cement production, and other uses or products. To supplement domestic fluorine supplies, about 53,000 metric tons of fluorosilicic acid (equivalent to 93,300 tons of 92% fluorspar) was recovered from phosphoric acid plants processing phosphate rock. Fluorosilicic acid was used primarily in water fluoridation, either directly or after processing into sodium silicofluoride, and to make aluminum fluoride for the aluminum industry.

Salient Statistics—United States:	1997	1998	1999	2000	2001^e
Production:					
Finished, all grades ¹	—	—	—	NA	NA
Fluorspar equivalent from phosphate rock	121	118	122	119	93
Imports for consumption:					
Acid grade	485	462	419	484	530
Metallurgical grade	51	41	59	39	33
Fluorspar equivalent from hydrofluoric acid plus cryolite	175	204	192	208	181
Exports ²	62	24	55	40	21
Shipments from Government stockpile	97	110	131	106	71
Consumption:					
Apparent ³	551	591	615	601	636
Reported	491	538	515	512	570
Stocks, yearend, consumer and dealer ⁴	375	468	373	289	281
Employment, mine and mill, number	—	—	—	5	5
Net import reliance ⁵ as a percentage of apparent consumption	100	100	100	100	100

Recycling: An estimated 8,000 to 10,000 tons per year of synthetic fluorspar is recovered from uranium enrichment, stainless steel pickling, and petroleum alkylation. Primary aluminum producers recycled HF and fluorides from smelting operations. HF is recycled in the petroleum alkylation process.

Import Sources (1997-2000): China, 63%; South Africa, 26%; and Mexico, 11%.

Tariff: Item	Number	Normal Trade Relations 12/31/01
Acid grade (97% or more CaF ₂)	2529.22.0000	Free.
Metallurgical grade (less than 97% CaF ₂)	2529.21.0000	Free.

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

Government Stockpile: During fiscal year 2001, the Defense National Stockpile Center (DNSC) made no sales of fluorspar. Under the proposed fiscal year 2002 Annual Materials Plan, the DNSC will be authorized to sell 54,400 metric tons (60,000 short dry tons) of metallurgical grade and 10,900 tons (12,000 short dry tons) of acid grade. In addition to the material below, the stockpile contains 57,000 tons of (62,800 short dry tons) of nonstockpile-grade material.

Stockpile Status—9-30-01⁶

Material	Uncommitted inventory	Committed inventory	Authorized for disposal	Disposal plan FY 2001	Disposals FY 2001
Acid grade	9	130	9	—	—
Metallurgical grade	46	51	46	54	—

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Events, Trends, and Issues: Milford Mining Company, LLC, which started mining in 2000, produced and shipped small amounts of metallurgical-grade fluorspar, kaolinite, and silica from its mine in southern Utah (R.B. Craik, Milford Mining Company, LLC, written commun., September 12, 2001). This was the first domestic production of fluorspar since Ozark-Mahoning Co. closed down operations in early 1996.

U.S. aluminum production decreased by an estimated 30% compared with that of 2000. Alcoa World Alumina temporarily shut down production (effective March 31, 2001) of aluminum fluoride at its Fort Meade, FL, facility because of reduced demand for the product. The Fort Meade plant used fluorosilicic acid from the phosphoric acid industry as its feedstock (Alcoa Inc., February 9, 2001, Alcoa adjusts alumina and aluminum fluoride production, accessed June 17, 2001, at URL http://www.alcoa.com/site/news_release/16767-2001_03_19.asp). This shutdown actually benefited fluorspar consumption, because the only other facility in the United States that produced aluminum fluoride is Alcoa's plant in Point Comfort, TX, which uses fluorspar as its feedstock.

Merchant sales of fluorspar were adversely affected by difficulties experienced by domestic steel producers. Steel companies suffered from foreign competition and slowing demand during the first three quarters of the year when U.S. steel production was down 12% compared with the same period in 2000. The terrorist attacks of September 11 pushed the U.S. further into recession exacerbating the problems. This may not be evident in the consumption data because prior to 2001 data for merchant sales were underreported.

World Mine Production, Reserves, and Reserve Base:

	Mine production		Reserves ^{7 8}	Reserve base ^{7 8}
	2000	2001 ^e		
United States	NA	NA	NA	6,000
China	2,450	2,450	23,000	94,000
France	100	100	10,000	14,000
Italy	65	70	6,000	7,000
Kenya	90	100	2,000	3,000
Mexico	635	620	32,000	40,000
Mongolia	199	180	10,000	NA
Morocco	100	80	NA	NA
Namibia	⁹ 66	⁹ 83	3,000	5,000
Russia	160	160	Moderate	18,000
South Africa	212	240	41,000	80,000
Spain	133	120	6,000	8,000
Other countries	<u>310</u>	<u>310</u>	<u>100,000</u>	<u>170,000</u>
World total (may be rounded)	4,520	4,510	230,000	440,000

World Resources: Identified world fluorspar resources were approximately 500 million tons of contained fluorspar. Resources of equivalent fluorspar from domestic phosphate rock were approximately 32 million tons. World resources of fluorspar from phosphate rock were estimated at 330 million tons.

Substitutes: Olivine and/or dolomitic limestone were used as substitutes for fluorspar. Byproduct fluorosilicic acid from phosphoric acid production was used as a substitute in aluminum fluoride production, and the potential also exists to use it as a substitute in HF production.

^eEstimated. NA Not available. — Zero.

¹Shipments.

²Exports are all general imports reexported or National Defense Stockpile material exported.

³Excludes fluorspar equivalent of fluorosilicic acid, hydrofluoric acid, and cryolite.

⁴Industry stocks plus National Defense Stockpile material committed for sale pending shipment.

⁵Defined as imports - exports + adjustments for Government and industry stock changes.

⁶See Appendix B for definitions.

⁷See Appendix C for definitions.

⁸Measured as 100% calcium fluoride.

⁹Data are in wet tons.