

FLUORSPAR

(Data in thousand metric tons, unless otherwise noted)

Domestic Production and Use: In 1996, fluorspar shipments totaled 8,000 tons from one mining company in southern Illinois. An estimated 91% of U.S. reported fluorspar consumption went into the production of hydrofluoric acid (HF) in Kentucky, 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. An estimated 5% of the reported fluorspar consumption was consumed as a flux in steelmaking and in iron and steel foundries. The remainder was consumed in primary aluminum production, glass manufacture, enamels, welding rod coatings, and other uses or products. To supplement domestic fluorine supplies, about 53,400 tons of fluorosilicic acid (equivalent to 94,000 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:	1992	1993	1994	1995	1996^e
Production: Finished, all grades ^{e 1}	² 52	² 60	² 49	² 51	8
Fluorspar equivalent from phosphate rock	106	116	97	98	94
Imports for consumption:					
Acid grade	423	434	434	470	485
Metallurgical grade	111	63	59	88	54
Fluorspar equivalent from hydrofluoric acid plus cryolite	106	99	108	114	150
Exports ³	14	13	24	42	30
Sales from Government stockpile	4	21	273	153	97
Consumption: Apparent ⁴	569	556	310	445	692
Reported	485	447	486	525	530
Stocks, yearend, consumer and dealer ⁵	75	78	284	405	230
Employment, mine and mill, number	130	130	130	130	5
Net import reliance ⁶ as a percent of apparent consumption	91	90	84	89	99

Recycling: Primary aluminum producers recycled HF and fluorides from smelting operations. HF is recycled in the petroleum alkylation process.

Import Sources (1992-95): China, 57%; South Africa, 23%; Mexico, 16%; and other, 4%.

Tariff:	Item	Number	Most favored nation (MFN) <u>12/31/96</u>	Non-MFN⁷ <u>12/31/96</u>
	Acid grade (more than 97% CaF ₂)	2529.22.0000	\$1.24/t	\$5.51/t.
	Metallurgical grade (less than 97% CaF ₂)	2529.21.0000	Free	13.5% ad val.

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

Government Stockpile: During fiscal year 1996, the Defense National Stockpile Center (DNSC) was authorized to sell 118,000 tons (130,000 short dry tons) of acid grade and 136,000 tons (150,000 short dry tons) of metallurgical grade. During the 1996 fiscal year, the DNSC sold 115,000 tons (125,000 short dry tons) of acid grade. This included nearly 34,000 tons (36,000 short dry tons) actually sold in September 1995, but under the fiscal year 1996 disposal authority. Sales of metallurgical grade only amounted to 15,500 tons (17,100 short dry tons). Under the proposed fiscal year 1997 Annual Materials Plan, the DNSC plans to sell 91,000 tons (100,000 short dry tons) of acid grade and 136,000 tons (150,000 short dry tons) of metallurgical grade.

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Stockpile Status—9-30-96 (thousand metric tons)

Material	Uncommitted inventory	Committed inventory	Authorized for disposal	Disposals Jan.-Sept. 96
Acid grade	412	265	353	80
Metallurgical grade	151	54	151	15

Events, Trends, and Issues: The last remaining domestic fluorspar mining company, located in southern Illinois, ceased production at the beginning of the year. Its parent company subsequently closed the Kentucky hydrofluoric acid plant that had been supplied by the Illinois mining company.

Production of chlorofluorocarbons (CFC's) ceased at the end of 1995. In 1996, consumer stocks of CFC's were depleted much sooner than had been anticipated, which resulted in a dramatic runup in prices for traditional CFC's, such as R-12 and R-502. This motivated consumers to convert from CFC's to replacement hydrofluorocarbons and hydrochlorofluorocarbons. There was a healthy increase in the seasonal demand for these replacement fluorocarbons. The increased demand for fluorocarbon replacements means increased demand for HF, which was expected to be in tight supply in the fourth quarter of 1996 and into 1997. The tight supply situation should ease later in 1997 when production ramps up at the HF plant in Amherstberg, Canada, which is resuming production after being mothballed for several years.

World Mine Production, Reserves, and Reserve Base:

	Mine production		Reserves ^{8,9}	Reserve base ^{8,9}
	1995	1996 ⁶		
United States	51	8	W	10,000
Brazil	80	80	W	W
China	1,900	1,900	27,000	46,000
France	125	120	10,000	14,000
Kenya	91	80	2,000	3,000
Mexico	523	590	19,000	23,000
Morocco	105	95	W	W
South Africa	196	225	30,000	36,000
Spain	97	100	6,000	8,000
United Kingdom	64	60	2,000	3,000
Other countries	708	700	¹⁰ 114,000	¹¹ 167,000
World total (rounded)	3,940	3,950	210,000	310,000

World Resources: Identified world fluorspar resources were approximately 400 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.

⁶Estimated. W Withheld to avoid disclosing company proprietary data.

⁷Shipments.

²Includes fluorspar from National Defense Stockpile reprocessed by Ozark-Mahoning Co., Illinois.

³Exports are all general imports reexported or National Defense Stockpile material exported.

⁴Excludes fluorspar equivalent of fluorosilicic acid, hydrofluoric acid, and cryolite.

⁵Industry stocks plus National Defense Stockpile material committed for sale pending shipment.

⁶Defined as imports - exports + adjustments for Government and industry stock changes.

⁷See Appendix B.

⁸See Appendix C for definitions.

⁹Measured as 100% calcium fluoride.

¹⁰Includes Brazil, Morocco, and the United States.

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