FLUORSPAR

(Data in thousand metric tons, unless otherwise noted)

Domestic Production and Use: There was no domestic mine production of fluorspar in 1997. There was some recovery of byproduct calcium fluoride from industrial waste streams, although it is not included in the data shown below. Material purchased from the National Defense Stockpile or imported was screened and dried for resale to customers. An estimated 90% of U.S. 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 10% 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, and other uses or products. To supplement domestic fluorine supplies, about 68,800 tons of fluorosilicic acid (equivalent to 121,000 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:	<u>1993</u>	<u> 1994</u>	<u> 1995</u>	<u> 1996</u>	1997 ^e
Production: Finished, all grades ^e 1	² 60	² 49	² 51	8	_
Fluorspar equivalent from					
phosphate rock	116	97	98	119	121
Imports for consumption:					
Acid grade	434	434	470	474	510
Metallurgical grade	63	59	88	39	68
Fluorspar equivalent from					
hydrofluoric acid plus cryolite	99	108	114	135	174
Exports ³	13	24	42	62	60
Shipments from Government stockpile	19	251	153	81	182
Consumption: Apparent⁴	560	563	599	711	609
Reported	447	486	525	527	515
Stocks, yearend, consumer and dealer ⁵	78	284	405	234	325
Employment, mine and mill, number Net import reliance ⁶ as a percent of	130	130	130	5	_
apparent consumption	89	91	91	99	100

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

Import Sources (1993-96): China, 64%; South Africa, 20%; Mexico, 13%; and other, 3%.

Tariff: Item	Item Number Most favored nation (MFN 12/31/97		Non-MFN ⁷ <u>12/31/97</u>
Acid grade (more than 97% CaF ₂) Metallurgical grade	2529.22.0000	\$0.83/t or Free ⁸	\$5.51/t.
(less than 97% CaF ₂)	2529.21.0000	Free	13.5% ad val.

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

Government Stockpile: During fiscal year 1997, the Defense National Stockpile Center (DNSC) was authorized to sell 163,000 tons (180,000 short dry tons) of acid grade and 45,000 tons (50,000 short dry tons) of metallurgical grade. During the 1997 fiscal year, the DNSC sold 137,000 tons (151,000 short dry tons) of acid grade. Sales of metallurgical grade totaled 45,000 tons (50,000 short dry tons). Under the proposed fiscal year 1998 Annual Materials Plan, the DNSC will attempt to sell 163,000 tons (180,000 short dry tons) of acid grade and 45,000 tons (50,000 short dry tons) of metallurgical grade.

FLUORSPAR

Stockpile Status—9-30-979

Matarial	Uncommitted	Committed	Authorized	Disposal plan	Disposals
Material	inventory	inventory	for disposal	FY 1997	FY 1997
Acid grade	254	191	217	163	137
Metallurgical grade	238	16	238	45	45

Events, Trends, and Issues: Two major fluorspar conferences were held during the year. The "International Fluorspar Conference 1997" was held in March in Vail, CO, and "Fluorspar 1997" was held in Shanghai, China, in October. Solvay S.A. acquired all the outstanding shares of Okorusu Holdings Ltd., owner of Namibian fluorspar mining company Okorusu Fluorspar (Pty) Ltd. Okorusu Fluorspar has the capacity to produce about 50,000 tons of acid-grade fluorspar, all of which will be allocated to Solvay's hydrofluoric acid plant at Bad Wimpfen, Germany. Mexico's Cia. Minera Las Cuevas completed construction of a new grinding and screening plant for metallurgical-grade fluorspar production and began construction of its new fluorspar refinery to produce high-purity, low-arsenic acid-grade fluorspar. The refinery will utilize a combination pyrometallurgical and leaching process to produce premium-grade fluorspar product. Representatives of more than 100 governments met in Montreal, Canada, to discuss changes to the phaseout schedule for chemicals that deplete the ozone layer. An accelerated phaseout of hydrochlorofluorcarbons was rejected, maintaining the current deadline of 2020 for developed countries and 2040 for developing countries.

World Mine Production, Reserves, and Reserve Base:

	Mine production		Reserves ^{13 14}	Reserve base ^{13 14}	
	<u> 1996</u>	<u> 1997°</u>			
United States	8	_	_	6,000	
Brazil	52	50	W	W	
China	2,150	2,200	23,000	94,000	
France	105	105	10,000	14,000	
Kenya	80	80	2,000	3,000	
Mexico	540	480	32,000	40,000	
Morocco	100	100	W	W	
South Africa	217	230	30,000	36,000	
Spain	105	105	6,000	8,000	
United Kingdom	60	60	2,000	3,000	
Other countries	723	<u>700</u>	¹⁵ 113,000	¹⁵ 167,000	
World total (rounded)	4,140	4,110	218,000	371,000	

<u>World Resources</u>: 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.

<u>Substitutes</u>: 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.

^eEstimated. W Withheld to avoid disclosing company proprietary data.

¹Shipments.

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.

⁸Free in the case of Canada, Mexico, and designated countries under the Generalized System of Preferences, Caribbean Basin Economic Recovery Act, U.S./Israel Free Trade Area, and the Andean Trade Preference Act.

⁹See Appendix C for definitions.

¹⁰Industrial Minerals, 1997, Solvay Buys Okorusu Fluorspar: Industrial Minerals, no. 359, p. 15.

¹¹Gaytan, Jose, 1997, Las Cuevas: A Vision to the Future: Fluorspar 1997 Conference, Shanghai, China, 1997, 26 p.

¹²Chemical Week, 1997, Accelerated HCFC Phaseout is Rejected: Chemical Week, v. 159, no. 36, p. 16.

¹³See Appendix D for definitions.

¹⁴Measured as 100% calcium fluoride.

¹⁵Includes Brazil and Morocco.