

Mineral Industry Surveys

For information, contact:

M. Michael Miller, Fluorspar Commodity Specialist
U.S. Geological Survey
983 National Center
Reston, VA 20192
Telephone: (703) 648-7716, Fax: (703) 648-7757
E-mail: mmiller1@usgs.gov

Barbara McNair (Data)
Telephone: (703) 648-7952
Fax: (703) 648-7975
E-mail: bmcnair@usgs.gov

Internet: <http://minerals.usgs.gov/minerals>

FLUORSPAR IN THE THIRD QUARTER 2004

Reported fluorspar consumption in the third quarter was 167,000 metric tons (t), about a 13% decrease compared with the previous quarter and essentially unchanged compared with the figure for the third quarter of 2003. Consumption of fluorspar for hydrofluoric acid (HF) and aluminum fluoride was 146,000 t, about a 14% decrease compared with the previous quarter and about 3% higher compared with the third quarter of 2003. Imports of fluorspar were 143,000 t, an increase of about 42% compared with the previous quarter, but about 5% less than in the third quarter of 2003.

In 2004, the British Geological Survey (BGS) released two fluorspar-related reports—a Mineral Planning Factsheet (7 pages) and a Commodity Profile (27 pages). They are available for free download on the BGS Web site at <http://www.bgs.ac.uk/mineralsuk/home.html>. The reports can be located either by clicking on the What's New link or by searching for fluorspar.

Industry News

Glebe Mines Ltd., the primary fluorspar producer in the United Kingdom, has been working with the University of Leicester to develop new exploration techniques to locate fluorspar deposits. The traditionally mined vein deposits have been largely depleted, but "replacement deposits," formed where the host limestones have been replaced by fluorite and barite, may still be available for mining. A limited understanding of the geologic controls of these types of deposits meant that no effective exploration methodology existed.

The project first involved taking a large volume of historical data from Glebe's previous excavations and importing this into a specially developed geographic information system. This allowed scientists at Leicester to use scientific principles to identify how and where replacement ore deposits can occur. The second element introduced geophysical techniques to reduce the amount of test drilling and trenching that Glebe had to undertake on a new site. Glebe Mines is now introducing these techniques to its new open cast sites, and the system has

already assisted in locating a major ore body (University of Leicester, 2004§¹).

South Africa's Witkop Mining (Pty.) Ltd.'s plant upgrade project essentially was completed during the summer. Significant steps included the commissioning of a new ball mill in April 2004 and the commissioning of another ball mill and a regrind mill in June 2004. Mine and plant improvements were expected to increase production capacity from 110,000 metric tons per year (t/yr) to 180,000 t/yr.

In the last couple of years, the Rand has strengthened significantly against the U.S. dollar. If the Rand continues to appreciate against the dollar, Witkop has a contingency plan to reduce costs that would involve recycling of tailings to recover fluorspar. Witkop has an estimated 45 million metric tons of tailings material (containing about 6% CaF₂) that could be considered for recycling. This recycling plan would supplement mine production. Such a recycling plan could, if necessary, be underway by the end of the first quarter of 2005 (Mining Review, 2004§).

Fluorspar 04, an international fluorspar conference, was held November 8-10, 2004, in San Luis Potosi, Mexico. Papers were presented on subjects ranging from fluorspar to HF to ocean shipping. More than 100 delegates from 23 countries attended the 3-day conference, which included a tour of Cia. Minera Las Cuevas's fluorspar mine.

Fluorochemical News

Effective October 1, 2004, Atofina S.A. reorganized and formed two new companies—Arkema Group and Total Petrochemicals. Arkema will consist of the businesses of the former Atofina Chemicals, including vinyl products, industrial chemicals, and performance products. Arkema's fluorochemicals products will be included in its industrial chemicals business unit (Arkema, 2004§). Arkema is a decentralized unit that is expected to be eventually spun off through either a public offering or a sale.

Although it is only a very small downstream market for

¹References that include a section mark (§) are found in the Internet References Cited section.

fluorspar and HF, the nitrogen trifluoride (NF₃) market continues to grow. This growth is being driven primarily by the strong demand for liquid crystal displays (LCDs), where it is used for cleaning applications. LCDs account for only about 20% of the NF₃ market, but demand for LCDs is growing at an estimated 30% per year. The largest market for NF₃ is the semiconductor market, where high-purity NF₃ is used as a decontaminant. The semiconductor market accounts for about 70% of demand and is growing at about 10% per year (Lerner, 2004).

Honeywell International Inc. announced a price increase for HF, effective September 13, 2004, on all North American orders or as contracts permit. Prices will increase by a minimum of 8% for both aqueous and anhydrous HF. Honeywell cited significant increases in costs for raw materials and shipping, as well as a sustained increase in energy and fuel costs, as the reasons for the price change (Honeywell International Inc., 2004§).

When the European Commission (EC) of the European Union officially adopted the Registration, Evaluation, Authorization and Restrictions of Chemicals (REACH) legislative proposal, it enabled requirements that chemical producers (including foreign firms wishing to sell their products in Europe) provide basic toxicity and exposure information on all chemicals in commerce (Lowell Center for Sustainable Production, 2003a§, b§). According to Annex III, however, minerals, ores, or substances occurring in nature are exempt from the obligation to register, if they are not chemically modified during their manufacturing, unless they meet the criteria for classification as dangerous according to Directive 67/548 (Commission of the European Communities, 2003§). This would exempt fluorspar from the

provisions of REACH.

Reference Cited

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TABLE 1
SALIENT FLUORSPAR STATISTICS¹

(Metric tons, unless otherwise specified)

	2003		2004			
	Third quarter	Fourth quarter	First quarter	Second quarter	Third quarter	Total
Imports for consumption:	151,000	143,000	226,000	101,000	143,000	470,000
Average value per ton, c.i.f. U.S. port, acid grade	\$141	\$156	\$172	\$162	\$166	\$161
Average value per ton, c.i.f. U.S. port, metallurgical	\$85	\$85	\$83	\$75	\$81	\$81
Exports	7,330	7,100	6,800	5,100	4,670	16,600
End of quarter stocks, consumer	113,000	126,000	173,000 ^r	102,000 ^r	93,400	XX
Fluorspar equivalent of imported hydrofluoric acid	32,800	35,500	43,300	48,600	47,900	140,000
Fluorspar equivalent of imported cryolite	845	758	1,370	1,240	1,080	3,690
Quarterly reported fluorspar consumption	166,000	161,000	167,000	191,000 ^r	167,000	525,000

^rRevised. XX Not applicable.

¹Data are rounded to no more than three significant digits; may not add to totals shown.

TABLE 2
CONSUMPTION OF FLUORSPAR BY END USE AND ASSAY RANGE¹
(DOMESTIC AND FOREIGN IN THE UNITED STATES)

(Metric tons)

End use or product	Second quarter 2004			Third quarter 2004			Year to date
	More than 97% calcium fluoride	Not more than 97% calcium fluoride	Total	More than 97% calcium fluoride	Not more than 97% calcium fluoride	Total	
Hydrofluoric acid and aluminum fluoride	169,000	--	169,000	146,000	--	146,000	462,000
Metallurgical	4,890 ^r	9,280 ^r	14,200 ^r	4,670	8,340	13,000	41,200
Other uses or products ²	7,280 ^r	--	7,280 ^r	7,510	--	7,510	21,400
Total	181,000 ^r	9,280 ^r	191,000 ^r	158,000	8,340	167,000	525,000
Stocks, end of quarter ³	76,300 ^r	25,900 ^r	102,000 ^r	72,100	21,300	93,400	XX

^rRevised. XX Not applicable. -- Zero.

¹Data are rounded to no more than three significant digits; may not add to totals shown.

²Includes acid grade used in enamel, glass and fiberglass, steel castings, and welding rod coatings.

³Stocks data include distributor stocks (excluding National Defense Stockpile holdings) and consumer stocks for hydrofluoric acid and aluminum fluoride.

TABLE 3
U.S. IMPORTS FOR CONSUMPTION OF FLUORSPAR, BY COUNTRY AND VALUE^{1,2}

	2003				2004							
	Third quarter		Fourth quarter		First quarter		Second quarter		Third quarter		Year to date	
	Quantity (metric tons)	Value ³ (thousands)										
Containing more than 97% calcium fluoride:												
China	111,000	\$16,200	94,900	\$15,700	171,000	\$31,100	23,500	\$4,430	104,000	\$18,200	298,000	\$53,800
France	--	--	42	14	--	--	--	--	44	16	44	16
Germany	--	--	--	--	--	--	19	9	--	--	19	9
Mexico	15,500	1,950	12,100	1,740	16,100	2,020	27,100	4,210	17,900	2,900	61,200	9,130
Mongolia	20	3	--	--	--	--	13,400	2,210	10,800	1,570	24,300	3,790
South Africa	15,000	1,870	28,000	3,580	21,000	2,640	28,300	4,180	6,000	707	55,300	7,530
Spain	--	--	--	--	--	--	--	--	--	--	--	--
United Kingdom	46	21	445	53	4	5	--	--	9	17	13	22
Total	142,000	20,000	135,000	21,100	208,000	35,800	92,400	15,000	138,000	23,400	439,000	74,300
Containing not more than 97% calcium fluoride:												
Canada	--	--	--	--	7	3	--	--	--	--	7	3
Mexico	9,010	762	7,390	629	18,200	1,520	6,350	511	4,840	392	29,400	2,420
Other	--	--	--	--	--	--	1,880	102	--	--	1,880	102
Total	9,010	762	7,390	629	18,300	1,520	8,230	614	4,840	392	31,300	2,530
Grand total	151,000	20,800	143,000	21,800	226,000	37,300	101,000	15,700	143,000	23,800	470,000	76,800

-- Zero.

¹Imports for consumption include imports of immediate entry, and warehouse withdrawals.

²Data are rounded to no more than three significant digits; may not add to totals shown.

³Cost, insurance, and freight at U.S. ports.

Source: U.S. Census Bureau.

TABLE 4
IMPORTS FOR CONSUMPTION OF HYDROFLUORIC ACID¹

	2003				2004							
	Third quarter		Fourth quarter		First quarter		Second quarter		Third quarter		Year to date	
	Quantity (metric tons)	Value ² (thousands)										
Canada	6,990	\$8,060	7,360	\$8,050	9,780	\$11,700	11,900	\$12,400	13,200	\$13,700	34,900	\$37,700
China	340	198	429	247	116	89	514	319	261	198	891	606
Germany	200	347	65	124	64	120	45	88	61	139	170	347
Japan	311	755	250	608	347	816	214	530	420	1,000	981	2,350
Mexico	13,900	12,900	15,500	14,600	18,400	17,500	19,700	18,700	17,900	17,400	56,000	53,600
Other ³	116	293	61	176	99 ^r	298 ^r	119 ^r	345 ^r	67	165	285	808
Total	21,800	22,600	23,700	23,800	28,800	30,500	32,400	32,400	31,900	32,500	93,200	95,500

^rRevised.

¹Data are rounded to no more than three significant digits; may not add to totals shown.

²Cost, insurance, and freight at U.S. ports.

³Includes France, Italy, the Republic of Korea, the Netherlands, Singapore, Spain, Switzerland, Taiwan, and the United Kingdom.

Source: U.S. Census Bureau.