

Mineral Industry Surveys

For information, contact:

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

Martha L. Jackson (Data)
Telephone: (703) 648-7944
Fax: (703) 648-7975
E-mail: mjackson@usgs.gov

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

FLUORSPAR IN THE SECOND QUARTER 2008

Reported fluorspar consumption in the second quarter was 138,000 metric tons (t), a decrease of about 2% compared with that of the previous quarter and a decrease of about 3% compared with consumption in the second quarter of 2007. Consumption of acid-grade fluorspar (acidspars) for hydrofluoric acid (HF) and aluminum fluoride (AlF₃) was 118,000 t, a slight decrease compared with that of the previous quarter and about 5% less than that in the second quarter of 2007. Consumption of metallurgical-grade fluorspar (metspar) for all uses was 9,280 t, a decrease of nearly 4% compared with that of the previous quarter, and 13% more than was consumed in the second quarter of 2007.

In recent years, the import values [cost, insurance, and freight (c.i.f.)] for some acidspars imports have been underreported. As a result, average import values for acidspars are no longer listed in table 1. According to *Industrial Minerals* magazine, end-of-second-quarter-2008 acidspars prices were—China, dry basis, c.i.f. U.S. Gulf of Mexico port, \$380 to \$400 per metric ton; Mexico, free on board (f.o.b.) Tampico, \$180 to \$200 per metric ton and \$330 to \$350 per metric ton (low arsenic); and South Africa, f.o.b. Durban, \$250 per metric ton (*Industrial Minerals*, 2008b).

Industry News

Hastie Mining Co. (Cave-In-Rock, IL) and Moodie Mineral Co. anticipated breaking ground in mid-September on the Klondike II fluorspar mine in Livingston, KY. An exploration program drilled 25 holes identifying fluorspar reserves in excess of 1 million metric tons with an average grade of 52% calcium fluoride. The flotation mill at Salem, KY, was vandalized while it sat idle; as a result, plans to restart the mill have been delayed, and there will be significant additional costs to bring the mill back into operating condition (Boyce Moody, III, Moody Minerals Co., oral commun., September 3, 2008).

In early 2008, Glebe Mines Ltd. (United Kingdom) submitted a planning application to the Peak District National Park Authority for the extraction of fluorspar. This would extend the existing Tearsall open pit on Bonsall Moor in Derbyshire, England. The proposal called for the extraction of approximately 660,000 t of fluorspar ore during a 6-year period

and would include progressive restoration. On completion of mining, the site would be fully restored to agricultural use during the following year. The application received support from the local town council, but the company was still waiting for a decision from the Park Authority (Glebe Mines Ltd., 2008; *Industrial Minerals*, 2008a).

The Glebe Mines application received valuable support in the form of British Geological Survey Open Report OR/08/027 entitled “The need for indigenous fluorspar production in England.” The report was part of a larger project analyzing the need for nonenergy indigenous mineral production in England. The report described the uses of fluorspar and its importance to the English economy and downstream industries that it supports. The principal aims were to provide background information on fluorspar and its downstream industries, review economic benefits, determine the need for indigenous production and the impacts of ceasing production, and consider environmental impacts (Lusty and others, 2008).

As part of the project to restart fluorspar mining on the Burin Peninsula of Newfoundland, Canada, Burin Minerals Ltd. (Newfoundland and Labrador, Canada) hired Cabo Drilling Corp. (North Vancouver, British Columbia, Canada) to drill 15,000 meters on Burin’s St. Lawrence fluorspar property. Drilling commenced on June 11 with a single drill, but Burin has the option to request a second drill at a later date (Cabo Drilling Corp., 2008).

Tertiary Minerals plc (United Kingdom) awarded a contract to a Canadian mining services company to complete an extensive program of mineral processing tests to evaluate the production of acid-grade fluorspar concentrates from Tertiary’s Storuman fluorspar project in Sweden. The test work is a major component of an economic and technical scoping study that is scheduled for completion later this year (Tertiary Minerals plc, 2008a). Tertiary completed a drilling program in spring 2008 designed to reinvestigate the deposit originally discovered in the 1970s by Gränges Aluminium AB (Sweden). The first round of assay results from 10 drill holes were received, and results were positive enough to warrant submission of an additional 138 samples for assay. According to the company, step-out holes suggested the potential for large extensions of the ore deposit in

previously untested areas (Tertiary Minerals plc, 2008b).

Fluorochemical News

Spain's Minerales y Productos Derivados S.A. (Minersa) will replace Industries Chimiques du Fluor (Tunisia) as the major shareholder and technology partner in Alfluorco (Pty) Ltd. (South Africa). Minersa will own a 50% stake in the company, which is studying the feasibility of constructing an HF and AlF₃ plant at Richards Bay. Vergenoeg Mining Company (Pty) Ltd. (South Africa) and the state-owned Industrial Development Corp. each hold a 25% stake in the company. Minersa, which is a 30% shareholder in Vergenoeg, operates one of the largest HF and AlF₃ facilities in Europe. Completion of the bankable feasibility study was expected by the end of the year (van der Merwe, 2008).

Arkema announced plans to begin European production in 2011 of a new fluorinated refrigerant, hydrofluoroolefin R1234yf, which is expected by Arkema to gradually replace HFC-134a currently used in automobile air conditioning systems. This action was in response to the European Union directive mandating the elimination of HFC-134a in new vehicle models, effective January 1, 2011, and in all new vehicles beginning January 1, 2017. The directive requires the use of refrigerants with global warming potentials (GWP) of less than 150 (where carbon dioxide equals 1). R1234yf has a GWP of 4 compared with 1,300 for HFC-134a (Arkema, 2008).

References Cited

- Arkema, 2008, Arkema launches an industrial production project in Europe of a low-GWP fluorinated gas for automotive air-conditioning: Colombes, France, Arkema press release, July 9, 1 p. (Accessed August 28, 2008, via <http://www.arkema.com/sites/group/en/press/home.page>.)
- Cabo Drilling Corp., 2008, Cabo to drill 15,000 meters for Burin Minerals: North Vancouver, British Columbia, Canada, Cabo Drilling Corp. news release, June 16, 1 p. (Accessed September 3, 2008, at http://www.marketwire.com/press_release/Cabo-Drilling-Corp-TSX-VENTURE-CBE-868920.html.)
- Glebe Mines Ltd., 2008, Tearsall—The planning application: United Kingdom, Glebe Mines Ltd. (Accessed August 27, 2008, at <http://www.tearsall.co.uk/>)
- Industrial Minerals, 2008a, Glebe fluorspar application supported: Industrial Minerals, no. 491, August, p. 16.
- Industrial Minerals, 2008b, Prices: Industrial Minerals, no. 490, July, p. 80.
- Lusty, P.A.J., Brown, T.J., Ward, J., and Bloomfield, S., 2008, The need for indigenous fluorspar production in England: British Geological Survey Open Report OR/08/027, 29 p. (Accessed September 2, 2008, at http://www.bgs.ac.uk/mineralsuk/free_downloads/home.html#fluorspar.)
- Tertiary Minerals plc, 2008a, Contract awarded for mineral processing testwork on Storuman fluorspar project: Macclesfield, United Kingdom, Tertiary Minerals plc news release, July 8, 2 p. (Accessed September 10, 2008, via <http://www.tertiaryminerals.com/>.)
- Tertiary Minerals plc, 2008b, Drilling results confirm Storuman fluorspar deposit extends for at least 2 km along strike: Macclesfield, United Kingdom, Tertiary Minerals plc news release, September 2, 3 p. (Accessed September 10, 2008, via <http://www.tertiaryminerals.com/>.)
- van der Merwe, Christy, 2008, Spain's Minersa to become main shareholder in SA hydrofluoric acid joint venture: Creamer Media's Mining Weekly Online, July 22, 1 p. (Accessed September 3, 2008, at <http://www.miningweekly.com/article.php?id=138625>.)

TABLE 1
SALIENT FLUORSPAR STATISTICS¹

(Metric tons, unless otherwise specified)

	2007			2008		Total or average
	Second quarter	Third quarter	Fourth quarter	First quarter	Second quarter	
Imports for consumption:						
Quantity	202,000	129,000	177,000	122,000	157,000 *	279,000 *
Average value per ton, c.i.f. U.S. port, acid grade	(2)	(2)	(2)	(2)	(2)	(2)
Average value per ton, c.i.f. U.S. port, metallurgical grade	\$112	\$110	\$110	\$103	\$106 *	\$104
Exports	3,190	3,010	3,600	4,070	4,620	8,690
End of quarter stocks, consumer	115,000	114,000	90,100	102,000	107,000	XX
Imports for consumption of hydrofluoric acid ³	41,000	35,000	34,300	35,000	36,700 *	71,700 *
Imports for consumption of cryolite ³	1,270	800	853	2,370	2,160 *	4,530 *
Quarterly reported fluorspar consumption	143,000	132,000	132,000	142,000	138,000	280,000

XX Not applicable.

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

²Value data appear to be underreported and are too low to make accurate average-value-per-ton calculations for acid-grade imports.

³In the past, these data showed imports in fluorspar equivalents, but data are now actual imports for consumption of indicated materials.

*Correction posted on November 7, 2008.

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

(Metric tons)

	Hydrofluoric acid and aluminum fluoride	Metallurgical	Other uses or products ²	Total	Stocks, end of period ³
2007:					
First quarter:					
More than 97% calcium fluoride	114,000	3,630	7,020	124,000	67,900
Not more than 97% calcium fluoride	--	3,920	3,810	7,740	20,900
Total	114,000	7,550	10,800	132,000	88,900
Second quarter:					
More than 97% calcium fluoride	124,000	3,710	7,120	135,000	94,600
Not more than 97% calcium fluoride	--	8,230	--	8,230	20,700
Total	124,000	11,900	7,120	143,000	115,000
Third quarter:					
More than 97% calcium fluoride	114,000	3,710	6,990	124,000	95,800
Not more than 97% calcium fluoride	--	7,890	--	7,890	18,300
Total	114,000	11,600	6,990	132,000	114,000
Fourth quarter:					
More than 97% calcium fluoride	112,000	3,710	7,230	123,000	78,200
Not more than 97% calcium fluoride	--	4,210	4,450	8,660	11,900
Total	112,000	7,920	11,700	132,000	90,100
Grand total	464,000	39,000	36,600	539,000	XX
2008:					
First quarter:					
More than 97% calcium fluoride	120,000	4,020	7,640	132,000	85,800
Not more than 97% calcium fluoride	--	9,660	--	9,660	16,100
Total	120,000	13,700	7,640	142,000	102,000
Second quarter:					
More than 97% calcium fluoride	118,000	3,630	7,170	129,000	92,000
Not more than 97% calcium fluoride	--	9,280	--	9,280	15,100
Total	118,000	12,900	7,170	138,000	107,000
Grand total	239,000	26,600	14,800	280,000	XX

XX Not applicable. -- Zero.

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

²May include cement, enamel, glass and fiberglass, steel castings, and welding rod coatings.

³Stocks 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}

	2007						2008					
	Second quarter		Third quarter		Fourth quarter		First quarter		Second quarter*		Year*	
	Quantity (metric tons)	Value ³ (thousands)	Quantity (metric tons)	Value ³ (thousands)	Quantity (metric tons)	Value ³ (thousands)	Quantity (metric tons)	Value ³ (thousands)	Quantity (metric tons)	Value ³ (thousands)	Quantity (metric tons)	Value ³ (thousands)
Containing more than 97% calcium fluoride:												
China	130,000	\$23,800	11,900	\$2,630	88,600	\$20,600	14,700	\$3,540	68,400	\$21,400	83,200	\$25,000
Germany	--	--	--	--	--	--	133	17	--	--	133	17
Mexico	46,600	7,870	66,600	10,300	63,500	10,100	67,300	12,300	63,000	11,000	130,000	23,300
Mongolia	--	--	23,800	4,450	--	--	--	--	--	--	--	--
Russia	--	--	--	--	--	--	1	7	--	--	1	7
South Africa	10,900	1,830	19,900	3,320	10,600	2,840	15,000	2,540	14,500	2,920	29,500	5,450
United Kingdom	4	16	21	6	348	51	7	20	4	11	11	31
Total	187,000	33,500	122,000	20,700	163,000	33,600	97,100	18,400	146,000	35,400	243,000	53,800
Containing not more than 97% calcium fluoride:												
Mexico	14,400	1,620	6,560	722	14,300	1,580	24,500	2,530	11,100	1,190	35,600	3,720
Namibia	278	24	191	17	--	--	276	24	243	21	519	45
South Africa	19	3	--	--	--	--	--	--	--	--	--	--
Total	14,700	1,640	6,750	739	14,300	1,580	24,800	2,560	11,400	1,210	36,200	3,770
Grand total	202,000	35,200	129,000	21,400	177,000	35,100	122,000	21,000	157,000	36,600	279,000	57,500

-- 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.

³Value data for imports "containing more than 97% calcium fluoride" are believed to be underreported; insufficient information is available to make accurate adjustments.

Source: U.S. Census Bureau.

*Correction posted on November 7, 2008.

TABLE 4
IMPORTS FOR CONSUMPTION OF HYDROFLUORIC ACID¹

	2007						2008					
	Second quarter		Third quarter		Fourth quarter		First quarter		Second quarter*		Year*	
	Quantity (metric tons)	Value ² (thousands)	Quantity (metric tons)	Value ² (thousands)	Quantity (metric tons)	Value ² (thousands)	Quantity (metric tons)	Value ² (thousands)	Quantity (metric tons)	Value ² (thousands)	Quantity (metric tons)	Value ² (thousands)
Canada	9,770	\$14,100	6,880	\$12,200	5,230	\$9,390	5,130	\$10,000	7,300	\$13,000	12,400	\$23,000
China	540	430	708	680	441	457	442	595	279	365	721	960
Germany	79	189	92	232	163	371	162	346	159	440	321	787
Japan	212	481	298	618	255	543	391	933	270	439	661	1,370
Mexico	30,300	31,000	26,900	28,000	28,200	29,700	28,800	30,600	28,700	30,700	57,500	61,300
Other	53	48	123	144	35	82	16	52	16	58	33	110
Total	41,000	46,200	35,000	41,800	34,300	40,500	35,000	42,600	36,700	45,000	71,700	87,600

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

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

Source: U.S. Census Bureau.

*Correction posted on November 7, 2008.