

# Mineral Industry Surveys

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## FLUORSPAR IN THE FIRST QUARTER 2011

Reported fluorspar consumption in the first quarter was 126,000 metric tons (t), an increase of 17% compared with that of the previous quarter and 9% more than that consumed in the first quarter of 2010. First quarter stocks increased by more than 8% compared with those of the previous quarter and were 23% higher than those of the first quarter of 2010. Table 5 now shows end-of-quarter prices for fluorspar from Industrial Minerals magazine.

### Industry News

Solvay S.A. (Brussels, Belgium) announced that it had acquired a fluorspar mine near Chiprovtsi, Bulgaria, from the Italy-based N&N Group. The agreement included the transfer of all fluorspar concession and exploration rights to Solvay. Current production capacity is about 30,000 metric tons per year (t/yr) of mostly acid-grade fluorspar, with plans to increase production to 50,000 t/yr by the end of 2011 (Solvay S.A., 2011).

The Chiprovtsi area in Montana Province has had a long history of mining, but the last mine closed in the 1990s. N&N Group began a geologic assessment in 2004 that resulted in expanded knowledge of the extent and quantity of fluorspar resources in the project area. This information encouraged the company to acquire the licenses for the old mines and production plant and to begin rehabilitation of the mines and construction of a new flotation mill. In 2009, the mine and flotation plant entered final industrial tests and by the end of the year all mine- and mill-related obstacles were resolved. Impurities such as arsenic, lead, and phosphates are either not present or found in trace amounts (N&N Group, 2010).

South African fluorspar producer Sallies Ltd. (Pretoria) was expected to reopen its Witkop Mine in western Transvaal after negotiations with key customers and after receiving an \$8 million loan from its new majority stockholder Maghreb Minerals plc (London, United Kingdom). The mine has been closed since June 2009, although the company did process and ship some acid-grade fluorspar during 2010. Mining plans have undergone extensive revisions, and facility improvements have been made that would reportedly allow the company to operate more efficiently and lower costs. The operation was expected to

return to a consistent production level in the second quarter of 2011 (Creamer, 2011).

### Fluorochemical News

The U.S. Environmental Protection Agency (EPA) approved two hydrofluoroolefin (HFO) compounds as replacements for chlorofluorocarbons—HFO 1234ze and HFO 1234yf. HFO 1234ze, developed by Honeywell International Inc., has been approved for use as a foam blowing agent. HFO 1234ze has a very low global warming potential (GWP), is nonflammable, and can replace existing high-GWP blowing agents such as hydrofluorocarbons (HFC) 134a and 152a (SprayFoam.com, Inc., 2011). HFO 1234yf, which was jointly developed by Honeywell and E.I. du Pont de Nemours and Company, may now be used in air conditioning for new cars and light trucks. It is the likely successor to HFC 134a, which is the standard refrigerant currently used in most modern vehicles (U.S. Environmental Protection Agency, 2011).

In a related matter, the EPA has agreed to grant a petition filed by several environmental groups to withdraw the agency's approval of HFC 134a for use in air conditioning systems installed in new light duty vehicles (passenger cars, pick-up trucks, minivans, and sport utility vehicles). A formal "notice and comment" rulemaking to set the phase-out schedule will follow (SustainableBusiness.com News, 2011).

As evidence that there is no single solution to replacing existing high-GWP blowing agents, General Electric Co. announced that it had adopted the hydrocarbon cyclopentane for foam blowing at the company's Decatur, AL, refrigerator manufacturing plant. Although possessing a very low GWP compared to HFC 134a, until relatively recently U.S. appliance manufacturers have been reluctant to use it or other hydrocarbons because they are flammable (Herrera, 2011).

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TABLE 1  
SALIENT FLUORSPAR STATISTICS<sup>1</sup>  
(Metric tons, unless otherwise specified)

	2010				First-fourth quarter total or average	2011 First quarter
	First quarter	Second quarter	Third quarter	Fourth quarter		
Imports for consumption:						
Quantity	131,000	131,000	146,000	131,000	539,000	181,000
Average value per ton, c.i.f. U.S. port, metallurgical grade	\$98	\$103	\$100	\$102	\$100	\$101
Exports	5,290	4,740	3,430	4,420	17,900	5,520
End of the period stocks, consumer	107,000	108,000	97,400 <sup>r</sup>	121,000	121,000	131,000
Imports for consumption of hydrofluoric acid	29,100	34,300	36,500	35,000	135,000	34,400
Imports for consumption of cryolite	1,520	960	1,650	1,190	5,320	1,900
Quarterly reported fluorspar consumption	116,000	112,000	112,000	108,000	448,000	126,000

<sup>r</sup>Revised.

<sup>1</sup>Data 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 RANGE<sup>1</sup>  
(DOMESTIC AND FOREIGN IN THE UNITED STATES)

(Metric tons)

	Hydrofluoric acid and other uses <sup>2</sup>	Metallurgical	Total	Stocks, end of period <sup>3</sup>
2010:				
First quarter:				
More than 97% calcium fluoride	107,000	2,720	110,000	93,400
Not more than 97% calcium fluoride	--	6,010	6,010	13,400
<b>Total</b>	<b>107,000</b>	<b>8,730</b>	<b>116,000</b>	<b>107,000</b>
Second quarter:				
More than 97% calcium fluoride	102,000	2,720	105,000	95,200
Not more than 97% calcium fluoride	--	7,120	7,120	12,400
<b>Total</b>	<b>102,000</b>	<b>9,840</b>	<b>112,000</b>	<b>108,000</b>
Third quarter:				
More than 97% calcium fluoride	102,000	2,720	105,000	85,000
Not more than 97% calcium fluoride	--	7,120	7,120	12,400 <sup>r</sup>
<b>Total</b>	<b>102,000</b>	<b>9,840</b>	<b>112,000</b>	<b>97,400<sup>r</sup></b>
Fourth quarter:				
More than 97% calcium fluoride	98,400	2,720	101,000	109,000
Not more than 97% calcium fluoride	--	7,120	7,120	12,400
<b>Total</b>	<b>98,400</b>	<b>9,840</b>	<b>108,000</b>	<b>121,000</b>
<b>Grand total</b>	<b>410,000</b>	<b>38,300</b>	<b>448,000</b>	<b>121,000</b>
2011:				
First quarter:				
More than 97% calcium fluoride	116,000	2,990	119,000	119,000
Not more than 97% calcium fluoride	--	7,830	7,830	12,400
<b>Total</b>	<b>116,000</b>	<b>10,800</b>	<b>126,000</b>	<b>131,000</b>

<sup>r</sup>Revised. -- Zero.

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

<sup>2</sup>May include cement, enamel, glass and fiberglass, steel castings, hydrofluoric acid, and welding rod coatings.

<sup>3</sup>Stocks include some distributor stocks and consumer stocks for hydrofluoric acid.

TABLE 3  
U.S. IMPORTS FOR CONSUMPTION OF FLUORSPAR, BY COUNTRY AND VALUE<sup>1,2</sup>

	2010								First-		2011	
	First quarter		Second quarter		Third quarter		Fourth quarter		Fourth quarter		First quarter	
	Quantity (metric tons)	Value (thousands)										
Containing more than 97% calcium fluoride:												
China	40,100	\$10,100	28,000	\$8,160	10,400	\$3,230	20,200	\$7,000	98,700	\$28,500	25,000	\$9,450
Mexico	51,200	8,850	66,600	11,500	90,100	15,700	79,400	13,900	287,000	49,900	90,500	15,900
Mongolia	--	--	11,900	3,400	--	--	10,200	2,900	22,100	6,300	--	--
South Africa	13,500	3,410	9,900	2,510	9,900	2,380	--	--	33,300	8,300	15,600	4,000
United Kingdom	1	5	1	5	554	66	3	4	559	80	1	5
Other	--	--	--	--	118	15	134	17	252	32	1	7
Total	105,000	22,400	116,000	25,600	111,000	21,400	110,000	23,800	442,000	93,100	131,000	29,300
Containing not more than 97% calcium fluoride:												
Mexico	25,700	2,520	14,400	1,480	35,400	3,540	21,100	2,160	96,500	9,690	50,400	5,060
Other	--	--	--	--	1	3	--	--	1	3	--	--
Total	25,700	2,520	14,400	1,480	35,400	3,540	21,100	2,160	96,500	9,690	50,400	5,060
Grand total	131,000	24,900	131,000	27,100	146,000	24,900	131,000	25,900	539,000	103,000	181,000	34,400

-- Zero.

<sup>1</sup>Imports for consumption include imports of immediate entry and warehouse withdrawals.

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

Source: U.S. Census Bureau.

TABLE 4  
IMPORTS FOR CONSUMPTION OF HYDROFLUORIC ACID<sup>1</sup>

	2010								First-		2011	
	First quarter		Second quarter		Third quarter		Fourth quarter		Fourth quarter		First quarter	
	Quantity (metric tons)	Value <sup>2</sup> (thousands)										
Canada	2,300	\$7,810	2,630	\$10,100	4,080	\$13,500	2,950	\$10,500	12,000	\$41,900	1,850	\$6,040
China	1,270	1,260	1,770	2,100	1,790	2,230	1,690	2,230	6,520	7,820	1,370	1,920
Germany	127	281	92	308	76	255	61	219	356	1,060	45	162
Japan	206	490	172	413	228	545	286	663	892	2,110	244	595
Mexico	25,200	31,600	29,600	38,000	30,200	38,000	29,800	37,200	115,000	145,000	30,700	43,700
Other	46	105	109	245	143	331	159	348	457	1,030	175	274
Total	29,100	41,500	34,300	51,100	36,500	54,800	35,000	51,100	135,000	199,000	34,400	52,700

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

<sup>2</sup>Cost, insurance, and freight at U.S. ports.

Source: U.S. Census Bureau.

TABLE 5  
 QUARTERLY FLUORSPAR PRICES<sup>1</sup>

(Dollars per metric ton)

	2010				2011
	First quarter	Second quarter	Third quarter	Fourth quarter	First quarter
Acidspar:					
Chinese, dry basis, cost, insurance, and freight (c.i.f.) Gulf port, filtercake	350-380	350-380	350-380	370-400	440-460
Chinese, f.o.b. China, wet filtercake	230-280	275-300	275-300	300-320	400-420
Mexican, free on board (f.o.b.) Tampico, filtercake	260-290	260-285	260-290	260-290	330-360
Mexican, f.o.b. Tampico, arsenic <5 parts per million	300-360	300-360	280-320	290-320	350-370
South African, f.o.b. Durban, filtercake	250-300	250-280	250-280	290-310	330-335
Metspar, Mexican, f.o.b. Tampico	140-195	170-200	170-200	170-200	180-220

<sup>1</sup>Sources: Industrial Minerals, no. 511, April 2010, p. 70; no. 514, July 2010, p. 70; no. 517, October 2010, p. 66; no. 520, January 2011, p. 58; and no. 523, April 2011, p. 70.