Mineral Industry Surveys

For information, contact:
Michele E. McRae, Fluorspar Commodity Specialist
National Minerals Information Center
U.S. Geological Survey
989 National Center
Reston, VA 20192
Telephone: (703) 648-7743, Fax: (703) 648-7757
Email: mmcrae@usgs.gov

Samir Hakim (Data)
Telephone: (703) 648-7955
Fax: (703) 648-7792
Email: shakim@usgs.gov

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

FLUORSPAR IN THE FOURTH QUARTER 2015

Total fluorspar imports in the fourth quarter were 132,000 metric tons (t), an 89% increase compared with those of the third quarter (fig. 1, table 1). Imports of material containing more than 97% calcium fluoride increased by 137% during the same period (table 3). Despite the significant increase in

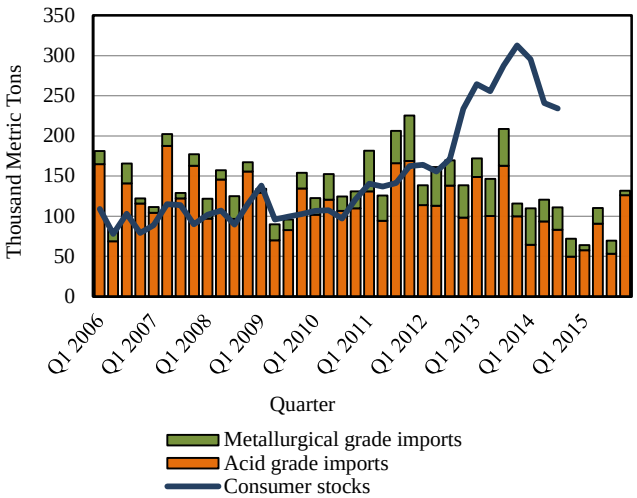

Figure 1. Acid and metallurgical grade imports for consumption and consumer stocks from the first quarter of 2006 to the fourth quarter of 2015. Consumer stock data were withheld beginning in the fourth quarter of 2014 to avoid disclosing proprietary data. Source: U.S. Geological Survey and U.S. Census Bureau.

import quantities, prices for most imported acid grade fluorspar decreased in the fourth quarter of 2015 (table 5). In 2015, total fluorspar imports were 376,000 t, a decrease of 9% compared with those of 2014 (table 1). The decrease was entirely for metallurgical grade material, which decreased by 61% (table 3). Total acid grade imports increased by 13% to 328,000 t in 2015.

Mining and Exploration News

The government of Newfoundland and Labrador, Department of Environment and Conservation, released the St. Lawrence AGS Vein fluorspar project from further environmental review. The project, proposed by Canada Fluorspar Inc., would include four open pit and underground mine operations, a tailings management facility capable of storing 2.8 million metric tons of flotation tailings, a mill facility capable of processing 200,000 metric tons per year fluorspar flotation concentrate, and a marine terminal facility capable of handling vessels of 10,000 to 65,000 deadweight tons (Canada Fluorspar Inc., 2015). Prior to construction, the company will still be required to submit an Environmental Protection Plan and Environmental Effects Monitoring Program, a Development Plan, and a Mine Rehabilitation and Closure Plan (Department of Environment and Conservation of Newfoundland and Labrador, 2015).

Fluorochemical News

To comply with regulatory timelines established by the European Union's Mobile Air-Conditioning (MAC) Directive, automobile manufacturer Daimler AG (Daimler) announced it would introduce carbon dioxide (CO_2)-based air-conditioning systems in all 2017 model year Mercedes-Benz E- and S-Class passenger cars; all other 2017 models would use the hydrofluoroolefin refrigerant R-1234yf. The directive requires that air-conditioning refrigerants in all new model vehicles sold after January 1, 2013, and all cars sold after 2017, have a global warming potential (GWP) of less than 150. (The GWP represents how much a given mass of a chemical contributes to global warming during a given time period compared to the same mass of CO_2, with the GWP of CO_2 defined as 1.0.) Despite validation of R-1234yf's safety by the Society of Automotive Engineers International and the European Commission's Joint Research Centre, Daimler decided not to use the refrigerant owing to its mild flammability and instead pursued development of a CO_2-based air-conditioning system.

Daimler, however, was unable to implement the CO_2 technology in all of its passenger cars in time to meet the MAC Directive requirements (Daimler AG, 2015). If successfully deployed, the CO_2 system would represent the first viable alternative to fluorinated MAC refrigerants.

The Chemours Company (Chemours) and partner Changshu 3F Zhonghao began construction of a plant to produce hydrofluoroolefin (HFO-1336mzz) in Changshu, China. The initial application for the product was to be a foam expansion agent. The product was also anticipated to be used as a refrigerant in a variety of systems. The project, which would increase the company's capacity to produce low GWP refrigerants and foam-blowing agents, was scheduled to begin production in 2017 (Gaved, 2015).

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References Cited

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TABLE 1
SALIENT FLUORSPAR STATISTICS[1]

(Metric tons, unless otherwise specified)

	2014		2015				
	4th quarter	1st quarter–4th quarter	1st quarter	2d quarter	3d quarter	4th quarter	1st quarter–4th quarter
Fluorspar:							
Imports for consumption	72,000	414,000	64,300	110,000	69,600	132,000	376,000
Exports	3,080	13,400	4,270	3,600	2,970	2,860	13,700
End of the period stocks, consumer	W	W	W	W	W	W	W
Reported consumption	W	W	W	W	W	W	W
Other compounds, imports for consumption:							
Aluminum fluoride	9,360	38,400	9,590	8,800	9,470	4,530	32,400
Cryolite	5,370	16,200	4,290	5,540	5,540	3,570	18,900
Hydrofluoric acid	29,700	125,000	32,600	33,600	31,000	23,100	120,000

W Withheld to avoid disclosing company proprietary data.

[1]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[1]
(DOMESTIC AND FOREIGN IN THE UNITED STATES)

(Metric tons)

	Hydrofluoric acid and other uses[2]	Metallurgical	Total	Stocks, end of period[3]
2014:				
4th quarter:				
More than 97% calcium fluoride	W	W	W	W
Not more than 97% calcium fluoride	--	7,940	7,940	20,000
Total	W	W	W	W
1st quarter–4th quarter	W	W	W	W
2015:				
1st quarter:				
More than 97% calcium fluoride	W	W	W	W
Not more than 97% calcium fluoride	--	7,500	7,500	21,700
Total	W	W	W	W
2d quarter:				
More than 97% calcium fluoride	W	W	W	W
Not more than 97% calcium fluoride	--	7,430	7,430	22,000
Total	W	W	W	W
3d quarter:				
More than 97% calcium fluoride	W	W	W	W
Not more than 97% calcium fluoride	--	7,400	7,400	22,300
Total	W	W	W	W
4th quarter:				
More than 97% calcium fluoride	W	W	W	W
Not more than 97% calcium fluoride	--	7,400	7,400	21,200
Total	W	W	W	W
1st quarter–4th quarter	W	W	W	W

-- Zero. W Withheld to avoid disclosing company proprietary data.
[1]Data are rounded to no more than three significant digits; may not add to totals shown.
[2]May include cement, enamel, glass and fiberglass, steel castings, hydrofluoric acid, and welding rod coatings.
[3]Stocks include some distributor stocks and consumer stocks for hydrofluoric acid.

TABLE 3

U.S. IMPORTS FOR CONSUMPTION OF FLUORSPAR, BY COUNTRY AND VALUE[1, 2, 3]

	2014				2015									
	4th quarter		1st quarter–4th quarter		1st quarter		2d quarter		3d quarter		4th quarter		1st quarter–4th quarter	
	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)
Containing more than 97% calcium fluoride:														
China	--	--	801	$520	19,500	$7,000	6,220	$1,570	--	--	--	--	25,700	$8,580
Germany	--	--	47	34	--	--	--	--	70	$36	190	$97	260	133
Mexico	37,600	$11,600	210,000	54,300	33,100	9,670	34,700	9,860	43,200	12,500	65,000	18,300	176,000	50,300
Mongolia	100	61	14,200	5,330	10	10	14,800	6,200	--	--	--	--	14,800	6,210
Netherlands	--	--	5	4	4	16	--	--	--	--	--	--	4	16
South Africa	12,100	3,230	38,000	11,700	--	--	19,300	4,350	--	--	12,100	2,740	31,400	7,090
Spain	--	--	9,950	3,540	--	--	--	--	9,330	2,740	12,300	2,510	21,700	5,240
Sweden	--	--	1	2	--	--	--	--	--	--	--	--	--	--
United Kingdom	186	102	8,490	2,740	23	25	2	7	800	408	1,500	845	2,320	1,290
Vietnam	--	--	9,110	4,400	5,080	1,020	15,900	5,660	--	--	35,200	9,450	56,200	16,100
Total	50,000	15,000	291,000	82,600	57,700	17,800	90,900	27,600	53,400	15,600	126,000	34,000	328,000	95,000
Containing not more than 97% calcium fluoride:														
China	369	221	707	284	38	40	554	305	72	31	36	15	700	391
Mexico	21,400	5,130	110,000	20,300	6,470	1,560	18,400	4,510	16,200	3,910	5,420	1,240	46,400	11,200
Mongolia	300	192	6,920	1,090	--	--	--	--	--	--	--	--	--	--
Spain	--	--	--	--	--	--	--	--	11	13	--	--	11	13
Switzerland	--	--	--	--	--	--	1	2	--	--	--	--	1	2
United Kingdom	--	--	--	--	--	--	508	252	--	--	--	--	508	252
Vietnam	--	--	5,470	745	--	--	--	--	--	--	--	--	--	--
Total	22,000	5,540	123,000	22,400	6,510	1,600	19,500	5,070	16,200	3,950	5,460	1,250	47,700	11,900
Grand total	72,000	20,500	414,000	105,000	64,300	19,400	110,000	32,700	69,600	19,600	132,000	35,200	376,000	107,000

-- Zero.

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

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

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

Source: U.S. Census Bureau.

TABLE 4

IMPORTS FOR CONSUMPTION OF HYDROFLUORIC ACID[1]

	2014				2015									
	4th quarter		1st quarter–4th quarter		1st quarter		2d quarter		3d quarter		4th quarter		1st quarter–4th quarter	
	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)	Quantity (metric tons)	Value[2] (thousands)
Canada	300	$482	2,620	$10,700	154	$296	117	$195	119	$218	207	$375	597	$1,080
China	1,080	1,170	5,280	5,850	1,790	1,920	1,980	2,230	1,840	1,930	1,560	1,500	7,170	7,580
Germany	340	820	1,000	2,460	380	914	474	1,240	353	911	259	623	1,470	3,690
Japan	418	680	1,610	2,880	486	740	366	584	385	680	235	395	1,470	2,400
Mexico	27,300	47,000	113,000	188,000	29,400	49,900	30,300	50,300	28,000	45,300	20,600	32,600	108,000	178,000
Spain	38	108	114	324	--	--	56	167	19	61	38	110	113	338
Other	188	600	778	2,020	345	849	345	923	320	800	163	473	1,170	3,050
Total	29,700	50,800	125,000	213,000	32,600	54,600	33,600	55,700	31,000	49,900	23,100	36,100	120,000	196,000

-- Zero.

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

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

Source: U.S. Census Bureau.

TABLE 5
END OF QUARTER FLUORSPAR PRICES

(Dollars per metric ton)

	2014	2015			
	4th quarter	1st quarter	2d quarter	3d quarter	4th quarter
Acidspar:					
Chinese, dry basis, cost, insurance, and freight, Gulf port, filtercake	340–370	320–350	320–350	300–320	270–300
Chinese, free on board (f.o.b.) China, wet filtercake	290–310	280–300	280–300	260–280	260–280
Mexican, f.o.b. Tampico, filtercake	290–330	290–330	290–330	270–290	260–280
Mexican, f.o.b. Tampico, arsenic <5 parts per million	370–420	370–420	370–420	310–340	280–310
South African, f.o.b. Durban, filtercake	300–330	300–330	300–330	280–300	260–280
Metspar, Mexican, f.o.b. Tampico	230–270	230–270	230–270	230–270	230–270

Source: Industrial Minerals magazine (London).