

Mineral Industry Surveys

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FLUORSPAR IN THE THIRD QUARTER 2019

Fluorspar imports in the third quarter of 2019 were 128,000 metric tons (t), 117,000 t of which were acid grade and 11,400 t of which were metallurgical grade (fig. 1, table 1). Acid-grade imports increased by 36% as compared with those in the previous quarter but decreased by 20% as compared with imports in the third quarter of 2018. Metallurgical-grade imports increased slightly as compared with those in the previous quarter but decreased by 42% as compared with imports in the third quarter of 2018. Fluorspar imports can vary substantially from quarter to quarter based on supply agreements and production schedules of leading fluorspar consumers.

In the third quarter of 2019, imports of other fluorine-containing materials produced directly from fluorspar were 32,400 t for hydrofluoric acid, 8,460 t for aluminum fluoride, and 4,390 t for cryolite (table 1). Mexico was the leading supplier of hydrofluoric acid accounting for 91% of imports (table 3). Exports of acid- and metallurgical-grade fluorspar, aluminum fluoride, and cryolite were likely re-exports as there

is no domestic production (table 1).

The average unit value of acid-grade imports in the third quarter of 2019 was \$331 per metric ton, a slight decrease as compared with that in the previous quarter, but a 20% increase as compared with the annual average unit value of \$276 per metric ton in 2018. The average unit value of metallurgical-grade fluorspar from Mexico (96% of metallurgical-grade imports) was \$302 per metric ton, unchanged from that in the previous quarter, but a 23% increase as compared with the average annual unit value of metallurgical-grade imports from Mexico in 2018.

According to Fastmarkets IM, the price of acid-grade fluorspar from China decreased by 10% to \$430 to \$450 per metric ton in the third quarter of 2019 compared with that in the second quarter of 2019 (table 4). Prices from other major exporting countries including Mexico and South Africa were unchanged. The price of metallurgical-grade fluorspar from Mexico was also unchanged compared with that in the second quarter.

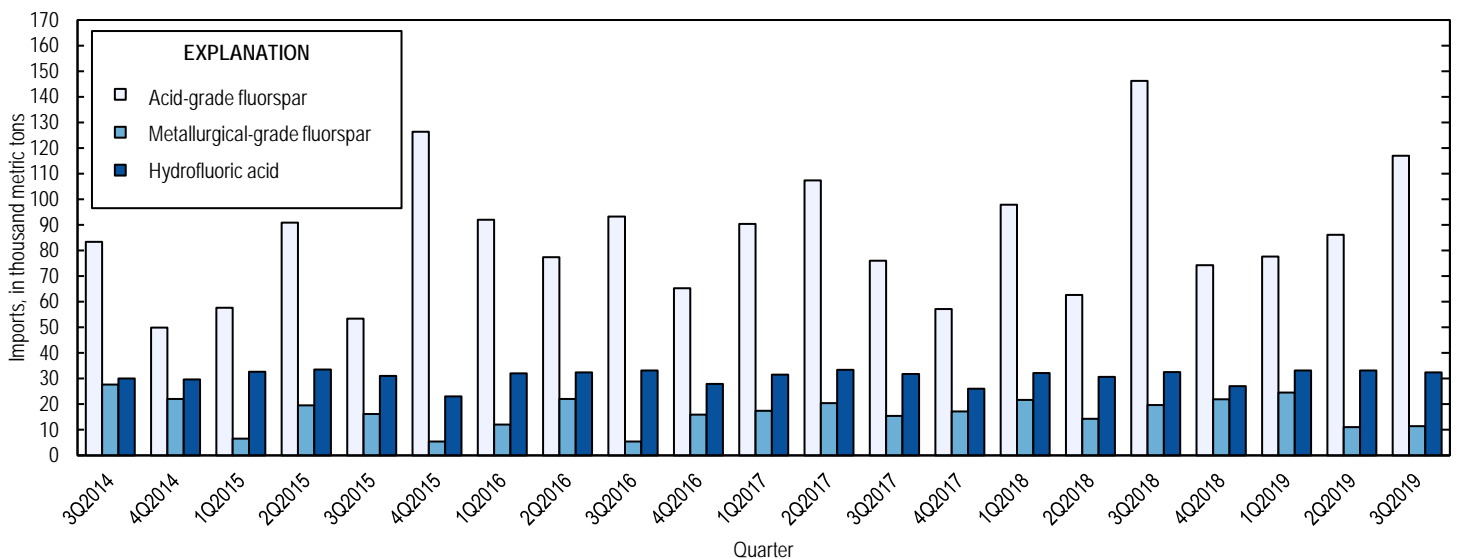


Figure 1. Acid-grade fluorspar, metallurgical-grade fluorspar, and hydrofluoric acid imports from the third quarter of 2014 through the third quarter of 2019. Source: U.S. Census Bureau.

Fluorochemical News

In July 2019, in response to public concerns about per- and polyfluoroalkyl substances (PFAS) contamination at military installations and surrounding communities, the U.S. Department of Defense (DOD) established a PFAS Task Force. DOD previously tested 524 water systems worldwide and identified 401 active and former locations with known or suspected releases of perfluorooctanoic acid (PFOA) or perfluorooctane sulfonate (PFOS). DOD identified 36 drinking water systems where PFOA and (or) PFOS levels exceeded the U.S. Environmental Protection Agency's health advisory recommendation of 70 parts per trillion and continued to characterize, prioritize, and initiate remediation in accordance with the Comprehensive Environmental Response, Compensation and Liability Act (Superfund). Contamination at most of the affected sites was attributed to the military's use of fluorinated aqueous film forming foams (AFFF) used to extinguish jet fuel fires. DOD stopped land-based use of AFFF in maintenance, testing and training exercises in 2016 and implemented measures to mitigate contamination from AFFF used in emergencies. DOD continued to research fluorine-free AFFF alternatives and engaged with other federal partners in continuing to assess environmental and health effects from PFAS including committing \$40 million in funding for the Agency for Toxic Substances and Disease Registry for an exposure assessment at 8 military installations and a nationwide health study (Paley, 2019).

Mining and Exploration News

SepFluor Ltd. announced that it officially opened the Nokeng Fluorspar Mine at Rust de Winter, Gauteng, South Africa on August 1, 2019. The flotation plant was designed to

process blended ore from two hematite-fluorspar deposits, the Outwash Fan and Plattekop. The company expected to produce 180,000 metric tons per year of acid-grade fluorspar and 30,000 metric tons per year metallurgical-grade fluorspar briquettes. Based on production from the two ore bodies, the company estimated a 19-year mine life. However, the mining complex includes a third partially explored orebody that the company believed might be an extension of Plattekop and which could extend the mine life. The company also announced that it was preparing a Definitive Feasibility Study for its Wallmannsthal project and was in the process of securing financing to build a 60,000 metric-ton-per-year hydrofluoric acid plant and a 60,000 metric-ton-per-year aluminum fluoride plant in Ekandustria, Gauteng, South Africa, which it expected would support the Government's Fluorochemical Expansion Initiative to develop downstream processing capability (SepFluor Ltd., 2019).

References Cited

- SepFluor Ltd., 2019, New SA fluorspar mine paves way for downstream beneficiation: Johannesburg, South Africa, SepFluor Ltd. press release., August 1, 2 p. (Accessed May 6, 2020, at <https://www.sepfluor.co.za/images/downloads/new-SA-fluorspar-mine-paves-way-for-downstream-beneficiation-01082019.pdf>.)
- Paley, Miranda, 2019, DOD moving forward with task force to address PFAS: Arlington, VA, U.S. Department of Defense, August 9. (Accessed May 4, 2020, at <https://www.defense.gov/Explore/News/Article/Article/1930618/dod-moving-forward-with-task-force-to-address-pfas/>.)

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TABLE 1
SALIENT FLUORSPAR STATISTICS¹

(Metric tons, unless otherwise specified)

	2018			2019		
	3d quarter	4th quarter	1st quarter– 4th quarter	1st quarter	2d quarter	3d quarter
Production, fluorspar	--	--	--	--	--	--
Imports for consumption: ²						
Fluorspar:						
Acid grade, more than 97% calcium fluoride	146,000	74,300	381,000	77,700	86,100	117,000
Metallurgical grade, less than 97% calcium fluoride	19,700	21,900	77,600	24,500	11,100	11,400
Total	166,000	96,200	459,000	102,000	97,200	128,000
Hydrofluoric acid	32,500	27,000	123,000	33,100	33,100	32,400
Aluminum fluoride	6,320	8,640	25,600	7,050	12,900	8,460
Cryolite	4,060	6,490	16,800	5,970	5,260	4,390
Exports: ²						
Fluorspar:						
Acid grade, more than 97% calcium fluoride	403	126	2,720	125	796	522
Metallurgical grade, less than 97% calcium fluoride	1,750	1,500	6,250	1,740	929	1,180
Total	2,150	1,620	8,970	1,870	1,730	1,700
Hydrofluoric acid	4,420	5,330	18,500	4,800	4,610	3,540
Aluminum fluoride	304	450	1,030	89	159	77
Cryolite	2,570	2,070	11,700	2,850	2,360	1,880
Apparent consumption, fluorspar: ³						
Acid grade, more than 97% calcium fluoride	146,000	74,200	378,000	77,600	85,300	117,000
Metallurgical grade, less than 97% calcium fluoride	17,900	20,400	71,300	22,700	10,200	10,200
Total	164,000	94,600	450,000	100,000	95,500	127,000

-- Zero.

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

²Source: U.S. Census Bureau.

³Imports minus exports.

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

	2018						2019							
	3d quarter		4th quarter		1st quarter–4th quarter		1st quarter		2d quarter		3d quarter		1st quarter–3d quarter	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
	(metric tons)	(thousands)	(metric tons)	(thousands)	(metric tons)	(thousands)	(metric tons)	(thousands)	(metric tons)	(thousands)	(metric tons)	(thousands)	(metric tons)	(thousands)
Acid grade, more than 97% calcium fluoride:														
Canada	11,000	\$3,430	--	--	11,000	\$3,430	4,810	\$1,250	--	--	--	--	4,810	\$1,250
China	--	--	--	--	394	244	--	--	9,960	\$4,760	18,300	\$8,910	28,300	13,700
France	--	--	--	--	--	--	--	--	38	21	--	--	38	21
Germany	76	55	444	\$73	1,190	307	452	77	--	--	--	--	452	77
Japan	629	330	--	--	630	333	--	--	--	--	566	312	566	312
Mexico	61,600	16,400	58,100	14,400	235,000	60,500	57,300	15,500	55,900	15,100	70,000	20,300	183,000	51,000
Mongolia	340	227	231	154	571	381	57	37	168	104	57	33	282	174
Netherlands	--	--	--	--	--	--	--	--	--	--	6,560	2,600	6,560	2,600
Russia	--	--	--	--	1	14	--	--	--	--	--	--	--	--
South Africa	26,700	9,470	--	--	41,700	14,400	--	--	9,990	4,500	--	--	9,990	4,500
Spain	8,990	2,980	--	--	19,000	6,320	1	6	10,100	4,640	--	--	10,100	4,640
United Kingdom	--	--	11	6	15	18	--	--	4	12	2	6	6	18
Vietnam	36,900	10,300	15,500	3,910	71,300	19,400	15,100	4,260	--	--	21,500	6,500	36,600	10,800
Total	146,000	43,200	74,300	18,600	381,000	105,000	77,700	21,100	86,100	29,200	117,000	38,700	281,000	89,000
Metallurgical grade, less than 97% calcium fluoride:														
Belgium	1	\$4	--	--	1	\$4	--	--	--	--	--	--	--	--
China	294	191	306	\$183	859	549	212	\$133	89	\$58	415	\$248	716	\$439
Germany	--	--	--	--	--	--	--	--	6	4	--	--	6	4
India	--	--	--	--	--	--	21	12	36	21	36	21	93	54
Mexico	19,200	5,020	21,200	4,730	75,400	18,500	23,900	5,640	11,000	3,320	10,900	3,300	45,900	12,300
Mongolia	200	152	340	224	1,100	777	336	198	--	--	--	--	336	198
Netherlands	--	--	--	--	--	--	1	4	--	--	--	--	1	4
South Africa	--	--	1	11	28	22	--	--	--	--	--	--	--	--
Spain	--	--	--	--	133	89	--	--	--	--	--	--	--	--
United Kingdom	--	--	1	17	1	17	--	--	--	--	--	--	--	--
Total	19,700	5,360	21,900	5,170	77,600	20,000	24,500	5,990	11,100	3,400	11,400	3,570	47,000	13,000
Grand total	166,000	48,600	96,200	23,700	459,000	125,000	102,000	27,100	97,200	32,600	128,000	42,300	328,000	102,000

-- 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 3
U.S. IMPORTS FOR CONSUMPTION OF HYDROFLUORIC ACID^{1,2}

	2018						2019							
	3d quarter		4th quarter		1st quarter–4th quarter		1st quarter		2d quarter		3d quarter		1st quarter–3d 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)
Belgium	--	--	--	--	--	--	18	\$42	--	--	--	--	18	\$42
Canada	122	\$246	104	\$216	410	\$855	63	210	44	\$154	129	\$242	236	606
China	803	929	395	480	2,550	3,190	431	592	892	1,110	685	778	2,010	2,480
Germany	389	800	243	541	1,460	2,920	271	634	238	605	338	802	847	2,040
India	--	--	18	22	74	109	37	49	179	179	89	107	305	335
Israel	--	--	--	--	--	--	--	--	--	--	15	17	15	17
Japan	330	1,090	354	956	1,490	3,820	270	682	589	1,480	642	1,570	1,500	3,730
Korea, Republic of	395	464	325	869	1,130	1,840	674	1,310	692	1,470	339	891	1,710	3,660
Mexico	29,800	43,500	24,800	37,300	112,000	165,000	30,600	46,500	29,600	46,200	29,500	49,800	89,700	142,000
Netherlands	--	--	--	--	--	--	--	--	18	23	--	--	18	23
Singapore	97	310	64	206	386	1,180	129	407	32	102	64	204	225	713
Spain	496	738	601	876	2,270	3,260	493	872	591	936	368	525	1,450	2,330
Sweden	18	70	--	--	18	70	--	--	--	--	--	--	--	--
Taiwan	70	201	133	403	438	1,230	56	158	175	475	182	478	413	1,110
Thailand	--	--	--	--	249	--	--	--	--	--	--	--	--	--
United Kingdom	--	--	--	--	(3)	2	--	--	--	--	--	--	--	--
Total	32,500	48,400	27,000	41,900	123,000	183,000	33,100	51,400	33,100	52,700	32,400	55,400	98,500	160,000

-- Zero.

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

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

³Less than ½ unit.

Source: U.S. Census Bureau.

TABLE 4
END OF QUARTER FLUORSPAR PRICES

(Dollars per metric ton)

	2018		2019		
	3d quarter	4th quarter	1st quarter	2d quarter	3d quarter
Acid grade, more than 97% calcium fluoride:					
Dry basis, cost, insurance, and freight, Gulf port, filtercake	260–270	260–270	260–270	NA	NA
China, free on board (f.o.b.) China, wet filtercake	410–500	550–580	450–515	460–520	430–450
Mexican, f.o.b. Tampico, wet filtercake ¹	300–320	400–450	400–450	400–450	400–450
South Africa, f.o.b. Durban, filtercake	350–400	450–490	440–490	440–490	440–490
Metallurgical grade, minimum 85% calcium fluoride, Mexican, f.o.b. Tampico	230–250	300–320	280–320	280–320	280–320

NA Not available.

¹As of the third quarter of 2018, price includes material formerly listed as 'Mexican, f.o.b. Tampico, arsenic <5 parts per million'.

Source: Fastmarkets IM (London).