

38 Fluorite

Fluorite or fluorspar is the common name of the mineral having chemical composition calcium fluoride (CaF_2). It is a mineral with veritable bouquet of brilliant colours from hall-mark colour purple, to blue, green, yellow, colourless, brown, pink, black and reddish orange, rivalled in colour range only by quartz. The rich purple colour is by far the most famous and popular colour. It easily competes with the beautiful purple of amethyst.

Fluorite is found as a common gangue mineral in hydrothermal veins, especially those containing lead & zinc minerals. It is also found in some greisens, granites, and high temperature veins and as a component of some marbles and other metamorphic rocks. It is an important commercial source of fluorine. Fluorite plays a vital role in the manufacture of aluminium, gasoline, insulating foams, refrigerants, steel and uranium fuel.

Mainly two grades of fluorite are involved in consumption and trade, namely, the acid grade containing more than 97% CaF_2 and the sub-acid grade analysing 97% or less CaF_2 . The sub-acid grade includes metallurgical and ceramic grades and is commonly known as metallurgical grade. Fluorite production in the country is scarce. Production of fluorite is reported from the states of Gujarat, Maharashtra and Rajasthan.

In addition to the natural fluorite production, synthetic fluorite is recovered as by-product during uranium processing, petroleum alkylation and stainless pickling. The by-product, fluorosilicic acid, obtained from phosphoric acid plants while processing phosphate rock also supplements fluorite as source of fluorine.

RESOURCES

As per the UNFC system, the total resources of fluorite in the country as on 1.4.2005 are estimated at 20.17 million tonnes. Out of these, 9.21 million tonnes are placed under reserves category and 10.95 million tonnes under remaining resources category. The reserves are further classified into 8.58 million tonnes under proved category and 0.63 million tonnes under probable category.

By States, Gujarat accounts for 69% of the total resources having 13.93 million tonnes, followed by Rajasthan with 5.24 million tonnes (26%), Chhattisgarh 0.55 million tonnes (3%) and Maharashtra 0.45 million tonnes (2%). The resources are further classified into marketable grade which accounted for (82%) of the total resources, low grade (16%) and unclassified grade (2%) (Table-1).

PRODUCTION, STOCKS & PRICES

The production of fluorite (total) at 7296 tonnes in 2007-08 increased as compared to that in the previous year. The production of fluorite (graded) was 3,502 tonnes and that of fluorite (concentrate), 3,794 tonnes during the year under review.

There were three reporting mines in both the years. The entire output was reported from public sector. Fluorite (graded) was reported from Maharashtra in 2007-08 (Tables - 2 to 4).

The mine-head stock at the end of the year 2007-08 was 292 tonnes as against 52 tonnes at the beginning of the year (Table - 5).

The average daily labour employed in fluorite mines in 2007-08 was 58 as against 126 in the previous year. The domestic prices of fluorite are furnished in Table - 6.

**Table - 1 : Reserves/Resources of Fluorite as on 1.4.2005
(By Grades/States)**

Grade/State	Reserves			Remaining resources					Total resources (A+B)		
	Proved STD111	Probable STD121 STD122	Total (A)	Feasibility STD211	Pre-feasibility STD221 STD222	Measured STD331	Indicated STD332	Inferred STD333		Reconnaissance STD334	Total (B)
All India : Total	8585124	165222 463485	9213831	65889	450168 6224178	1713833	495061	1857527	145183	10951838	20165669
By Grades											
Low	-	- -	-	-	3790	9680 1710348	445660	1000003	-	3169481	3169481
Marketable	8585124	9702 307965	8902791	65889	446378 6214498	-	33650	832524	145183	7738122	16640913
Unclassified	-	155520 155520	311040	-	- -	3485	15751	25000	-	44236	355276
By States											
Chhattisgarh	-	- -	-	65889	153132	9288 185485	5573	126088	-	545455	545455
Gujarat	7663840	- 200160	7864000	-	- 5723360	-	-	337920	-	6061280	13925280
Maharashtra	287975	- 64100	352075	-	- -	-	-	100000	-	100000	452075
Rajasthan	633309	165222 199225	997756	-	297036 491530	1528348	489488	1293519	145183	4245103	5242859

Figures rounded off.

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Table - 2 : Producers of Fluorite, 2007-08

Name and address of producer	Location of mine	
	State	District
Gujarat Mineral Dev. Corporation Ltd, Khanij Bhawan, 132-Ft. Ring Road, Vastrapur, Ahmedabad, Gujarat	Gujarat	Vadodara
Maharashtra State Mining Corp. Ltd, Udyog Bhawan, Civil Lines, Nagpur-440 001, Maharashtra.	Maharashtra	Chandrapur

**Table – 3 : Production of Fluorite (Graded and Concentrates),
2005-06 to 2007-08
(By States)**

(Quantity in tonnes; value in Rs. '000)

State	2005-06		2006-07		2007-08(p)	
	Quantity	Value	Quantity	Value	Quantity	Value
<u>Fluorite (Total)</u>						
India	9341	49676	2053	8905	7296	61346
Gujarat	3764	35082	-	-	3794	45555
Maharashtra	3906	10822	2005	8730	3502	15791
Rajasthan	1671	3772	48	175	-	-
<u>Fluorite (Graded)</u>						
India	5577	14594	2053	8905	3502	15791
Maharashtra	3906	10822	2053	8730	3502	15791
Rajasthan	1671	3772	48	175	-	-
<u>Fluorite (Concentrates)</u>						
India	3764	35082	-	-	3794	45555
Gujarat	3764	35082	-	-	3794	45555

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**Table – 4 : Production of Fluorite (Graded and Concentrates),
2006-07 and 2007-08
(By Sector/States/Districts)**

(Quantity in tonnes; value in Rs. '000)

State/District	2006-07			2007-08(p)		
	No. of mines	Quantity	Value	No. of mines	Quantity	Value
Fluorite (Total)						
India	3	2053	8905	3	7296	61346
Public sector	3	2053	8905	3	7296	61346
Fluorite (Graded)						
India	2	2053	8905	2	3502	15791
Public sector	2	2053	8905	2	3502	15791
Maharashtra	1	2005	8730	1	3502	15791
Chandrapur	1	2005	8730	1	3502	15791
Rajasthan	1	48	175	1	-	-
Jalore	1	48	175	1	-	-
Fluorite (Concentrates)						
India	1	-	-	1	3794	45555
Public sector	1	-	-	1	3794	45555
Gujarat	1	-	-	1	3794	45555
Vadodara	1	-	-	1	3794	45555

**Table - 6 : Prices of Fluorspar/ Fluorite (Graded) , 2005-06 to 2007-08
(Domestic Markets)**

(In Rs. per tonne)

Grade	Market	2005-06	2006-07	2007-08 (p)
Lumps + 80% CaF ₂	Ex-mine Dongargaon (Maharashtra)	5500-6215	7435-6850	7435-6850
Lumps + 75% to 80% CaF ₂	Ex-mine Dongargaon (Maharashtra)	4650-5280	6325-7195	6325-7195
Lumps + 70% to 75% CaF ₂	Ex-mine Dongargaon (Maharashtra)	4000-4565	5350-6120	5350-6120
Lumps + 65% to 70% CaF ₂	Ex-mine Dongargaon (Maharashtra)	2900-3630	4440-5170	4440-5170
Lumps + 55% to 65% CaF ₂	Ex-mine Dongargaon (Maharashtra)	2425-3050	3115-4285	3115-4285
Lumps + 60% to 65% CaF ₂	Ex-mine Dongargaon (Maharashtra)	2875-3163	3715-4285	3715-4285
Lumps + 55% to 60% CaF ₂	Ex-mine Dongargaon (Maharashtra)	2575-2833	5115-3585	5115-3585
Lumps + 45% to 55% CaF ₂	Ex-mine Dongargaon (Maharashtra)	1800	2290-3010	2290-3010
Lumps + 50% to 55% CaF ₂	Ex-mine Dongargaon (Maharashtra)	2250-2475	2640-3010	2640-3010
Lumps + 45% to 50% CaF ₂	Ex-mine Dongargaon (Maharashtra)	1950-2145	2350-2560	2350-2560
Lumps + 35% to 45% CaF ₂	Ex-mine Dongargaon (Maharashtra)	1440-1749	2000-2235	2000-2235
Lumps + 25% to 35% CaF ₂	Ex-mine Dongargaon (Maharashtra)	780-1023	1025	1025
Dust fines + 45% to 55% CaF ₂	Ex-mine Dongargaon (Maharashtra)	800-1045	1045	1045
Dust fines + 55% to 65% CaF ₂	Ex-mine Dongargaon (Maharashtra)	1400-1705	1705	1705
Waste dump + 30% to 40% CaF ₂	Ex-mine Dongargaon (Maharashtra)	500-715	715	715
Waste Lumps + 25% to 30% CaF ₂	Ex-mine Dongargaon (Maharashtra)	240-440	440-525	440-525
+ 15% to 20% CaF ₂	Ex-mine RSMML (Rajasthan)	368	420	420
+ 20% to 30% CaF ₂	Ex-mine RSMML (Rajasthan)	1045	1150	1150
+ 30% to 40% CaF ₂	Ex-mine RSMML (Rajasthan)	2273	2378	2378
+ 50% to 60% CaF ₂	Ex-mine RSMML (Rajasthan)	3113	3428	3428
+ 70% to 75% CaF ₂	Ex-mine RSMML (Rajasthan)	4652	5177	5177

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**Table - 5 : Mine-head Stocks of Fluorite,
2007-08(p)
(By State)**

(In tonnes)		
State	At the beginning of the year	At the end of the year
India	52	292
Maharashtra	52	292

MINING

Ambadungar Fluorspar Mine in Gujarat owned by GMDC is the largest fluorite mine in the country. Mining is carried out by opencast method, using heavy earth moving equipment of 0.9 cu m, 0.17 cu m hydraulic excavators with 7 tonnes dumpers. The capacity of the mine is 500 tonnes per day.

MSMC operated Dongargaon fluorite mines manually in Chandrapur district, Maharashtra. The run-of-mine was hand sorted for marketing.

When in operation, RSMML carries out semi-mechanised opencast mining in Karara, Tavidar and Lakhawas areas in Jalore district, Rajasthan. Fluorite of different grade is obtained manually by hand breaking & sorting method.

BENEFICIATION

Low grade fluorite produced is used after beneficiation in the industries. GMDC has a beneficiation plant of 1,82,000 tpy capacity located at Kadipani to produce acid grade and metallurgical grade fluorite, analysing 92.5 to 95.5% CaF₂ and 86 to 93% CaF₂, respectively. Besides, it has facility to produce MFC powder analysing 65 to 85% CaF₂ starch briquettes (81% CaF₂, min) and silicate briquettes (79% CaF₂, min).

RSMML has a Pilot Beneficiation Plant located at Village Verdha, about 28 km from Dungarpur to process the mineral rejects (-20% CaF₂) lying in the mine. The plant has 10-15 tpd capacity to produce fluorite powder analysing 80-85% CaF₂. No production was reported in 2007-08.

The hand-picked high grade ore from Dongargaon mine of MSMC is beneficiated in a beneficiation plant of M/s SANBRO Corporation Ltd, situated at Waregaon, Koradi, Nagpur district, to produce fluorite concentrate.

CONSUMPTION

Fluorite consumption was 70,700 tonnes in 2007-08. The major consuming industry is the chemical industry which accounted for more than 79% of the total consumption reported. Industrywise consumption of fluorite is given in Table-7.

**Table - 7 : Reported Consumption of Fluorite
2005-06 to 2007-08
(By Industries)**

(In tonnes)			
Industry	2005-06	2006-07	2007-08(p)
All Industries	70600	70700	70700
Alloy steel	3200 (14)	3200 (14)	3200 (14)
Aluminium	100 (4)	100 (4)	100 (4)
Cement	7800 (10)	7400 (10)	7500 (10)
Chemicals	56000 (4)	56000 (4)	56000 (4)
Electrode	300 (8)	300 (8)	300 (8)
Ferro-alloys	300 (6)	300 (6)	300 (6)
Foundry	300 (8)	300 (8)	300 (8)
Glass	200 (6)	200 (6)	200 (6)
Iron & steel	2400 (7)	2900 (8)	2800 (8)

Figures rounded off.

Data collected on non-statutory basis.

Figures in parentheses denote the number of units in organised sector reporting consumption.

SPECIFICATIONS

BIS has prescribed IS : 8587 - 1993 (First Revision, reaffirmed 1999) for acid grade fluorite for use in chemical industries, and IS : 4574 - 1989 (Second Revision, reaffirmed 2003) for fluorite in metallurgical industries.

USES

Acid grade fluorite is used as a feedstock in the manufacture of hydrofluoric acid (HF) and to produce aluminium fluoride (AlF_3). The major use of HF is for the production of a wide range of fluorocarbon chemicals, including hydrofluorocarbons (HFCs) hydrochlorofluorocarbons (HCFCs), and fluoropolymers. But owing to environmental concerns, part of chlorofluorocarbons (CFCs) are replaced by HCFCs. HF is used in the manufacture of uranium tetrafluoride required to make nuclear fuel and fission explosives. It is also used in stainless pickling, petroleum alkylation, glass etching, oil & gas well treatment and as etcher/cleaner in electronic industry.

HF is used in the manufacture of a host of fluorine chemicals used in dielectrics, metallurgy, wood preservatives, herbicides, mouthwashes, decay-preventing dentifrices, plastics and water fluoridation.

AlF_3 manufactured from acid grade fluorite is used in electrolytic recovery of aluminium. On an average, worldwide consumption of fluorides is about 21 kg for every tonne of aluminium produced. This ranged from 10 to 12 kg per tonne in a modern pre-baked aluminium smelter and about 40 kg in an old Soderberg smelter without scrubber.

Ceramic grade fluorite containing 85 to 95% CaF_2 is used in ceramic industry as a flux and as an opacifier in the production of flat glass, white or opal glass and enamels.

Metallurgical grade fluorite is used primarily as fluxing agent by steel industry. It is added to slag to make it more reactive through increased fluidity. Fluorite of different grades is used in the manufacture of aluminium, cement and glass fibres. It is also used in the melt shop by foundry industry.

INDUSTRY

Many fluorine-based chemicals like hydrofluoric acid, aluminium fluoride, cryolite, sodium silicofluoride and hydrofluorosilicic acid were produced by chemical and fertilizer industries in the country.

In addition to material produced indigenously, substantial quantity of high grade fluorite was also imported to meet the demand of the fluorine-based chemical industries.

The Tanfac Industries Ltd, a joint sector company of TIDCO, Cuddalore, Tamil Nadu, is engaged in the manufacture of inorganic fluorine-based chemicals, such as, aluminium fluoride, anhydrous hydrofluoric acid, sodium silico fluoride, ammonium bifluoride, potassium fluoride, cryolite and various other fluorine-based chemicals. The company has an annual installed capacity of 16,500 tonnes of aluminium fluoride, 66,000 tonnes of sulphuric acid, 14,000 tonnes of hydrofluoric acid and 3,500 tonnes of speciality fluorines.

The Navin Fluorine Industries Ltd, Surat, Gujarat, has an installed capacity of about 22,000 tpy of hydrofluoric acid. The Company produces a number of fluorine chemicals, namely, hydrofluoric acid, cryolite, mafrolite, aluminium fluoride and various grades of maftron.

Sterlite Industries (India) Ltd, a Vedanta Group Company, was planning to set up a high bulk density and low bulk density aluminium fluoride plant of 13,000 tpy capacity at or near Thoothokudi, Tamil Nadu as a joint venture. The plant will produce aluminium fluoride through hydro- fluorosilicic acid route.

Apatite and rock phosphate containing 3 to 4% CaF_2 was another useful source for recovery of fluorine. Coimbatore Pioneer Fertilizer Ltd, was the only fertilizer plant which produced sodium silicofluoride in the past. Hydrofluorosilicic acid producing units were Rashtriya Chemicals & Fertilizer Ltd, Mumbai and Dharamsi Morarji Chemical Co. Ltd, Ambarnath, Maharashtra. Aluminium fluoride was being produced by Southern Petrochemical Industries Corporation Ltd., Thoothokudi, Tamil Nadu with an installed capacity of 2,560 tpy.

SUBSTITUTES

Olivine or dolomitic limestone was used as substitute for fluorite. The by-product fluorosilicic acid from phosphoric acid production was used as a substitute in aluminium fluoride production.

ENVIRONMENT

Fluorine attracts environmental concern. Use of fluorine in drinking water has begun to wane. Fluorine is toxic in high concentration but beneficial in low concentration. Although fluorine has been under attack ever since its use in water in 1949, the only significant health problem with which it has been linked was 'Fluorosis', a disease that involves health defects and bone lesions. This problem is caused by concentration of fluoride that are much higher than the permissible levels in municipal water supplies. As per Indian Standards, the permissible limit of fluoride in the drinking water is 1.5 mg/l. "Defluoridisation by adsorption" is a common economical and efficient method for removal of excess fluoride from drinking water. Electrolytic precipitation based on use of aluminium salts and by electrochemical route, etc. are the other few methods used for defluoridisation.

Fluorine is at the centre of controversy in chlorofluorocarbons (CFCs), which cause depletion of atmospheric ozone layer that protects the earth from ultraviolet radiation, a major cause of skin cancer. The hydrofluorocarbon (HFC) and hydrochlorofluorocarbon (HCFC) compounds, which have been developed as an alternative to CFC, require more hydrofluoric acid than CFC and are expected to boost fluorite consumption. These gases being greenhouse gases are being phased out. It is reported that even if CFC emission is stopped, the present level of these gases may take up to ten years to reach the upper atmosphere where they could persist for a century or more.

According to United Nations Environment Programme, an international agreement to curtail illegal trade in CFC and other ozone depleting chemicals came into effect on 10 November 1999. The agreement, which was authorised through an amendment to the Montreal Protocol in 1997, requires nations to create licensing system for international sales of ozone depleting chemicals. Further, as a part of the Montreal Protocol, 129 nations agreed on a three-year funding package to enable developing countries to continue their efforts to phase out CFC and other ozone depleting chemicals and accordingly the Fund's Executive Committee approved major agreements with China and India to finance the shutdown of CFC production facilities in the two countries during the next ten years.

The United Nations Environment Programme (UNEP) has prepared a Montreal Protocol Handbook that provides additional detail and explanation of the provisions. (CIESIN's Thematic Guide on Ozone Depletion and Global Environmental Change presents an in-depth look at causes, human and environmental effects, and policy responses to stratospheric ozone depletion.

WORLD REVIEW

World total reserve base of fluorite was 480 million tonnes. China and South Africa possess 23% and 17% of the world resources, respectively.

World production of fluorite in 2007 increased to 5.7 million tonnes from 5.6 million tonnes in 2006. China remained the leading producer of fluorite with 3.2 million tonnes. The production is still dominated by Chejiang Province (about 50%). There has also been significant output from Fujian, Hunan, Anhui, Guizhou, Hubei, Henan and Jiangxi. Mexico is second in the production of fluorite after China. Over 80% of Mexico's output was from Las Cuevas, the world's largest fluorite mine. Other principal producing countries were Mongolia, South Africa, Russia, Spain, Namibia and Kenya. In Vietnam, Tiberon Minerals Ltd, is looking to develop Nui Phaotungsten-fluorite deposits, which is located 80 km north of Hanoi.

The world resources and production of fluorite are given in Tables - 8 and 9, respectively.

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**Table - 8 : World Resources of Fluorite
(By Principal Countries)**

(In '000 tonnes)

Country	Reserve base
World: Total (rounded)	480000
China	110000
France	14000
Kenya	3000
Mexico	40000
Mongolia	16000
Morocco	NA
Namibia	5000
Russia	18000
South Africa	80000
Spain	8000
USA	6000
Other countries	180000

Source : Mineral Commodity Summaries, 2008.

**Table - 9 : World Production of Fluorite
(By Principal Countries)**

(In '000 tonnes)

Country	2005	2006	2007
World : Total	5300	5600	5700
China	2700	3000	3200
France	53	40 ^(e)	NA
Kenya@	110	132	85
Mexico	875	936	933
Morocco	115	103	79
Mongolia	368	377	373
Namibia	115	132	132 ^(e)
Russia ^(e)	246	210 ^(e)	180 ^(e)
South Africa	266	270 ^(e)	295 ^(e)
Spain	144	145	137
Other countries	308	255	286

Source: World Mineral Production, 2003-2007.

@: Exports.

FOREIGN TRADE

Exports

Exports of fluorite decreased to 467 tonnes in 2007-08 from 1,111 tonnes in 2006-07. Exports were mainly to Nepal (31%), Saudi Arabia (20%), Turkey(18%), Vietnam (11%) and Israel (9%). Exports of aluminium fluoride increased to 10,012 tonnes in 2007-08 from 9,145 tonnes in the previous year. Exports were mainly to New Zealand (44%), UAE (34%) and Australia (13%). Exports of hydrofluoric acid increased in 2007-08 to 811 tonnes from 542 tonnes in the previous year. Exports of sodium fluoride decreased to 244 tonnes in 2007-08 from 322 tonnes in the previous year (Tables - 10 to 13).

Imports

Imports of fluorite increased to 162,110 tonnes in 2007-08 from 131,000 tonnes in the previous year. Imports were mainly from China (64%), Kenya (29%) and Hong Kong (4%). Imports of aluminium fluoride also increased to 13,287 tonnes in 2007-08 from 8,960 tonnes in the previous year. Imports were from China (86%) and Indonesia (14%). In 2007-08, imports of sodium fluoride decreased to 36 tonnes as against 57 tonnes in the previous year. Similarly, imports of hydrofluoric acid also decreased to 1,607 tonnes in 2007-08 from 1,819 tonnes in the previous year. (Tables - 14 to 17).

**Table - 10 : Exports of Fluorite
(By Countries)**

Country	2006-07		2007-08	
	Qty (t)	Value (Rs. '000)	Qty (t)	Value (Rs. '000)
All Countries	1111	7231	467	4642
Saudi Arabia	550	1991	94	1483
Turkey	112	1624	83	1173
Israel	97	1292	42	967
Nepal	-	-	144	489
UAE	-	-	5	194
Vietnam	54	163	54	171
Ghana	-	-	25	120
Brazil	20	209	-	-
Philippines	139	1195	-	-
UK	110	563	-	-
Other countries	29	194	20	45

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**Table - 11 : Exports of Aluminium Fluoride
(By Countries)**

Country	2006-07		2007-08	
	Qty (t)	Value (Rs.'000)	Qty (t)	Value (Rs.'000)
All Countries	9145	452461	10012	535084
New Zealand	4633	239075	4390	263061
UAE	3574	167347	3402	157465
Australia	96	4908	1329	69678
Korea, Rep. of	642	33668	493	23846
Japan	70	3216	310	18119
Sri Lanka	-	-	35	1076
Switzerland	-	-	12	634
Malaysia	3	140	23	494
UK	27	946	6	153
USA	29	855	2	119
Netherlands	30	644	-	-
Other countries	41	1662	10	439

**Table - 12 : Exports of Sodium Fluoride
(By Countries)**

Country	2006-07		2007-08	
	Qty (t)	Value (Rs.'000)	Qty (t)	Value (Rs.'000)
All Countries	322	5994	244	5844
Thailand	-	-	20	1401
Turkey	40	557	100	1394
Italy	52	358	31	797
Nigeria	36	615	23	496
Iran	20	358	25	383
Netherlands	48	716	2	75
Germany	22	508	-	-
Jordan	30	461	-	-
Qatar	18	996	-	-
UK	34	759	-	-
Other countries	22	666	43	1298

**Table - 13 : Exports of Hydrofluoric Acid
(By Countries)**

Country	2006-07		2007-08	
	Qty (t)	Value (Rs.'000)	Qty (t)	Value (Rs.'000)
All Countries	542	23973	811	35214
Australia	107	5008	131	6300
USA	6	231	122	5412
Singapore	113	6545	85	5024
Pakistan	-	-	159	4707
Israel	16	1025	90	3801
UAE	17	1091	29	2087
Philippines	123	4131	43	1742
Syria	-	-	31	1598
Saudi Arabia	53	2903	30	1053
New Zealand	52	1439	33	1022
Other countries	55	1600	58	2468

**Table - 14 : Imports of Fluorite
(By Countries)**

Country	2006-07		2007-08	
	Qty (t)	Value (Rs.'000)	Qty (t)	Value (Rs.'000)
All Countries	131000	1172943	162110	1649331
China	56101	513137	103067	1055066
Kenya	38787	335488	47344	478114
Hong Kong	8576	89337	5697	59172
Mexico	16159	129006	4690	40432
Pakistan	-	-	318	3500
Germany	220	4171	152	2852
Czech Republic	-	-	100	2093
Iran	2058	20430	149	1472
Mongolia	8995	79692	-	-
Unspecified	-	-	230	2353
Other countries	104	1682	363	4277

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**Table - 15 : Imports of Aluminium Fluoride
(By Countries)**

Country	2006-07		2007-08	
	Qty (t)	Value (Rs.'000)	Qty (t)	Value (Rs.'000)
All Countries	8960	391704	13287	612569
China	6063	276243	11384	528185
Indonesia	2295	90783	1893	83324
Germany	++	5	6	593
Belgium	-	-	4	467
Canada	2	230	-	-
Lithuania	600	24437	-	-
UK	++	6	-	-

**Table - 16 : Import of Sodium Fluoride
(By Countries)**

Country	2006-07		2007-08	
	Qty (t)	Value (Rs.'000)	Qty (t)	Value (Rs.'000)
All Countries	57	11008	36	4739
Germany	33	6552	16	2479
Belgium	13	2424	15	2073
China	10	1735	5	186
USA	-	-	++	1
Phillippines	1	297	-	-

**Table - 17 : Imports of Hydrofluoric Acid
(By Countries)**

Country	2006-07		2007-08	
	Qty (t)	Value (Rs.'000)	Qty (t)	Value (Rs.'000)
All Countries	1819	68811	1607	72210
China	1783	62861	1420	59190
Singapore	7	1192	89	5540
UK	3	365	21	1965
Jordan	-	-	38	1873
Germany	-	-	1	60
Belgium	++	7	-	-
USA	26	4386	38	3582

FUTURE OUTLOOK

The resources of fluorite in India are limited and grades of fluorite produced do not meet the specifications of the chemical industry which is the bulk consumer of fluorite. Ambadungar Fluorspar Mine of GMDC is the only domestic source of acid grade fluorite, slightly inferior in quality with high phosphorus content. Hence, to meet the requirements, the domestic chemical industry will have to depend both qualitatively and quantitatively, on imported fluorite in the coming years, both for direct use and for blending with the domestic acid grade fluorite.