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## FLUORSPAR (Acid Grade) Material Safety Data Sheet

### SECTION 1 – PRODUCT IDENTIFICATION

**Product Trade Name:** Fluorspar  
**Chemical Name/Synonyms:** Calcium Fluoride  
**Chemical Formula:** CaF<sub>2</sub>  
**Chemical Family:** Calcium Fluoride salt  
**Utilization:** Flux in ferrous metallurgy; Production of glass and hydrofluoric acid, Portland cement.

### SECTION 2 – HAZARDOUS INGREDIENTS / IDENTITY INFORMATION

**WHMIS (Canada)** Not controlled  
**Classification (EEC)** Not controlled (See section 15). Pictogram: None  
**Other hazards** No known effects from chronic exposure. Possibility of irritation, silicosis. Avoid dusty conditions.  
**Environmental hazards** No known effects.

### SECTION 3 – PHYSICAL/CHEMICAL CHARACTERISTICS

<u>Name</u>	<u>CAS No.</u>	<u>Percent (%)</u>	<u>CE No.</u>	<u>R-Phases<sup>1</sup></u>
Calcium Fluoride	7789-75-5	94-97.5	238-575-7	Not applicable
Amorphous Silica	7631-86-9	09-2.8	231-545-4	Not applicable
Calcium Carbonate	1317-65-3	1.0-2.9	215-279-6	Not applicable

**Note 1:** See Section 15 for the complete wording of risk phrases.

### SECTION 4 – FIRST-AID MEASURES

**Eye Contact** – Remove contact lenses if present. Immediately rinse eyes with plenty of water, while holding eyelids open for at least 15 minutes. Consult a physician. Dust: Possibility of irritation to the eyes.

**Skin Contact** – Remove contaminated clothing. Flush exposed skin gently and thoroughly with running water and non-abrasive soap. Dust: Possibility of skin irritation.

**Inhalation** – Remove the person from exposure. Bring to fresh air. Difficult breathing: Give oxygen. Get **immediate** medical attention. Possibility of irritation: Mucous membranes, upper respiratory tract, lungs.

**Ingestion** – Induce vomiting. Drink a lot of water or milk. **UNCONSCIOUS** person: **DO NOT** induce vomiting or give any liquid. Consult a physician.

### SECTION 5 – FIRE-FIGHTING MEASURES

**Flash Point** Not applicable  
**Flammable Limits** Not applicable  
**Auto-Ignition Temperature** Not applicable  
**Products of Combustion** Calcium oxide; Carbon dioxide; Hydrogen fluoride  
**Fire Hazard** NOT flammable. Dust: Flammable when exposed to heat or

flames. Heated to decomposition: Very toxic fumes release.  
**Silica:** Flammable when exposed to flames or by chemical reaction with oxidants.  
**Calcium Carbonate:** Non-flammable and non-combustible. Ignition on contact with fluorine.  
**Explosion Hazard** Not explosive (mechanical impact: static discharge), Dust: Slightly explosive to explosive in presence of open flames and sparks.  
**Extinguishing Media** NON-FLAMMABLE. Use fire-fighting materials and procedures adapted to the immediate environment.  
**Protective Equipment** Firefighters must wear self-contained breathing apparatus (SCBA).

**SECTION 6 – ACCIDENTAL RELEASE MEASURES**

**Measures** Use appropriate tools to minimize dust generation. Put the spilled solid in a convenient recycling container. Finish cleaning by spreading water on the contaminated surface and dispose of, according to local and regulatory requirements.

**Protective Equipment** Large concentrations of fumes or dust: Use a self-contained breathing apparatus (SCBA) to avoid inhalation of material.  
 Small concentrations: Use a NIOSH/OSHA approved full face respirator or the equivalent. Full protective clothing. Boots, Gloves.

**SECTION 7 – HANDLING AND STORAGE**

**Handling** **DO NOT** ingest or inhale dust. Keep away from incompatible substances (acids). Ingestion or inhalation: Seek medical advice immediately and provide medical personnel with a copy of this MSDS.  
**Conditions for storage** Away from incompatible substances.

**SECTION 8 – EXPOSURE CONTROLS / PERSONAL PROTECTION**

Name	CAS No.	Control Parameters
		United Kingdom OEL-TWA (mg/m <sup>3</sup> )
Calcium Fluoride	7789-75-5	2.5 (F)
Amorphous Silica	7631-86-9	Not established
Calcium Carbonate	1317-65-3	10 (total inhalable dust) 4 (respirable dust)

**Note: Calcium Fluoride**

Belgium, Denmark, EU (Directive 2000/39/EC)\*\*, Finland, France, Greece, Ireland, Italy, Luxembourg, Mexico, Portugal, South Africa: OEL (as F): 2.5 mg/m<sup>3</sup>.  
 Bulgaria: ACGIH TLV-TWA (as F): 2.5 mg/m<sup>3</sup>.  
 Hungary: OEL (as F): 2.5 mg/m<sup>3</sup>; STEL (as F): 2.5 mg/m<sup>3</sup>.  
 Austria: OEL (as F): 2.5 mg/m<sup>3</sup>; STEL (as F): 12.5 (Frequency x Duration in minutes/shift: 2 x 30).  
 Estonia, Netherlands, Sweden: OEL (as F): 2 mg/m<sup>3</sup>.  
 Germany: OEL (as F) (Inhalable fraction): 1 \* mg/m<sup>3</sup>; STEL (as F, 15 min.) (Inhalable fraction) : 4 (multiplication factor).  
 Poland: MAC (as HF): 1 mg/m<sup>3</sup>; MAC-STLV (as HF): 3 mg/m<sup>3</sup>.  
 Switzerland: OEL (as F) (Inhalable dust): 1 mg/m<sup>3</sup>; STEL (as F) (Inhalable dust) : 4 (Freq. x Duration in minutes/shift: 4 x 15).  
 Iceland, Norway: OEL (as F): 0.6 mg/m<sup>3</sup>.  
 USA: ACGIH TLV-TWA and OSHA PEL-TWA (as F): 2.5 mg/m<sup>3</sup>.

\*If the OEL value is complied with, there should be no risk of reproductive damage.  
 \*\*Commission Directive 2000/39/EC of 8 June 2000 establishing a first list of indicative occupational exposure limit values in implementation of Council Directive 98/24/EC on the protection of the health and safety of workers from the risks related to chemical agents at work, OJ (L 142) 47, 16 June 2000.

**Amorphous silica:** ACGIH TLV-TWA (USA): Not established; OSHA PEL-TWA (USA): 80% SiO<sub>2</sub>; NIOSH REL-TWA (<10 hours): 6 mg/m<sup>3</sup>; IDLH: 3000 mg/m<sup>3</sup>.

**Calcium carbonate:** ACGIH TLV-TWA (USA): Not established; OSHA PEL-TWA (USA): 80% SiO<sub>2</sub>; NIOSH REL-TWA (<10 hours): 5 mg/m<sup>3</sup> (respirable fraction), 10 mg/m<sup>3</sup> (total).

*Consult local authorities for acceptable exposure limits.*

**Engineering controls** Use process enclosures, local exhaust ventilation or other engineering controls to keep airborne levels below recommended exposure limits.

**Individual protection** Safety glasses. Coveralls. Work gloves and boots. Dust respirator. Be sure to use a NIOSH approved respirator or equivalent when concentrations exceed occupational exposure limits.

## SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES

<b>Physical State and Appearance</b>	Solid (Crystalline powder 50 mesh-325 mesh approx.	<b>Odor</b>	Odorless
<b>Molecular Weight</b>	78.08	<b>Taste</b>	N/A
<b>pH (1% soln/water)</b>	Not applicable	<b>Color</b>	Light orange to tan
<b>Boiling Point</b>	2 500°C (4 532°F)	<b>Volatility</b>	N/A
<b>Melting Point</b>	1 420°C (2 588°F)	<b>% Moisture</b>	9% (Max.)
<b>Critical Temperature</b>	Not available	<b>Odor Threshold</b>	N/A
<b>Specific Gravity</b>	3.18 (Water=1)	<b>Water/Oil Dist. Coeff.</b>	N/A
<b>Vapor Pressure</b>	Not applicable	<b>Ionicity (in water)</b>	N/A
<b>Vapor Density</b>	Not available	<b>Dispersion</b>	N/A
<b>Solubility</b>	Practically insoluble: 0.0015 g/100 ml		

## SECTION 10 - STABILITY AND REACTIVITY

<b>Stability</b>	Stable under normal conditions.
<b>Hazardous Decomposition</b>	Possibility of toxic release of hydrofluoric gases at temperatures above 1000°C in the presence of moist air.
<b>Conditions to avoid</b>	Strong acids and high temperatures (above 1000°C).
<b>Hazardous Polymerization</b>	Will not occur
<b>Materials to avoid</b>	Reactive with: Acids. <b>Calcium fluoride:</b> Acids, chemically active metals, reducing agents, water. Contact with hot concentrated sulfuric acid: Possibility of production of hydrofluoric acid (Hydrogen fluoride). <b>Amorphous silica:</b> Violent reaction with: Fluoride, oxygen difluoride, chlorine trifluoride. <b>Calcium carbonate:</b> Alum, ammonium salts, mercury and hydrogen, fluorine, magnesium, acids. <i>NOTE: This list of products is not exhaustive. Verify technical documents to determine any incompatibilities with your process.</i>
<b>Corrosivity</b>	No

## SECTION 11 – TOXICOLOGICAL INFORMATION

<b>Routes of Entry</b>	Ingestion. Inhalation. Eye and skin contacts.
<b>Carcinogenicity</b>	<b>Calcium carbonate; Calcium fluoride:</b> NOT A CARCINOGEN (IARC); NOT CLASSIFIABLE (Human, A4, ACGIH). <b>Amorphous silica:</b> NOT CLASSIFIABLE (Human, Group 3, IARC); NOT LISTED (ACGIH).
<b>Mutagenicity</b>	Not applicable.
<b>Teratogenicity</b>	Not applicable.
<b>Acute toxicity</b>	<b>Calcium fluoride:</b> ORAL acute (LD50): 4 250 mg/kg (Rat); INTRAPERITONEAL (LD50): >1 500 mg/kg (rat); 2 638 mg/kg (Mouse). (RTECS). <b>Amorphous silica:</b> ORAL acute (LD50): 3 160 mg/kg (Rat). INTRAVENOUS acute (LD50): 15 mg/kg (Rat). (RTECS). <b>Calcium carbonate:</b> ORAL acute (LD50): 6 450 mg/kg (Rat). (RTECS).

**Acute Effects** Solid form: No health hazards. Conditions and work practices which generate dust or fumes should be avoided or controlled. Ingestion and inhalation: Possibility of diffuse abdominal pain, nausea, vomiting, diarrhea, thirst, saliva, albuminuria, shock.

**Chronic Effects** No known effects from chronic exposure. Repeated or prolonged exposure (Normal work conditions): Do not aggravate medical conditions.  
**Calcium fluoride:** Chronic overexposure: May cause increased bone density. Irritant for: Skin, eyes, nose, throat, and respiratory tract. May cause: coughing, chest discomfort.  
**Amorphous silica:** Target organ for acute and chronic overexposure (NIOSH 90-117): Respiratory system. Chronic overexposure: Possibility of shortness of breath. Prolonged dust inhalation can cause silicosis (Fibrosis of the lungs).  
**Calcium carbonate:** No chronic effects of exposure have been reported. Irritant for: skin, eyes, nose, throat, respiratory tract. Can cause: sneezing and coughing, use an antacid (small quantity); calcium supplement.  
**Toxicity** Workers with the following pre-existing conditions warrant particular attention.  
**Amorphous silica:** Tuberculosis.  
**Calcium carbonate:** Respiratory diseases.  
*Eating, drinking, and smoking must be prohibited in areas where this material is handled and processed. Wash hands and face before eating, drinking, and smoking.*

**SECTION 12 – ECOLOGICAL INFORMATION**

**Ecotoxicity** Not available.  
**Toxicity to Animals** **Amorphous silica:** ORAL acute (LD50): 3 160 mg/kg (Rat).  
 INTRAVENOUS acute (LD50): 15 mg/kg (Rat). (RTECS).  
**Biodegradation Products** Not applicable  
**Biodegradation Products (Toxicity)** Not applicable  
**Remarks on Environment** **Calcium fluoride:** Used to fluoridate drinking water.  
**BOD5 and COD** Not available

**SECTION 13 – DISPOSAL CONSIDERATIONS**

**Disposal methods** Recycle to process, if possible. Consult local or regional authorities. If the product becomes a waste, material should be tested to determine if it must be classified as a hazardous waste under the Resource Conservation Recovery Act (RCRA 40CFR261.3). Discard in full compliance with Federal, Provincial and local regulations.  
**RCRA P-Series and RCRA U-Series:** Not listed.

**SECTION 14 – TRANSPORT INFORMATION**

**ADR** Not applicable.  
**PIN** Not applicable.  
**Special Provisions (Transport)** Not applicable.

**SECTION 15 – REGULATORY INFORMATION**

**Labeling (EEC)** EU: Consolidated Inventories: Listed.  
**Calcium fluoride:** EU Consolidated Inventories: numero EC 232-188-7  
**Amorphous silica:** EU Consolidated Inventories: EC Number 231-545-4  
**Calcium carbonate:** EU Consolidated Inventories: numero EC 215-279-6  
 Not classified in the Annex I of Directive 67/548/EEC  
 Not listed in the Annex I of Council Regulation No (EC) 304/2003  
 Not listed in a priority list (as foreseen under Council Regulation (EEC) No 793/93  
**Risk Phrases (EEC)** None  
**Safety Phrases (EEC)** None  
**CEPA DSL (CANADA)** CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA): On the Domestic Substances List (DSL); Acceptable for use under the provisions of CEPA.  
 Calcium fluoride; Calcium carbonate.

**DOT Classification (USA)**  
**Regulation (USA)**

Not regulated.  
TSCA (EPA, Toxic Substance Control Act) Chemical Inventory (40 CFR710): Listed.  
**Calcium fluoride; Amorphous silica.**  
Not regulated.

**Classifications HCS (USA)**

**NFPA (National Fire Protection Association) (USA)**

**Fire Hazard** 0      **Reactivity** 0      **Health** 2      **Special Hazard**

**OVERVIEW:**

Commercially available Fluorspar contains about 0.8 to 1.5% SiO<sub>2</sub> plus minor trace impurities. The product is minimally hazardous when in its delivered state combined with about 10% maximum water as a filtercake. Dust hazards exist when the product is either dried intentionally or through prolonged open storage.

**DOT (USA) (Pictograms)**

**DSCG (Europe) (Pictograms)**

**ADR (Europe) Pictograms**

**SECTION 16 – OTHER INFORMATION**

- References** -TLVs and BEIs (2009). Based on the Documentation of the Threshold Limit Values for Chemical Substances and Physical Agents & Biological Exposure Indices. ACGIH, Cincinnati, OH – <http://www.acgih.org>
- CCOHS (2009) – Canadian Centre for Occupational Health and Safety – <http://www.ccohs.ca/>
- ERG (2008). Emergency Response Guidebook, US Department of Transportation, Transport Canada, et le Secretariat of Communications and Transportation of Mexico
- HSDB (2009) – Hazardous Substances Data Bank. TOXNET® Network of databases on toxicology, hazardous chemicals, and environmental health. NLM Databases & Electronic Resources, US National Library of Medicine, NHI, 8600 Rockville Pike, Bethesda, MD 20894 – <http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?HSDB>
- ESIS: C&L (Classification and Labeling), substances or preparations in accordance with Directive 67/548/EEC (substances) and 1999/45/EC (preparations),
- ESIS: EINECS (European Inventory of Existing Commercial Chemical Substances) O.J. C 146A, 15.6.1990
- ESIS: EINECS corrections published in O.J. C 54/13 01.03.2002, 2002/C54/08.
- IARC – Monographs on the Evaluation of Carcinogenic Risks to Humans (collection) – <http://www-cie.iarc.fr/>
- Merck Index (1999). Merck & Co., Inc., 12<sup>th</sup> edition
- NIOSH US (2009) – Pocket Guide to Chemical Hazards – <http://www.edc.gov/niosh/npg/>
- Patty's Industrial Hygiene and Toxicology, 3<sup>rd</sup> Revised Edition
- Reglement sur les produits controles (Canada)
- RTECS (2009). Registry of Toxic Effects of Chemical Substances, NIOSH, CDC
- Toxicologie industrielle & intoxication professionnelle, 3e edition, Lauwerys
- TSCA (2009) – US EPA Toxic Substance Control Act, Chemical Inventory. System of Registries (SoR), Substance Registry Services, [http://iaspub.epa.gov/sor\\_internet/registry/substreg/searchandretrieve/substancesearch/search.do](http://iaspub.epa.gov/sor_internet/registry/substreg/searchandretrieve/substancesearch/search.do)

<b>Glossary</b>	ACGIH:	American Conference of Governmental Industrial Hygienists.
	HSDB:	Hazardous Substances Data Bank.
	IARC:	International Agency for Research on Cancer.
	NIOSH:	National Institute of Occupational Safety and Health.
	NTP:	US National Toxicology Program.
	OSHA:	Occupational Safety and Health Administration.
	RTECS:	Registry of Toxic Effects of Chemical Substances.

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