Distributed by:
Laguna Clay Company
14400 Lomitas Ave
City of Industry, CA 91746
1-800-4Laguna
info@lagunaclay.com
www.lagunaclay.com

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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: CaF2
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

Name	CAS No.	Percent (%)	CE No.	R-Phases[1]
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^3)
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^3.
Bulgaria: ACGIH TLV-TWA (as F): 2.5 mg/m^3.
Hungary: OEL (as F): 2.5 mg/m^3 ; STEL (as F): 2.5 mg/m^3.
Austria: OEL (as F): 2.5 mg/m^3 ; STEL (as F): 12.5 (Frequency x Duration in minutes/shift: 2 x 30).
Estonia, Netherlands, Sweden: OEL (as F): 2 mg/m^3.
Germany: OEL (as F) (Inhalable fraction): 1 * mg/m^3; STEL (as F, 15 min.) (Inhalable fraction) : 4 (multiplication factor).
Poland: MAC (as HF): 1 mg/m^3; MAC-STLV (as HF): 3 mg/m^3.
Switzerland: OEL (as F) (Inhalable dust): 1 mg/m^3; STEL (as F) (Inhalable dust) : 4 (Freq. x Duration in minutes/shift: 4 x 15).
Iceland, Norway: OEL (as F): 0.6 mg/m^3.
USA: ACGIH TLV-TWA and OSHA PEL-TWA (as F): 2.5 mg/m^3.
*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_2; NIOSH REL-TWA (<10 hours): 6 mg/m^3; IDLH: 3000 mg/m^3.
Calcium carbonate: ACGIH TLV-TWA (USA): Not established; OSHA PEL-TWA (USA): 80/% SiO_2 NIOSH REL-TWA (<10 hours): 5 mg/m^3 (respirable fraction), 10 mg/m^3 (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

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

SECTION 10 - STABILITY AND REACTIVITY

Stability Stable under normal conditions.

Hazardous Decomposition Possibility of toxic release of hydrofluoric gases at temperatures above 1000°C in the presence of moist air.

Conditions to avoid Strong acids and high temperatures (above 1000°C).

Hazardous Polymerization Will not occur

Materials to avoid Reactive with: Acids.
Calcium fluoride: Acids, chemically active metals, reducing agents, water.
Contact with hot concentrated sulfuric acid: Possibility of production of hydrofluoric acid (Hydrogen fluoride).
Amorphous silica: Violent reaction with: Fluoride, oxygen difluoride, chlorine trifluoride.
Calcium carbonate: Alum, ammonium salts, mercury and hydrogen, fluorine, magnesium, acids.
NOTE: *This list of products is not exhaustive. Verify technical documents to determine any incompatibilities with your process.*

Corrosivity No

SECTION 11 – TOXICOLOGICAL INFORMATION

Routes of Entry Ingestion. Inhalation. Eye and skin contacts.

Carcinogenicity **Calcium carbonate; Calcium fluoride:** NOT A CARCINOGEN (IARC); NOT CLASSIFIABLE (Human, A4, ACGIH).
Amorphous silica: NOT CLASSIFIABLE (Human, Group 3, IARC); NOT LISTED (ACGIH).

Mutagenicity Not applicable.

Teratogenicity Not applicable.

Acute toxicity **Calcium fluoride:** ORAL acute (LD50): 4 250 mg/kg (Rat): INTRAPERITONEAL (LD50): >1 500 mg/kg (rat); 2 638 mg/kg (Mouse). (RTECS).
Amorphous silica: ORAL acute (LD50): 3 160 mg/kg (Rat). INTRAVENOUS acute (LD50): 15 mg/kg (Rat). (RTECS).
Calcium carbonate: 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) Not regulated.

Regulation (USA) TSCA (EPA, Toxic Substance Control Act) Chemical Inventory (40 CFR710): Listed.
Calcium fluoride; Amorphous silica.

Classifications HCS (USA) Not regulated.

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% Si02 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) **DSCL (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., 12th edition

-NIOSH US (2009) – Pocket Guide to Chemical Hazards – http://www.cdc.gov/niosh/npg/

-Patty's Industrial Hygiene and Toxicology, 3rd 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

Glossary

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.