

This product safety summary is intended to provide a general overview of the chemical substance in the context of ICCA global product strategy. It is not intended to provide emergency response, medical or treatment information nor to provide an overview of all safety and health information. This summary is not intended to replace the Safety Data Sheet. For detailed guidance on the use or regulatory status of this substance, please consult the Safety Data Sheet.

A. CHEMICAL PRODUCT IDENTIFICATION:

Product Name	Calcium fluoride
Synonyms	Fluorite (Fluorspar)
IUPAC Name	Calcium difluoride
CAS NO	7789-75-5
E C No	232-188-7
Molecular Formula	CaF ₂

B. USES AND APPLICATIONS:

- ✓ Calcium fluoride is used to manufacture optical components such as windows and lenses, used in thermal imaging systems, spectroscopy, telescopes, and excimer lasers. It is transparent over a broad range from ultraviolet (UV) to infrared (IR) frequencies.

C. PHYSICAL / CHEMICAL PROPERTIES:

Properties	Value
Physical state and appearance	Solid white powder or cubic crystal
Odor	Odorless
Molecular Weigh	78.08 g/mole
Color:	White powder or cubic crystals
Boiling Point	2500°C / 4532°F
Melting Point / Range	1403°C / 2557.4°F
Flash Point	Not applicable
Specific Gravity	3.18 g/cm ³ at 20°C

Critical Temperature	-
Relative Density	3.18 g/cm ³ at 20°C
Vapor Pressure	No information available
Vapor Density	No information available
Volatility	No information available
Odor Threshold	No information available
Partition Coefficient	No information available
Water Solubility	Very slightly soluble in cold water. 15 mg/L
Explosive/oxidising properties	No information available

D. HEALTH EFFECTS:

Excess exposure to **fluoride** can lead to a bone disease known as skeletal fluorosis. Over many years, this can result in pain and damage to bones and joints. The bones may become hardened and less elastic, increasing the **risk** of fractures.

Effect	Value
Acute Toxicity Oral / inhalation / dermal	ORAL LD50: >2000 mg/kg DERMAL LD50: Not classified INHALATION LC50: >5070 mg/m ³ air Based on available information, According to GHS product is not classified as Acutely Toxic.
Irritation / corrosion Skin / eye/ respiratory tract	Causes skin / eye / respiratory tract irritation.
Sensitisation	Based on available information, the classification criteria are not met.
Toxicity after repeated exposure Oral / inhalation / dermal	Based on available information, the classification criteria are not met.
Mutagenicity/Teratogenicity	Based on available information, the classification criteria are not met.
Carcinogenicity	Based on available information, the classification criteria are not met.
Toxicity for reproduction	Based on available information, the classification criteria are not met.

E. ENVIRONMENTAL EFFECTS:

CaF₂ is released during production and industrial use to waste water, where it is expected to precipitate, especially when the pH>4.5. ... Therefore it can be concluded that the release of HF from water to the **atmosphere** can be considered negligible.

Effect Assessment	Value
Aquatic Toxicity	Toxicity to Fish LC50: =>100 mg/L Toxicity to aquatic Invertebrate EC50: 26 - 48 mg/L Toxicity to Algae EC50: 88.32 mg/L Based on available information, According to GHS product is not classified for Aquatic Toxicity.

Fate and behavior	Value
Degradation/Persistence	Biodegradability is not applicable parameter for inorganic materials.
Bio-accumulation	Bio-concentration Factor = 64 l/kg ww
PBT/vPvB conclusion	This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher. In accordance with Annex XIII, a PBT assessment is not required for inorganic substances.

*: Persistent, Bio accumulative and Toxic (PBT)

**: very Persistent and very Bio accumulative (vPvB)

F. EXPOSURE :

Human health	
Consumers	The decision to infuse industrial fluoride compounds into public water supplies to permeate the blood and organs of consumers with fluoride as an ingested dental prophylactic was an error that resulted in serious consequences including loss of life.

	Properties: When heated to decomposition it emits toxic fumes of hydrogen fluoride.
Workers	Most cases of acute poisoning in humans have been associated with suicidal or accidental ingestion of fluoride-containing insecticides and other products in the home. Acute fluoride poisoning is manifested by vomiting, diarrhoea, abdominal pain, cyanosis, severe weakness, dyspnoea, muscle spasms, paresis and paralyses, cardiovascular disorders including ventricular fibrillation, convulsions, coma and death. Fluoride kills by blocking normal cellular metabolism. Fluoride inhibits enzymes, particularly metallo-enzymes involved in essential processes, causing vital functions such as the initiation and transmission of nerve impulses to cease. The strong affinity of fluoride for calcium leads to hypocalcaemia.

Environment
As fluorspar it is found in sedimentary rocks and as Cryolite in igneous rocks. These fluoride minerals are nearly insoluble in water. Hence fluorides will be present in ground water only when conditions favour their solution. It is also present in sea water (0.8-1.4 ppm), in mica and in many drinking water supplies.

G. RISK MANAGEMENT MEASURES

Effect	Value
Eyes	Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists, get medical attention.
Skin protection	Wash off immediately with soap and plenty of water for at least for 15 minutes. Take off contaminated clothing and wash before reuse. If irritation develops and persists, get medical attention.
Ingestion	Do NOT induce vomiting. Rinse mouth immediately and drink large quantities of water. Never give anything by mouth to an unconscious person. Obtain medical attention immediately if ingested.

Inhalation	Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, give artificial respiration. Seek medical attention.
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H. PERSONAL PROTECTIVE EQUIPMENT AND EMERGENCY MEASURES

Effect		Value
Engineering controls		Ensure adequate ventilation, especially in confined areas. Ensure that eyewash stations and safety showers are close to work station. If applicable, use process enclosure, local exhaust ventilation, or other engineering controls to maintain airborne level below recommended exposure limits. If exposure limits have not been established maintain airborne levels to acceptable level.
Special risks , Specific hazards		Thermal decomposition (above 1400 °C) can lead to release of irritating gases and vapours.
Personnel Protective equipment	Eye/Face protection	Use tightly sealed safety glasses. Chemical resistant goggles must be worn.
	Skin protection	Preventative skin protection is recommended. Wear long sleeves and/or protective coveralls.
	Hand protection	Wear suitable protective gloves.
	Respiratory protection	For limited exposure use an N95 dust mask. For prolonged exposure use an air purifying respirator with high efficiency particulate air (HEPA) filters. Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN149 approved respirators if exposure limits are exceeded or symptoms are experienced.

I. ACCIDENTAL RELEASE MEASURES

- ✓ Use proper personal protective equipment (pl refer MSDS)
- ✓ Person Precautions: Ensure adequate ventilation. Use personal protective equipment as required. Avoid dust formation.
- ✓ Environmental precautions: Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.


- ✓ Spill cleanup measures: Sweep up and shovel into suitable containers for disposal. Avoid dust formation. Keep in properly labeled containers. Keep in suitable, closed containers for disposal. Treat recovered material as described in the section "Disposable considerations"

J. FIRE FIGHTING MEASURES

Suitable Extinguishing Media	Use extinguishing agents appropriate to local circumstances and the surrounding environment.
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K. CLASSIFICATION AND LABELLING

Under GHS substances are classified according to their physical, health, and environmental hazards. The hazards are communicated via specific labels and the eSDS. GHS attempts to standardize hazard communication so that the intended audience (workers, consumers, transport workers, and emergency responders) can better understand the hazards of the chemicals in use. Substances registered for REACH are classified according CLP (EC) 1272/2008, implementation of the GHS in the European Union.

Classification H315 H319 H335	Skin corrosion/irritation: Category 2 Eye damage/irritation: Category 2 STOT – single exposure: Category 3
Pictogram	
Signal Word	Warning
Hazard statements H315 H319 H335	Causes skin irritation Causes serious eye irritation May cause respiratory irritation
Precautionary statements P261 P264 P271 P280 P304+P340 P312 P302+P352 P321	Avoid breathing dust/fume/gas/mist/vapors/spray. Wash hand, skin, face thoroughly after handling. Use only outdoors or in a well-ventilated area. Wear protective gloves/eye protection/face protection. IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTRE/doctor/physician if you feel unwell. IF ON SKIN: Wash with plenty of soap and water. Specific treatment (see ... on this label)



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P332+P313	IF Skin irritation occurs : Get medical advice/attention.
P362+P364	Take off contaminated clothing and wash it before reuse.
P305+P351+P338	IF IN EYES: rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do continue rinsing.
P337+P313	If eye irritation persists: Get medical advice/attention.
P403+P233	Store in a well-ventilated place. Keep container tightly closed.
P405	Store Locked up.
P501	Disposal of contents/container to an approved plant.

L. BASIC TRANSPORT INFORMATION

DOT / TDG/ IATA/ IMDG/IMO	
UN No.	Not Regulated
Proper shipping Name	
Technical name	
Hazard Class	
Packaging Group	
Marine Pollutant	

M. REGULATORY INFORMATION

✓ **International Inventories**

TSCA	Complies
EINECS/ ELINCS	Complies
DSL/NDSL	Complies
PICCS	Complies
ENCS	Complies
IECSC	Complies
AICS	Complies
KECL	Complies



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Legend

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory

DSL/NDL - Canadian Domestic Substances List/Non-Domestic Substances List

EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances

PICCS - Philippines Inventory of Chemicals and Chemical Substances

ENCS - Japan Existing and New Chemical Substances

IECSC - China Inventory of Existing Chemical Substances

AICS - Australian Inventory of Chemical Substances

KECL - Korean Existing and Evaluated Chemical Substances

N. CONCLUSIONS

- ✓ Calcium fluoride is used to manufacture optical components such as windows and lenses, used in thermal imaging systems, spectroscopy, telescopes, and excimer lasers. It is transparent over a broad range from ultraviolet (UV) to infrared (IR) frequencies.
- ✓ By applying the appropriate Risk Management measures the concentrations to be expected at workplaces and to the general public are below recommended exposure limits

O. CONTACT INFORMATION

Company Name	GUJARAT FLUOROCHEMICALS LIMITED
Address	12/A, GIDC Dahej Industrial Estate, Taluka: Vagra, Bharuch 392 130, Gujarat, India
Business Phone	+91 – 2641 – 618031, 248152
Business Fax	+91 – 2641 – 618012
Web Site	www.gfl.co.in

P. DISCLAIMER

- ✓ The information contained in this paper is intended as advice only and whilst the information is provided in utmost good faith and has been based on the best information currently available, is to be relied upon at the user's own risk.



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