CALCIUM FLUORIDE

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME
CALCIUM FLUORIDE

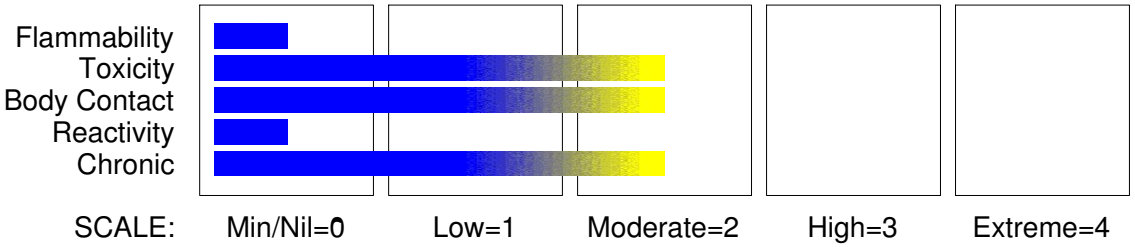
OTHER NAMES

CaF2, metspar, fluospar, fluorspar, fluorite, "calcium difluoride", "natural fluorite", fluorospar

PRODUCT USE
General laboratory reagent; flux in open hearth steel furnaces, in metal smelting and glass manufacture.
Raw material for hydrogen fluoride manufacture. Ingredient in welding fluxes.
Component in ceramics; in carbon electrodes, emery wheels, certain cements, optical equipment. Also a catalyst in wood preservatives.

SUPPLIER
Company: S D FINE- CHEM LIMITED
Address:
315- 317, T.V. INDUSTRIAL ESTATE,
248, WORLI,
MUMBAI- 400030.INDIA.
technical@sdfine.com
Telephone: 91- 22- 24959898
Telephone: 91- 22- 24959899
Fax: 91- 22- 24937232

HAZARD RATINGS



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Section 2 - HAZARDS IDENTIFICATION

GHS Classification

Acute Toxicity (Oral) Category 5
Organ Damage Category 2
Respiratory Irritation Category 3

EMERGENCY OVERVIEW

HAZARD

WARNING
Determined by using GHS criteria:
H335 H303 H373
May cause respiratory irritation
May be harmful if swallowed
May cause damage to organs through prolonged or repeated exposure by inhalation.

PRECAUTIONARY STATEMENTS

Prevention

Do not breathe dust/fume/gas/mist/vapours/spray.

Response

IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.
Get medical advice/attention if you feel unwell.

Disposal

Dispose of contents and container in accordance with relevant legislation.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
calcium fluoride	7789-75-5	>85
silica amorphous	7631-86-9	<1.5
silica crystalline - quartz	14808-60-7	<1

Section 4 - FIRST AID MEASURES

SWALLOWED

For advice, contact a Poisons Information Centre or a doctor.

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· If swallowed do NOT induce vomiting.
· If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.
· Observe the patient carefully.
· Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious
· Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink.
· Seek medical advice.

EYE

If this product comes in contact with the eyes:
· Immediately hold eyelids apart and flush the eye continuously with running water.
· Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.
· Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes.
· Transport to hospital or doctor without delay.
· Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

SKIN

If skin contact occurs:
· Immediately remove all contaminated clothing, including footwear.
· Flush skin and hair with running water (and soap if available).
· Seek medical attention in event of irritation.

INHALED

· If fumes or combustion products are inhaled remove from contaminated area.
· Lay patient down. Keep warm and rested.
· Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.
· Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary.
· Transport to hospital, or doctor.

NOTES TO PHYSICIAN

For acute or short term repeated exposures to fluorides:
· Fluoride absorption from gastro-intestinal tract may be retarded by calcium salts, milk or antacids.
· Fluoride particulates or fume may be absorbed through the respiratory tract with 20-30% deposited at alveolar level.
· Peak serum levels are reached 30 mins. post-exposure; 50% appears in the urine within 24 hours.
· For acute poisoning (endotracheal intubation if inadequate tidal volume), monitor breathing and evaluate/monitor blood pressure and pulse frequently since shock may supervene with little warning. Monitor ECG immediately; watch for arrhythmias and evidence of Q-T prolongation or T-wave changes. Maintain monitor. Treat shock vigorously with isotonic saline (in 5% glucose) to restore blood volume and enhance renal excretion.
· Where evidence of hypocalcaemic or normocalcaemic tetany exists, calcium gluconate (10 ml of a 10% solution) is injected to avoid tachycardia.
BIOLOGICAL EXPOSURE INDEX - BEI
These represent the determinants observed in specimens collected from a healthy worker exposed at the Exposure Standard (ES or TLV):

continued...

Determinant	Index	Sampling Time	Comments
Fluorides in urine	3 mg/gm creatinine	Prior to shift	B, NS
	10mg/gm creatinine	End of shift	B, NS

B: Background levels occur in specimens collected from subjects NOT exposed
NS: Non-specific determinant; also observed after exposure to other exposures.

Section 5 - FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA
· Use extinguishing media suitable for surrounding area.
There is no restriction on the type of extinguisher which may be used.

FIRE FIGHTING
· Alert Fire Brigade and tell them location and nature of hazard.
· Wear breathing apparatus plus protective gloves for fire only.
· Prevent, by any means available, spillage from entering drains or water courses.
· Use fire fighting procedures suitable for surrounding area.
· DO NOT approach containers suspected to be hot.
· Cool fire exposed containers with water spray from a protected location.
· If safe to do so, remove containers from path of fire.
· Equipment should be thoroughly decontaminated after use.

FIRE/EXPLOSION HAZARD
· Non combustible.
· Not considered a significant fire risk, however containers may burn.
Decomposes on heating and produces acrid and toxic fumes of: highly discomforting hydrogen fluoride.

FIRE INCOMPATIBILITY
No known incompatibility with normal range of industrial materials.

Personal Protective Equipment
Breathing apparatus.
Chemical splash suit.

Section 6 - ACCIDENTAL RELEASE MEASURES

EMERGENCY PROCEDURES

MINOR SPILLS
Clean up all spills immediately.
Sweep up.
Avoid generating dust.
Place spilled material in clean, dry, sealable, labelled container.

MAJOR SPILLS
Alert Fire Brigade and tell them location and nature of hazard.
Clear area of personnel and move upwind.
· Wear breathing apparatus plus protective gloves.

continued...

Section 6 - ACCIDENTAL RELEASE MEASURES

· Prevent, by any means available, spillage from entering drains or water courses.
Vacuum up or sweep up.
Avoid generating dust.
Collect recoverable product into labelled containers for recycling.
After clean up operations, decontaminate and launder all protective clothing and equipment before storing and re-using.

EMERGENCY RESPONSE PLANNING GUIDELINES (ERPG)
The maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to one hour WITHOUT experiencing or developing

life-threatening health effects is:
calcium fluoride 500 mg/m³

irreversible or other serious effects or symptoms which could impair an individual's ability to take protective action is:
calcium fluoride 25 mg/m³

other than mild, transient adverse effects without perceiving a clearly defined odour is:
calcium fluoride 15 mg/m³

The threshold concentration below which most people will experience no appreciable risk of health effects:
calcium fluoride 5 mg/m³

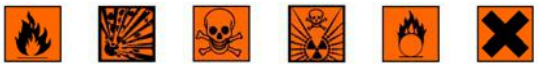
American Industrial Hygiene Association (AIHA)

Ingredients considered according to the following cutoffs

Very Toxic (T+)	>= 0.1%	Toxic (T)	>= 3.0%
R50	>= 0.25%	Corrosive (C)	>= 5.0%
R51	>= 2.5%		
else	>= 10%		

where percentage is percentage of ingredient found in the mixture

SAFE STORAGE WITH OTHER CLASSIFIED CHEMICALS



+	X	+	X	0	+

+: May be stored together
O: May be stored together with specific preventions
X: Must not be stored together

Personal Protective Equipment advice is contained in Section 8 of the MSDS.

Section 7 - HANDLING AND STORAGE

PROCEDURE FOR HANDLING
Avoid generating and breathing dust.
· Limit all unnecessary personal contact.
· Wear protective clothing when risk of exposure occurs.

continued...

· Use in a well-ventilated area.
· Avoid contact with incompatible materials.
· When handling, DO NOT eat, drink or smoke.
· Keep containers securely sealed when not in use.
· Avoid physical damage to containers.
· Always wash hands with soap and water after handling.
· Work clothes should be laundered separately.
· Use good occupational work practice.
· Observe manufacturer's storing and handling recommendations.
· Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions are maintained.

SUITABLE CONTAINER

Packaging as recommended by manufacturer.
· Check that containers are clearly labelled.
Steel drum.
Multi-ply paper bag with sealed plastic liner or heavy gauge plastic bag.
NOTE: Bags should be stacked, blocked, interlocked, and limited in height so that they are stable and secure against sliding or collapse. Check that all containers are clearly labelled and free from leaks. Packing as recommended by manufacturer.

STORAGE INCOMPATIBILITY

Segregate from strong acids.
Avoid contamination of water, foodstuffs, feed or seed.

STORAGE REQUIREMENTS

· Keep dry.
· Store under cover.
· Protect containers against physical damage.
· Observe manufacturer's storing and handling recommendations.

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE CONTROLS

The following materials had no OELs on our records

• silica amorphous: CAS:7631- 86- 9 CAS:112945- 52- 5 CAS:61673- 46- 9 CAS:60572- 11- 4 CAS:56731- 06- 7 CAS:67167- 16- 2 CAS:12737- 36- 9 CAS:62655- 73- 6 CAS:70536- 23- 1 CAS:70536- 61- 7 CAS:70563- 35- 8 CAS:37241- 25- 1 CAS:37334- 65- 9 CAS:37340- 45- 7 CAS:37380- 93- 1 CAS:39336- 66- 8 CAS:39372- 58- 2 CAS:39409- 25- 1 CAS:39443- 40- 8 CAS:39456- 81- 0 CAS:50813- 13- 3 CAS:50926- 93- 7 CAS:50935- 83- 6 CAS:11139- 73- 4 CAS:87501- 59- 5 CAS:1340- 09- 6 CAS:37220- 24- 9 CAS:12774- 28- 6 CAS:52350- 43- 3 CAS:53468- 64- 7 CAS:55599- 33- 2 CAS:56645- 27- 3 CAS:12765- 74- 1 CAS:12753- 63- 8 CAS:12125- 13- 2 CAS:51542- 58- 6 CAS:11139- 72- 3 CAS:9049- 77- 8 CAS:51542- 57- 5 CAS:78207- 17- 7 CAS:126879- 14- 9 CAS:155575- 05- 6 CAS:155552- 25- 3 CAS:152787- 33- 2 CAS:152206- 35- 4 CAS:149779- 02- 2 CAS:146585- 72- 0 CAS:145808-

continued...

77- 1 CAS:173299- 41- 7 CAS:145537- 54- 8 CAS:179046- 03- 8 CAS:138860- 82- 9 CAS:137263- 03- 7 CAS:136881- 80- 6 CAS:136303- 13- 4 CAS:127831- 27- 0 CAS:127689- 16- 1 CAS:126879- 49- 0 CAS:126879- 30- 9 CAS:145686- 91- 5 CAS:231629- 15- 5 CAS:402828- 40- 4 CAS:402828- 39- 1 CAS:402828- 37- 9 CAS:368432- 40- 0 CAS:341028- 71- 5 CAS:330152- 64- 2 CAS:264907- 28- 0 CAS:250579- 78- 3 CAS:172306- 09- 1 CAS:247900- 77- 2 CAS:139074- 73- 0 CAS:217643- 58- 8 CAS:207868- 97- 1 CAS:206770- 31- 2 CAS:203526- 86- 7 CAS:191289- 29- 9 CAS:188357- 77- 9 CAS:185461- 90- 9 CAS:184654- 53- 3 CAS:250579- 70- 5 CAS:98253- 25- 9 CAS:97343- 62- 9 CAS:97709- 14- 3 CAS:98226- 40- 5 CAS:125623- 17- 8 CAS:89493- 21- 0 CAS:83652- 92- 0 CAS:122985- 48- 2 CAS:83589- 56- 4 CAS:113384- 41- 1 CAS:108727- 71- 5 CAS:107497- 59- 6

EMERGENCY EXPOSURE LIMITS

Material	Revised IDLH Value (mg/m3)	Revised IDLH Value (ppm)
silica amorphous	3, 000	
silica crystalline - quartz	50	

MATERIAL DATA

Based on a study in which the threshold for minimum increase in bone density due to fluoride exposure was 3.38 mg/m3 (as fluoride), the present TLV-TWA has been adopted to prevent irritant effects and disabling bone changes. There is also support for the proposition that occupational exposure below the TLV will have no adverse effect on pregnant women or off-spring. IARC has classified fluorides in drinking water as Group 3 carcinogens; i.e. Not classifiable as to its carcinogenicity to humans. Equivocal evidence of carcinogenic activity (osteosarcoma) has been found in male rats administered sodium fluoride in drinking water. (0-175 ppm) Evidence was not found in female rats or in male or female mice.

INGREDIENT DATA

SILICA AMORPHOUS:

It is the goal of the ACGIH (and other Agencies) to recommend TLVs (or their equivalent) for all substances for which there is evidence of health effects at airborne concentrations encountered in the workplace.

At this time no TLV has been established, even though this material may produce adverse health effects (as evidenced in animal experiments or clinical experience). Airborne concentrations must be maintained as low as is practically possible and occupational exposure must be kept to a minimum.

NOTE: The ACGIH occupational exposure standard for Particles Not Otherwise Specified (P.N.O.S) does NOT apply.

SILICA CRYSTALLINE - QUARTZ:

Because the margin of safety of the quartz TLV is not known with certainty and given the associated link between silicosis and lung cancer it is recommended that quartz concentrations be maintained as far below the TLV as prudent practices will allow.

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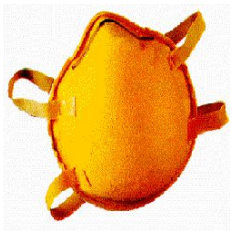
PERSONAL PROTECTION

EYE

· Safety glasses with side shields; or as required,
· Chemical goggles.
· Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lens or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience. Medical and first-aid personnel should be trained in their removal and suitable equipment should be readily available. In the event of chemical exposure, begin eye irrigation immediately and remove contact lens as soon as practicable. Lens should be removed at the first signs of eye redness or irritation - lens should be removed in a clean environment only after workers have washed hands thoroughly. [CDC NIOSH Current Intelligence Bulletin 59].

HANDS/FEET

Wear general protective gloves: i.e. Disposable polythene gloves or Cotton gloves or Light weight rubber gloves, with Barrier cream preferably Safety footwear.

OTHER

· Overalls.
· Eyewash unit.

RESPIRATOR

Protection Factor	Half- Face Respirator	Full- Face Respirator	Powered Air Respirator
10 x ES	P1 Air- line*	- -	PAPR- P1 -
50 x ES	Air- line**	P2	PAPR- P2
100 x ES	-	P3	-
		Air- line*	-
100+ x ES	-	Air- line**	PAPR- P3

* - Negative pressure demand ** - Continuous flow.

The local concentration of material, quantity and conditions of use determine the type of personal protective equipment required.
For further information consult your Occupational Health and Safety Advisor.

ENGINEERING CONTROLS

Use in a well-ventilated area.
· Local exhaust ventilation is required where solids are handled as powders or crystals; even when particulates are relatively large, a certain proportion will be powdered by mutual friction.

continued...

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

· Exhaust ventilation should be designed to prevent accumulation and recirculation of particulates in the workplace.
· If in spite of local exhaust an adverse concentration of the substance in air could occur, respiratory protection should be considered. Such protection might consist of:
(a): particle dust respirators, if necessary, combined with an absorption cartridge;
(b): filter respirators with absorption cartridge or canister of the right type;
(c): fresh-air hoods or masks
· Build-up of electrostatic charge on the dust particle, may be prevented by bonding and grounding.
· Powder handling equipment such as dust collectors, dryers and mills may require additional protection measures such as explosion venting.

Air contaminants generated in the workplace possess varying "escape" velocities which, in turn, determine the "capture velocities" of fresh circulating air required to efficiently remove the contaminant.

Type of Contaminant:	Air Speed:
direct spray, spray painting in shallow booths, drum filling, conveyer loading, crusher dusts, gas discharge (active generation into zone of rapid air motion)	1- 2.5 m/s (200- 500 f/min.)
grinding, abrasive blasting, tumbling, high speed wheel generated dusts (released at high initial velocity into zone of very high rapid air motion).	2.5- 10 m/s (500- 2000 f/min.)

Within each range the appropriate value depends on:

Lower end of the range	Upper end of the range
1: Room air currents minimal or favourable to capture	1: Disturbing room air currents
2: Contaminants of low toxicity or of nuisance value only	2: Contaminants of high toxicity
3: Intermittent, low production.	3: High production, heavy use
4: Large hood or large air mass in motion	4: Small hood- local control only

Simple theory shows that air velocity falls rapidly with distance away from the opening of a simple extraction pipe. Velocity generally decreases with the square of distance from the extraction point (in simple cases). Therefore the air speed at the extraction point should be adjusted, accordingly, after reference to distance from the contaminating source. The air velocity at the extraction fan, for example, should be a minimum of 4-10 m/s (800-2000 f/min) for extraction of crusher dusts generated 2 metres distant from the extraction point. Other mechanical considerations, producing performance deficits within the extraction apparatus, make it essential that theoretical air velocities are multiplied by factors of 10 or more when extraction systems are installed or used.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE

White to light grey to brown odourless solid (fine powder, crystals).
Almost insoluble in water, 0.0016 g/100 ml @ 18 deg. C.; soluble in

continued...

ammonium salts. Mohs hardness 4.

PHYSICAL PROPERTIES
Solid.
Does not mix with water.
Sinks in water.

Molecular Weight: 78.08 pure
Melting Range (°C): 1350- 1423
Solubility in water (g/L): Partly miscible
pH (1% solution): Not available.
Volatile Component (%vol): Not available.
Relative Vapour Density (air=1): Not applicable
Lower Explosive Limit (%): Not applicable
Autoignition Temp (°C): Not applicable
State: Divided solid

Boiling Range (°C): 2513
Specific Gravity (water=1): 3.18 @ 20 C
pH (as supplied): Not available
Vapour Pressure (kPa): Negligible
Evaporation Rate: Not applicable
Flash Point (°C): Not applicable
Upper Explosive Limit (%): Not applicable
Decomposition Temp (°C): Not available.
Viscosity: Not available

Section 10 - CHEMICAL STABILITY AND REACTIVITY INFORMATION

CONDITIONS CONTRIBUTING TO INSTABILITY
Product is considered stable and hazardous polymerisation will not occur.
Contact with acids produces toxic fumes i.e. hydrogen fluoride.

Section 11 - TOXICOLOGICAL INFORMATION

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

SWALLOWED
Accidental ingestion of the material may be damaging to the health of the individual.
Considered an unlikely route of entry in commercial/industrial environments.
Fluoride is a general protoplasmic poison which appears to produce at least four major functional derangements;
(1) enzyme inhibition, (2) hypocalcaemia, (3) cardiovascular collapse and (4) specific organ damage.

Hypocalcaemia which leads to severe reductions in plasma levels of both total calcium and ionic calcium, may appear several hours after exposure producing painful and involuntary muscular contractions (tetany) initially of the extremities (carpopedal spasm, twitching of limb muscles, laryngo-spasm, cardiospasm etc). Cardiovascular collapse is probably the principal cause of death in acute fluoride poisoning with sinus tachycardia the commonest cardiac finding and serious cardiac arrhythmias also common. Poisonings also cause major adverse effects on the brain and kidneys.

Toxic effects may include headache, excessive salivation, rapid movements of the eyeball (nystagmus) and dilated pupils. Convulsions may occur but lethargy, stupor and coma are more common. Renal pathology (acute congestion) has been described in human casualties.

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EYE
Although the material is not thought to be an irritant (as classified by EC Directives), direct contact with the eye may produce transient discomfort characterised by tearing or conjunctival redness (as with windburn).
The dust may produce eye discomfort causing transient smarting, blinking.

SKIN
Skin contact with the material may damage the health of the individual; systemic effects may result following absorption.
The material is not thought to be a skin irritant (i.e. is unlikely to produce irritant dermatitis as described in EC Directives using animal models). Temporary discomfort, however, may result from prolonged dermal exposures. Good hygiene practice requires that exposure be kept to a minimum and that suitable gloves be used in an occupational setting.
Toxic effects may result from skin absorption.
Open cuts, abraded or irritated skin should not be exposed to this material.

INHALED
Inhalation may produce health damage*.
Limited evidence exists, or practical experience predicts, that the material produces irritation of the respiratory system in a significant number of individuals following inhalation.
Not normally a hazard due to non-volatile nature of product.
Acute effects of fluoride inhalation include irritation of nose and throat, coughing and chest discomfort.

A single acute over-exposure may even cause nose bleed. Pre-existing respiratory conditions such as emphysema, bronchitis may be aggravated by exposure. Occupational asthma may result from exposure.
Acute silicosis occurs under conditions of extremely high silica dust exposure particularly when the particle size of the dust is small. It differs greatly from classical silicosis both clinically and pathologically. The disease is rapidly progressive with diffuse pulmonary involvement developing only months after the initial exposure and causing deaths within 1 to 2 years. It is often complicated by an associated tuberculosis. The lungs of victims contain no classical silicotic nodules or only a few, microscopic abortive nodules, whereas the air spaces are diffusively filled and distended with silica-containing, lipoprotein paste in which degenerating and necrotic macrophages are sometimes discernible - the condition is sometimes described as alveolar lipoproteinosis. The uptake of silica particles by macrophages and lysosymal incorporation, is followed by rupture of the lysosomal membrane and release of lysosomal enzymes into cytoplasm of the macrophage. This causes the macrophage to be digested by its own enzymes and after lysis the free silica is released to be ingested by other macrophages thus continuing initiate collagen formation in the lung tissue producing the characteristic nodule found in classical (chronic) silicosis.

CHRONIC HEALTH EFFECTS
On the basis, primarily, of animal experiments, concern has been expressed by at least one classification body that the material may produce carcinogenic or mutagenic effects; in respect of the available information, however, there presently exists inadequate data for making a satisfactory assessment.
Principal routes of exposure are usually by inhalation of generated dust and skin contact / eye contact with the material.
Prolonged or repeated skin contact may cause drying with cracking, irritation and possible dermatitis following.
Chronic symptoms produced by crystalline silicas included decreased vital lung capacity

continued...

and chest infections. Lengthy exposure may cause silicosis a disabling form of pneumoconiosis which may lead to fibrosis, a scarring of the lining of the air sacs in the lung. Symptoms may appear 8 to 18 months after initial exposure. Smoking increases this risk. Classic silicosis is a chronic disease characterised by the formation of scattered, rounded or stellate silica-containing nodules of scar tissue in the lungs ranging from microscopic to 1.0 cm or more. The nodules isolate the inhaled silica particles and protect the surrounding normal and functioning tissue from continuing injury. Simple silicosis (in which the nodules are less than 1.0 cm in diameter) is generally asymptomatic but may be slowly progressive even in the absence of continuing exposure. Simple silicosis can develop in complicated silicoses (in which nodules are greater than 1.0 cm in diameter) and can produce disabilities including an associated tuberculous infection (which 50 years ago accounted for 75% of the deaths among silicotic workers). Crystalline silica deposited in the lungs causes epithelial and macrophage injury and activation. Crystalline silica translocates to the interstitium and the regional lymph nodes and cause the recruitment of inflammatory cells in a dose dependent manner. In humans, a large fraction of crystalline silica persists in the lungs. The question of potential carcinogenicity associated with chronic inhalation of crystalline silica remains equivocal with some studies supporting the proposition and others finding no significant association. The results of recent epidemiological studies suggest that lung cancer risk is elevated only in those patients with overt silicosis. A relatively large number of epidemiological studies have been undertaken and in some, increased risk gradients have been observed in relation to dose surrogates - cumulative exposure, duration of exposure, the presence of radiographically defined silicosis, and peak intensity exposure. Chronic inhalation in rats by single or repeated intratracheal instillation produced a significant increase in the incidences of adenocarcinomas and squamous cell carcinomas of the lung. Lifetime inhalation of crystalline silica (87% alpha-quartz) at 1 mg/m3 (74% respirable) by rats, produced an increase in animals with keratinising cystic squamous cell tumours, adenomas, adenocarcinomas, adenosquamous cell carcinomas, squamous cell carcinoma and nodular bronchiolar alveolar hyperplasia accompanied by extensive subpleural and peribronchiolar fibrosis, increased pulmonary collagen content, focal lipoproteinosis and macrophage infiltration. Thoracic and abdominal malignant lymphomas developed in rats after single intrapleural and intraperitoneal injection of suspensions of several types of quartz.
Some studies show excess numbers of cases of schleroderma, connective tissue disorders, lupus, rheumatoid arthritis chronic kidney diseases, and end-stage kidney disease in workers
NOTE: Some jurisdictions require health surveillance be conducted on workers occupationally exposed to silica, crystalline. Such surveillance should emphasise
· demography, occupational and medical history and health advice
· standardised respiratory function tests such as FEV1, FVC and FEV1/FVC
· standardised respiratory function tests such as FV1, FVC and FEV1/FVC
· chest X-ray, full size PA view
· records of personal exposure.
The fluorosis hazard of inorganic fluorides does not exist with calcium fluoride because it is insoluble in body fluids. [OHMTADS]
Chronic bronchitis and silicosis has been observed in fluorspar miners.
Calcium fluoride is thought to accentuate the fibrotic actions of silica.
For personnel habitually exposed to the dust, annual measurement of urinary fluoride is recommended.
Technical grades contain 1-1.5% silica impurity.

TOXICITY AND IRRITATION

TOXICITY	IRRITATION
Oral (rat) LD50: 4250 mg/kg	Nil Reported

continued...

Section 11 - TOXICOLOGICAL INFORMATION

SILICA AMORPHOUS:

TOXICITY	IRRITATION
Oral (rat) LD50: 3160 mg/kg	Skin (rabbit): non- irritating *
Dermal (rabbit) LD50: >5000 mg/kg *	Eye (rabbit): non- irritating *
Inhalation (rat) LC50: >0.139 mg/l/14h * *	

[Grace]

The substance is classified by IARC as Group 3:
NOT classifiable as to its carcinogenicity to humans.
Evidence of carcinogenicity may be inadequate or limited in animal testing.
Reports indicate high/prolonged exposures to amorphous silicas induced lung fibrosis in experimental animals; in some experiments these effects were reversible. [PATTYS]

SILICA CRYSTALLINE - QUARTZ:

TOXICITY	IRRITATION
Inhalation (human) LCLo: 0.3 mg/m³/10Y	Nil Reported
Inhalation (human) TCLo: 16 mppcf*/8H/17.9Y	
Inhalation (rat) TCLo: 50 mg/m³/6H/71W	

WARNING: For inhalation exposure ONLY: This substance has been classified by the IARC as Group 1: CARCINOGENIC TO HUMANS.
Intermittent; focal fibrosis,
(pneumoconiosis), cough, dyspnoea
Intermittent; liver - tumours.
* Millions of particles per cubic foot (based on impinger samples counted by light field techniques).
NOTE : the physical nature of quartz in the product determines whether it is likely to present a chronic health problem. To be a hazard the material must enter the breathing zone as respirable particles.

Section 12 - ECOLOGICAL INFORMATION

No data.
Refer to data for ingredients, which follows:

SILICA AMORPHOUS:
DO NOT discharge into sewer or waterways.
Aquatic toxicity (Daphnia magna) 24h EC50: >1000 mg/l
Fish toxicity (Brachydanio rerio) 96h LC50: >10,000 mg/l [Grace]

SILICA CRYSTALLINE - QUARTZ:
DO NOT discharge into sewer or waterways.

Section 13 - DISPOSAL CONSIDERATIONS

- Recycle wherever possible or consult manufacturer for recycling options.
- Consult State Land Waste Management Authority for disposal.
- Bury residue in an authorised landfill.
- Recycle containers if possible, or dispose of in an authorised landfill.

continued...

Section 14 - TRANSPORTATION INFORMATION

HAZCHEM: None

NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS:UN, IATA, IMDG

Section 15 - REGULATORY INFORMATION

REGULATIONS

calcium fluoride (CAS: 7789-75-5) is found on the following regulatory lists;
OECD Representative List of High Production Volume (HPV) Chemicals

calcium fluoride (CAS: 14542-23-5) is found on the following regulatory lists;
OECD Representative List of High Production Volume (HPV) Chemicals

No data available for calcium fluoride as CAS: 29070-15-3.

Section 16 - OTHER INFORMATION

INGREDIENTS WITH MULTIPLE CAS NUMBERS

Ingredient Name	CAS
calcium fluoride	7789- 75- 5, 14542- 23- 5, 29070- 15- 3
silica amorphous	7631- 86- 9, 112945- 52- 5, 61673- 46- 9, 60572- 11- 4, 56731- 06- 7, 67167- 16- 2, 12737- 36- 9, 62655- 73- 6, 70536- 23- 1, 70536- 61- 7, 70563- 35- 8, 37241- 25- 1, 37334- 65- 9, 37340- 45- 7, 37380- 93- 1, 39336- 66- 8, 39372- 58- 2, 39409- 25- 1, 39443- 40- 8, 39456- 81- 0, 50813- 13- 3, 50926- 93- 7, 50935- 83- 6, 11139- 73- 4, 87501- 59- 5, 1340- 09- 6, 37220- 24- 9, 12774- 28- 6, 52350- 43- 3, 53468- 64- 7, 55599- 33- 2, 56645- 27- 3, 12765- 74- 1, 12753- 63- 8, 12125- 13- 2, 51542- 58- 6, 11139- 72- 3, 9049- 77- 8, 51542- 57- 5, 78207- 17- 7, 126879- 14- 9, 155575- 05- 6, 155552- 25- 3, 152787- 33 - 2, 152206- 35- 4, 149779- 02- 2, 146585- 72- 0, 145808- 77- 1, 173299- 41- 7, 145537- 54- 8, 179046- 03- 8, 138860- 82- 9, 137263- 03- 7, 136881- 80- 6, 136303- 13- 4, 127831- 27- 0, 127689- 16- 1, 126879- 49- 0, 126879- 30- 9, 145686- 91- 5, 231629- 15- 5, 402828- 40- 4, 402828- 39- 1, 402828- 37- 9, 368432- 40- 0, 341028- 71- 5,

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330152- 64- 2, 264907- 28- 0, 250579- 78- 3, 172306- 09- 1, 247900- 77- 2, 139074- 73- 0, 217643- 58- 8, 207868- 97- 1, 206770- 31- 2, 203526- 86- 7, 191289- 29- 9, 188357- 77- 9, 185461- 90- 9, 184654- 53- 3, 250579- 70- 5, 98253- 25- 9, 97343- 62- 9, 97709- 14- 3, 98226- 40- 5, 125623- 17- 8, 89493- 21 - 0, 83652- 92- 0, 122985- 48- 2, 83589- 56- 4, 113384- 41- 1, 108727- 71- 5, 107497- 59- 6

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