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Trade name: Vacuct® CERAMIC FIBER

SECTION 1: Identification

Product identifier: Vacuct® CERAMIC FIBER.
Chemical Name: Vitreous Aluminosilicate Fiber.
Trade Names: Vacuct® 2300°F, 2600°F, 3000°F ceramic fiber products, Including: Board shapes, steel-less sleeves, burner blocks, peepsight windows, customer-specified applications.
Synonym(s): RCF, ceramic fiber, synthetic vitreous fiber (SVF), man-made vitreous fiber (MMVF), man-made mineral fiber (MMMf).
SDS number: DMS003
Recommended use: Refractory Ceramic Fiber Product. Primarily used as thermal insulating material.
Recommended restrictions: No data available

Manufacturer/Importer/Supplier/Distributor information:
Company Name: Danser, Inc.
Company Address: P. O. Box 4098
Parkersburg, WV 26104
Company Telephone: (304) 679 3666
Company Website: www.danserinc.com
Contact Person: Matt Richards.
E-mail: mrichards@danserinc.com
Emergency phone number: (304) 679 3667 Ext 1016.

SECTION 2: Hazard(s) identification

Classification of the chemical in accordance with paragraph (d) of §1910.1200:

Physical hazards

No physical hazards for this product.

Health hazards

Carcinogenicity Category 1B.
Specific target organ toxicity - repeated exposure Category 1.

Environmental hazards

No environmental hazards for this product.

Signal word: **WARNING.**

Hazard statement(s): Suspected of causing cancer by inhalation.

Hazard symbol(s):



Precautionary statement(s):

Prevention:

Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Do not breathe dusts or mists.
Wash hands thoroughly after handling.
Do not eat, drink or smoke when using this product.
Use personal protective equipment as required.

Response:

IF exposed: Call a POISON CENTER or doctor/physician.
Specific treatment (see instructions on this label).

Storage:

Store locked up.

Disposal:

Dispose of contents/containers in accordance with local/regional/national/international regulations.

**Hazard(s) not otherwise
Classified (HNOC):**

None known.

Percentage of ingredient(s) of unknown acute toxicity:

100% of the mixture consists of ingredients of unknown acute toxicity (oral/dermal/inhalation).

SECTION 3: Composition/information on ingredients

Mixture:

Chemical Name	Concentration (% by weight)	CAS #
Refractories, Fibers, Aluminosilicate	82.9	142844-00-6
Binder :	< 9.32	
Silica, amorphous		7631-86-9
Sodium hydroxide		1310-73-2
Water		7732-18-5
Starch	7.78	56780-58-6

SECTION 4: First-aid Measures

Inhalation: If respiratory tract irritation develops, move the person to a dust free location. See Section 8 for additional measures to reduce or eliminate exposure. If symptoms persist, seek medical attention.

Skin contact: If skin becomes irritated, remove soiled clothing and launder before reuse. Do not rub or scratch exposed skin. Wash area of contact thoroughly with soap and water. Using a skin cream or lotion after washing may be helpful. If symptoms persist, seek medical attention. May aggravate existing skin disease.

Eye contact: If eyes become irritated, flush immediately with copious amounts of lukewarm water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. Do not rub eyes. Get medical attention if irritation persists.

Ingestion: If gastrointestinal tract irritation develops, move the person to a dust free environment. Immediately rinse mouth with water. DO NOT induce vomiting. Consult a physician if necessary.

Most important symptoms/effects, acute and delayed: Mild mechanical irritation to skin, eyes and upper respiratory system may result from exposure. These effects are usually temporary.

Indication of immediate medical attention and special treatment needed: Skin and respiratory effects are the result of temporary, mild mechanical irritation; fiber exposure should not result in allergic manifestations. If any symptoms are observed, contact a physician and give them this SDS sheet.

SECTION 5: Fire-fighting measures

Suitable extinguishing media: Non-flammable. Use extinguishing media suitable for type of surrounding fire.

Unsuitable extinguishing media: None known.

Specific hazards arising from the chemical: None known.

Hazardous combustion products may include: None known.

Special protective equipment and precautions for fire-fighters:

NFPA Codes: Flammability: 0 Health: 1 Reactivity: 0 Special: 0

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures:

Use personal protective equipment. Avoid creating airborne dust. Dust suppressing cleaning methods such as wet sweeping or vacuuming should be used to clean the work area. If vacuuming, the vacuum must be equipped with a HEPA filter. Compressed air or dry sweeping should not be used for cleaning. Ensure adequate ventilation.

Methods and materials for containment and cleaning up:

SMALL SPILL: Wear appropriate protective clothing (see Section 8). Dust suppressing cleaning methods such as wet sweeping or vacuuming should be used to clean the work area. If vacuuming, the vacuum must be equipped with a HEPA filter. Compressed air or dry sweeping should not be used for cleaning. Place in approved container for disposal.

LARGE SPILL: Wear appropriate protective clothing (see Section 8). Restrict access to contaminated area. Stop spill at source. Dike to prevent spreading. Dust suppressing cleaning methods such as wet sweeping or vacuuming should be used to clean the work area. If vacuuming, the vacuum must be equipped with a HEPA filter. Compressed air or dry sweeping should not be used for cleaning. Place in approved container for disposal. Follow all local, state, and federal regulations for disposal. Do not contaminate water while cleaning equipment or disposing of wastes.

SECTION 7: Handling and Storage

Precautions for safe handling: Handle ceramic fiber carefully. Limit the use of power tools unless in conjunction with local exhaust. Use hand tools whenever possible. Frequently clean the work area with HEPA filtered vacuum or wet sweeping to minimize the accumulation of debris. Do not use compressed air for clean-up.

Observe good personal hygiene practices. Change protective gloves/clothing when signs of contamination appear. Keep out of reach of children.

Conditions for safe storage, including any incompatibles: Store in original factory container in a dry area. Do not transfer to an unmarked container. Keep container closed when not in use. Product packaging may contain residue. Do not reuse.

SECTION 8: Exposure controls/personal protection

Control Parameters:

Occupational exposure limits:

US OSHA HAZARDOUS COMPONENTS (29 CFR 1910.1200): Permissible Exposure Limits		
Substance	PEL-TWA (8 hour)	PEL-STEL (15 min)
Refractories, Fibers, Aluminosilicate	No data available*	No data available **
Silica, amorphous	80 mg/m ³ /%SiO ₂ (Table Z-3 Mineral Dusts)	No data available
Sodium hydroxide	2 mg/m ³	No data available
Starch	15 mg/m ³ (Total dust)	No data available

ACGIH Threshold Limit Values		
Substance	TLV-TWA (8 hour)	TLV-STEL (15 min)
Refractories, Fibers, Aluminosilicate	0.2 fibre/cm ³	No data available
Silica, amorphous	10 mg/m ³ (amorphous precipitated silica)	No data available
Sodium hydroxide	2 mg/m ³ (Ceiling)	No data available
Starch	10 mg/m ³	No data available

***Except for the state of California, where the PEL for RCF is 0.2 f/cc 8-hr TWA, there is no specific regulatory standard for RCF in the U.S. OSHA’s “Particulate Not Otherwise Regulated (PNOR)” standard [29 CFR 1910.1000, Subpart Z, Air Contaminants] applies generally - Total Dust Total Dust 15 mg/m³; Respirable Fraction 5 mg/m³.**

****In the absence of an OSHA PEL, HTIW Coalition has adopted a recommended exposure guideline (REG), as measured under NIOSH Method 7400 B. For further information on the history and development of the REG see “Rationale for the Recommended Exposure Guideline” at page 34 of the HTIW Coalition Product Stewardship Program http://www.htiwcoalition.org/documents/PSP_2012.pdf**

Other Exposure Limits: Refractory ceramic fibres: 5 mg/m³
 US NIOSH Recommended Exposure Limits (RELs)

Refractory ceramic fibers: MRL (fibers/cc) – 0.03
 US ATSDR Minimal Risk Levels for Hazardous Substances (MRLs)

Sodium Hydroxide: Ceiling 2mg/m³
US NIOSH Recommended Exposure Limits (RELs)

RCF-related occupational exposure limits vary internationally. Regulatory OEL examples include: Australia – 0.5 f/cc; Austria – 0.5 f/cc; Canada – 0.5 to 1.0 f/cc; Denmark – 1.0 f/cc; France – 0.6 f/cc; Germany – 0.5 f/cc; Netherlands – 1.0 f/cc; New Zealand – 1.0 f/cc; Norway – 2.0 f/cc; Poland – 2.0 f/cc; Sweden – 1.0 f/cc; United Kingdom – 2.0 f/cc.

Non-regulatory OEL examples include: RCFC REG 0.5 f/cc. The objectives and criteria underlying each of these OEL decisions also vary. The evaluation of occupational exposure limits and determining their relative applicability to the workplace is best performed, on a case-by-case basis, by a qualified Industrial Hygienist.

Appropriate engineering controls: Use engineering controls such as local exhaust ventilation, point of generation dust collection, down draft work stations, emission controlling tool designs, and materials handling equipment designed to minimize airborne fiber emissions.

Individual protection measures, such as personal protective equipment:

Eye/face protection: Wear goggles or safety glasses with side shields, as necessary. Do not wear contact lenses. Never touch eyes with soiled body parts or materials. If possible, have eye-washing facilities readily available where eye irritation can occur.

Skin and Hand protection: Wear gloves, head coverings and full body clothing as necessary to prevent skin irritation. Washable or disposable clothing may be used. If possible, do not take unwashed clothing home. If used work clothing must be taken home, employers should ensure employees are thoroughly trained on the best practices to minimize or avoid non-work dust exposure (e.g., vacuum clothes before leaving the work area, wash work clothing separately, rinse washer before washing other household clothes, etc.).

Respiratory protection: When engineering and/or administrative controls are insufficient to maintain workplace concentrations within the 0.5 f/cc REG, the use of appropriate respiratory protection, pursuant to the requirements of OSHA Standards 29 CFR 1910.134 and 29 CFR 1926.103, is recommended. The following information is provided as an example of appropriate respiratory protection for aluminosilicate fibers. The evaluation of workplace hazards and the identification of appropriate respiratory protection are best performed, on a case-by-case basis, by a qualified Industrial Hygienist.

MANUFACTURER'S RESPIRATORY PROTECTION RECOMMENDATIONS WHEN HANDLING RCF PRODUCTS

Not yet determined but expected to be below 5.0 f/cc based on operation: Half-face, air-purifying respirator equipped with a NIOSH certified P100 particulate filter cartridge

Respirable Airborne Fiber Conc (levels are 8-hr. time-weighted averages)	Respirator Recommendation:
"Reliably" less than 0.5 f/cc:	Optional
0.5 f/cc to 5.0 f/cc:	Half-face, air-purifying respirator equipped with a NIOSH certified P100 particulate filter cartridge.
5.0 f/cc to 25 f/cc:	Full-facepiece, air purifying respirator equipped with a NIOSH certified P100 particulate filter cartridge or PAPR.
Greater than 25 f/cc:	PAPR with tight-fitting full facepiece or a supplied air respirator in continuous flow mode.

When individual workers request respiratory protection as a matter of personal comfort or choice where exposures are "reliably" below 0.5 f/cc A NIOSH certified respirator, such as a disposable particulate respirator, or respirators with filter cartridges rated N95 or better

The P100 recommendation is a conservative default choice; in some case, solid arguments can be made that other respirator types (e.g., N95, R99, etc.) may be suitable for some tasks or work environments. The P100 recommendation is not designed to limit informed choices, provided that respiratory protection decisions comply with 29 CFR 1910.134.

Other Information:

- Concentrations based upon an eight-hour time weighted average (TWA) as determined by air samples collected and analyzed pursuant to NIOSH method 7400 (B) for airborne fibers.
- The manufacturer recommends the use of a full-facepiece air purifying respirator equipped with an appropriate particulate filter cartridge during furnace tear-out events and the removal of used RCF to control exposures to airborne fiber and the potential presence of crystalline silica. If exposure levels are known, the respiratory protection chart provided above may be applied.
- Potential exposure to other airborne contaminants should be evaluated by a qualified Industrial Hygienist for the selection of appropriate respiratory protection and air monitoring.

Other: Use as necessary to prevent exposure. Work clothing should be changed daily. Contaminated clothing should be removed and washed thoroughly before re-using.

Thermal hazards: None known.

SECTION 9: Physical and chemical properties

Appearance:

Physical state:	Solid.
Form:	Fibrous material.
Color:	White.
Odor:	Odorless.
Odor threshold:	No data available.
pH:	Not applicable.
Initial Boiling point/Boiling Range:	Not applicable.
Melting Point:	1760° C (3200° F)
Flash point:	None.
Evaporation rate:	Not available.
Flammability (solid, gas):	None.
Upper/lower flammability or explosive limits	
Flammability limit – lower:	Not Determined.
Flammability limit – upper:	Not Determined.
Explosive limit – lower:	Not Determined.
Explosive limit – upper:	Not Determined.
Vapor pressure (MMhG):	Not applicable.
Vapor density (Air=1):	Not applicable.
Relative density (Specific gravity):	2.50 – 2.75
Solubilities (water, other):	Not Soluble in Water. Soluble in hydrofluoric acid, phosphoric acid, and concentrated alkali.
Partition coefficient (n-octanol/water):	Not available.
Auto-ignition temperature:	Not known.
Decomposition temperature:	Not available.
Viscosity:	Not known.
Other information:	
% Volatile:	Not applicable.

SECTION 10: Stability and Reactivity

Reactivity: Stable.
Chemical stability: This material is stable under normal handling and storage conditions.
Possibility of hazardous reactions: Material is not known to polymerize.
Conditions to avoid: None known.
Incompatible materials: Soluble in hydrofluoric acid, phosphoric acid, and concentrated alkali.
Hazardous decomposition products: None known.

SECTION 11: Toxicological information

Information on likely routes of exposure:

Inhalation: If inhaled in sufficient quantity, may cause temporary, mild mechanical irritation to respiratory tract. Symptoms may include scratchiness of the nose or throat, cough or chest discomfort.

Ingestion: Unlikely exposure route.

Skin: May cause temporary, mild mechanical irritation. Exposure may also result in inflammation, rash or itching.

Eye: May cause temporary, mild mechanical irritation. Fibers may be abrasive; prolonged contact may cause damage to the outer surface of the eye. Do not wear contact lenses while handling.

Symptoms related to the physical, chemical, and toxicological characteristics:

Pre-existing medical conditions, including dermatitis, asthma or chronic lung disease may be aggravated by exposure; individuals who have a history of allergies may experience greater amounts of skin and respiratory irritation.

Delayed and immediate effects and chronic effects from short or long-term exposure:

There has been no increased incidence of respiratory disease in studies examining occupationally exposed workers. In animal studies, long-term laboratory exposure to doses hundreds of times higher than normal occupational exposures has produced fibrosis, lung cancer, and mesothelioma in rats or hamsters. The fibers used in those studies were specially sized to maximize rodent respirability.

Acute toxicity:

Ingredient Information:

Substance	Test Type (species)	Value
Refractories, Fibers, Aluminosilicate	LD ₅₀ Oral (Rat)	None known
	LD ₅₀ Dermal (Rat)	None known
	LC ₅₀ Inhalation, Dust	None known
Silica, amorphous	LD ₅₀ Oral (Rat)	3160 mg/kg
	LD ₅₀ Dermal (Rabbit)	> 5000 mg/kg
	LC ₅₀ Inhalation (Rat)	> 200 g/m ³ (1h)
Sodium hydroxide	LD ₅₀ Oral (Rat)	None known
	LD ₅₀ Dermal (Rat)	None known
	LC ₅₀ Inhalation, Dust	None known
Starch (corn starch)	LD ₅₀ Oral (Rat)	None known
	LD ₅₀ Dermal - Intraperitoneal (Mouse)	6600 mg/kg
	LC ₅₀ Inhalation (Rat)	None known

Product Acute Toxicity Estimates:

No data available.

Skin corrosion/irritation:	Based upon information available on the known components, the product may cause temporary, mild mechanical irritation, inflammation, rash or itching.
Serious eye damage/eye irritation:	Based upon information available on the known components, the product is may cause temporary, mild mechanical irritation and may cause damage to the outer surface of the eye.
Respiratory sensitization:	Based upon information available on the known components, the product may cause respiratory sensitization in certain sensitive individuals.
Skin sensitization:	Based upon information available on the known components, the product may cause skin sensitization in certain sensitive individuals.
Germ cell mutagenicity:	Based upon information available on the known components, the product is not anticipated to be a mutagen.
Carcinogenicity:	<p>In October 2001, the International Agency for Research on Cancer (IARC) confirmed that Group 2b (possible human carcinogen) remains the appropriate IARC classification for RCF.</p> <p>The Seventh Annual Report on Carcinogens (1994), prepared by the National Toxicology Program (NTP), classified respirable RCF and glass wool as substances reasonably anticipated to be carcinogens. The American Conference of Governmental Industrial Hygienists (ACGIH) has classified RCF as "A2-Suspected Human Carcinogen."</p> <p>The Commission of The European Communities (DG XI) has classified RCF as a substance that should be regarded as if it is carcinogenic to humans.</p> <p>The Canadian Environmental Protection Agency (CEPA) has classified RCF as "probably carcinogenic" (Group 2).</p>
Reproductive toxicity:	Based upon information available on the known components, the product is not anticipated to cause reproductive toxicity.
Specific target organ toxicity- Single exposure:	Based upon information available on the known components, the product may cause specific target organ toxicity after single exposure.

Specific target organ toxicity-

Repeat exposure:

Based upon information available on the known components, the product is not anticipated to cause specific target organ toxicity after repeated or prolonged exposure.

Aspiration hazard:

Based upon information available on the known components, the product is not anticipated to be an aspiration hazard.

Further information:

Epidemiological studies of RCF production workers have indicated no increased incidence of respiratory disease, nor other significant health effects. In animal studies, long-term, high-dose inhalation exposure resulted in the development of respiratory disease in rats and hamsters.

The University of Cincinnati is conducting an ongoing epidemiologic investigation. The evidence obtained from employees in U. S. RCF manufacturing facilities is as follows:

- 1) There is no evidence of any fibrotic lung disease (interstitial fibrosis) from evaluations of chest X-rays.
- 2) There is no evidence of an elevated incidence of lung disease among RCF manufacturing employees.
- 3) In early studies, an apparent statistical "trend" was observed, in the exposed population, between RCF exposure duration and some measures of lung function. The observations were clinically insignificant. If these observations were made on an individual employee, the results would be interpreted as being within the normal (predicted) respiratory range. A more recent longitudinal study of employees with 5 or more pulmonary function tests found that there was no effect on lung function associated with RCF production experience. Initial data (circa 1987) seemed to indicate an interactive effect between smoking and RCF exposure; more recent data, however, found no interactive effect. Nevertheless, to promote good health, RCF employees are still actively encouraged not to smoke.

4) Pleural plaques (thickening along the chest wall) have been observed in a small number of RCF employees. Some studies appear to show a relationship between the occurrence of pleural plaques on chest radiographs and the following variables: (a) years since RCF production hire date; (b) duration of RCF production employment; and (c) cumulative RCF exposure. The best evidence to date indicates that pleural plaques are a marker of exposure only. Pleural plaques are not associated with pulmonary impairment. The pathogenesis of pleural plaques remains incompletely understood; however, the mechanism appears to be an inflammatory response caused by inhaled fibers.

TOXICOLOGY

A number of toxicological studies designed to identify any potential health effects from RCF exposure have been completed. In one study, conducted by the Research and Consulting Company, (Geneva, Switzerland), rats and hamsters were exposed to 30 mg/m³ (about 200 fibers/cc) of specially-prepared RCF for 6 hours/day, 5 days/week, for up to 24 months. In rats, a statistically significant increase in lung tumors was observed; two mesotheliomas (cancer of

the pleural lining between the chest wall and lung) were also identified. Hamsters did not develop lung tumors; however, interstitial fibrosis and mesothelioma was found. Some, in the scientific community, have concluded that the "maximum tolerated dose" was exceeded and that significant particle contamination was a confounding issue; therefore, these study findings may not represent an accurate assessment of the potential for RCF to produce adverse health effects.

In a related multi-dose study with a similar protocol, other rats were exposed to doses of 16 mg/m³, 9 mg/m³, 3 mg/m³ that corresponds to about 115, 75, and 25 fibers per cubic centimeter respectively. This study found no statistically significant increase in lung cancer. Some cases of pleural and parenchymal fibrosis were seen in the 16 mg/m³ dose group. Some cases of mild fibrosis and one mesothelioma were observed in the 9 mg/m³ group. No acute respiratory effects were seen in the rats in the 3 mg/m³ exposure group, which suggests that there may be a dose/response threshold, below which irreversible respiratory impacts do not occur.

Other toxicological studies have been conducted which utilized non-physiological exposure methods such as intrapleural, intraperitoneal and intratracheal implantation or injection. Some of these studies have found that RCF is a potential carcinogen. Some experts, however, suggest that these tests have limited relevance because they bypass many of the biological mechanisms that prevent fiber deposition or facilitate fiber clearance.

Silica, Amorphous: Toxic effects found in animals following a single inhalation exposure to amorphous silica include upper respiratory irritation, lung congestion, bronchitis and emphysema. Repeated inhalation exposures at concentrations of 50 to 150 mg/m³ produced increased lung weights and lung changes. No progressive pulmonary fibrosis was seen and the observed lung changes were reversible. No adverse effects were observed in this study at 10 mg/m³. No animal test reports have been found which define carcinogenic, mutagenic or reproductive effects.

SECTION 12: Ecological information

Ecotoxicity:

Product data:

No data available

Ingredient Information:

Substance	Test Type	Species	Value
Refractories, Fibers, Aluminosilicate	LC ₅₀	Fish	None available
	EC ₅₀	Invertebrate	None available
	LC ₅₀	Algae	None available
Silica, amorphous	LC ₅₀	Fish	None available
	EC ₅₀	Invertebrate	None available
	LC ₅₀	Algae	None available

Sodium Hydroxide	LC ₅₀	Gambusia affinis (Mosquito fish) Oncorhynchus mykiss (rainbow trout)	125 mg/l (96h) 45.4 mg/l (96h)
	EC ₅₀	EC50 - Daphnia (water flea)	40.38 mg/l (48h)
	LC ₅₀	Algae	None available
Starch	LC ₅₀	Fish	None available
	EC ₅₀	Invertebrate	None available
	LC ₅₀	Algae	None available

Persistence and degradability: No data available.
Bioaccumulative potential: No data available.
Mobility in soil: No data available.
Mobility in general: No data available.
Other adverse effects: No data available.

SECTION 13: Disposal considerations

Disposal instructions:

To prevent waste materials becoming airborne, a covered container or plastic bagging is recommended.

RCF, as manufactured, is not classified as a hazardous waste according to Federal regulations (40 CFR 261). Any processing, use, alteration or chemical additions to the product, as purchased, may alter the disposal requirements. Under Federal regulations, it is the waste generator's responsibility to properly characterize a waste material, to determine if it is a "hazardous" waste. Check local, regional, state or provincial regulations to identify all applicable disposal requirements.

SECTION 14: Transport Information

DOT: Not regulated United Nations (UN) Number: Not applicable.
IATA: Not regulated United Nations (UN) Number: Not applicable.
IMDG: Not regulated United Nations (UN) Number: Not applicable.

INTERNATIONAL

Not classified as dangerous goods under ADR (road), RID (train), or IMDG (ship).
 Canadian TDG Hazard Class & PIN: Not regulated.

Special precautions during transport: Not available.

Labels: Not applicable

North America (NA) Number: Not applicable.

Placards: Not applicable.

Bill of Lading: Product name.

SECTION 15: Regulatory Information

USA:

United States Federal Regulations: This SDS complies with the OSHA, 29 CFR 1910.1200. The product is hazardous under OSHA.

Toxic Substances Control Act (TSCA) – All substances in this product are listed, as required, on the TSCA inventory. RCF has been assigned a CAS number; however, it is a simple mixture and therefore not required to be listed on the TSCA inventory. The components of RCF are listed on the inventory.

SARA Superfund and Reauthorization Act of 1986 Title III sections 302, 311,312 and 313:

Section 302 – No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

CERCLA/Superfund, 40 CFR 117, 302: This product does not contain chemicals listed on CERCLA/Superfund. RCF contains fibers with an average diameter greater than one micron and thus is not considered a hazardous air pollutant.

CHEMICAL	C.A.S. Number	Weight %	Section 311/312
Refractories, Fibers, Aluminosilicate	142844-00-6	82.9	Chronic Health Hazard
Silica, Amorphous	7631-86-9	< 9.32	Acute Health Hazard, Chronic Health Hazard.
Sodium Hydroxide	1310-73-2	< 9.32	Not applicable
Starch	56780-58-6	7.78	Acute Health Hazard, Chronic Health Hazard

STATE REGULATIONS:

This SDS contains specific health and safety data is applicable for state requirements. For details on your regulatory requirements you should contact the appropriate agency in your state.

California Proposition 65: Ceramic fibers (airborne particles of respirable size) are listed in Proposition 65 as a chemical known to the State of California to cause cancer.

California Occupational Safety and Health Regulations (CAL/OSHA) - Hazardous Substances List: RCF fibers and Silica are listed on the CAL/OSHA HSL.

Massachusetts Right to Know: Silica, Amorphous, Starch (as dust) and Sodium hydroxide are listed on the Massachusetts Right to Know list.

Minnesota Hazardous Substance List: Sodium hydroxide, Silica and Starch are listed on the Minnesota HSL.

New Jersey Right to Know: Refractory ceramic fibers, Silica Amorphous and Sodium hydroxide are listed on the New Jersey Right to Know list.

Pennsylvania Right to Know: Silica and Sodium hydroxide are listed on the Pennsylvania Right to Know list.

INTERNATIONAL REGULATIONS:

Canadian Controlled Products Regulations (WHMIS): RCF is classified as Class D2A – Materials Causing Other Toxic Effects in accordance with the hazard criteria of the Controlled Products Regulations and the SDS contains all the information required by the Controlled Products Regulations.

Canada Domestic Substances List (DSL): All substances in this product are listed, as required, on the Domestic Substance List (DSL).

European Union: European Directive 97/69/EC classified RCF as a Category 2 carcinogen; that is it "should be regarded as if it is carcinogenic to man."

SECTION 16: Other Information

RCF DEVITRIFICATION

As produced, all RCF fibers are vitreous (glassy) materials, which do not contain crystalline silica. Continued exposure to elevated temperatures may cause these fibers to devitrify (become crystalline). The first crystalline formation (mullite) begins to occur at approximately 985° C (1805° F). Crystalline silica (cristobalite) formation may begin at temperatures of approximately 1200° C (2192° F). The occurrence and extent of crystalline phase formation is dependent on the duration and temperature of exposure, fiber chemistry and/or the presence of fluxing agents. The presence of crystalline phases can be confirmed only through laboratory analysis of the "hot face" fiber.

IARC's evaluation of crystalline silica states, "Crystalline silica inhaled in the form of quartz or cristobalite from occupational sources is carcinogenic to humans (Group 1)" and additionally notes, "carcinogenicity in humans was not detected in all industrial circumstances studied" (IARC Monograph Vol. 68, 1997). NTP lists all polymorphs of crystalline silica amongst substances, which may "reasonably be anticipated to be carcinogens".

IARC and NTP did not evaluate after-service RCF, which may contain various crystalline phases. However, an analysis of after-service RCF samples obtained pursuant to an exposure monitoring agreement with the USEPA, found that in the furnace conditions sampled, most did not contain detectable levels of crystalline silica. Other relevant RCF studies found that (1) simulated after-service RCF showed little, or no, activity where exposure was by inhalation or by intraperitoneal injection; and (2) after-service RCF was not cytotoxic to macrophage-like

cells at concentrations up to 320 g/cm² - by comparison, pure quartz or cristobalite were significantly active at much lower levels (circa 20 g/cm²).

RCF AFTER-SERVICE REMOVAL

Respiratory protection should be provided in compliance with OSHA standards. During removal operations, a full face respirator is recommended to reduce inhalation exposure along with eye and respiratory tract irritation. A specific evaluation of workplace hazards and the identification of appropriate respiratory protection are best performed, on a case-by-case basis, by a qualified industrial hygiene professional.

DEFINITIONS

ACGIH: American Conference of Governmental Industrial Hygienists
ADR: Carriage of Dangerous Goods by Road (International Regulation)
CAA: Clean Air Act
CAS: Chemical Abstracts Service
CERCLA: Comprehensive Environmental Response, Compensation and Liability Act
DSL: Domestic Substances List
EPA: Environmental Protection Agency
EU: European Union
f/cc: Fibers per cubic centimeter
HEPA: High Efficiency Particulate Air
HMIS: Hazardous Materials Identification System
IARC: International Agency for Research on Cancer
IATA: International Air Transport Association
IMDG: International Maritime Dangerous Goods Code
mg/m³: Milligrams per cubic meter of air
mppcf: Million particles per cubic meter
NFPA: National Fire Protection Association
NIOSH: National Institute for Occupational Safety and Health
OSHA: Occupational Safety and Health Administration
29 CFR 1910.134 & 1926.103: OSHA Respiratory Protection Standards
29 CFR 1910.1200 & 1926.59: OSHA Hazard Communication Standards
PEL: Permissible Exposure Limit (OSHA)
PIN: Product Identification Number
PNOC: Particulates Not Otherwise Classified
PNOR: Particulates Not Otherwise Regulated
PSP: Product Stewardship Program
RCFC: Refractory Ceramic Fibers Coalition
RCRA: Resource Conservation and Recovery Act
REG: Recommended Exposure Guideline (RCFC)
REL: Recommended Exposure Limit (NIOSH)
RID: Carriage of Dangerous Goods by Rail (International Regulations)
SARA: Superfund Amendments and Reauthorization Act
SARA Title III: Emergency Planning and Community Right to Know Act
SARA Section 302: Extremely Hazardous Substances
SARA Section 304: Emergency Release

SARA Section 311: SDS/List of Chemicals and Hazardous Inventory
SARA Section 312: Emergency and Hazardous Inventory
SARA Section 313: Toxic Chemicals and Release Reporting
STEL: Short Term Exposure Limit`
SVF: Synthetic Vitreous Fiber
TDG: Transportation of Dangerous Goods
TLV: Threshold Limit Value (ACGIH)
TSCA: Toxic Substances Control Act
TWA: Time Weighted Average
WHMIS: Workplace Hazardous Materials Information System (Canada)

DISCLAIMER

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