

SDS FC 2300 LD

Effective Date March 26th, 2020

1. IDENTIFICATION

- A. Product Identifier used on label:** FC 2300 LD as a blanket, bulk, modules, paper, braids, rope or felts.
- B. Other means of identification:** High Temperature Ceramic Fibre Vacuum Formed Insulation Product; High Temperature Insulating Ceramic Vacuum-Formed Boards or Shapes; High Temperature Insulating Product as a blend of Ceramic Fibre and binders; Refractory Ceramic Fibre (RCF), Ceramic Wool, Man-Made Vitreous Fibre (MMVF).
- C. Recommended use of the product: Primary Use:** Refractory Ceramic Fiber (RCF) materials are used primarily in industrial high temperature insulating applications. Examples include back-up insulating for molten steel ladles, torpedo cars, tundish, heat shields, heat containment, expansion joints, industrial furnaces, ovens, kilns, boilers and other process equipment at applications up to 1400 deg C*/ 2550 deg F*. Ceramic fiber-based products are not intended for direct sale to the general public. While RCF is used in the manufacture of some consumer products, such as catalytic converters, mats and wood burning stoves, the materials are contained, encapsulated, or bonded within the units. ***refer to the technical data sheet for specific operating temperature limits and shrinkage data.**
- D. Tertiary Use: Installation, removal (industrial and professional) / Maintenance and service life (industrial & professional). Uses Advised Against:** Dismantling product for use in other applications.
- E. Manufacturer Name:** FibreCast Incorporated, 3264 Mainway, Burlington, Ontario, Canada, L7M 1A7 Phone 905-319-1080; Fax 905-319-7611; email: sales@fibrecast.com
- F. Emergency Phone #:** CHEMTREC will provide assistance for chemical emergencies at 1-800-424-9300

2. HAZARDS IDENTIFICATION

- A. Classification of the chemical is based in Canada on the 5th revised edition of the Globally Harmonized System of Classification and Labelling of Chemicals from the United Nations Economic Commission for Europe and in the USA, it is based on the US Occupational Safety and Health Administration Hazard Communication Standards of 2012.** These standards indicate that that the product is considered as IARC Group 2B. Canada has the same grouping.
- B. Signal word, hazard statement(s), symbol(s) and precautionary statement(s):** RCF is classified as a category 2 carcinogen.

**Hazard Pictogram:****Signal Word:** Warning**Hazard Statements:** Suspected of causing cancer by inhalation.**Precautionary statements:** Do not handle until all safety instructions have been read and understood. Use respiratory protection as required. If concerned about exposure, get medical advice. Store in a manner to minimize airborne dust. Dispose of waste in accordance with local, provincial or state and federal regulations.**Supplementary Information:** May cause temporary mechanical irritation to exposed eyes, skin or respiratory tract. Minimize exposure to airborne dust.

- C. Describe any hazards not otherwise classified that have been identified during the classification process:** Mild mechanical irritation to skin, eyes and upper respiratory system may result from exposure. These effects are usually temporary.
- D. Mixture Rule:** Not applicable.



3. COMPOSITION / INFORMATION ON INGREDIENTS

COMPONENTS	CAS NUMBER	% BY WEIGHT
Refractories, Fibres Aluminosilicate	142844-00-6	65 to 85
Colloidal Silica	7631-86-9	10 to 30
Cationic Starch Ether	56780-58-6	3 to 7

*Synonyms: RCF; ceramic fibre; alumino silicate wool [ASW]; synthetic vitreous fibre [SVF]; man-made vitreous fibre [MMVF]; man-made mineral fibre [MMMMF]; high temperature insulation wool [HTIW]

(d) Impurities and stabilizing additives: Not applicable

4. FIRST AID MEASURES

A. Description of necessary measures subdivided according to the different routes of exposure, i.e., inhalation, skin and eye contact, and ingestion.

SKIN: Handling of this material may generate mild mechanical temporary skin irritation. If this occurs, rinse affected areas with water and wash gently. Do not rub or scratch exposed skin.

EYES: In case of eye contact flush abundantly with water; have eye bath available. Do not rub eyes.

NOSE AND THROAT: If these become irritated move to a dust free area, drink water and blow nose. If symptoms persist, seek medical advice.

B. 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.

C. Indication of immediate medical attention and special treatment needed, if necessary: Skin and respiratory effects are the result of temporary, mild mechanical irritation; fiber exposure does not result in allergic manifestations.

5. FIRE FIGHTING MEASURES

A. Suitable (and unsuitable) extinguishing media:

Use extinguishing agent suitable for surrounding combustible materials.

B. Specific hazards arising from the chemical (e.g., nature of any hazardous combustion products):

Product is a non-combustible product, class of reaction to fire is zero. Packaging and surrounding materials may be combustible. During the initial heating of the product, some thermal decomposition of the binder will occur at about 450 O F (232 O C) from this first heat of the product. This may release smoke, carbon monoxide and carbon dioxide. Use adequate ventilation or other precautions to eliminate exposure to vapours resulting from thermal decomposition of the binder. Exposure to thermal decomposition fumes may cause respiratory tract irritation, bronchial hyper-reactivity or an asthmatic-type response.

C. Special protective equipment and precautions for fire-fighters: NFPA Codes: Flammability: 0 Health: 1 Reactivity: 0 Special: 0

6. ACCIDENTAL RELEASE MEASURES

A. Personal precautions, protective equipment, and emergency procedures: Minimize airborne dust. Compressed air or dry sweeping should not be used for cleaning.

B. Methods and materials for containment and cleaning up: Frequently clean the work area with high efficiency vacuum or wet sweeping to minimize the accumulation of debris. Do not use compressed air for clean-up.

C. EMPTY CONTAINERS: Product packaging may contain residue. Do not reuse.



7. HANDLING AND STORAGE

- A. **Precautions for safe handling:** Handle fiber carefully to minimize airborne dust. Limit use of power tools unless in conjunction with local exhaust ventilation. Use hand tools whenever possible.
- B. **Conditions for safe storage, including any incompatibilities:** Store in a manner to minimize airborne dust.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

- A. **Canadian provincial OEL's [TWAEV's]** for RCF range from 0.2 to 1.0 f/cc depending on the province. In Ontario, the Ontario TWAEV for ceramic fibre is 0.5 f/cc, 8-hr. 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. In USA, the OSHA permissible exposure limit (PEL), American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value (TLV), and any other exposure limit used or recommended by the manufacturer, importer, or employer preparing the safety data sheet, where available is: 0.2 f/cc TLV, 8-hr. TWA. These recommended limits refer to the power state.

COMPONENTS	CAS NUMBER	%	Recommended OEL Ontario
Refractory Ceramic fibre	142844-00-6	65 to 85	1.0 fibres/cc or 3 mg/m ³ as a respirable particulate
Colloidal silica	7631-86-9	10 to 30	no regulated limit; guideline 6 mg/m ³
Cationic starch ether	56780-58-6	3 to 7	no regulated limit; guideline 5 mg/m ³ respirable dust

- B. **Appropriate engineering controls:** Use engineering controls such as local exhaust ventilation, point of generation dust collection, emission controlling tool designs, and materials handling equipment designed to minimize airborne fiber emissions.
- C. **Individual protection measures, such as personal protective equipment**
 - Skin Protection:** Wear personal protective equipment as needed to prevent skin irritation. Washable or disposable clothing may be used. If possible, do not take unwashed clothing home. If soiled work clothing must be taken home, employees should be informed on best practices to minimize non-work dust exposure (e.g., vacuum clothes before leaving the work area, wash work clothing separately, and rinse washer before washing other household clothes).
 - Eye Protection:** As necessary, wear goggles or safety glasses with side shields.
 - Respiratory Protection:** When engineering and/or administrative controls are insufficient to maintain workplace concentrations below the 0.5 f/cc or a regulatory OEL, the use of appropriate respiratory protection is recommended. A NIOSH certified respirator with a filter efficiency of at least 95% should be used. Workers need to be fit-tested prior to using a specific air-purifying respirator. The evaluation of workplace hazards and the identification of appropriate respiratory protection is best performed, on a case by case basis, by a qualified Industrial Hygienist.
 - Other Information:** Airborne Concentrations based upon an eight-hour time weighted average (TWA) as determined by air samples collected and analyzed pursuant to NIOSH method 7400 for airborne fibers. The manufacturer recommends the use of a full-face piece 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.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

APPEARANCE Off white to light brown, fibrous material manufactured into a specific shape	EVAPORATION RATE Not applicable	PARTITION COEFFICIENT: n-octanol/water Not applicable
ODOUR Odourless	FLAMMABILITY Not applicable	AUTO-IGNITION TEMPERATURE Not applicable
ODOUR TRESHOLD Slight	UPPER/LOWER FLAMMABILITY OR EXPLOSIVE LIMITS Not applicable	DECOMPOSITION TEMPERATURE Not applicable
pH Not applicable	VAPOUR DENSITY Not applicable	VISCOSITY Not applicable
MELTING POINT 1760° C (3200° F)	VAPOUR PRESSURE Not applicable	FLASH POINT Not applicable
INITIAL BOILING POINT AND BOILING RANGE Not applicable	DENSITY[#/ft³] 14 to 18	SOLUBILITY Insoluble



10. STABILITY AND REACTIVITY

A. Reactivity	RCF is non-reactive.
B. Chemical stability	As supplied RCF is stable and inert.
C. Possibility of hazardous reactions	None
D. Conditions to avoid	Please refer to handling and storage advice in Section 7
E. Incompatible materials	None
F. Hazardous decomposition products	During the initial heating of the product, some thermal decomposition of the binder will occur at about 450 O F (232 O C) from this first heat of the product. This may release smoke, carbon monoxide and carbon dioxide. Use adequate ventilation or other precautions to reduce exposure to vapours resulting from thermal decomposition of the binder. Exposure to thermal decomposition fumes may cause respiratory tract irritation, bronchial hyper-reactivity or an asthmatic-type response.

11. TOXICOLOGICAL INFORMATION

TOXICOKINETICS, METABOLISM AND DISTRIBUTION

- A. Basic Toxicokinetics:** Exposure is predominantly by inhalation or ingestion. Man-made vitreous fibers of a similar size to RCF have not been shown to migrate from the lung and/or gut and do not become located in other organs of the body.
- B. Human Toxicological Data/Epidemiology Data:** In order to determine possible human health effects following RCF exposure, the University of Cincinnati has been conducting medical surveillance studies on RCF workers in the U.S.A; this epidemiological study has been ongoing for >30 years. The Institute of Occupational Medicine (IOM) has conducted medical surveillance studies on RCF workers in European manufacturing facilities. Pulmonary morbidity studies among production workers in the U.S.A. and Europe have demonstrated an absence of interstitial fibrosis. In the European study a reduction of lung capacity among smokers has been identified, however, based on the latest results from a longitudinal study of workers in the U.S.A. with over 17+year follow-up, there has been no accelerated rate of loss of lung function. A statistically significant correlation between pleural plaques and cumulative RCF exposure was evidenced in the U.S.A. longitudinal study. The U.S.A. mortality study showed no excess mortality related to all deaths, all cancer, or malignancies or diseases of the respiratory system including mesothelioma.
- C. Irritant Properties:** Negative results have been obtained in animal studies for skin irritation. Inhalation exposures using the nose only route produce simultaneous heavy exposures to the eyes, but no reports of excess eye irritation exist. Animals exposed by inhalation similarly show no evidence of respiratory tract irritation. Human data confirm that only mechanical irritation, resulting in itching, occurs in humans. Screening at manufacturers' plants in the UK has failed to show any human cases of skin conditions related to fiber exposure.
- D. International Agency for Research on Cancer and National Toxicology Program (IARC),** in 1988, Monograph v.43 (and later reaffirmed in 2002, v.81), classified RCF as possibly carcinogenic to humans (group 2B). IARC evaluated the possible health effects of RCF as follows: There is inadequate evidence in humans for the carcinogenicity of RCF. There is sufficient evidence in experimental animals for the carcinogenicity of RCF. The Annual Report on Carcinogens, prepared by NTP, classified respirable RCF as "reasonably anticipated" to be a carcinogen.

12. ECOLOGICAL INFORMATION (Non-mandatory)

A. Ecotoxicity (aquatic and terrestrial, where available)	No known aquatic toxicity.
B. Persistence and degradability	These products are insoluble materials that remain stable over time and are chemically identical to inorganic compounds found in the soil and sediment; they remain inert in the natural environment.
C. Bioaccumulative potential	No bio accumulative potential.
D. Mobility in soil	No mobility in soil.
E. Other adverse effects (such as hazardous to the ozone layer)	No adverse effects of this material on the environment are anticipated.



13. DISPOSAL CONSIDERATIONS

- A. WASTE MANAGEMENT:** To prevent waste materials from becoming airborne during waste storage, transportation and disposal, a covered container or plastic bagging is recommended.
- B. DISPOSAL:** This product, as manufactured, is not classified as a hazardous waste according to Federal regulations. 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.

14. TRANSPORT INFORMATION (Non-mandatory)

A. UN number	Not Applicable
B. UN proper shipping name	Not Regulated.
C. Transport hazard class	Not Applicable
D. Packing group, if applicable	Not Applicable
E. Environmental hazards (e.g., Marine pollutant -Yes/No)	Not a marine pollutant
F. Transport in bulk (according to Annex II of MARPOL 73/78 and the IBC Code)	Not Applicable
G. Special precautions which a user needs to be aware of, or needs to comply with, in connection with transport or conveyance either within or outside their premises	Not Applicable

Canadian TDG Hazard Class & PIN: Not regulated

Not classified as dangerous goods under ADR (road), RID (train) or IMDG (ship).

15. REGULATORY INFORMATION

15.1 CANADIAN REGULATIONS

Canada Canadian Workplace Hazardous Materials Information System (WHMIS 2015) – Classified as Class D2A – Materials Causing Other Toxic Effects

Canadian Environmental Protection Act (CEPA) - All substances in this product are listed, as required, on the Domestic Substance List (DSL)

15.2 UNITED STATES REGULATIONS

OSHA

Comply with Hazard Communication Standards 29 CFR 1910.1200 and 29 CFR 1926.59 and the Respiratory Protection Standards 29 CFR 1910.134 and 29 CFR 1926.103.

California

“Ceramic fibers (airborne particles of respirable size)” is listed in Proposition 65, The Safe Drinking Water and Toxic Enforcement Act of 1986 as a chemical known to the State of California to cause cancer.

15.3 Other States

RCF products are not known to be regulated by states other than California; however, state and local OSHA and EPA regulations may apply to these products. If in doubt, contact your local regulatory agency.



16. OTHER INFORMATION

16.1 Devitrification: (b) Additional Information on After Service Material:

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 phase silica may begin to form at approximately 1100° C (2012° F). When the glass RCF fibers devitrify, they form a mixed mineral crystalline silica containing dust. The crystalline silica is trapped in grain boundaries within a matrix predominately consisting of mullite. 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 or furnace contaminants.

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 also studied mixed mineral crystalline silica containing dusts such as coal dusts (containing 5 – 15 % crystalline silica) and diatomaceous earth without seeing any evidence of disease. NTP lists all polymorphs of crystalline silica amongst substances which may "reasonably be anticipated to be carcinogens".

However, an analysis of after-service RCF samples obtained pursuant to an exposure monitoring agreement with the US EPA, 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 micrograms/cm² - by comparison, pure quartz or cristobalite were significantly active at much lower levels (circa 20 micrograms/cm²).

16.2 Definitions

ACGIH	American Conference of Governmental Industrial Hygienists
ADR	Carriage of Dangerous Goods by Road (International Regulation)
AES	Alkaline Earth Silicate Wools
ASW	Alumino-Silicate Wools
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
HTIW	North American high temperature insulation wool industry
IARC	International Agency for Research on Cancer
IATA	International Air Transport Association
IMDG	International Maritime Dangerous Goods Code
mg/m ³	Milligrams per cubic meter of air
mmpcf	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 1910.1200 & 1926.59	OSHA Respiratory Protection Standards
29 CFR 1910.1200 & 1926.59:	OSHA Hazard Communication Standards



PCW	Polycrystalline Wools
PEL	Permissible Exposure Limit (OSHA)
PIN	Product Identification Number
PNOC	Particulates Not Otherwise Classified
PNOR	Particulates Not Otherwise Regulated
PSP	Product Stewardship Program
RCFA	Refractory Ceramic Fiber Association
RCRA	Resource Conservation and Recovery Act
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	MSDS/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)

16.3 Revision Summary: Updated SDS to align with the new WHMIS 2015 Regulation introduced, Feb 11th, 2015, SDS Revision Date: April 2nd, 2020; SDS Prepared By: G.E. Menzies P. Eng. ROH 16.2

16.4 DISCLAIMER:

The information presented herein is presented in good faith and believed to be accurate as of the effective date of this Safety Data Sheet. Employers may use this SDS to supplement other information gathered by them in their efforts to assure the health and safety of their employees and the proper use of the product. This summary of the relevant data reflects professional judgment; employers should note that information perceived to be less relevant has not been included in this SDS. Therefore, given the summary nature of this document, FibreCast Inc. does not extend any warranty (expressed or implied), assume any responsibility, or make any representation regarding the completeness of this information or its suitability for the purposes envisioned by the user.