



FC 2300 HD

Effective Date: March 17th, 2020**1. IDENTIFICATION**

- A. Product Identifier used on label:** FC 2300 HD
- B. Other means of identification:** High Temperature Ceramic Fiber Vacuum Formed Insulation Product; High Temperature Insulating Product as a blend of Ceramic Fiber and binders; Refractory Ceramic Fiber (RCF), Ceramic Wool, Man-Made Vitreous Fiber (MMVF), High Temperature Insulating Wool (HTIW)
- C. Recommended use of the product:** Primary Use: Ceramic Fiber 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 ceramic fiber is used in the manufacture of some consumer products, such as catalytic converter 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 limit and shrinkage data.
- D. Tertiary Use:** Installation, removal (industrial and professional) / Maintenance and service life (industrial & professional)
- E. Uses Advised Against:** Dismantling product for reuse on other applications.
- F. Manufacturer's Name:** FibreCast Incorporated, 3264 Mainway, Burlington, Ontario, Canada, L7M 1A7
Phone 905-319-1080; Fax 905-319-7611; email: sales@fibrecast.com
- G. Emergency Phone #:** CHEMTREC will provide assistance for chemical emergencies at 1-800-424-9300

2. HAZARDS IDENTIFICATION

- A. Classification of the chemical:** in accordance with paragraph (d) of §1910.1200 The U.S. Occupational Safety and Health Administration (OSHA) Hazard Communication Standard (HCS) 2012 indicates that IARC Group 2B corresponds to OSHA HCS 2012 Category 2 carcinogen classification. The same grouping applies in Canada.
- B. Signal word, hazard statement(s), symbol(s) and precautionary statement(s).** Ceramic Fiber is classified as a category 2 carcinogen and requires a Hazard Pictogram as shown below:



B.1. Signal Word: Warning

B.2. Hazard Statements: Suspected of causing cancer by inhalation.

B.3. 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.

B.4. Describe any hazards not otherwise classified during classification process: Mild mechanical irritation to skin, eyes and upper respiratory system may result from exposure. These effects are usually temporary.
Minimize exposure to airborne dust.

Describe any hazards not otherwise classified that have been identified during the classification process

- 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. These effects are usually temporary.
- D. Mixture rule:** Not applicable.



3. COMPOSITION / INFORMATION ON INGREDIENTS

COMPONENTS	CAS NUMBER	% BY WEIGHT
Refractories, Fibers Aluminosilicate	142844-00-6	45 to 70
Silicon dioxide	14808-60-7	15 to 40
Colloidal Silica	7631-86-9	10 to 30
Cationic Starch Ether	56780-58-6	1 to 5

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-wash 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. 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. 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 non-combustible products, 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 0 F (232 0 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 this 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 & precautions for fire-fighters:

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

6. ACCIDENTAL RELEASE MEASURES

A. Personal precautions, PPE, 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:** Prevent generation of dust. Do not dry clean dust covered objects and floors. Wash thoroughly with plenty of water. Use appropriate industrial vacuums for dust removal.
- B. Conditions for safe storage:** Store under normal warehouse conditions. Store away from food.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

- A. Ontario Occupational exposure limits [OEL] [TWAEV's]** for ceramic fiber range from 0.2 to 1.0 f/cc depending on the province. In Ontario, the TWAEV for ceramic fiber 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. Product is a solid and not a powder. The TWAEV noted below refers to a powder state.

COMPONENTS	CAS NUMBER	% BY WEIGHT	Ontario TWAEV
Refractory Ceramic fiber	142844-00-6	45 to 70	0.5 f/cc average over 8-hr.
Silicon dioxide	14808-60-7	15 to 40	0.10 mg/m ³ as respirable particles
Colloidal Silica	7631-86-9	10 to 30	10 mg/m ³ as inhalable particles; 3mg/m ³ as respirable particles
Cationic Starch Ether	56780-58-6	1 to 5	10 mg/m ³ as inhalable particles; 3mg/m ³ as respirable particles

- 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.
- C. Individual protection measures, such as personal protective equipment**

Skin Protection: Wear personal protective equipment (e.g. gloves), as necessary 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 fiber concentrations below the 0.5 f/c, the use of appropriate respiratory protection, 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 selection of appropriate respiratory protection is best performed, on a case by case basis, by a qualified Industrial Hygienist.

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-face piece air purifying respirator equipped with an appropriate particulate filter cartridge during furnace tear-out events.

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 board or shape

FLAMMABILITY : Not applicable

ODOUR : Odourless

UPPER/LOWER FLAMMABILITY OR EXPLOSIVE LIMITS : Not applicable

ODOUR TRESHOLD : Not applicable

VAPOR PRESSURE : Not applicable

pH : Not applicable

VAPOR DENSITY : Not applicable



MELTING POINT : 1760° C (3200° F)	RELATIVE DENSITY [# /cf] : 22 to 26
INITIAL BOILING POINT AND BOILING RANGE : Not applicable	SOLUBILITY : Insoluble
FLASH POINT : Not applicable	PARTITION COEFFICIENT: n-octanol/water : Not applicable
AUTO-IGNITION TEMPRATURE : Not applicable	DECOMPOSITION TEMPERATURE : Not applicable
VISCOSITY : Not applicabe	

10. STABILITY AND REACTIVITY

A. Reactivity	PCW is stable and non-reactive.
B. Chemical stability	As supplied board or shape 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 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.

11. TOXICOLOGICAL INFORMATION

11.1 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. 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.
- B. 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.
- C. 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. STABILITY AND REACTIVITY

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 bioaccumulative 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. Incompatible materials	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

15. REGULATORY INFORMATION

- A. CANADIAN REGULATIONS** Canada Canadian Workplace Hazardous Materials Information System (WHMIS 2015) – Product is Classified as Class D2A – Materials Causing Other Toxic Effects Canadian Environmental Protection Act (CEPA) - All substances in this product are listed, on the Domestic Substance List (DSL)

- B. 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)” are 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.

- C. 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 Hazardous Materials Identification System (HMIS) has ratings of 1 to 4 and are still shown on many MSDS / SDS. HMIS was created in 1980 and its rating system is the reverse of new Canadian GHS rating system. For this product, the following HMIS applies: HMIS Health 1* (* denotes potential for chronic effects); HMIS Flammability 0; HMIS Reactivity 0; HMIS Personal Protective Equipment X (To be determined by user)

16.2 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. (IARC Monograph Vol. 68, 1997). 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).

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



16.2 Definitions Continued...

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 WHMIS 2015 Regulation dated Feb 11/15 Revision Date: March 17th, 2020. SDS Prepared By: G.E. Menzies P. Eng. ROH.

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.