

## SAFETY DATA SHEETS

**This SDS packet was issued with item:**

073430279

N/A



INSTA-FRAC

## MATERIAL SAFETY DATA SHEET

MSDS No. M0132

Effective Date: 03/05/2007

### 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Trade Names: Insta-Frac

Product Group: REFRACTORY CERAMIC FIBER PRODUCT

Chemical Name: VITREOUS ALUMINOSILICATE FIBER

Synonym(s): RCF, ceramic fiber, synthetic vitreous fiber (SVF), man-made vitreous fiber (MMVF), man-made mineral fiber (MMMF)

Manufacturer/Supplier: KEYSTONE INDUSTRIES

616 Hollywood Ave  
Cherry Hill, NJ 08002

Information: 800-333-3131

Emergencies: 800-535-5053

### 2. COMPOSITION / INFORMATION ON INGREDIENTS

COMPONENTS	CAS NUMBER	% BY WEIGHT
Water	7732-18-5	65-70
Refractories, Fibers, Aluminosilicate	142844-00-6	20-25
Silica (amorphous)	7631-86-9	5-10
Hydroxyethylcellulose	9004-62-0	1-3

(See Section 8 "Exposure Controls / Personal Protection" for exposure guidelines)

### 3. HAZARDS IDENTIFICATION

#### EMERGENCY OVERVIEW

CAUTION! MAY BE HARMFUL IF SWALLOWED.

MAY CAUSE SKIN AND EYE IRRITATION.

DRIED, ABRADED PRODUCT MAY CAUSE RESPIRATORY TRACT IRRITATION AND POSE POSSIBLE CANCER HAZARD BY INHALATION.

(See Section 11 for more information)

#### CHRONIC EFFECT

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.

#### OTHER POTENTIAL EFFECTS

**TARGET ORGANS:**

Respiratory Tract (nose & throat), Eyes, Skin

**RESPIRATORY TRACT (nose & throat) IRRITATION:**

If dried, airborne product is 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.

**EYE IRRITATION:**

May cause temporary, mild mechanical irritation. Fibers may be abrasive; prolonged contact may cause damage to the outer surface of the eye.

**SKIN IRRITATION:**

Exposure to dried product may cause temporary, mild mechanical irritation. Exposure may also result in inflammation, rash or itching.

**GASTROINTESTINAL IRRITATION:**

Unlikely route of exposure. Small amounts swallowed incidental to normal handling operations are not likely to cause injury.

**MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:**

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.

**HAZARD CLASSIFICATION**

Although studies, involving occupationally exposed workers, have not identified any increased incidence of respiratory disease, results from animal testing have been used as the basis for hazard classification. In each of the following cases, the conclusions are qualitative only and do not rest upon any quantitative analysis suggesting that the hazard actually may occur at current occupational exposure levels.

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.

The **Seventh Annual Report on Carcinogens (1994)**, prepared by the **National Toxicology Program (NTP)**, classified respirable RCF and glasswool as substances reasonably anticipated to be carcinogens.

The **American Conference of Governmental Industrial Hygienists (ACGIH)** has classified RCF as "A2-Suspected Human Carcinogen."

The **Commission of The European Communities (DG XI)** has classified RCF as a substance that should be regarded as if it is carcinogenic to man.

The **State of California**, pursuant to Proposition 65, The Safe Drinking Water and Toxic Enforcement Act of 1986, has listed "ceramic fibers (airborne fibers of respirable size)" as a chemical known to the State of California to cause cancer.

The **Canadian Environmental Protection Agency (CEPA)** has classified RCF as "probably carcinogenic" (Group 2).

The **Canadian Workplace Hazardous Materials Information System (WHMIS)** -- RCF is classified as Class D2A -- Materials Causing Other Toxic Effects

The **Hazardous Materials Identification System (HMIS)** --

Health 1\* Flammability 0 Reactivity 0 Personal Protection Index: X (Employer Determined)  
(\* denotes potential for chronic effects)

**4. FIRST AID MEASURES****FIRST AID PROCEDURES**

**RESPIRATORY TRACT (nose & throat) IRRITATION:**

If respiratory tract irritation develops, move the person to a dust free location. Get medical attention if the irritation continues. See Section 8 for additional measures to reduce or eliminate exposure.

**EYE IRRITATION:**

If eyes become irritated, flush immediately with large 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.

**SKIN IRRITATION:**

If skin becomes irritated, remove soiled clothing. 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.

**GASTROINTESTINAL IRRITATION:**

If gastrointestinal tract irritation develops, move the person to a dust free environment.

**NOTES TO PHYSICIANS:**

Skin and respiratory effects are the result of temporary, mild mechanical irritation; fiber exposure does not result in allergic manifestations.

<b>5. FIRE FIGHTING MEASURES</b>
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**NFPA Codes:**                      **Flammability:** 0      **Health:** 1                      **Reactivity:** 0                      **Special:** 0

**NFPA Unusual Hazards:**                      None

**Flammable Properties:**                      None

**Flash Point:**                      None

**Hazardous Decomposition Products:**

Thermal decomposition of binder from fires or from first heat of product may release smoke, carbon monoxide, carbon dioxide, aldehydes, and carboxylic acids. Use adequate ventilation or other precautions to eliminate exposure to vapors resulting from thermal decomposition of binder. Exposure to thermal decomposition fumes may cause respiratory tract irritation, bronchial hyper-reactivity or an asthmatic-type response.

**Unusual Fire and Explosion Hazard:**                      None

**Extinguishing Media:**                      Use extinguishing media suitable for type of surrounding fire.

<b>6. ACCIDENTAL RELEASE MEASURES</b>
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**SPILL PROCEDURES**

Minimize 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.

<b>7. HANDLING AND STORAGE</b>
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Normal conditions of use and application are not expected to release respirable particulates of airborne fibers. Removal of used product, sanding, scraping, or otherwise destroying the integrity of the dried product may result in the release of particulates and fibers. During such operations where fibers could possibly be released, appropriate respiratory protection should be provided as discussed below and/or in Section 8 under Respiratory Protection.

**STORAGE**

Store in original container in a dry area. Keep container closed when not in use.

**HANDLING**

Handle ceramic fiber carefully. Limit 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.

### **EMPTY CONTAINERS:**

Product packaging may contain residue. Do not reuse.

## **8. EXPOSURE CONTROLS/PERSONAL PROTECTION**

### **EXPOSURE GUIDELINES -- RCF**

COMPONENTS	OSHA PEL	MANUFACTURER REG
Refractories, Fibers, Aluminosilicate	None Established*	0.5 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 15 mg/m<sup>3</sup>; Respirable Fraction 5 mg/m<sup>3</sup>.
- \*\* The Refractory Ceramic Fibers Coalition (RCFC) has sponsored comprehensive toxicology and epidemiology studies to identify potential RCF-related health effects [see Section 11 for more details], consulted experts familiar with fiber and particle science, conducted a thorough review of the RCF-related scientific literature, and further evaluated the data in a state-of-the-art quantitative risk assessment. Based on these efforts and in the absence of an OSHA PEL, RCFC has adopted a recommended exposure guideline, as measured under NIOSH Method 7400 B. The manufacturers' REG is intended to promote occupational health and safety through prudent exposure control and reduction and it reflects relative technical and economic feasibility as determined by extensive industrial hygiene monitoring efforts undertaken pursuant to an agreement with the U.S. Occupational Safety and Health Administration (OSHA).

### **OTHER OCCUPATIONAL EXPOSURE LEVELS (OEL)**

RCF-related occupational exposure limits vary internationally. Regulatory OEL examples include: Australia – 0.5 f/cc; Austria – 0.5 f/cc; Canada – 0.2 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 – 1.0 f/cc. Non-regulatory OEL examples include: ACGIH TLV 0.2 f/cc; 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.

### **EXPOSURE GUIDELINES -- OTHER INGREDIENTS**

COMPONENTS	OSHA PEL	MANUFACTURER REG
Water	None established	None established
Silica (amorphous)	20 mppcf or 80 mg/m <sup>3</sup> / % SiO <sub>2</sub>	None established
Hydroxyethylcellulose	None established	None established

### **OTHER OCCUPATIONAL EXPOSURE LEVELS (OEL)**

Non-regulatory OEL examples include: ACGIH TLVs (TWAs): Water -- None established. Silica (amorphous) -- 10 mg/m<sup>3</sup>. Hydroxyethylcellulose -- None established.

### **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.

### **PERSONAL PROTECTION EQUIPMENT**

Respiratory Protection -- RCF:

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 is best performed, on a case by case basis, by a qualified Industrial Hygienist.

<b>MANUFACTURER'S RESPIRATORY PROTECTION RECOMMENDATIONS WHEN HANDLING RCF PRODUCTS</b>	
<b>Respirable Airborne Fiber Concentration</b> (levels are 8-hr. time-weighted averages)	<b>Respirator Recommendation<sup>†</sup></b>
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
"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

<sup>†</sup> 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.

#### Skin 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 soiled work clothing must be taken home, employers should ensure employees are thoroughly trained on the best practices to minimize 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.).

#### Eye Protection:

Wear safety glasses with side shields or other forms of eye protection in compliance with appropriate OSHA standards to prevent eye irritation. The use of contact lenses is not recommended, unless used in conjunction with appropriate eye protection. Do not touch eyes with soiled body parts or materials. If possible, have eye-washing facilities readily available where eye irritation can occur.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

ODOR AND APPEARANCE:	White, odorless, fibrous material
CHEMICAL FAMILY:	Vitreous Aluminosilicate Fibers
BOILING POINT:	Not Applicable
WATER SOLUBILITY (%):	Not Soluble In Water
MELTING POINT:	1760° C (3200° F)
SPECIFIC GRAVITY:	2.50 – 2.75
VAPOR PRESSURE:	Not Applicable
pH:	Not Applicable
VAPOR DENSITY (Air = 1):	Not Applicable
% VOLATILE:	Not Applicable
MOLECULAR FORMULA:	Not Applicable

## 10. STABILITY AND REACTIVITY

**CHEMICAL STABILITY:** Stable under conditions of normal use.  
**INCOMPATIBILITY:** Soluble in hydrofluoric acid, phosphoric acid, and concentrated alkali.  
**CONDITIONS TO AVOID:** None.

### HAZARDOUS DECOMPOSITION PRODUCTS:

Thermal decomposition of binder from fires or from first heat of product may release smoke, carbon monoxide, carbon dioxide, aldehydes, and carboxylic acids. Use adequate ventilation or other precautions to eliminate exposure to vapors resulting from thermal decomposition of binder. Exposure to thermal decomposition fumes may cause respiratory tract irritation, bronchial hyper-reactivity or an asthmatic-type response.

**HAZARDOUS POLYMERIZATION:** Not Applicable.

## 11. TOXICOLOGICAL INFORMATION

Normal conditions of use and application are not expected to release respirable particulates of airborne fibers. Removal of used product, sanding, scraping, or otherwise destroying the integrity of the dried product may result in the release of particulates and fibers. The toxicological information below applies to the aluminosilicate fiber portion of the dried product.

### HEALTH DATA SUMMARY

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.

### EPIDEMIOLOGY

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/m<sup>3</sup> (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/m<sup>3</sup>, 9 mg/m<sup>3</sup>, 3 mg/m<sup>3</sup> which 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/m<sup>3</sup> dose group. Some cases of mild fibrosis and one mesothelioma were observed in the 9 mg/m<sup>3</sup> group. No acute respiratory effects were seen in the rats in the 3 mg/m<sup>3</sup> 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.

To obtain more epidemiology or toxicology information, please call the toll free telephone number for the Unifrax I LLC Product Stewardship Program found in Section 16 - Other Information.

## **12. ECOLOGICAL INFORMATION**

No ecological concerns have been identified.

## **13. DISPOSAL CONSIDERATIONS**

### **WASTE MANAGEMENT**

To prevent waste materials from becoming airborne during waste storage, transportation and disposal, a covered container or plastic bagging is recommended.

### **DISPOSAL**

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.



## 14. TRANSPORT INFORMATION

### U.S. DEPARTMENT OF TRANSPORTATION (DOT)

Hazard Class:	No: Regulated	United Nations (UN) Number:	Not Applicable
Labels:	No: Applicable	North America (NA) Number:	Not Applicable
Placards:	No: Applicable	Bill of Lading:	Product Name

### INTERNATIONAL

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

## 15. REGULATORY INFORMATION

### UNITED STATES REGULATIONS

**EPA:** **Superfund Amendments and Reauthorization Act (SARA)** Title III - This product does not contain any substances reportable under Sections 302, 304, 313, (40 CFR 372). Sections 311 and 312 (40 CFR 370) apply (delayed hazard).  
**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.  
**Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)** and the **Clean Air Act (CAA)** - RCF contains fibers with an average diameter greater than one micron and thus is not considered a hazardous air pollutant.

**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.

**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.

### INTERNATIONAL REGULATIONS

**Canada:** **Canadian Workplace Hazardous Materials Information System (WHMIS)** - RCF is 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)

**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."

## 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 phase silica may begin to form 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/cm<sup>2</sup> - by comparison, pure quartz or cristobalite were significantly active at much lower levels (circa 20 g/cm<sup>2</sup>).

### 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 is 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

<b>HMIS:</b>	Hazardous Materials Identification System
<b>HTW:</b>	High Temperature Woods
<b>IARC:</b>	International Agency for Research on Cancer
<b>IATA:</b>	International Air Transport Association
<b>IMDG:</b>	International Maritime Dangerous Goods Code
<b>mg/m<sup>3</sup>:</b>	Milligrams per cubic meter of air
<b>mmpcf:</b>	Million particles per cubic meter
<b>NFPA:</b>	National Fire Protection Association
<b>NIOSH:</b>	National Institute for Occupational Safety and Health
<b>OSHA:</b>	Occupational Safety and Health Administration
<b>29 CFR 1910.134 &amp; 1926.103:</b>	OSHA Respiratory Protection Standards
<b>29 CFR 1910.1200 &amp; 1926.59:</b>	OSHA Hazard Communication Standards
<b>PEL:</b>	Permissible Exposure Limit (OSHA)
<b>PIN:</b>	Product Identification Number
<b>PNOC:</b>	Particulates Not Otherwise Classified
<b>PNOR:</b>	Particulates Not Otherwise Regulated
<b>PSP:</b>	Product Stewardship Program
<b>RCFC:</b>	Refractory Ceramic Fibers Coalition
<b>RCRA:</b>	Resource Conservation and Recovery Act
<b>REG:</b>	Recommended Exposure Guideline (RCFC)
<b>REL:</b>	Recommended Exposure Limit (NIOSH)
<b>RID:</b>	Carriage of Dangerous Goods by Rail (International Regulations)
<b>SARA:</b>	Superfund Amendments and Reauthorization Act
<b>SARA Title III:</b>	Emergency Planning and Community Right to Know Act
<b>SARA Section 302:</b>	Extremely Hazardous Substances
<b>SARA Section 304:</b>	Emergency Release
<b>SARA Section 311:</b>	MSDS/List of Chemicals and Hazardous Inventory
<b>SARA Section 312:</b>	Emergency and Hazardous Inventory
<b>SARA Section 313:</b>	Toxic Chemicals and Release Reporting
<b>STEL:</b>	Short Term Exposure Limit
<b>SVF:</b>	Synthetic Vitreous Fiber
<b>TDG:</b>	Transportation of Dangerous Goods
<b>TLV:</b>	Threshold Limit Value (ACGIH)
<b>TSCA:</b>	Toxic Substances Control Act
<b>TWA:</b>	Time Weighted Average
<b>WHMIS:</b>	Workplace Hazardous Materials Information System (Canada)

**Revision Summary:** Minor revisions to Sections 1, 6, 8, & 16. Replaces 3/9/04 MSDS.

**MSDS Prepared By:**

#### **DISCLAIMER**

The information presented herein is presented in good faith and believed to be accurate as of the effective date of this Material Safety Data Sheet. Employers may use this MSDS 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 MSDS. Therefore, given the summary nature of this document, Keystone Ind. 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.



## SAFETY DATA SHEET

SDS No. M0132

Effective Date: 09/29/2014

### 1. IDENTIFICATION

(a) Product identifier INSTA-FRAC

used on the label

(b) Other means of identification

(c) Recommended use of the chemical and restrictions on use Use when making corrections to all ceramic restorations. Use for additions or staining crowns, inlays and veneers. Except add ons to margins

d) Name, address, and telephone number Keystone Industries  
52 West King Street  
Myerstown, PA 17067  
(856)-663-4700  
[www.keystoneind.com](http://www.keystoneind.com)

(e) Emergency Phone Number: (800)-535-5053

### 2. HAZARDS IDENTIFICATION

WARNING!  
POSSIBLE CANCER HAZARD BY INHALATION.  
(See Section 11 for more information)

#### CHRONIC EFFECT

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.

#### POTENTIAL HEALTH EFFECTS

**LIKELY ROUTES OF EXPOSURE:** Respiratory Tract (nose & throat), Eyes, Skin

**RESPIRATORY TRACT (nose & throat) IRRITATION:**

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.

**EYE IRRITATION:**

May cause temporary, mild mechanical irritation. Fibers may be abrasive; prolonged contact may cause damage to the outer surface of the eye.

**SKIN IRRITATION:**

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

### 3. COMPOSITION / INFORMATION ON INGREDIENTS

<u>(a) Chemical and (b) Common Name</u>	<u>(c) CAS Number</u>	<u>% BY WEIGHT</u>
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Water	7732-18-5	65-70
Refractories, Fibers, Aluminosilicate	142844-00-6	20-25
Silica (amorphous)	7631-86-9	5-10
Hydroxyethylcellulose	9004-62-0	1-3
* <b>Synonyms:</b> RCF, ceramic fiber, Alumino Silicate Wool (ASW), synthetic vitreous fiber (SVF), man-made vitreous fiber (MMVF), man-made mineral fiber (MMMf), 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**

**NOTES TO PHYSICIANS**

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 and**

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

Non-combustible products, class of reaction to fire is zero.

Packaging and surrounding materials may be combustible. Use extinguishing agent suitable for surrounding combustible materials.

Thermal decomposition of binder from fires or from first heat of product may release smoke, carbon monoxide, carbon dioxide, aldehydes, and carboxylic acids. Use adequate ventilation or other precautions to eliminate exposure to vapors resulting from thermal decomposition of 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. See Section 8 "Exposure Controls / Personal Protection" for exposure guidelines.

### (b) Methods and materials for containment and cleaning up

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.

## 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.

### EMPTY CONTAINERS

Product packaging may contain residue. Do not reuse.

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

(a) 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 chemical manufacturer, importer, or employer preparing the safety data sheet, where available

<u>Components</u>	<u>OSHA PEL</u>	<u>NIOSH REL</u>	<u>ACGIH TLV</u>	<u>MANUFACTURER REG</u>
Refractories, Fibers, Aluminosilicate	None established*	0.5 f/cc, 8-hr. TWA	0.2 f/cc TLV, 8-hr. TWA	0.5 f/cc, 8-hr. TWA**
Water	None established		None established	None established
Silica (amorphous)	20 mppcf or 80 mg/m <sup>3</sup>		10 mg/m <sup>3</sup>	None established
Hydroxyethylcellulose	/ % SiO <sub>2</sub>		None established.	None established
	None established			

\*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 15 mg/m<sup>3</sup>; Respirable Fraction 5 mg/m<sup>3</sup>.

\*\*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](http://www.htiwcoalition.org/documents/PSP_2012.pdf).

### OTHER OCCUPATIONAL EXPOSURE LEVELS (OEL)

RCF-related occupational exposure limits vary internationally. Regulatory OEL examples include: California, 0.2 f/cc; Canadian provincial OELs range from 0.2 to 1.0 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.

**(b) 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.

**(c) Individual protection measures, such as personal protective equipment**

**Skin 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 soiled work clothing must be taken home, employers should ensure employees are thoroughly trained on the best practices to minimize 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.).

**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 REG or a regulatory OEL, the use of appropriate respiratory protection, pursuant to the requirements of OSHA Standards 29 CFR 1910.134 and 29 CFR 1926.103, is recommended. A NIOSH certified respirator with a filter efficiency of at least 95% should be used. The 95% filter efficiency recommendation is based on NIOSH respirator selection logic sequence for exposure to particulates. Selection of filter efficiency (i.e. 95%, 99% or 99.97%) depends on how much filter leakage can be accepted and the concentration of airborne contaminants. Other factors to consider are the NIOSH filter series N, R or P. (N) **N**ot resistant to oil, (R) **R**esistant to oil and (P) oil **P**roof. These recommendations are not designed to limit informed choices, provided that respiratory protection decisions comply with 29 CFR 1910.134.

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.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

<b>(a) Appearance</b>	White, fibrous wool	<b>(j) Upper/lower flammability or explosive limits</b>	Not applicable
<b>(b) Odor</b>	Odorless	<b>(k) Vapor pressure</b>	Not applicable
<b>(c) Odor threshold</b>	Not applicable	<b>(l) Vapor density</b>	Not applicable
<b>(d) pH</b>	Not applicable	<b>(m) Relative density</b>	2.50 – 2.75
<b>(e) Melting point</b>	1760° C (3200° F)	<b>(n) Solubility</b>	Insoluble
<b>(f) Initial boiling point and boiling range</b>	Not applicable	<b>(o) Partition coefficient: n-octanol/water</b>	Not applicable

<b>(g) Flash point</b>	Not applicable	<b>(p) Auto-ignition temperature</b>	Not applicable
<b>(h) Evaporation rate</b>	Not applicable	<b>(q) Decomposition temperature</b>	Not applicable
<b>(i) Flammability</b>	Not applicable	<b>(r) Viscosity</b>	Not applicable

## 10. STABILITY AND REACTIVITY

<b>(a) Reactivity</b>	RCF is non-reactive.
<b>(b) Chemical stability</b>	As supplied RCF is stable and inert.
<b>(c) Possibility of hazardous reactions</b>	None
<b>(d) Conditions to avoid</b>	Please refer to handling and storage advice in Section 7
<b>(e) Incompatible materials</b>	None
<b>(f) Hazardous decomposition products</b>	Thermal decomposition of binder from fires or from first heat of product may release smoke, carbon monoxide, carbon dioxide, aldehydes, and carboxylic acids. Use adequate ventilation or other precautions to eliminate exposure to vapors resulting from thermal decomposition of binder. Exposure to thermal decomposition fumes may cause respiratory tract irritation, bronchial hyper-reactivity or an asthmatic-type response.

## 11. TOXICOLOGICAL INFORMATION

For more details on scientific publications referenced in this SDS see <http://www.htiwoalition.org/publications.html>

### **(a) through (d)**

### **TOXICOKINETICS, METABOLISM AND DISTRIBUTION**

#### **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 25 years and medical surveillance of RCF workers continues. 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 (McKay et al. 2011).

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 (LeMasters et al. 2003).



## Information on Toxicological Effects

- *Acute toxicity: short term inhalation*  
No data available: Short term tests have been undertaken to determine fiber (bio) solubility rather than toxicity; repeat dose inhalation tests have been undertaken to determine chronic toxicity and carcinogenicity.
- *Acute toxicity: oral*  
No data available: Repeated dose studies have been carried out using gavage. No effect was found.
- *Skin corrosion/irritation*  
Not a chemical irritant according to test method OECD no. 404.
- *Serious eye damage/irritation*  
Not possible to obtain acute toxicity information due to the morphology and chemical inertness of the substance.
- *Respiratory or skin sensitization*  
No evidence from human epidemiological studies of any respiratory or skin sensitization potential.
- *Germ cell mutagenicity/genotoxicity*  
Method: In vitro micronucleus test  
Species: Hamster (CHO)  
Dose: 1-35 mg/ml  
Routes of administration: In suspension  
Results: Negative
- *Carcinogenicity*  
Method: Inhalation, multi-dose  
Species: Rat  
Dose: 3 mg/m<sup>3</sup>, 9 mg/m<sup>3</sup> and 16 mg/m<sup>3</sup>  
Routes of administration: Nose only inhalation  
Results: Fibrosis just reached significant levels at 16 and 9 mg/m<sup>3</sup> but not at 3 mg/m<sup>3</sup>. None of the parenchymal tumor incidences were higher than the historical control values for this strain of animal.  
  
Method: Inhalation, single dose  
Species: Rat  
Dose: 30 mg/m<sup>3</sup>  
Routes of administration: Nose only inhalation  
Results: Rats were exposed to a single concentration of 200 WHO fibers/ml specially prepared RCF for 24 months. High incidence of exposure-related pulmonary neoplasms (bronchoalveolar adenomas and carcinomas) was observed. A small number of mesotheliomas were observed in each of the fiber exposure groups (Mast et al 1995a).  
  
Method: Inhalation, single dose  
Species: Hamster  
Dose: 30 mg/m<sup>3</sup>  
Routes of administration: Nose only inhalation  
Results: Hamsters were exposed to a single concentration of 260 WHO fibers/ml specially prepared RCF for 18 months and developed lung fibrosis, a significant number of pleural mesotheliomas (42/102) but no primary lung tumors (McConnell et al 1995).  
  
Method: Inhalation, single dose  
Species: Rat

Dose: RCF1: 130 F/ml and 50 mg/m<sup>3</sup> (25% of non fibrous particles)

RCF1a: 125 F/ml and 26 mg/m<sup>3</sup> (2% of non fibrous particles)

Routes of administration: Nose only inhalation

Results: Rats were exposed to RCF1 and RCF1a for 3 weeks. The objective of the study was to compare lung retention and biological effects of the original RCF1 compared to RCF1a. The main difference of these 2 samples was the non-fibrous particle content of respectively 25% versus 2%. The post treatment observation was 12 months. Alveolar clearance was barely retarded after RCF1A exposure. After RCF1 exposure, however, a severe retardation of clearance was observed. (Bellmann et al 2001).

After intraperitoneal injection of ceramic fibers into rats in three experiments (Smith et al 1987, Pott et al 1987, Davis et al 1984), mesotheliomas were found in the abdominal cavity in two studies, while the third report (Pott et al 1987) had incomplete histopathology. Only a few mesotheliomas were found in the abdominal cavity of hamsters after intraperitoneal injection in one experiment (Smith et al 1987). However, the ceramic fibers tested were of relatively large diameter. When rats and hamsters were exposed via intraperitoneal injection, tumor incidence was related to fiber length and dose (Smith et al 1987, Pott et al 1987, Miller et al 1999, Pott et al 1989). (From SCOEL publication (EU Scientific Committee on Occupational Exposure Limits) SCOEL/SUM/165, September 2011).

- *Reproductive toxicity*

Method: Gavage

Species: Rat

Dose: 250mg/kg/day

Routes of administration: Oral

Results: No effects were seen in an OECD 421 screening study. There are no reports of any reproductive toxic effects of mineral fibers. Exposure to these fibers is via inhalation and effects seen are in the lung. Clearance of fibers is via the gut and the feces, so exposure of the reproductive organs is extremely unlikely.

- *STOT-Single exposure*

Not applicable

- *STOT-Repeated exposure*

Not applicable

- *Aspiration hazard*

Not applicable

See the following review publications for a summary and discussion:

Interpretation of these animal experiments is complex and there is not complete agreement amongst scientists internationally. A summary of the evidence relating to RCF carcinogenicity in vivo can be found in SCOEL/SUM/165 and in Utell and Maxim 2010.

#### Other information

Numerous studies indicate the relevance of biopersistence as a determinant of toxic effects of fiber exposure. (Maxim et al 2006).

#### **Irritant Properties**

Negative results have been obtained in animal studies (EU method B 4) 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.

#### **(e) 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 (latest edition), prepared by NTP, classified respirable RCF as "reasonably anticipated" to be a carcinogen).

Not classified by OSHA.

## 12. ECOLOGICAL INFORMATION (Non-mandatory)

<b>(a) Ecotoxicity (aquatic and terrestrial, where available)</b>	No known aquatic toxicity.
<b>(b) Persistence and degradability</b>	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.
<b>(c) Bioaccumulative potential</b>	No bioaccumulative potential.
<b>(d) Mobility in soil</b>	No mobility in soil.
<b>(e) Other adverse effects (such as hazardous to the ozone layer)</b>	No adverse effects of this material on the environment are anticipated.

## 13. DISPOSAL CONSIDERATIONS (Non-mandatory)

### WASTE MANAGEMENT

To prevent waste materials from becoming airborne during waste storage, transportation and disposal, a covered container or plastic bagging is recommended.

### DISPOSAL

This product, 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.

## 14. TRANSPORT INFORMATION (Non-mandatory)

<b>(a) UN number</b>	Not Applicable
<b>(b) UN proper shipping name</b>	Not Applicable
<b>(c) Transport hazard class(es)</b>	Not Applicable
<b>(d) Packing group, if applicable</b>	Not Applicable
<b>(e) Environmental hazards (e.g., Marine pollutant (Yes/No))</b>	Not a marine pollutant
<b>(f) Transport in bulk (according to Annex II of MARPOL 73/78 and the IBC Code)</b>	Not Applicable
<b>(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</b>	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 (Non-mandatory)

### UNITED STATES REGULATIONS

- EPA** **Superfund Amendments and Reauthorization Act (SARA)** Title III - this product does not contain any substances reportable under Sections 302, 304, 313, (40 CFR 372). Sections 311 and 312 (40 CFR 370) apply (delayed hazard).  
**Hazard Categories:** Immediate Hazard – No  
Delayed Hazard – Yes  
Fire Hazard – No  
Pressure Hazard – No  
Reactivity Hazard - No
- Toxic Substances Control Act (TSCA)** - RCF is not required to be listed on the TSCA inventory.
- Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)** and the **Clean Air Act (CAA)** - this product contains fibers with an average diameter greater than one micron and thus is not considered a hazardous air pollutant.
- 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.
- 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.

### INTERNATIONAL REGULATIONS

**Canada Canadian Workplace Hazardous Materials Information System (WHMIS)** – 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)

#### **Europe Integration of RCF into ANNEX XV of the REACH Regulation**

RCF is classified under the CLP (classification, labelling and packaging of substances and mixtures) regulation as a category 1B carcinogen. On January 13, 2010 the European Chemicals Agency (ECHA) updated the candidate list for authorization (Annex XV of the REACH regulation) and added 14 new substances in this list including aluminosilicate refractory ceramic fibers.

As a consequence, EU (European Union) or EEA (European Economic Area) suppliers of articles which contain aluminosilicate refractory ceramic fibers in a concentration above 0.1% (w/w) have to provide sufficient information, available to them, to their customers or upon requests to a consumer within 45 days of the receipt of the request. This information must ensure safe use of the article, and as minimum contains the name of the substance.

## 16. OTHER INFORMATION

In 2002, OSHA endorsed a five year voluntary product stewardship program called PSP 2002. On May 23, 2007, HTIW Coalition's predecessor, RCFC, and its member companies renewed this voluntary product stewardship agreement with OSHA. On April 16, 2012, HTIW Coalition renewed this agreement.

This new five year program, called PSP 2012, continues and builds upon the earlier programs. PSP 2012 is a highly acclaimed, multifaceted strategic risk management initiative designed specifically to reduce workplace exposures to refractory ceramic fiber (RCF). For more information regarding PSP 2012, please visit <http://www.htiwcoalition.org>

### **Hazardous Materials Identification System (HMIS) Hazard Rating**

HMIS Health 1\* (\* denotes potential for chronic effects)

HMIS Flammability 0

HMIS Reactivity 0

HMIS Personal Protective Equipment To be determined by user

### **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".

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 micrograms/cm<sup>2</sup> - by comparison, pure quartz or cristobalite were significantly active at much lower levels (circa 20 micrograms/cm<sup>2</sup>).

### **DEFINITIONS**

<b>ACGIH:</b>	American Conference of Governmental Industrial Hygienists
<b>ADR:</b>	Carriage of Dangerous Goods by Road (International Regulation)
<b>CAA:</b>	Clean Air Act
<b>CAS:</b>	Chemical Abstracts Service
<b>CERCLA:</b>	Comprehensive Environmental Response, Compensation and Liability Act
<b>DSL:</b>	Domestic Substances List
<b>EPA:</b>	Environmental Protection Agency
<b>EU:</b>	European Union
<b>f/cc:</b>	Fibers per cubic centimeter
<b>HEPA:</b>	High Efficiency Particulate Air

<b>HMIS:</b>	Hazardous Materials Identification System
<b>IARC:</b>	International Agency for Research on Cancer
<b>IATA:</b>	International Air Transport Association
<b>IMDG:</b>	International Maritime Dangerous Goods Code
<b>mg/m<sup>3</sup>:</b>	Milligrams per cubic meter of air
<b>mmpcf:</b>	Million particles per cubic meter
<b>NFPA:</b>	National Fire Protection Association
<b>NIOSH:</b>	National Institute for Occupational Safety and Health
<b>OSHA:</b>	Occupational Safety and Health Administration
<b>29 CFR 1910.134 &amp; 1926.103:</b>	OSHA Respiratory Protection Standards
<b>29 CFR 1910.1200 &amp; 1926.59:</b>	OSHA Hazard Communication Standards
<b>PEL:</b>	Permissible Exposure Limit (OSHA)
<b>PIN:</b>	Product Identification Number
<b>PNOC:</b>	Particulates Not Otherwise Classified
<b>PNOR:</b>	Particulates Not Otherwise Regulated
<b>PSP:</b>	Product Stewardship Program
<b>RCRA:</b>	Resource Conservation and Recovery Act
<b>REL:</b>	Recommended Exposure Limit (NIOSH)
<b>RID:</b>	Carriage of Dangerous Goods by Rail (International Regulations)
<b>SARA:</b>	Superfund Amendments and Reauthorization Act
<b>SARA Title III:</b>	Emergency Planning and Community Right to Know Act
<b>SARA Section 302:</b>	Extremely Hazardous Substances
<b>SARA Section 304:</b>	Emergency Release
<b>SARA Section 311:</b>	MSDS/List of Chemicals and Hazardous Inventory
<b>SARA Section 312:</b>	Emergency and Hazardous Inventory
<b>SARA Section 313:</b>	Toxic Chemicals and Release Reporting
<b>STEL:</b>	Short Term Exposure Limit
<b>SVF:</b>	Synthetic Vitreous Fiber
<b>TDG:</b>	Transportation of Dangerous Goods
<b>TLV:</b>	Threshold Limit Value (ACGIH)
<b>TSCA:</b>	Toxic Substances Control Act
<b>TWA:</b>	Time Weighted Average
<b>WHMIS:</b>	Workplace Hazardous Materials Information System (Canada)

**Revision Summary:** Updated SDS to align with OSHA HCS 2012. Replaces 06/06/2013 SDS.

**Revision Date:** 09/29/2014

## 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, Keystone Industries 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.