



SDS No. M0450

SAFETY DATA SHEET

Effective Date: 06/06/2013

1. IDENTIFICATION

Product Identifier: SILPLATE MASS 1500

Manufacturer/Supplier: Unifrax I LLC
2351 Whirlpool St.
Niagara Falls, NY 14305-2413

Product Stewardship Information Hotline
1-800-322-2293 (Monday - Friday 8:00 a.m. - 4:30 p.m. EST)

For additional SDSs, visit our web page, <http://www.unifrax.com> or call Unifrax Customer Service at (716) 278-3800

Emergency Phone Number: CHEMTREC will provide assistance for chemical emergencies. Call 1-800-424-9300

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

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.

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.

3. COMPOSITION / INFORMATION ON INGREDIENTS

COMPONENTS

Refractories, Fibers, Aluminosilicate*
Water
Silica (amorphous)
Ethylene glycol
Polyethylene oxide
Polycrystalline Wools (PCW)
CAS Name: basic aluminium chloride
reaction products with silica

CAS NUMBER

142844-00-6
7732-18-5
7631-86-9
107-21-1
25322-68-3
675106-31-7**

% BY WEIGHT

up to 40
20-30
25-30
3-5
1-2
1-2

***Synonyms:** RCF, ceramic fiber, synthetic vitreous fiber (SVF), man-made vitreous fiber (MMVF), man-made mineral fiber (MMMF), high temperature insulation wool (HTIW)

****PCW** can also be identified by a combination of CAS Numbers : 1344-28-1 (fibrous forms of Aluminium Oxide), 7631-86-9 (Silica, non-crystalline), or 1302-93-8 (Mullite).

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

4. FIRST AID MEASURES

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.

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

Suitable Extinguishing Media:

Use extinguishing media suitable for type of surrounding fire.

Hazardous Decomposition Products:

Thermal decomposition of binder from fires or from first heat of product may release smoke, carbon monoxide and carbon dioxide. 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.

Flammable Properties:

Non combustible

Special protective equipment and precautions for fire-fighters

Wear a NIOSH certified respirator together with other protective gear appropriate to the surrounding fire.

Unusual Fire and Explosion Hazard:

None

NFPA Unusual Hazards:

None

6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS

Minimize airborne dust. Compressed air or dry sweeping should not be used for cleaning. See Section 8 "Exposure Controls / Personal Protection" for exposure guidelines.

METHODS AND MATERIALS FOR CONTAINMENT AND CLEANING UP

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.

7. HANDLING AND STORAGE

PRECAUTIONS FOR SAFE HANDLING

Handle fiber carefully to minimize airborne dust. 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.

CONDITIONS FOR SAFE STORAGE

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

EMPTY CONTAINERS

Product packaging may contain residue. Do not reuse.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

EXPOSURE GUIDELINES

<u>Components</u>	<u>OSHA PEL</u>	<u>ACGIH TLV</u>	<u>MANUFACTURER REG</u>
Refractories, Fibers, Aluminosilicate	None established*	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 ³ / % SiO ₂ 5 mg/m ³ PEL (resp. fraction), 15 mg/m ³ PEL (total dust) as PNOR	10 mg/m ³ . PNOC -- 10 mg/m ³ (total dust), 3 mg/m ³ (respirable fraction)	None established None established
Polyethylene oxide	None established	None established	None established
Ethylene glycol	50 ppm (125 mg/m ³) C	50 ppm (127 mg/m ³) TLV-C (vapor and mist)	None established
Polycrystalline Wools (PCW)	None established	None established	See below***

*Except of in the state of California, 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/m³; Respirable Fraction 5 mg/m³. The PEL for RCF in California is 0.2 f/cc, 8-hr TWA.

**HTIW Coalition 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, HTIW Coalition 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).

***As with most industrial materials, it is prudent to minimize unnecessary exposure to respirable dusts. Note that industrial hygiene standards and occupational exposure limits differ between countries and local jurisdictions. Check with your employer to identify any "respirable dust", "total dust" or "fiber" exposure standards to follow in your area. If no regulatory dust or fiber control standard apply, a qualified industrial hygiene professional can assist with a specific evaluation of workplace conditions and the identification of appropriate respiratory protection practices. In the absence of other guidance, the supplier has found that it is generally feasible to control occupational fiber exposure to 0.5 f/cc or less.

OTHER OCCUPATIONAL EXPOSURE LEVELS (OEL)

RCF-related occupational exposure limits vary internationally. Regulatory OEL examples include: California – 0.2 f/cc; Canada – 0.2 to 1.0 f/cc, United Kingdom – 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.

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.

MANUFACTURER'S RESPIRATORY PROTECTION RECOMMENDATIONS WHEN HANDLING RCF PRODUCTS	
<u>Respirable Airborne Fiber Concentration</u> (levels are 8-hr. time-weighted averages)	<u>Respirator Recommendation</u> [†]
Not yet determined but expected to be below REG/PEL/OEL based on operation "Reliably" less than REG/PEL/OEL	A respirator with a filter efficiency of at least 95% See recommendation below for individual worker requests
Up to 10 times of REG/PEL/OEL	A single use respirator or half-face, air purifying respirator with a filter efficiency of at least 95%
Up to 50 times of REG/PEL/OEL	Full-facepiece, air purifying respirator equipped with a NIOSH certified particulate filter cartridge with a filter efficiency of at least 95% or PAPR
Greater than 50 times of REG/PEL/OEL	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 single use particulate respirator with a filter efficiency of at least 95%.

[†] 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. Higher filter efficiency means lower filter leakage. Other factors to consider are the NIOSH filter series N, R or P. (N) Not resistant to oil, (R) Resistant to oil and (P) oil Proof. These recommendations are 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

Appearance	Orange, putty like material	Upper/lower flammability or explosive limits	Not applicable
Odor	Odorless	Vapor pressure	Not applicable
Odor threshold	Not applicable	Vapor density	Not applicable
pH	Not applicable	Relative density	2.50 - 2.75 (fiber)
Melting point	1760° C (3200° F)	Solubility	Insoluble
Initial boiling point and boiling range	Not applicable	Partition coefficient: n-octanol/water	Not applicable
Flash point	Not applicable	Auto-ignition temperature	Not applicable
Evaporation rate	Not applicable	Decomposition temperature	Not applicable
Flammability	Not applicable	Viscosity	Not applicable

10. STABILITY AND REACTIVITY

REACTIVITY

CHEMICAL STABILITY:

Not Applicable.

POSSIBILITY OF HAZARDOUS REACTIONS:

Stable under conditions of normal use .

CONDITIONS TO AVOID:

Not Applicable.

INCOMPATIBLE MATERIALS:

None.

HAZARDOUS DECOMPOSITION PRODUCTS:

None known.

Thermal decomposition of binder from fires or from first heat of product may release smoke , carbon monoxide and carbon dioxide . 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

LIKELY ROUTES OF EXPOSURE:

Respiratory Tract (nose & throat), Eyes, Skin

SYMPTOMS RELATED TO THE PHYSICAL, CHEMICAL AND TOXICOLOGICAL CHARACTERISTICS:**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.

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.

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

In order to determine possible human health effects following RCF exposure, the University of Cincinnati in the United States and the Institute of Occupational Medicine (IOM) in Europe have conducted medical surveillance studies on RCF workers in U.S. and European manufacturing facilities. The University of Cincinnati study has been in progress for over 20-years, collecting data from respiratory questionnaires, lung function tests, chest X-rays, exposure monitoring, and worker mortality.

The results of this study of RCF plant workers exposed from 1953 to the present have shown (LeMasters *et al.*, 2003):

- No excess mortality related to all deaths, all cancers, or lung cancer
- No statistically significant increase in interstitial findings (fibrosis), and
- No mesotheliomas or increase in lung cancer

The initial cross-sectional spirometry studies in the U.S. (LeMasters *et al.* 1998) and Europe (Cowie *et al.* 2001) revealed lung function decrements in the RCF-exposed cohort that were associated with heavier historical exposures. Subsequently, longitudinal studies have revealed no RCF exposure related decrements in lung function associated with current exposure levels.

Through 1996, pleural plaques seen on chest X-rays in 2.7% of the workers. Pleural plaques are considered a marker of exposure and not disease. The prevalence of pleural plaques has remained relatively constant over time, perhaps as a result of lower current exposure levels.

Thus, this long term epidemiology study has demonstrated an absence of interstitial fibrosis, no increased mortality risk and no decrement in lung function associated with current exposures.

TOXICOLOGY

Early animal studies of RCF effects by intraperitoneal and intrapleural injections, as well as by inhalation, resulted in mostly negative results. In an effort to eliminate any questions posed by the results of these early studies, a definitive *Maximum Tolerated Dose Study* (MTD) by nose only, lifetime inhalation in rats and hamsters, was designed in the 1980s. The MTD study appeared to confirm that RCF was an animal carcinogen under certain test conditions, e.g., extremely high concentrations of approximately 200 f/cc inhaled directly into the lungs.

A later review of the MTD pathology indicated that the animals' lungs were likely "overloaded" because of large

quantities of non-fibrous particles, and that this overload condition was likely responsible for the disease observed . In fact, evaluation of the aerosol samples used confirmed the presence of significant quantities of particulate matter .

In a subsequent multi-dose animal inhalation study at 25 f/cc, 75 f/cc, and 115 f/cc; a *no observed effect level* (NOEL) was found at 25 f/cc. This level is 50 times the HTIW Coalition recommended exposure guideline (REG) of 0.5 f/cc for humans.

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 Annual Report on Carcinogens (latest edition), prepared by the **National Toxicology Program (NTP)**, classified respirable RCF as "reasonably anticipated" to be a carcinogen.

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

NOTE ON POLYCRYSTALLINE WOOLS (PCW) INGREDIENT:

Lifetime rat inhalation studies of polycrystalline fiber show that at the maximum dose level tested , there was no evidence of lung cancer, lung fibrosis or any other significant adverse effect . Intraperitoneal, intratracheal and intrapleural studies in rats, together with two in vitro tests, have all shown negative results . Despite some study limitations, it is important to note the consistent lack of carcinogenic response in animal studies .

In 1988, the International Agency for Research on Cancer (IARC) considered the carcinogenicity of several groups of fibers. One grouping they considered was a poorly defined collection of disparate fiber types [polycrystalline fiber, refractory ceramic fiber (referred to as RCF) and single crystal whiskers] into a broad, single category they termed "ceramic fibers". The IARC monograph clearly indicated that test data specific to polycrystalline fibers were negative , but according to the IARC classification principles , positive results with other fiber types led to the conclusion that all fibers in the group should be considered as possible human carcinogens (IARC Category 2B). In a subsequent monograph on MMVF (2002), IARC did not specifically re-evaluate polycrystalline fiber . The Annual Report on Carcinogens prepared by the National Toxicology Program (NTP), (latest edition) classified "ceramic fibers (respirable size)" as reasonably anticipated to be carcinogens .

As produced most polycrystalline fibers, including Saffil® and Fiberglass®, have fiber diameters too large to be respirable. Numerous scientific studies suggest that the potential toxicity of a respirable fiber is directly related to bio-persistence (the length of time it take for the fiber to clear the lung). Based on limited in-vitro laboratory analysis, which measure the dissolution rate of fibers in simulated lung fluid , polycrystalline fibers are known to be relatively durable.

Data from respiratory surveillance studies are not available for PCW workers . In a small cohort of workers exposed to PCW with historical co-exposures to RCF and other fibers, there was no evidence of interstitial lung disease on chest x-rays nor an accelerated rate of loss of lung function on pulmonary function testing . Symptom responses could not be attributed to or excluded from exposure to PCW as a consequence of the prior fiber exposures .

12. ECOLOGICAL INFORMATION

Ecotoxicity
Persistence and degradability
Bioaccumulative potential
Mobility in soil

Unlikely to be hazardous to aquatic life .
The product shows no evidence for biodegradability .
Low potential for bioaccumulation .
No mobility in soil .

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

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

Hazard Class:	Not Regulated	United Nations (UN) Number:	Not Applicable
Labels:	Not Applicable	North America (NA) Number:	Not Applicable
Placards:	Not 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) - RCF has been assigned a CAS number; however, it is an "article" under TSCA and therefore exempt from listing 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/ASW in to ANNEXE 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 and zirconia aluminosilicate refractory ceramic fibers.

As a consequence, EU (European Union) or EEA (European Economical Area) suppliers of articles which contain aluminosilicate refractory ceramic fibers and zirconia 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

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). 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. 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/cm² - by comparison, pure quartz or cristobalite were significantly active at much lower levels (circa 20 micrograms/cm²).

RCF AFTER-SERVICE REMOVAL

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

PRODUCT STEWARDSHIP PROGRAM

Unifrax has established a program to provide customers with up-to-date information regarding the proper use and handling of refractory ceramic fiber. In addition, Unifrax has also established a program to monitor airborne fiber concentrations at customer facilities. If you would like more information about this program, please call the Unifrax Product Stewardship Information Hotline at 1-800-322-2293.

In 2002, the Occupational Safety and Health Administration (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.

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, Unifrax I LLC 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.

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>

DEFINITIONS

ACGIH:	American Conference of Governmental Industrial Hygienists
ADR:	Carriage of Dangerous Goods by Road (International Regulation)
CAA:	Clean Air Act
CAS:	Chemical Abstracts Service
CERCLA:	Comprehensive Environmental Response, Compensation and Liability Act
DSL:	Domestic Substances List
EPA:	Environmental Protection Agency
EU:	European Union
f/cc:	Fibers per cubic centimeter
HEPA:	High Efficiency Particulate Air
HMIS:	Hazardous Materials Identification System
IARC:	International Agency for Research on Cancer
IATA:	International Air Transport Association
IMDG:	International Maritime Dangerous Goods Code
mg/m³:	Milligrams per cubic meter of air
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 1910.134 & 1926.103:	OSHA Respiratory Protection Standards
29 CFR 1910.1200 & 1926.59:	OSHA Hazard Communication Standards
PEL:	Permissible Exposure Limit (OSHA)
PIN:	Product Identification Number
PNOC:	Particulates Not Otherwise Classified
PNOR:	Particulates Not Otherwise Regulated
PSP:	Product Stewardship Program
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)

Revision Summary: European classification section updated

Revision Date: 06/06/2013

SDS Prepared By: UNIFRAX RISK MANAGEMENT DEPARTMENT

DISCLAIMER