



MM PyroFlex Fire Barrier

Expansion Joint System

The products listed below along with their corresponding Safety Data Sheets (SDS) are contained in this document.

- Floor Fire Barrier
- Wall Fire Barrier
- Underslab Fire Barrier

SAFETY DATA SHEET

1. IDENTIFICATION

PRODUCT NAME: PYRO-FLEX® BARRIER I – Blanket
Generic Name: Refractory Ceramic Fiber Product

(b) Other means of identification

FIBERS
FIBERFRAX® HIGH PURITY FIBERS: HP-ODB; Module Trim; MT-HP; HP-Chopped; H Bulk; Regular Bulk, Spun Bulk, Fiberfrax FPP Fiber.
FIBERFRAX® 6000 SERIES FIBERS: All bulk fibers from 6000-AAA to 6100-ZZZ, 6900-70A to 6900-99Z.
FIBERFRAX® 7000 SERIES FIBERS: 7000-AA to 7100-ZZ.
FIBERFRAX® MILLED FIBERS: EF-119; HP Ball Milled A; HP Ball Milled B; HP Ball Milled C/D
FIBERFRAX® HIGH INDEX FIBERS: W-657; W-707; W-758; HS-95C; MX-135-CW; MX-400-CW; HS-70; HS-70C.
FIBERFRAX® HSA™ FIBERS: HSA-K; HSA-HP.
FIBERFRAX® KAOLIN FIBERS: K-Chopped; KMTX; MT; MTX; MT-T; MX-150.

BLANKETS
Durablanket® AC; Durablanket® HP; Durablanket® HP-S; Durablanket® S; Durablanket® Strip; Tank Car Insulation; TCB; QSB600; QSB800; FIBERMAT®; LO-CON™ BLANKET, Fiberfrax® SP Mat

PAPERS
FIBERFRAX® BINDERLESS PAPERS: 972-AH; 972-FH; 972-JH; 882-FH; 882-JH; HSA-F without binder; HSA-J without binder.

(c) Recommended use of the chemical and restrictions on use

- **Primary Use:** Refractory Ceramic Fiber (RCF) materials are used primarily in industrial high temperature insulating applications. Examples include heat shields, heat containment, gaskets, expansion joints, industrial furnaces, ovens, kilns, boilers and other process equipment at applications up to 1400°C. RCF based products are not intended for direct sale to the general public. While RCFs are used in the manufacture of some consumer products, such as catalytic converter mats and wood burning stoves, the materials are contained, encapsulated, or bonded within the units.
- **Secondary Use:** Conversion into wet and dry mixtures and articles (refer to section 8).
- **Tertiary Use:** Installation, removal (industrial and professional) / Maintenance and service life (industrial and professional) (refer to section 8).

Uses Advised Against
Spraying of dry product

CONTACT: MM Systems Corporation
50 MM Way, P.O. Box 98

Toll Free Domestic: 800-241-3460
International: 1-706-824-7500

For Chemical Emergency
Spill, Leak, Fire, Exposure, or Accident
Call CHEMTREC Day or Night

Within USA and Canada:
Outside USA and Canada:

800-424-9300
+1-703-527-3887
Collect Calls Accepted

(e) **Emergency Phone Number:**

CHEMTREC will provide assistance for chemical emergencies. Call **1-800-424-9300**

2. HAZARDS IDENTIFICATION

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

The U.S. Occupational Safety and Health Administration (OSHA) Hazard Communication Standard (HCS) 2012 indicates that IARC Group 2B corresponds to OSHA HCS 2012 Category 2 carcinogen classification (see, e.g., §1910.1200, Appendix F, Part D).

(b) Signal word, hazard statement(s), symbol(s) and precautionary statement(s) in accordance with paragraph (f) of §1910.1200

Under OSHA HCS 2012, RCF is classified as a category 2 carcinogen.

Hazard Pictogram



Signal Word

Warning

Hazard Statements

Suspected of causing cancer by inhalation.

Precautionary statements

Do not handle until all safety instructions have been read and understood.
Use respiratory protection as required; see section 8 of the Safety Data Sheet.
If concerned about exposure, get medical advice.
Store in a manner to minimize airborne dust.
Dispose of waste in accordance with local, state and federal regulations.

Supplementary Information

May cause temporary mechanical irritation to exposed eyes, skin or respiratory tract.
Minimize exposure to airborne dust.

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

Mild mechanical irritation to skin, eyes and upper respiratory system may result from exposure.
These effects are usually temporary.

(d) Mixture rule

Not applicable.

3. COMPOSITION / INFORMATION ON INGREDIENTS

(a) Chemical and (b) Common Name
Refractories, Fibers, Aluminosilicate

(c) CAS Number
142844-00-6

% BY WEIGHT
100

***Synonyms:** RCF, ceramic fiber, Alumino Silicate Wool (ASW), synthetic vitreous fiber (SVF), man-made vitreous fiber

(MMVF), man-made mineral fiber (MMMMF), high temperature insulation wool (HTIW)

(d) Impurities and stabilizing additives

Not applicable.

4. FIRST AID MEASURES

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

SKIN

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

EYES

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

NOSE AND THROAT

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

(b) Most important symptoms/effects, acute and delayed

Mild mechanical irritation to skin, eyes and upper respiratory system may result from exposure. These effects are usually temporary.

(c) Indication of immediate medical attention and special treatment needed, if necessary

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

Use extinguishing agent suitable for surrounding combustible materials.

(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.

(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 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.

7. HANDLING AND STORAGE

(a) Precautions for safe handling

Handle fiber carefully to minimize airborne dust. Limit use of power tools unless in conjunction with local exhaust ventilation. Use hand tools whenever possible.

(b) Conditions for safe storage, including any incompatibilities

Store in a manner to minimize airborne dust.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

(a) 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>
Refractory Ceramic Fiber (RCF)	None established*	0.5 f/cc, 8-hr. TWA	0.2 f/cc TLV, 8-hr. TWA	0.5 f/cc, 8-hr. TWA**

*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/m³; Respirable Fraction 5 mg/m³.

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

OTHER OCCUPATIONAL EXPOSURE LEVELS (OEL)

RCF-related occupational exposure limits vary internationally. Regulatory OEL examples include: California, 0.2 f/cc; Canadian provincial OELs ranging 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 personal protective equipment (e.g gloves), as necessary to prevent skin irritation. Washable or disposable clothing may be used. If possible, do not take unwashed clothing home. If soiled work clothing must be taken home, employees should be informed on best practices to minimize non-work dust exposure (e.g., vacuum clothes before leaving the work area, wash work clothing separately, and rinse washer before washing other household clothes).

Eye Protection

As necessary, wear goggles or safety glasses with side shields.

Respiratory Protection

When engineering and/or administrative controls are insufficient to maintain workplace 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 manmade mineral fibers. Pursuant to NIOSH recommendations, N-95 respirators are appropriate for exposures up to 10 times the NIOSH Recommended Exposure Limit (REL). With respect to RCF, both the NIOSH REL and the industry REG have been set at 0.5 fibers per cubic centimeter of air (f/cm³). Accordingly, N-95 would provide the necessary protection for exposures up to 5 f/cm³. Further, the Respirator Selection Guide published by 3M Corporation, the primary respirator manufacturer, specifically recommends use of N-95 respirators for RCF exposures. In cases where exposures are known to be above 5.0 f/cm³, 8 hour TWA, a filter efficiency of 100% should be used. 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.

The evaluation of workplace hazards and the identification of appropriate respiratory protection is best performed, on a case by case basis, by a qualified Industrial Hygienist.

Other Information

- 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.

9. PHYSICAL AND CHEMICAL PROPERTIES

(a) Appearance	White, fibrous wool	(j) Upper/lower flammability or explosive limits	Not applicable
(b) Odor	Odorless	(k) Vapor pressure	Not applicable
(c) Odor threshold	Not applicable	(l) Vapor density	Not applicable
(d) pH	Not applicable	(m) Relative density	2.50 – 2.75
(e) Melting point	1760° C (3200° F)	(n) Solubility	Insoluble

(f) Initial boiling point and boiling range	Not applicable	(o) Partition coefficient: n-octanol/water	Not applicable
(g) Flash point	Not applicable	(p) Auto-ignition temperature	Not applicable
(h) Evaporation rate	Not applicable	(q) Decomposition temperature	Not applicable
(i) Flammability	Not applicable	(r) Viscosity	Not applicable

10. STABILITY AND REACTIVITY

(a) Reactivity	RCF is non-reactive.
(b) Chemical stability	As supplied RCF is stable and inert.
(c) Possibility of hazardous reactions	None
(d) Conditions to avoid	Please refer to handling and storage advice in Section 7
(e) Incompatible materials	None
(f) Hazardous decomposition products	None.

11. TOXICOLOGICAL INFORMATION

For more details on scientific publications referenced in this SDS see <http://www.htiwcoalition.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/m³, 9 mg/m³ and 16 mg/m³
Routes of administration: Nose only inhalation
Results: Fibrosis just reached significant levels at 16 and 9 mg/m³ but not at 3 mg/m³. 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/m³

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/m³

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/m³ (25% of non fibrous particles)

RCF1a: 125 F/ml and 26 mg/m³ (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)

(a) Ecotoxicity (aquatic and terrestrial, where available)	No known aquatic toxicity.
(b) Persistence and degradability	These products are insoluble materials that remain stable over time and are chemically identical to inorganic compounds found in the soil and sediment; they remain inert in the natural environment.

(c) Bioaccumulative potential	No bioaccumulative potential.
(d) Mobility in soil	No mobility in soil.
(e) Other adverse effects (such as hazardous to the ozone layer)	No adverse effects of this material on the environment are anticipated.

13. DISPOSAL CONSIDERATIONS (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)

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

Canadian TDG Hazard Class & PIN: Not regulated

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

15. REGULATORY INFORMATION (Non-mandatory)

UNITED STATES REGULATIONS

EPA	<p>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).</p> <p>Hazard Categories: Immediate Hazard – No Delayed Hazard – Yes Fire Hazard – No Pressure Hazard – No Reactivity Hazard - No</p> <p>Toxic Substances Control Act (TSCA) - RCF is not required to be listed on the TSCA inventory.</p> <p>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</p>
OSHA	<p>Comply with Hazard Communication Standards 29 CFR 1910.1200 and 29 CFR 1926.59</p>

California	and the Respiratory Protection Standards 29 CFR 1910.134 and 29 CFR 1926.103. "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

Product Stewardship Program

Unifrax I LLC 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 Product Stewardship Information Hotline at 1-800-322-2293.

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

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: Updated SDS to align with OSHA HCS 2012. Replaces 09/24/2014 SDS.
Revision Date: 02/12/2015

SDS Prepared By: UNIFRAX RISK MANAGEMENT DEPARTMENT

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, 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.

SAFETY DATA SHEET

SECTION 1: IDENTIFICATION

1.1. Product Identifier

Product Form: PYRO-FLEX® BARRIER II - 300

Product Name: FIBER GLASS

Synonyms: Texturized fiberglass products

1.2. Intended Use of the Product

Use of the Substance/Mixture: No use is specified

1.3. Name, Address, and Telephone of the Responsible Party

CONTACT: MM Systems Corporation
50 MM Way, P.O. Box 98

Toll Free Domestic: 800-241-3460
International: 1-706-824-7500

For Chemical Emergency

Spill, Leak, Fire, Exposure, or Accident
Call CHEMTREC Day or Night

Within USA and Canada:

Outside USA and Canada:

800-424-9300

+1-703-527-3887

Collect Calls Accepted

SECTION 2: HAZARDS IDENTIFICATION

2.1. Classification of the Substance or Mixture

GHS-US Classification

Not classified

2.2. Label Elements

GHS-US Labeling

No labeling applicable

2.3. Other Hazards

The following applies to the product if it is cut, sanded or altered in such a way that excessive and/or significant particulates and/or dusts may be generated: Dust may cause mechanical irritation to eyes, nose, throat, and lungs.

2.4. Unknown Acute Toxicity (GHS-US)

No data available

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substance

Not applicable

3.2. Mixture

Name	Product Identifier	%
Glass, oxide, chemicals	(CAS No) 65997-17-3	98 - 100
Size	(CAS No) Proprietary	0-2

Within the meaning of the OSHA Hazard Communication Standard [29 CFR 1910.1200]: this mixture is not considered a hazard when used in a manner which is consistent with the labeled directions. This mixture is considered an article in its final form.

SECTION 4: FIRST-AID MEASURES

4.1. Description of First-aid Measures

First-aid Measures General: The need for first aid is not anticipated under normal conditions of use.

First-aid Measures After Inhalation: Not expected to be a primary route of exposure. For particulates, dust, or fumes from processing: move to fresh air.

First-aid Measures After Skin Contact: Gently wash with plenty of soap and water. Not expected to present a significant dermal hazard under anticipated conditions of normal use.

First-aid Measures After Eye Contact: No health effects expected. If irritation does occur, flush with lukewarm, gently flowing water for 5 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Obtain medical attention if irritation develops or persists.

First-aid Measures After Ingestion: Ingestion is unlikely. If it does occur, watch the person for several days to make sure that intestinal blockage does not occur.

4.2. Most Important Symptoms and Effects Both Acute and Delayed

Symptoms/Injuries: Not expected to present a significant hazard under anticipated conditions of normal use.

Symptoms/Injuries After Inhalation: Prolonged contact with large amounts of dust may cause mechanical irritation.

Symptoms/Injuries After Skin Contact: Direct contact may cause irritation by mechanical abrasion.

Symptoms/Injuries After Eye Contact: May cause mechanical eye irritation.

Symptoms/Injuries After Ingestion: Not expected to be a primary route of exposure. May cause gastro-intestinal blockage if swallowed.

Chronic Symptoms: There are no known health effects from the long term use or contact with non-respirable continuous filament fibers, which is the type of fiberglass that is used. Non-respirable fibers cannot reach the deep lung because they have a diameter of greater than 3.5 micrometers. Fibers of this diameter cannot penetrate the narrow, bending passages of the human respiratory tract to reach the lower regions of the lung, and thus have no possibility of causing serious pulmonary damage. They deposit on the surfaces of the upper respiratory tract, nose, or pharynx. These fibers are then cleared through normal physiological mechanisms.

4.3. Indication of Any Immediate Medical Attention and Special Treatment Needed

If medical advice is needed, have product container or label at hand.

SECTION 5: FIRE-FIGHTING MEASURES

5.1. Extinguishing Media

Suitable Extinguishing Media: Use extinguishing media appropriate for surrounding fire.

Unsuitable Extinguishing Media: None known.

5.2. Special Hazards Arising From the Substance or Mixture

Fire Hazard: Product is not flammable.

Explosion Hazard: Product is not explosive.

Reactivity: Hazardous reactions will not occur under normal conditions.

5.3. Advice for Firefighters

Precautionary Measures Fire: Exercise caution when fighting any fire.

Firefighting Instructions: Use firefighting measures appropriate for the surrounding fire.

Protection During Firefighting: Do not enter fire area without proper protective equipment, including respiratory protection.

Hazardous Combustion Products: Carbon oxides (CO, CO₂), hydrogen and water.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal Precautions, Protective Equipment and Emergency Procedures

General Measures: Accidental release of the product does not present a hazard under normal conditions of use.

6.1.1. For Non-Emergency Personnel

Protective Equipment: Use of personal protective equipment (PPE) is not generally required but should be evaluated based on the extent and severity of accidental release.

Emergency Procedures: Evacuate the area if accidental release presents a significant hazard.

6.1.2. For Emergency Personnel

Protective Equipment: Equip cleanup crew with proper protection as conditions warrant.

Emergency Procedures: Upon arrival at the scene a first responder is expected to protect oneself and the public, secure the area, and call for the assistance of trained personnel as conditions permit.

6.2. Environmental Precautions

The product does not pose a significant hazard to the environment.

6.3. Methods and Materials for Containment and Cleaning Up

For Containment: Contain the product and collect as any solid.

Methods for Cleaning Up: Clean up accidental release immediately and dispose of waste safely. Recover the product by vacuuming, shoveling or sweeping as conditions permit.

6.4. Reference to Other Sections

See Section 8 for advice on personal protective equipment and Section 13 for disposal considerations.

SECTION 7: HANDLING AND STORAGE

7.1. Precautions for Safe Handling

Additional Hazards When Processed: Further processing of the product requires an evaluation of potential hazards based upon intended use.

Precautions for Safe Handling: There are no specific precautions necessary for safe handling of the product.

Hygiene Measures: Handle in accordance with good industrial hygiene and safety procedures.

7.2. Conditions for Safe Storage, Including Any Incompatibilities

Technical Measures: No technical measures are necessary for storage of the product.

Storage Conditions: No specific conditions are required for storage of the product.

Incompatible Products: None known.

7.3. Specific End Use(s)

No use is specified

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control Parameters

For substances listed in section 3 that are not listed here, there are no established exposure limits from the manufacturer, supplier, importer, or the appropriate advisory agency including: ACGIH (TLV), AIHA (WEEL), NIOSH (REL), or OSHA (PEL).

Glass, oxide, chemicals (65997-17-3)		
USA NIOSH	NIOSH REL (TWA) (mg/m ³)	3 fibers/cm ³ (fibers ≤3.5 μm in diameter & ≥10μm in length), TWA 5mg/m ³ (total)
USA OSHA	OSHA PEL (TWA) (mg/m ³)	15 mg/m ³ total dust, 5 mg/m ³ , respirable fraction 8 hr

8.2. Exposure Controls

Appropriate Engineering Controls

: Engineering controls are not required for normal use of this product.

Personal Protective Equipment

: Personal protective equipment is not generally required but should be evaluated based on conditions of use.

Respiratory Protection

: When manufacturing or handling product in large quantities and dusts or particulates may be generated, maintain airborne concentrations below recommended limits. Workplace risk assessments should be completed before specifying and implementing respirator usage. NIOSH/MSHA approved respirators for protection should be used if found to be necessary.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on Basic Physical and Chemical Properties

Physical State	: Solid
Appearance	: White woven base fabric
Odor	: None
Odor Threshold	: No data available
pH	: Not applicable
Evaporation Rate	: Not applicable
Melting Point	: > 1500 °F (> 815.56 °C)
Freezing Point	: Not applicable
Boiling Point	: Not applicable
Flash Point	: No data available
Auto-ignition Temperature	: No data available
Decomposition Temperature	: No data available
Flammability (solid, gas)	: No data available
Vapor Pressure	: Not applicable
Relative Vapor Density at 20°C	: Not applicable
Relative Density	: No data available
Specific Gravity	: 2.6
Solubility	: Insoluble
Partition Coefficient: N-Octanol/Water	: Not applicable
Viscosity	: Not applicable

9.2. Other Information

No additional information available

SECTION 10: STABILITY AND REACTIVITY

- 10.1. Reactivity:** Hazardous reactions will not occur under normal conditions.
- 10.2. Chemical Stability:** Stable under recommended handling and storage conditions.
- 10.3. Possibility of Hazardous Reactions:** Hazardous polymerization will not occur.
- 10.4. Conditions to Avoid:** None known.
- 10.5. Incompatible Materials:** None known.
- 10.6. Hazardous Decomposition Products:** Sizing may decompose in a fire. See Section 5 of SDS for information on hazardous combustion products.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1. Information on Toxicological Effects

- Acute Toxicity:** Not classified
- Skin Corrosion/Irritation:** Not classified
- Serious Eye Damage/Irritation:** Not classified

Respiratory or Skin Sensitization: Not classified

Germ Cell Mutagenicity: Not classified

Carcinogenicity: Not classified. (There are no known health effects from the long term use or contact with non-respirable continuous filament fibers, which is the type of fiberglass that is used. Non-respirable fibers cannot reach the deep lung because they have a diameter of greater than 3.5 micrometers. Fibers of this diameter cannot penetrate the narrow, bending passages of the human respiratory tract to reach the lower regions of the lung, and thus have no possibility of causing serious pulmonary damage. They deposit on the surfaces of the upper respiratory tract, nose, or pharynx. These fibers are then cleared through normal physiological mechanisms)

Glass, oxide, chemicals (65997-17-3)	
IARC group	2B

Reproductive Toxicity: Not classified

Specific Target Organ Toxicity (Single Exposure): Not classified

Specific Target Organ Toxicity (Repeated Exposure): Not classified

Aspiration Hazard: Not classified

Symptoms/Injuries After Inhalation: Prolonged contact with large amounts of dust may cause mechanical irritation.

Symptoms/Injuries After Skin Contact: Direct contact may cause irritation by mechanical abrasion.

Symptoms/Injuries After Eye Contact: May cause mechanical eye irritation.

Symptoms/Injuries After Ingestion: Not expected to be a primary route of exposure. May cause gastro-intestinal blockage if swallowed.

Chronic Symptoms: There are no known health effects from the long term use or contact with non-respirable continuous filament fibers, which is the type of fiberglass that is used. Non-respirable fibers cannot reach the deep lung because they have a diameter of greater than 3.5 micrometers. Fibers of this diameter cannot penetrate the narrow, bending passages of the human respiratory tract to reach the lower regions of the lung, and thus have no possibility of causing serious pulmonary damage. They deposit on the surfaces of the upper respiratory tract, nose, or pharynx. These fibers are then cleared through normal physiological mechanisms.

SECTION 12: ECOLOGICAL INFORMATION

12.1. Toxicity

Ecology - General : Not classified.

12.2. Persistence and Degradability

Zetex® Untreated Products	
Persistence and Degradability	Not established.

12.3. Bioaccumulative Potential

Zetex® Untreated Products	
Bioaccumulative Potential	Not established.

12.4. Mobility in Soil No additional information available

12.5. Other Adverse Effects

Other Information : Avoid release to the environment.

SECTION 13: DISPOSAL CONSIDERATIONS

13.1. Waste Treatment Methods

Waste Disposal Recommendations: Dispose in a safe manner in accordance with local, regional, national, and international regulations.

SECTION 14: TRANSPORT INFORMATION

The shipping description(s) stated herein were prepared in accordance with certain assumptions at the time the SDS was authored, and can vary based on a number of variables that may or may not have been known at the time the SDS was issued.

14.1. In Accordance with DOT Not regulated for transport

14.2. In Accordance with IMDG Not regulated for transport

14.3. In Accordance with IATA Not regulated for transport

SECTION 15: REGULATORY INFORMATION

15.1. US Federal Regulations

Glass, oxide, chemicals (65997-17-3)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	

15.2. US State Regulations Neither this product nor its chemical components appear on any US state lists.

SECTION 16: OTHER INFORMATION, INCLUDING DATE OF PREPARATION OR LAST REVISION

Revision Date : 10/18/2016
Other Information : This document has been prepared in accordance with the SDS requirements of the OSHA Hazard Communication Standard 29 CFR 1910.1200

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.

SDS US (GHS HazCom)

SAFETY DATA SHEET

SECTION I - PRODUCTION IDENTIFICATION

PRODUCT NAME: **PYRO-FLEX® BARRIER III – Silica Mat Z**
GENERIC NAME: Silica Mat Z

CONTACT: MM Systems Corporation
50 MM Way, P.O. Box 98

Toll Free Domestic: 800-241-3460
International: 1-706-824-7500

For Chemical Emergency
Spill, Leak, Fire, Exposure, or Accident
Call CHEMTREC Day or Night

Within USA and Canada: **800-424-9300**
Outside USA and Canada: **+1-703-527-3887**
Collect Calls Accepted

SECTION II - INGREDIENTS

The above products are considered "articles" according to OSHA hazard Communication Standard 29 CFR 1910.1200 and, as such, are exempt from the Material Safety Data Sheet provisions of 29 CFR 1910.1200(G)(6). As a service to the customer, Newtex Industries Inc. has prepared this Material Safety Data Sheet to provide appropriate safety and handling information. These products are considered non-hazardous when used according to accepted practices for the intended use.

<u>COMMON NAME:</u>	<u>CHEMICAL NAME:</u>	<u>CAS No.</u>	<u>WT.%</u>
Silica Fibers			99-100%
- SiO ₂			>94%
- Al ₂ O ₃			5%
Vermiculite Coating			<1%

SECTION III - HAZARD IDENTIFICATION

Emergency Overview

No unusual conditions are expected from this product.
Fiberglass may cause mechanical irritation to
the skin, eye, and upper respiratory tract.

PRIMARY ROUTES OF ENTRY:

Inhalation: No effects are known to be associated with the inhalation of vapors from this material. Breathing dusts and fibers may cause short-term mechanical irritation of the nose, throat and upper respiratory tract.

- Skin: Short contact with human skin is not likely to produce skin irritation. Repeated prolonged contact can induce mild irritation. This product is not likely to be absorbed through human skin.
- Eyes: May cause a physical irritation to the eye.
- Ingestion: Although not likely to occur in industrial applications, accidental ingestion may cause irritation of the mouth and gastrointestinal tract.

CHRONIC HEALTH EFFECTS:

There is no known chronic health effects associated with long term use or contact with this product. As manufactured, Z-SIL AR PRODUCTS are Non-respirable. Non-respirable fibers cannot reach the deep lung, because they have a diameter of greater than 3.5 microns. Fibers of this diameter cannot penetrate the narrow, bending passages of the human respiratory tract to reach the lower regions of the lung and thus, have no possibility of causing serious pulmonary damage. Instead they are deposited on the surface of the upper respiratory tract, nose, or pharynx. These fibers are then cleared through normal physiological mechanisms. Chopped, crushed or severely mechanically processed fiberglass may contain a very small amount of respirable fibers that could reach the deep lung. There is not an established threshold limit (TLV) that is directly applicable to Z-SIL AR PRODUCTS. Chemically, Z-SIL AR PRODUCTS are composed of amorphous silica with trace elements of aluminum, titanium and iron. The products are all continuous filament materials.

CARCINOGENICITY:

This product is not known as a carcinogen.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE:

Respiratory or skin conditions that are aggravated by mechanical irritants may be at an increased risk for worsening from exposure to this product.

SECTION IV – FIRST AID

- INHALATION: Move the person to fresh air. Seek medical attention if irritation persists.
- SKIN: Wash any material off skin with mild soap and cool water. Do not rub or scratch irritated areas. This may force fibers into the skin. Seek medical attention if irritation persists.
- EYES: Flush with water for at least 15 minutes. Seek medical attention if irritation persists.
- INGESTION: Not expected to occur. Should ingestion take place, the person should be watched for several days to ensure intestinal blockage does not occur.

SECTION V - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (METHOD USED):	N/A
FLAMMABLE LIMIT:	LEL: N/A UEL: N/A
AUTO IGNITION TEMPERATURE:	N/A
UNUSUAL FIRE AND EXPLOSIVE HAZARDS:	None
EXTINGUISHING MEDIA:	Silica will not support combustion. In a sustained fire use an extinguisher appropriate for surrounding fire.
SPECIAL FIRE FIGHTING PROCEDURES:	Silica itself will not support combustion, but in a sustained fire, proper protection against products of combustion for the fuel and the sizing must be worn. Use self-contained breathing apparatus (SCBA) and full bunker turnout gear in a sustained fire.
HAZARDOUS COMBUSTION PRODUCTS:	In a sustained fire, the organic binders will decompose, releasing minor quantities of decomposition products believed to be insufficient to be harmful.

SECTION VI - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:

<u>Land Spill:</u>	Material is a solid. Pick up the larger pieces and wet sweep or vacuum up any scrapes. Place in a suitable container for disposal as a non-hazardous waste.
<u>Water Spill:</u>	This material will sink and disperse along the bottom of waterways and ponds. Large pieces should be removed and placed in a suitable container for disposal. Smaller pieces cannot be easily removed after it is waterborne; however, the material is non-hazardous in water.
<u>Air Release:</u>	The material will settle out of the air where it can be cleaned as a land spill.

SECTION VII – HANDLING AND STORAGE

PRECAUTIONS TO BE TAKEN IN HANDLING:	For maximum comfort, avoid excessive contact with skin and use good personal hygiene.
OTHER PRECAUTIONS:	If excessive dust is generated, use a respirator approved by NIOSH for dust. This material is not

an electrical conductor and may accumulate static charge.

STORAGE TEMPERATURE: N/A

STORAGE PRESSURE: N/A

GENERAL: No special storage procedures are required for this material.

SECTION VIII – EXPOSURE CONTROL/ PERSONAL PROTECTION

EXPOSURE LIMITS:

<u>COMMON NAME:</u>	<u>OSHA PEL</u> 8-hr TWA	<u>ACGIH TLV</u> 8-hr TWA
Silica Fibers		
- Amorphous Silica	Not Established	10 mg/m ³
- Total Dust	15 mg/m ³	10 mg/m ³
- Respirable Dust	5 mg/m ³	Not Established
Vermiculite Coating	Not Listed	Not Listed
Size	None Established	None Established

OSHA = Occupational Safety and Health Administration

ACGIH = American Conference of Governmental Industrial Hygienists

PEL = Permissible Exposure Limits

TLV = Threshold Limit Value

PNOC = Particles Not Otherwise Classified

As manufactured the continuous filament silica in this product is not respirable. Continuous filament glass products that are chopped, crushed or severely mechanically processed during manufacturing or use may contain a very small amount of respirable particulate, some of which may be glass shards.

VENTILATION: Use local exhaust or general room dilution to maintain employee exposures below occupational exposure limits.

LOCAL EXHAUST: Is not necessary. Use if required to keep employees exposure below occupational exposure limits during use or manufacturing.

SPECIAL: Z-SIL Products will partially transform to a cristabolite structure when subjected to steady state temperatures above 1850 F. In the event that the Z-SIL Products are subjected to continuous temperatures exceeding 1850 F, appropriate caution should be exercised.

AFTER-SERVICE FIBERS/CRISTABOLITE

CONCENTRATION

RESPIRATOR

Up to 5 fibers/cc or Up to 0.5 mg/m³ respirable cristabolite

Half-face, air-purifying respirator with high-efficiency particulate air (HEPA) filter cartridges

5-25 fibers/cc or 0.5-2.5 mg/m³ respirable cristabolite

Full-face air-purifying respirator equipped with high-efficiency particulate air (HEPA) filter cartridges or powered air-purifying respirator (PAPR) equipped with HEPA filter cartridges

Greater than: 25 fibers/cc or 2.5 mg/m³ respirable cristabolite

Full-face positive pressure supplied air respirator

MECHANICAL: None
OTHER: None

RESPIRATORY PROTECTION: If the use or manufacturing of this product generates high dust levels, the level of glass fibers in the air exceeds the occupational exposure limits or if irritation occurs use a properly fitted NIOSH/MSHA approved disposable respirator such as 3M model 8210 (or 3M model 8271 in high humidity environments). Always use a respirator in accordance with your company's respiratory protection program, local regulations, and OSHA regulation 29CFR1910.134.

PROTECTIVE GLOVES: Not required, but gloves and barrier creams can be used to protect against mechanical irritation of the hands.

EYE PROTECTION: As generally good practice, safety glasses with side shields should be worn.

OTHER PROTECTIVE CLOTHING OR EQUIPMENT: None required. Good personal hygiene, barrier creams, caps, coveralls, loose fitting long sleeve shirt that covers to the base of the neck and long pants will maximize comfort. Skin irritation is known to occur chiefly at pressure points such as around the neck, wrist, waist, and between fingers.

WORK HYGIENIC PRACTICES: Handle using good industrial hygiene and safety practices. Wash thoroughly with mild soap and cool water after handling of the material. Remove material from clothing using vacuum equipment (never used compressed air). Always wash work cloths separately from other clothing. Wipe out washer or sink to prevent loose glass fibers from getting on other clothing. Keep the work area clean of dusts and fibers released during processing or fabrication. Use vacuum equipment to clean up product. Avoid dry sweeping or using compressed air as these

techniques re-suspend dusts and fibers into the air. Have access to a shower and eye wash station.

SECTION IX - PHYSICAL DATA

BOILING POINT:	Not Applicable
MELTING POINT:	Not Applicable
FREEZING POINT:	Not Applicable
SPECIFIC GRAVITY RANGE (H ₂ O=1):	2.1
pH:	Not Applicable
VISCOSITY:	Not Applicable
SOLUBILITY IN WATER:	Insoluble
PERCENT VOLATILE BY VOLUME:	None
VAPOR DENSITY (Air=1):	Not Applicable
VAPOR PRESSURE (mm Hg):	Not Applicable
EVAPORATION RATE (Butyl Acetate=1):	Not Applicable
PHYSICAL STATE:	Solid
APPEARANCE AND ODOR:	Off-white yarns woven together into a fabric with no significant odor.

SECTION X - REACTIVITY DATA

STABILITY:	Stable
CONDITIONS TO AVOID:	See INCOMPATIBILITY
INCOMPATIBILITY:	Z-SIL AR PRODUCTS are not compatible with basic phosphates, hydrofluoric acids, some oxides and hydroxides; especially at elevated temperature

HAZARDOUS DECOMPOSITION OR BYPRODUCTS:

In a sustained fire, the binders will decompose releasing minor quantities of decomposition products believed to be insufficient to be harmful.

HAZARDOUS POLYMERIZATION: Will not occur

SECTION XI - TOXICOLOGICAL INFORMATION

CARCINOGENICITY: The table below indicates whether or not each agency has listed each ingredient as a carcinogen.

<u>INGREDIENT</u>	<u>ACGIH</u>	<u>IARC</u>	<u>NTP</u>	<u>OSHA</u>	<u>97/69/EC</u>
Silica Fibers	No	No	No	No	No
Vermiculite Coating	Yes	No	Yes	Yes	No
Size	No	No	No	No	No

ACGIH: A4 Not Classifiable as a Human Carcinogen
IARC: 3 Not Classifiable with respect to Human Carcinogenicity

Z-SIL Products will partially transform to a cristabolite structure, a crystalline form of silica when subjected to steady state temperatures above 1850 F. In the event that the Z-SIL Products are subjected to continuous temperatures exceeding 1850 F, appropriate caution should be exercised. The OSHA PEL for cristobalite is 0.05 mg/m³ (respirable).

SECTION XII - ECOLOGICAL INFORMATION

This material is not expected to cause harm to animals, plants or fish. No Special precautions are needed in case of a release or spill.

SECTION XIII – DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD: Waste material must be disposed of in accordance with federal, state, provincial and local environmental control regulations. Dispose of as any other innocuous material. Product is not a hazardous waste under RCRA 40 CFR 261.

SECTION XIV - TRANSPORTATION INFORMATION

DOT SHIPPING NAMES:	Not regulated
HAZARD CLASS OR DIVISION:	None
SECONDARY:	None
IDENTIFICATION NUMBER:	None
PACKING GROUP:	None
LABEL(S) REQUIRED (if not excepted):	None
SPECIAL PROVISIONS:	None
PACKAGE EXCEPTIONS:	None
NON-BULK PACKAGING:	None
BULK PACKAGING:	None
EPA HAZARDOUS SUBSTANCES:	None
REPORTABLE QUANTITY:	Not Applicable
QUANTITY LIMITATIONS:	
PASSENGER AIRCRAFT:	None
CARGO AIRCRAFT:	None
MARINE POLLUTANTS:	None
FREIGHT DESCRIPTION:	None
HAZARDOUS MATERIAL SHIPPING DESCRIPTION:	None

TRANSPORTATION OF DANGEROUS GOODS – CANADA

DOT SHIPPING NAMES:	Not regulated
TDG HAZARD CLASSIFICATION	
PRIMARY:	None
SECONDARY:	None
IMO CLASSIFICATION:	None
ICAO/IATA CLASSIFICATION:	None
PRODUCT IDENTIFICATION NUMBER:	None
PACKING GROUP:	None
CONTROL TEMPERATURE:	None
EMERGENCY TEMPERATURE:	None
SCHEDULE XII QUANTITY RESTRICTIONS:	None
REPORTABLE QUANTITY FOR US SHIPMENTS:	None
IATA PACKAGING INSTRUCTIONS	
PASSENGER/CARGO:	None
CARGO ONLY:	None
LIMITED QUANTITY:	None
MAXIMUM NET QUANTITY PER PACKAGE	
PASSENGER/CARGO:	None
CARGO ONLY:	None
LIMITED QUANTITY:	None

SPECIAL PROVISIONS: None

SECTION XV - REGULATORY INFORMATION

TSCA STATUS: Each ingredient is on the Inventory.

SARA TITLE III

Hazard Categories:

Acute Health: Yes
Chronic Health: No
Fire Hazard: No
Pressure Hazard: No
Reactive Hazard: No

Reportable Ingredients:

Section 302/304: None
Section 313: None

CERCLA HAZARDOUS SUBSTANCE: Not listed

CALIFORNIA PROPOSITION 65

Chemical	CAS Number	Concentration Parts Per Billion (PPB) Maximum
1,4-Dioxane	123-91-1	< 5.0
Acetaldehyde	75-07-0	< 5.0
Ethylene Oxide	75-21-8	< 5.0
Formaldehyde	50-00-0	< 12.1

CLEAN AIR ACT: No ingredient is listed

NSR STATUS (CANADA): Each ingredient is on the DSL (Domestic substance list)

WHMIS (CANADA) STATUS: Not Controlled

WHMIS Classification(s): None

Z-SIL AR PRODUCTS are considered articles, therefore are exempt from the following requirements:

USA: TSCA – Toxic Substances Control Act
EUROPE: EINECS – European Inventory of Existing Commercial Chemical Substances
CANADA: DSL – Domestic Substance List
AUSTRALIA: AICS – Australian Inventory of Chemical Substances
KOREA: ECL (KECI) – Korean Existing Chemical Inventory
JAPAN: MITI (ENCS) – Existing and New Chemical Substances
PHILIPPINES: PICCS – Philippines Inventory of Chemicals and Chemical Substances

SECTION XVI – OTHER INFORMATION

HMIS AND NFPA HAZARD RATINGS

<u>HMIS Rating</u>		<u>NFPA Rating</u>	
Health (acute):	1	Health:	1
Flammability:	0	Flammability:	0
Reactivity:	0	Reactivity:	0
Personal Protection:	*	Unusual Hazards:	None

* Personal protective equipment requirements must be supplied by the user depending upon use.

The information herein is given in good faith, but no warranty, expressed or implied is made and we assume no liability from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes.

SAFETY DATA SHEET

1. IDENTIFICATION

PRODUCT NAME: **PYRO-FLEX® BARRIER IV – Mat-X**

(c) Recommended use of the chemical and restrictions on use

- **Primary Use:** Refractory Ceramic Fiber (RCF) materials are used primarily in industrial high temperature insulating applications. Examples include heat shields, heat containment, gaskets, expansion joints, industrial furnaces, ovens, kilns, boilers and other process equipment at applications up to 1400°C. RCF based products are not intended for direct sale to the general public. While RCFs are used in the manufacture of some consumer products, such as catalytic converter mats and wood burning stoves, the materials are contained, encapsulated, or bonded within the units.
- **Secondary Use:** Conversion into wet and dry mixtures and articles (refer to section 8).
- **Tertiary Use:** Installation, removal (industrial and professional) / Maintenance and service life (industrial and professional) (refer to section 8).

Uses Advised Against
Spraying of dry product.

ADDRESS: **MM Systems Corporation**
50 MM Way, P.O. Box 98
Pendergrass, GA 30567

INFORMATION TELEPHONE: Toll Free Domestic: 800-241-3460 International 1-706-824-7500

For Chemical Emergency
Spill, Leak, Fire, Exposure, or Accident
Call CHEMTREC Day or Night

Within USA and Canada: 800-424-9300
Outside USA and Canada: +1 703-527-3887 (Collect Calls Accepted)

2. HAZARDS IDENTIFICATION

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

The U.S. Occupational Safety and Health Administration (OSHA) Hazard Communication Standard (HCS) 2012 indicates that IARC Group 2B corresponds to OSHA HCS 2012 Category 2 carcinogen classification (see, e.g., §1910.1200, Appendix F, Part D).

(b) Signal word, hazard statement(s), symbol(s) and precautionary statement(s) in accordance with paragraph (f) of §1910.1200

Under OSHA HCS 2012, RCF is classified as a category 2 carcinogen.

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

Use extinguishing agent suitable for surrounding combustible materials.

(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.

Thermal decomposition of binder from fires or from first heat of product may release smoke, carbon monoxide, carbon dioxide, oxides of nitrogen and small amounts of aromatic and aliphatic hydrocarbons. 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 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.

7. HANDLING AND STORAGE

(a) Precautions for safe handling

Handle fiber carefully to minimize airborne dust. Limit use of power tools unless in conjunction with local exhaust ventilation. Use hand tools whenever possible.

(b) Conditions for safe storage, including any incompatibilities

Store in a manner to minimize airborne dust.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

(a) 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>
Refractory Ceramic Fiber (RCF)	None established*	0.5 f/cc, 8-hr. TWA	0.2 f/cc TLV, 8-hr. TWA	0.5 f/cc, 8-hr. TWA**
Vermiculite	5 mg/m ³ PEL (resp. fraction), 15 mg/m ³ PEL (total dust) as PNOR		Vermiculite, as PNOC -- 10 mg/m ³ (total dust), 3 mg/m ³ (respirable fraction). Acrylic latex -- None established.	None established
Acrylic latex	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 Total Dust 15 mg/m³; Respirable Fraction 5 mg/m³.

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

OTHER OCCUPATIONAL EXPOSURE LEVELS (OEL)

RCF-related occupational exposure limits vary internationally. Regulatory OEL examples include: California, 0.2 f/cc; Canadian provincial OELs ranging 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 personal protective equipment (e.g gloves), as necessary to prevent skin irritation. Washable or disposable clothing may be used. If possible, do not take unwashed clothing home. If soiled work clothing must be taken home, employees should be informed on best practices to minimize non-work dust exposure (e.g., vacuum clothes before leaving the work area, wash work clothing separately, and rinse washer before washing other household clothes).

Eye Protection

As necessary, wear goggles or safety glasses with side shields.

Respiratory Protection

When engineering and/or administrative controls are insufficient to maintain workplace 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 manmade mineral fibers. Pursuant to NIOSH recommendations, N-95 respirators are appropriate for exposures up to 10 times the NIOSH Recommended Exposure Limit (REL). With respect to RCF, both the NIOSH REL and the industry REG have been set at 0.5 fibers per cubic centimeter of air (f/cm³). Accordingly, N-95 would provide the necessary protection for exposures up to 5 f/cm³. Further, the Respirator Selection Guide published by 3M Corporation, the primary respirator manufacturer, specifically recommends use of N-95 respirators for RCF exposures. In cases where exposures are known to be above 5.0 f/cm³, 8 hour TWA, a filter efficiency of 100% should be used. 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.

The evaluation of workplace hazards and the identification of appropriate respiratory protection is best performed, on a case by case basis, by a qualified Industrial Hygienist.

Other Information

- 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.

9. PHYSICAL AND CHEMICAL PROPERTIES

(a) Appearance	White, fibrous wool	(j) Upper/lower flammability or explosive limits	Not applicable
(b) Odor	Odorless	(k) Vapor pressure	Not applicable
(c) Odor threshold	Not applicable	(l) Vapor density	Not applicable
(d) pH	Not applicable	(m) Relative density	2.50 – 2.75
(e) Melting point	1760° C (3200° F)	(n) Solubility	Insoluble
(f) Initial boiling point and boiling range	Not applicable	(o) Partition coefficient: n-octanol/water	Not applicable
(g) Flash point	Not applicable	(p) Auto-ignition temperature	Not applicable
(h) Evaporation rate	Not applicable	(q) Decomposition temperature	Not applicable
(i) Flammability	Not applicable	(r) Viscosity	Not applicable

10. STABILITY AND REACTIVITY

(a) Reactivity	RCF is non-reactive.
(b) Chemical stability	As supplied RCF is stable and inert.
(c) Possibility of hazardous reactions	None
(d) Conditions to avoid	Please refer to handling and storage advice in Section 7
(e) Incompatible materials	None
(f) Hazardous decomposition products	Thermal decomposition of binder from fires or from first heat of product may release smoke, carbon monoxide, carbon dioxide, oxides of nitrogen and small amounts of aromatic and aliphatic hydrocarbons. 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.htiwcoalition.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/m³, 9 mg/m³ and 16 mg/m³
Routes of administration: Nose only inhalation
Results: Fibrosis just reached significant levels at 16 and 9 mg/m³ but not at 3 mg/m³. 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/m³

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/m³

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/m³ (25% of non fibrous particles)

RCF1a: 125 F/ml and 26 mg/m³ (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)

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

Hazard Pictogram



Signal Word

Warning

Hazard Statements

Suspected of causing cancer by inhalation.

Precautionary statements

Do not handle until all safety instructions have been read and understood.

Use respiratory protection as required; see section 8 of the Safety Data Sheet.

If concerned about exposure, get medical advice.

Store in a manner to minimize airborne dust.

Dispose of waste in accordance with local, state and federal regulations.

Supplementary Information

May cause temporary mechanical irritation to exposed eyes, skin or respiratory tract.

Minimize exposure to airborne dust.

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

Mild mechanical irritation to skin, eyes and upper respiratory system may result from exposure.
These effects are usually temporary.

(d) Mixture rule

Not applicable.

3. COMPOSITION / INFORMATION ON INGREDIENTS

<u>(a) Chemical and (b) Common Name</u>	<u>(c) CAS Number</u>	<u>% BY WEIGHT</u>
Vermiculite	1318-00-9	50-60
Refractories, Fibers, Aluminosilicate	142844-00-6	30-40
Acrylic latex	28205-96-1	5-15

***Synonyms:** 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

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)

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

Canadian TDG Hazard Class & PIN: Not regulated

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

15. REGULATORY INFORMATION (Non-mandatory)

UNITED STATES REGULATIONS

EPA	<p>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).</p> <p>Hazard Categories: Immediate Hazard – No Delayed Hazard – Yes Fire Hazard – No Pressure Hazard – No Reactivity Hazard - No</p> <p>Toxic Substances Control Act (TSCA) - RCF is not required to be listed on the TSCA inventory.</p> <p>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.</p>
OSHA	<p>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.</p>
California	<p>"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.</p> <p>RCF products are not known to be regulated by states other than California; however, state</p>

Other States

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

VERMICULITE COMPOSITION

This product contains vermiculite. Some vermiculite deposits may contain other naturally occurring substances such as crystalline silica or asbestiform materials. Unifrax has relied upon supplier SDSs to conclude that crystalline silica or asbestiform materials are not present, in regulated quantities, in the vermiculite used in this product. As with other materials, 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. For more detailed information regarding vermiculite, call the Product Stewardship Information Hotline (see below).

Product Stewardship Program

Unifrax I LLC 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 Product Stewardship Information Hotline at 1-800-322-2293.

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	X (To be determined by user)

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: Updated SDS to align with OSHA HCS 2012. Replaces 05/27/2015 SDS.
Revision Date: 05/27/2015

SDS Prepared By: UNIFRAX RISK MANAGEMENT DEPARTMENT

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, 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.



Safety Data Sheet

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SECTION 1: Identification

1.1. Product identifier

3M Fire Barrier 2000+ Premium Silicone Sealant

Product Identification Numbers

98-0400-5299-9, 98-0400-5300-5

1.2. Recommended use and restrictions on use

Recommended use

A FIRE STOPPING SEALANT FOR FIRE RATED WALL AND FLOOR PENETRATION AND JOINTS., FIRE STOP MATERIAL

1.3. Supplier's details

MANUFACTURER:	3M
DIVISION:	Industrial Adhesives and Tapes Division
ADDRESS:	3M Center, St. Paul, MN 55144-1000, USA
Telephone:	1-888-3M HELPS (1-888-364-3577)

1.4. Emergency telephone number

1-800-364-3577 or (651) 737-6501 (24 hours)

SECTION 2: Hazard identification

2.1. Hazard classification

Not classified as hazardous according to OSHA Hazard Communication Standard, 29 CFR 1910.1200.

2.2. Label elements

Signal word

Not applicable.

Symbols

Not applicable.

Pictograms

Not applicable.

2.3. Hazards not otherwise classified

None.

60% of the mixture consists of ingredients of unknown acute oral toxicity.

SECTION 3: Composition/information on ingredients

Ingredient	C.A.S. No.	% by Wt
Polysiloxane NJTS Reg. No. 04499600-7182	Trade Secret*	30 - 60 Trade Secret *
Calcium Carbonate	471-34-1	30 - 60 Trade Secret *
Dimethyl Siloxane, Dimethylvinylsiloxo-terminated	68083-19-2	5 - 10 Trade Secret *
Methyltrimethoxysilane	1185-55-3	3 - 7 Trade Secret *
Stearic Acid	57-11-4	1 - 5 Trade Secret *

NJTS or NJTSRN: New Jersey Trade Secret Registry Number.

*The specific chemical identity and/or exact percentage (concentration) of this composition has been withheld as a trade secret.

SECTION 4: First aid measures

4.1. Description of first aid measures

Inhalation:

Remove person to fresh air. If you feel unwell, get medical attention.

Skin Contact:

Wash with soap and water. If signs/symptoms develop, get medical attention.

Eye Contact:

Flush with large amounts of water. Remove contact lenses if easy to do. Continue rinsing. If signs/symptoms persist, get medical attention.

If Swallowed:

Rinse mouth. If you feel unwell, get medical attention.

4.2. Most important symptoms and effects, both acute and delayed

See Section 11.1. Information on toxicological effects.

4.3. Indication of any immediate medical attention and special treatment required

Not applicable

SECTION 5: Fire-fighting measures

5.1. Suitable extinguishing media

In case of fire: Use a fire fighting agent suitable for ordinary combustible material such as water or foam to extinguish.

5.2. Special hazards arising from the substance or mixture

None inherent in this product.

Hazardous Decomposition or By-Products

Substance

Carbon monoxide
Carbon dioxide

Condition

During Combustion
During Combustion

5.3. Special protective actions for fire-fighters
 No special protective actions for fire-fighters are anticipated.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Evacuate area. Ventilate the area with fresh air. For large spill, or spills in confined spaces, provide mechanical ventilation to disperse or exhaust vapors, in accordance with good industrial hygiene practice. Warning! A motor could be an ignition source and could cause flammable gases or vapors in the spill area to burn or explode. Refer to other sections of this SDS for information regarding physical and health hazards, respiratory protection, ventilation, and personal protective equipment.

6.2. Environmental precautions

Avoid release to the environment.

6.3. Methods and material for containment and cleaning up

Collect as much of the spilled material as possible. Place in a closed container approved for transportation by appropriate authorities. Clean up residue. Seal the container. Dispose of collected material as soon as possible.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Keep out of reach of children. Avoid breathing dust/fume/gas/mist/vapors/spray. Do not eat, drink or smoke when using this product. Wash thoroughly after handling.

7.2. Conditions for safe storage including any incompatibilities

Keep container tightly closed.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Occupational exposure limits

Ingredient	C.A.S. No.	Agency	Limit type	Additional Comments
Methyltrimethoxysilane	1185-55-3	CMRG	TWA:50 ppm	
Calcium Carbonate	471-34-1	CMRG	TWA:10 mg/m3;STEL:20 mg/m3	
Limestone	471-34-1	OSHA	TWA(as total dust):15 mg/m3;TWA(respirable fraction):5 mg/m3	
STEARATES	57-11-4	ACGIH	TWA:10 mg/m3	A4: Not class. as human carcin

ACGIH : American Conference of Governmental Industrial Hygienists
 AIHA : American Industrial Hygiene Association
 CMRG : Chemical Manufacturer's Recommended Guidelines
 OSHA : United States Department of Labor - Occupational Safety and Health Administration
 TWA: Time-Weighted-Average
 STEL: Short Term Exposure Limit
 CEIL: Ceiling

8.2. Exposure controls

8.2.1. Engineering controls

Use general dilution ventilation and/or local exhaust ventilation to control airborne exposures to below relevant Exposure Limits and/or control dust/fume/gas/mist/vapors/spray. If ventilation is not adequate, use respiratory protection equipment.

8.2.2. Personal protective equipment (PPE)

Eye/face protection

None required.

Skin/hand protection

No chemical protective gloves are required.

Respiratory protection

An exposure assessment may be needed to decide if a respirator is required. If a respirator is needed, use respirators as part of a full respiratory protection program. Based on the results of the exposure assessment, select from the following respirator type(s) to reduce inhalation exposure:

Half facepiece or full facepiece air-purifying respirator suitable for organic vapors and particulates

For questions about suitability for a specific application, consult with your respirator manufacturer.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

General Physical Form:	Solid
Specific Physical Form:	Paste
Odor, Color, Grade:	Gray silicone sealant paste with alcoholic odor.
Odor threshold	No Data Available
pH	Not Applicable
Melting point	No Data Available
Boiling Point	Not Applicable
Flash Point	No flash point
Evaporation rate	No Data Available
Flammability (solid, gas)	Not Classified
Flammable Limits(LEL)	Not Applicable
Flammable Limits(UEL)	Not Applicable
Vapor Pressure	Not Applicable
Vapor Density	Not Applicable
Specific Gravity	1.34 [Ref Std: WATER=1] [Details: CONDITIONS: @ 25C]
Solubility In Water	No Data Available
Solubility- non-water	No Data Available
Partition coefficient: n-octanol/ water	No Data Available
Autoignition temperature	No Data Available
Decomposition temperature	No Data Available
Viscosity	No Data Available
VOC Less H2O & Exempt Solvents	31 g/l

SECTION 10: Stability and reactivity

10.1. Reactivity

This material is considered to be non reactive under normal use conditions.

10.2. Chemical stability

Stable.

10.3. Possibility of hazardous reactions

Hazardous polymerization will not occur.

10.4. Conditions to avoid

None known.

10.5. Incompatible materials

None known.

10.6. Hazardous decomposition products

<u>Substance</u>	<u>Condition</u>
None known.	

Refer to section 5.2 for hazardous decomposition products during combustion.

SECTION 11: Toxicological information

The information below may not be consistent with the material classification in Section 2 if specific ingredient classifications are mandated by a competent authority. In addition, toxicological data on ingredients may not be reflected in the material classification and/or the signs and symptoms of exposure, because an ingredient may be present below the threshold for labeling, an ingredient may not be available for exposure, or the data may not be relevant to the material as a whole.

11.1. Information on Toxicological effects

Signs and Symptoms of Exposure

Based on test data and/or information on the components, this material may produce the following health effects:

Inhalation:

Respiratory Tract Irritation: Signs/symptoms may include cough, sneezing, nasal discharge, headache, hoarseness, and nose and throat pain.

Skin Contact:

Contact with the skin during product use is not expected to result in significant irritation.

Eye Contact:

Contact with the eyes during product use is not expected to result in significant irritation.

Ingestion:

Gastrointestinal Irritation: Signs/symptoms may include abdominal pain, stomach upset, nausea, vomiting and diarrhea.

Toxicological Data

If a component is disclosed in section 3 but does not appear in a table below, either no data are available for that endpoint or the data are not sufficient for classification.

Acute Toxicity

Name	Route	Species	Value
Overall product	Ingestion		No data available; calculated ATE > 5,000 mg/kg
Calcium Carbonate	Dermal	Rat	LD50 > 2,000 mg/kg
Calcium Carbonate	Inhalation-Dust/Mist (4 hours)	Rat	LC50 3,0 mg/l
Calcium Carbonate	Ingestion	Rat	LD50 6,450 mg/kg
Dimethyl Siloxane, Dimethylvinylsiloxy-terminated	Dermal	Rabbit	LD50 > 15,440 mg/kg
Dimethyl Siloxane, Dimethylvinylsiloxy-terminated	Ingestion	Rat	LD50 > 15,440 mg/kg
Stearic Acid	Dermal	Rabbit	LD50 > 2,000 mg/kg

Stearic Acid	Ingestion	Rat	LD50 > 5,000 mg/kg
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ATE = acute toxicity estimate

Skin Corrosion/Irritation

Name	Species	Value
Calcium Carbonate	Rabbit	No significant irritation
Dimethyl Siloxane, Dimethylvinylsiloxy-terminated	Rabbit	No significant irritation
Stearic Acid	Rabbit	Mild irritant

Serious Eye Damage/Irritation

Name	Species	Value
Calcium Carbonate	Rabbit	No significant irritation
Dimethyl Siloxane, Dimethylvinylsiloxy-terminated	Rabbit	Mild irritant
Stearic Acid		Moderate irritant

Skin Sensitization

Name	Species	Value
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Respiratory Sensitization

Name	Species	Value
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Germ Cell Mutagenicity

Name	Route	Value
Stearic Acid	In Vitro	Not mutagenic

Carcinogenicity

Name	Route	Species	Value
Stearic Acid	Ingestion	Rat	Not carcinogenic

Reproductive Toxicity

Reproductive and/or Developmental Effects

Name	Route	Value	Species	Test Result	Exposure Duration
Calcium Carbonate	Ingestion	Not toxic to development	Rat	NOAEL 625 mg/kg/day	prematng & during gestation

Target Organ(s)

Specific Target Organ Toxicity - single exposure

Name	Route	Target Organ(s)	Value	Species	Test Result	Exposure Duration
Calcium Carbonate	Inhalation	respiratory system	All data are negative	Rat	NOAEL 0.812 mg/l	90 minutes
Stearic Acid	Inhalation	respiratory irritation	Some positive data exist, but the data are not sufficient for classification		NOAEL Not available	

Specific Target Organ Toxicity - repeated exposure

Name	Route	Target Organ(s)	Value	Species	Test Result	Exposure Duration
Calcium Carbonate	Inhalation	respiratory system	Some positive data exist, but the data are not sufficient for classification	Human	NOAEL Not available	occupational exposure
Stearic Acid	Ingestion	blood	Some positive data exist, but the data are not sufficient for classification	Rat	NOAEL Not available	6 weeks

Aspiration Hazard

Name	Value
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Please contact the address or phone number listed on the first page of the SDS for additional toxicological information on this material and/or its components.

SECTION 12: Ecological information

Ecotoxicological information

Please contact the address or phone number listed on the first page of the SDS for additional ecotoxicological information on this material and/or its components.

Chemical fate information

Please contact the address or phone number listed on the first page of the SDS for additional chemical fate information on this material and/or its components.

SECTION 13: Disposal considerations

13.1. Disposal methods

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

Prior to disposal, consult all applicable authorities and regulations to insure proper classification. Dispose of waste product in a permitted industrial waste facility.

EPA Hazardous Waste Number (RCRA): Not regulated

SECTION 14: Transport Information

For Transport Information, please visit <http://3M.com/Transportinfo> or call 1-800-364-3577 or 651-737-6501.

SECTION 15: Regulatory information

15.1. US Federal Regulations

311/312 Hazard Categories:

Fire Hazard - No Pressure Hazard - No Reactivity Hazard - No Immediate Hazard - Yes Delayed Hazard - No

15.2. State Regulations

15.3. Chemical Inventories

The components of this material are in compliance with the provisions of Australia National Industrial Chemical Notification and Assessment Scheme (NICNAS). Certain restrictions may apply. Contact the selling division for additional information.

The components of this product are in compliance with the new substance notification requirements of CEPA.

The components of this material are in compliance with the provisions of the Korean Toxic Chemical Control Law. Certain restrictions may apply. Contact the selling division for additional information.

The components of this product are in compliance with the chemical notification requirements of TSCA.

15.4. International Regulations

This SDS has been prepared to meet the U.S. OSHA Hazard Communication Standard, 29 CFR 1910.1200.

SECTION 16: Other information

NFPA Hazard Classification

Health: 1 Flammability: 1 Instability: 0 Special Hazards: None

National Fire Protection Association (NFPA) hazard ratings are designed for use by emergency response personnel to address the hazards that are presented by short-term, acute exposure to a material under conditions of fire, spill, or similar emergencies. Hazard ratings are primarily based on the inherent physical and toxic properties of the material but also include the toxic properties of combustion or decomposition products that are known to be generated in significant quantities.

HMIS Hazard Classification

Health: 1 Flammability: 1 Physical Hazard: 0 Personal Protection: X - See PPE section.

Hazardous Material Identification System (HMIS® III) hazard ratings are designed to inform employees of chemical hazards in the workplace. These ratings are based on the inherent properties of the material under expected conditions of normal use and are not intended for use in emergency situations. HMIS® III ratings are to be used with a fully implemented HMIS® III program. HMIS® is a registered mark of the American Coatings Association (ACA).

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