



## 1 Identification

### GHS Product Identifier

**ASPA-2**

### Other means of identification

Ceramic Fiber Paper.

### Recommended use of the chemical and restriction 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.

### Supplier's details

**ZIRCAR Refractory Composites, Inc.**

**P.O. Box 489**

**Florida, NY 10921**

**1-845-651-2200 (Monday - Friday 8:00 a.m. - 4:30 p.m. EST)**

Homepage, <http://www.zrci.com> or email [sales@zrci.com](mailto:sales@zrci.com)

### Emergency phone number

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

## 2 Hazard(s) identification

### Classification of the substance or mixture

#### (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.

### GHS label elements



Causes mild skin irritation

Use personal protective equipment as required.

### Other hazards which do not result in classification

#### 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

Description	CAS Number	EINECS Number	%	Note
Aluminosilicate Refractory Fibers,	1302-76-7	215-106-4	100	

### 4 First-aid measures

#### Description of necessary first-aid measures

##### 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.

##### EYE

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.

##### Gastrointestinal

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

#### 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.

#### 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; exposure does not result in allergic manifestations.

### 5 Fire-fighting measures

### Suitable extinguishing media

Non-combustible products, class of reaction to fire is zero.  
Packaging and surrounding materials may be combustible.  
Use extinguishing agent suitable for surrounding combustible materials.

### Specific hazards arising from the chemical

Non-combustible products, class of reaction to fire is zero.  
Packaging and surrounding materials may be combustible.  
Use extinguishing agent suitable for surrounding combustible materials.

### Special protective actions for fire-fighters

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

## 6 Accidental release measures

### 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.

### Environmental precautions

None.

### Methods and materials for containment and cleaning up

Frequently clean the work area with HEPA filtered vacuum or wet sweeping to minimize the accumulation of debris. Do not use compressed air for clean-up.

## 7 Handling and storage

### 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. (See section 8)

Service significantly above the product design temperature may increase friability and the possibility of generating airborne fibers or particulates. not considered problematic during use, airborne fibers may complicate removal activities. is recommended that product use be carefully matched to design parameters.

**After Service:** AS MANUFACTURED THIS PRODUCT IS COMPRISED OF ALUMINA AND SILICA WHICH MAY TRANSFORM UPON HEATING (TEMPERATURES GREATER THAN 1000°C FOR EXTENDED PERIODS OF TIME) TO NON-HAZARDOUS MULLITE AND CRISTOBALITE (CAS # 14464-46-1), A FORM OF CRYSTALLINE SILICA. OF THIS PRODUCT AFTER USE MY GENERATE DUSTS. OR REPEATED INHALATION OF RESPIRABLE FREE CRYSTALLINE SILICA DUST MAY CAUSE DELAYED LUNG INJURY (SILICOSIS). THE IARC WORKING GROUP CONCLUDED THAT CRYSTALLINE SILICA, IN THE FORM OF QUARTZ OR CRISTOBALITE, FROM OCCUPATIONAL SOURCES POSED A CARCINOGENIC RISK TO HUMANS (CATEGORY 1). IS SUFFICIENT EVIDENCE OF CARCINOGENICITY IN ANIMALS, BUT LIMITED EVIDENCE IN HUMANS. 'S FINAL RULE LIMIT AND ACGIH'S TLV FOR RESPIRABLE CRISTOBALITE IS 0.05 MG/M<sup>3</sup>. VENTILATION AND RESPIRATORY PROTECTION SHOULD BE PROVIDED IN COMPLIANCE WITH OSHA STANDARDS. ADHERENCE TO RECOMMENDED SAFE WORK PRACTICES IS ADVISED. PRODUCT REMOVAL MUST CONSIDER THE POSSIBILITY OF USAGE ABOVE DESIGN TEMPERATURES.

Product removal must consider the possibility of usage above design temperatures. section 8 for appropriate respiratory protection during removal.

### Conditions for safe storage, including any incompatibilities

**Store in a manner to minimize airborne dust.**

## **EMPTY CONTAINERS**

Product packaging may contain residue. Do not reuse.

### **8 Exposure controls/personal protection**

#### **Control parameters**

**(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.**

<b>Components</b>	<b>OSHA PEL</b>	<b>NIOSH REL</b>	<b>ACGIH TLV</b>	<b>MANUFACTURER</b>
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**

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

\*\*In the absence of an OSHA PEL, HTIW Coalition has adopted a recommended exposure guideline (REG), as measured

under NIOSH Method 7400 B. For further information on the history and development of the REG see "Rationale for

the Recommended Exposure Guideline" at page 34 of the HTIW Coalition Product Stewardship Program [http://www.htiwcoalition.org/documents/PSP\\_2012.pdf](http://www.htiwcoalition.org/documents/PSP_2012.pdf).

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

RCF-related occupational exposure limits vary internationally. Regulatory OEL examples include: California, 0.2 f/cc;

Canadian provincial OELs 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.

#### **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.

#### **Individual protection measures**

##### **Skin Protection**

Wear gloves, head coverings and full body clothing as necessary to prevent skin irritation. Washable or disposable clothing may be used. If possible, do not take unwashed clothing home. If soiled work clothing must be taken home, employers should ensure employees are thoroughly trained on the best practices to minimize non-work dust exposure (e.g., vacuum clothes before leaving the work area, wash work clothing separately, rinse washer before washing other household clothes, etc.).

##### **Eye Protection**

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

##### **Respiratory Protection**

When engineering and/or administrative controls are insufficient to maintain workplace concentrations

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

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

## 9 Physical and chemical properties

### Physical and chemical properties

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

## 10 Stability and reactivity

### Reactivity

Non-reactive.

### Chemical stability

As supplied RCF is stable and inert.

### Possibility of hazardous reactions

None.

### Conditions to avoid

Please refer to handling and storage advice in Section 7.

### Incompatible materials

Powerful oxidizers; fluorine, chlorine trifluoride, manganese trioxide; oxygen difluoride, etc.

## Hazardous decomposition products

None.

## 11 Toxicological information

### Toxicological (health) effects

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/m<sup>3</sup>, 9 mg/m<sup>3</sup> and 16 mg/m<sup>3</sup> Routes of administration: Nose only inhalation

Results: Fibrosis just reached significant levels at 16 and 9 mg/m<sup>3</sup> but not at 3 mg/m<sup>3</sup>. None of the parenchymal tumor incidences were higher than the historical control values for this strain of animal.

Method: Inhalation, single dose

Species: Rat

Dose: 30 mg/m<sup>3</sup>

Routes of administration: Nose only inhalation

Results: Rats were exposed to a single concentration of 200 WHO fibers/ml specially prepared RCF for 24 months. High incidence of exposure-related pulmonary neoplasms (bronchoalveolar adenomas and carcinomas) was observed. A small number of mesotheliomas were observed in each of the fiber exposure groups (Mast et al 1995a).

Method: Inhalation, single dose

Species: Hamster

Dose: 30 mg/m<sup>3</sup>

Routes of administration: Nose only inhalation

Results: Hamsters were exposed to a single concentration of 260 WHO fibers/ml specially prepared RCF for 18 months and developed lung fibrosis, a significant number of pleural mesotheliomas (42/102) but no primary lung tumors (McConnell et al 1995).

Method: Inhalation, single dose

Species: Rat

Dose: RCF1: 130 F/ml and 50 mg/m<sup>3</sup> (25% of non fibrous particles) RCF1a: 125 F/ml and 26 mg/m<sup>3</sup> (2% of non fibrous particles)

Routes of administration: Nose only inhalation

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

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

(From SCOEL publication (EU Scientific Committee on Occupational Exposure Limits) SCOEL/SUM/165, September 2011).

· *Reproductive toxicity*

Method: Gavage

Species: Rat

Dose: 250mg/kg/day

Routes of administration: Oral

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

· *STOT-Single exposure*

Not applicable

· *STOT-Repeated exposure*

Not applicable

· *Aspiration hazard*

Not applicable

See the following review publications for a summary and discussion:

Interpretation of these animal experiments is complex and there is not complete agreement amongst scientists internationally.

A summary of the evidence relating to RCF carcinogenicity in vivo can be found in SCOEL/SUM/165 and in Utell and Maxim 2010.

Other information

Numerous studies indicate the relevance of biopersistence as a determinant of toxic effects of fiber exposure.

(Maxim et al 2006).

#### **Irritant Properties**

Negative results have been obtained in animal studies (EU method B 4) for skin irritation. Inhalation exposures using the nose only route produce simultaneous heavy exposures to the eyes, but no reports of excess eye irritation exist. Animals exposed by inhalation similarly show no evidence of respiratory tract irritation. Human data confirm that only mechanical irritation, resulting in itching, occurs in humans. Screening at manufacturers' plants in the UK has failed to show any human cases of skin conditions related to fiber exposure.

#### **(e) International Agency for Research on Cancer and National Toxicology Program**

IARC, in 1988, Monograph v.43 (and later reaffirmed in 2002, v.81), classified RCF as possibly carcinogenic to humans (group 2B). IARC evaluated the possible health effects of RCF as follows:

- There is inadequate evidence in humans for the carcinogenicity of RCF.
- There is sufficient evidence in experimental animals for the carcinogenicity of RCF.

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

Not classified by OSHA.

- *STOT-Single exposure*

Not applicable

- *STOT-Repeated exposure*

Not applicable

- *Aspiration hazard*

Not applicable

See the following review publications for a summary and discussion:

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Not classified by OSHA.

#### **Numerical measures of toxicity (such as acute toxicity estimates)**

Not Applicable.

#### **Interactive effects**

Not Applicable.

#### **Where specific chemical data are not available**

Not Applicable.

#### **Mixtures**

Not Applicable.



**Mixture versus ingredient information**

Not Applicable.

**Information on the likely routes of exposure**

Not Applicable.

**Symptoms related to the physical, chemical and toxicological characteristics**

Not Applicable.

**Delayed and immediate effects and also chronic effects from short and long term exposure**

Not Applicable.

**12 Ecological information****Toxicity**

No known aquatic toxicity.

**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.

**Bioaccumulative potential**

No bioaccumulative potential.

**Mobility in soil**

No mobility in soil.

**Other adverse effects**

No adverse effects of this material on the environment are anticipated.

**13 Disposal considerations****Disposal methods****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****UN Number**

Not Applicable.

**UN Proper Shipping Name**

Not Applicable.

**Transport hazard class(es)**

Not Applicable.

**Packing group, if applicable**

Not Applicable.

**Environmental hazards**

Not a marine pollutant.

**Special precautions for user**

Not Applicable.

**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code**

Canadian TDG Hazard Class & PIN: Not regulated

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

**15 Regulatory information**

**Safety, health and environmental regulations specific for the product in question**

**UNITED STATES REGULATIONS**

**EPA Superfund Amendments and Reauthorization Act (SARA)** Title III - this product does not contain any substances reportable under Sections 302, 304, 313, (40 CFR 372). Sections 311 and 312 (40 CFR 370) apply (delayed hazard).

**Hazard Categories:** Immediate Hazard – No

Delayed Hazard – Yes

Fire Hazard – No

Pressure Hazard – No

Reactivity Hazard - No

**Toxic Substances Control Act (TSCA)** - RCF is not required to be listed on the TSCA inventory.

**Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)** and the **Clean Air Act (CAA)** - this product contains fibers with an average diameter greater than one micron and thus is not considered a hazardous air pollutant.

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

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

**Other States** RCF products are not known to be regulated by states other than California; however, state and local

OSHA and EPA regulations may apply to these products. If in doubt, contact your local regulatory agency.

**INTERNATIONAL REGULATIONS**

**Canada Canadian Workplace Hazardous Materials Information System (WHMIS)** – Classified as Class D2A – Materials

Causing Other Toxic Effects

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

Substance List (DSL)

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

RCF is classified under the CLP (classification, labelling and packaging of substances and mixtures) regulation as a category

1B carcinogen. On January 13, 2010 the European Chemicals Agency (ECHA) updated the candidate list for authorization

(Annex XV of the REACH regulation) and added 14 new substances in this list including aluminosilicate

refractory  
ceramic fibers.

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

## 16 Other information

### Other information

The HTIW Coalition and the U.S. Occupational Safety and Health Administration (OSHA) are partners in PSP HTW, a comprehensive, multi-faceted risk management program designed to control and reduce workplace exposures to high temperature insulation wools (HTIW). For more information regarding PSP HTW, please visit <http://www.htiwcoalition.org>

### DEFINITIONS

**ACGIH:** American Conference of Governmental Industrial Hygienists

**ADR:** Carriage of Dangerous Goods by Road (International Regulation)

**CAA:** Clean Air Act

**CAS:** Chemical Abstracts Service

**CERCLA:** Comprehensive Environmental Response, Compensation and Liability Act

**DSL:** Domestic Substances List

**EPA:** Environmental Protection Agency

**EU:** European Union

**f/cc:** Fibers per cubic centimeter

**HEPA:** High Efficiency Particulate Air

**HMIS:** Hazardous Materials Identification System

**IARC:** International Agency for Research on Cancer

**IATA:** International Air Transport Association

**IMDG:** International Maritime Dangerous Goods Code

**mg/m<sup>3</sup>:** 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

**SARASection 311:** MSDS/List of Chemicals and Hazardous Inventory

**SARASection 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 all previous MSDS.

**Revision Date: 4-10-17**

**SDS Prepared By:** ZIRCAR Refractory Composites, Inc.

**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, ZIRCAR Refractory Composites, Inc. does not extend any warranty (expressed or implied), assume any responsibility, or make any representation regarding the completeness of this information or its suitability for the purposes envisioned by the user.