1 Identification

GHS Product Identifier

RS-MAT3000

Other means of identification

Polycrystalline fiber, polycrystalline wool (PCW), man-made alumina fiber, high temperature insulation wool (HTIW).

Recomended use of the chemical and restriction on use

PCW 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 and applications. PCW based products are not intended for direct sale to the general public. While PCWs are used in the manufacture of some consumer products, such as catalytic converter mats, 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

Emergency phone number

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

2 Hazard(s) identification

GHS label elements

Causes mild skin irritation

May cause cancer

Use personal protective equipment as required.

Other hazards which do not result in classification

WARNING:
POSSIBLE CANCER HAZARD BY INHALATION DUE TO FIBER DIAMETER SIZE.
HAZARD CLASSIFICATION
In 1988 the **International Agency for Research on Cancer (IARC)** classified "ceramic fibers" as possible human carcinogens (Group 2b), and at that time, polycrystalline wool was included in this

broad category of materials. See section 11 for more information.
The Annual Report on Carcinogens prepared by the **National Toxicology Program (NTP),** (latest edition) classified “ceramic fibers (respirable size)” as reasonably anticipated to be carcinogens.

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 when machining.

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

3 Composition/information on ingredients

Description	CAS Number	EINECS Number	%	Note
Polycrystalline Wools (PCW)			100 - 0	
(PCW) 97% Alumina, 3% Silica			0	

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.

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

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.

COMPONENT	OSHA PEL	ACGIH TLV	MANUFACTURER
Polycrystalline Wools (PCW) (polycrystalline)	Particulates Not Otherwise Regulated (PNOR) : Total Dust -- 15 mg/m³. Respirable Fraction -- 5 mg/m³	Particulates Not Otherwise Classified (PNOC) : Inhalable particulate -- 10 mg/m³. Respirable particulate -- 3 mg/m³	See Below*

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

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)**N**ot resistant to oil, (R)**R**esistant to oil and (P) oil**P**roof. These recommendations are not designed to limit informed choices, provided that respiratory protection decisions comply with 29 CFR 1910.134.

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

9 Physical and chemical properties

Physical and chemical properties

(a) Appearance	White to tan
(b) Odor	Odorless
(c) Odor threshold	Not applicable
(d) pH	Not applicable

(e) Melting point	1760° C (3200° F)
(f) Initial boiling point and boiling range	Not applicable
(g) Flash point	Not applicable
(h) Evaporation rate	Not applicable
(i) Flammability	Not applicable
(j) Upper/lower flammability or explosive limits	Not applicable
(k) Vapor pressure	Not applicable
(l) Vapor density	Not applicable
(m) Relative density	2.5 to 2.7
(n) Solubility	Insoluble
(o) Partition coefficient: n-octanol/water	Not applicable
(p) Auto-ignition temperature	Not applicable
(q) Decomposition temperature	Not applicable
(r) Viscosity	Not applicable

10 Stability and reactivity

Reactivity

Non-reactive.

Chemical stability

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 triflouride, manganese trioxide; oxygen difluoride, etc.

Hazardous decomposition products

None.

11 Toxicological information

Toxicological (health) effects

(a) through (d)

Toxicological Data/Epidemiology Data
Lifetime rat inhalation studies of polycrystalline fiber show that at the maximum dose level tested, there was no evidence of lung cancer, lung fibrosis or any other significant adverse effect. Intraperitoneal, intratracheal and intrapleural studies in rats, together with two in vitro tests, have all shown negative results. Despite some study limitations, it is important to note the consistent lack of carcinogenic response in animal studies.
As produced most polycrystalline fibers have fiber diameters too large to be respirable. Numerous scientific studies suggest that the potential toxicity of a respirable fiber is directly related to bio-persistence (the length of time it take for the fiber to clear the lung). Based on limited in-vitro laboratory analysis, which measure the dissolution rate of fibers in simulated lung fluid, polycrystalline fibers are known to be relatively durable.

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

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

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.

Other information

Not classified by OSHA.

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 contains aluminum oxide (fibrous forms) which is reportable under Section 313 (40 CFR 372). Sections 311 and 312 (40 CFR 370) apply (delayed hazard).
Toxic Substances Control Act (TSCA) - PCW has been assigned a CAS number; however; it is an "article" under TSCA and therefore exempt from listing on the TSCA inventory.
Comprehensive Environmental Response, Compensation and Liability Act (**CERCLA)** and the **Clean Air Act (CAA)** - This product contains fibers with an average diameter greater than one micron and thus is not considered a hazardous air pollutant.
OSHA: Comply with **Hazard Communication Standards** 29 CFR 1910.1200 and 29 CFR 1926.59 and the **Respiratory Protection Standards** 29 CFR 1910.134 and 29 CFR 1926.103.
California: "Ceramic fibers (airborne particles of respirable size)" is listed in **Proposition 65, The Safe Drinking Water and Toxic Enforcement Act of 1986** as a chemical known to the State of California to cause cancer.
Other States: PCW 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: The assessment of all available toxicological test data on polycrystalline fibrers during the REACH registration process resulted in a "no classification" conclusion.

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 visithttp://www.htiwcoalition.org

DEFINITIONS

ACGIH: American Conference of Governmental Industrial Hygienists

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

CAA: Clean Air Act

CAS: Chemical Abstracts Service

CERCLA: Comprehensive Environmental Response, Compensation and Liability Act

DSL: Domestic Substances List

EPA: Environmental Protection Agency

EU: European Union

f/cc: Fibers per cubic centimeter

HEPA: High Efficiency Particulate Air

HMIS: Hazardous Materials Identification System

IARC: International Agency for Research on Cancer

IATA: International Air Transport Association

IMDG: International Maritime Dangerous Goods Code

mg/m³: Milligrams per cubic meter of air

mmpcf: Million particles per cubic meter

NFPA: National Fire Protection Association

NIOSH: National Institute for Occupational Safety and Health

OSHA: Occupational Safety and Health Administration

29 CFR 1910.134 & 1926.103: OSHA Respiratory Protection Standards

29 CFR 1910.1200 & 1926.59: OSHA Hazard Communication Standards

PEL: Permissible Exposure Limit (OSHA)

PIN: Product Identification Number

PNOC: Particulates Not Otherwise Classified

PNOR: Particulates Not Otherwise Regulated

PSP: Product Stewardship Program

RCRA: Resource Conservation and Recovery Act

REL: Recommended Exposure Limit (NIOSH)

RID: Carriage of Dangerous Goods by Rail (International Regulations)

SARA: Superfund Amendments and Reauthorization Act

SARA Title III: Emergency Planning and Community Right to Know Act

SARA Section 302: Extremely Hazardous Substances

SARA Section 304: Emergency Release

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.