



INDUSTRIES 3R

# MATERIAL SAFETY DATA SHEET

## IDENTITY

Part Number: **3R 2000 SIL**  
 Identity: Ceramic Cable  
 Description: Ceramic Cable

## SUPPLIER

Industries 3R inc.  
 55, route 116 Ouest  
 Danville (Québec) J0A 1A0  
 Tel: 819-839-2793  
 Fax: 819-839-2797

## COMPOSITION/INFORMATION ON THE COMPONENTS

<u>COMPONENTS</u>	<u># CAS</u>	<u>% BY WEIGHT</u>
Refractories, Fibers, Aluminosilicate	142844-00-6	80-85
Continuous filament fiberglass	65997-17-3	15-20
Rayon/ cellulose fiber	61788-77-0	2-4

## PHYSICAL AND CHEMICAL PROPERTIES

Odor & Appearance: White, odorless, fibrous material  
 Chemical Family: Vitreous Aluminosilicate Fibers  
 Boiling point: Not applicable  
 Water solubility (%): Not soluble in water  
 Melting Point: 1760°C (3200°F)  
 Specific Gravity: 2.50-2.75  
 Relative density: 2.50 – 2.75  
 Solubility: Insoluble  
 Vapor pressure: Not applicable  
 pH: Not applicable  
 % Volatile: Not applicable  
 Flash Point: Not applicable  
 Flammability: Not applicable

## FIRE-FIGHTING MEASURES

NFPA CODES: Flammability: 0 Health: 1 Reactivity: 0 Special: 0  
 Extinguishing media: use extinguishing media suitable for type of surrounding fire.  
 Specific hazards arising from the chemical: non-combustible products, class of reaction to fire is zero.  
 Packaging and surrounding materials may be combustible.

## STABILITY AND REACTIVITY

Reactivity: RCF is 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  
 Incompatible materials: None  
 Hazardous decomposition products: None

## **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).

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



Warning!

Suspected of causing cancer by inhalation.

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

Use respiratory protection as required; see section *Exposure control/personal protection* 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.

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

Minimize exposure to airborne dust.

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

These effects are usually temporary.

Mixture rule : not applicable.

## **FIRST AID MEASURES**

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.

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; fiber exposure does not result in allergic manifestations.

## **DISPOSAL CONSIDERATIONS**

**Waste management:** to prevent waste materials from becoming airborne during waste storage, transportation and disposal, a covered container or plastic bagging is recommended.

**Disposal:** this product, as manufactured, is not classified as a hazardous waste according to Federal regulations (40 CFR 261). Any processing, use, alteration or chemical additions to the product, as purchased, may alter the disposal requirements. Under Federal regulations, it is the waste generator's responsibility to properly characterize a waste material, to determine if it is a "hazardous" waste. Check local, regional, state or provincial regulations to identify all applicable disposal requirements.

## **EXPOSURE CONTROL/ 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

COMPONENTS	OSHA PEL	NIOSH REL	ACGIH TLV	MANUFACTURER REG
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**
Continuous filament fiberglass	1 f/cc TWA per HSPP 5 mg/m <sup>3</sup> PEL (resp. fraction)		1 f/cc TWA	None established
Rayon/cellulose fiber	15 mg/m <sup>3</sup> PEL (total dust) as PNOR		PNOC -- 10 mg/m <sup>3</sup> (total dust), 3 mg/m <sup>3</sup> (respirable fraction)	None established

\*Except for the state of California, where the PEL for RCF is 0.2 f/cc 8-hr TWA, there is no specific regulatory standard for RCF in the U.S. OSHA's "Particulate Not Otherwise Regulated (PNOR)" standard [29 CFR 1910.1000, Subpart Z, Air Contaminants] applies generally - Total Dust 15 mg/m<sup>3</sup>; Respirable Fraction 5 mg/m<sup>3</sup>.

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/cm<sup>3</sup>). Accordingly, N-95 would provide the necessary protection for exposures up to 5 f/cm<sup>3</sup>. 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/cm<sup>3</sup>, 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.

#### **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 *Exposure control / 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.

#### **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.

#### **TOXICOLOGICAL AND ECOLOGICAL INFORMATION**

##### **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.

#### 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.

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.

#### **TRANSPORT INFORMATION**

Hazard Class:	Not Regulated
Labels:	Not applicable
Placecards:	Not applicable
UN Number:	Not applicable
NA number:	Not applicale

Canadian TDG Hazard Class & Pin: Not regulated

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

#### **OTHER INFORMATION**

While the information and recommendations set forth herein are believed to be accurate, the manufacturer takes no warranty with respect thereto and disclaims all liability from reliance thereon.