

# SAFETY DATA SHEET



## SECTION 1 CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

**Product Name:** Pyrofil™ Carbon Fiber Size Code “S”

**Manufacturer's/Distributor's Name:** Mitsubishi Rayon Carbon Fiber and Composites, Inc.

**Manufacturer's/Distributor's Address:** 5900 88<sup>th</sup> Street  
Sacramento, CA 95828  
Telephone: (916) 386-1733  
Facsimile: (916) 383-7668

**Emergency Telephone Number:** **(916) 386-1733**  
**[9:00 am - 5:00 pm, M - F, PST]**

**Date Prepared:** June 16, 2015  
[previous version: Sept. 4, 2014]

**Product Form:** Article

**Recommended Use:** Structural Material

## SECTION 2 HAZARDS IDENTIFICATION

### \*\*\*Emergency Overview\*\*\*

Black continuous carbon fiber. Not expected to present an immediate concern for emergency response personnel. Not expected to present an immediate acute health, reactivity, or flammability hazard. Not expected to present an environmental hazard.

Label Pictogram:



Signal Word:

Warning

Hazard Classes:

Irritant  
Dermal Sensitizer

## HAZARD STATEMENTS:

### POTENTIAL HEALTH EFFECTS

**SKIN:** May cause skin irritation. Mechanical irritation may occur from carbon fiber abrading or becoming imbedded in the skin. Dermal sensitization may occur from exposure to sizing present on the carbon fiber.

**EYES:** Fragments of this product may cause mechanical eye irritation. Chemical irritation may occur from exposure to sizing present on the carbon fiber.

**INHALATION:** Inhalation exposure to respirable fibers of this product is not expected to occur under normal industrial conditions. Under very limited circumstances, however, exposure to respirable fibers of this product can occur and may result in respiratory tract irritation.

**INGESTION:** Not expected to occur during industrial activities since ingestion is not a relevant route of exposure.

**CHRONIC EFFECTS/CARCINOGENICITY:** Not regulated as a carcinogen. There are no chronic effects/carcinogenicity data available on this product. Under very limited circumstances, exposure to respirable fibers of this product can occur and may result in respiratory tract irritation; prolonged exposure may result in more adverse effects. See Section 11 – *Toxicological Information* for information on subchronic toxicity.

NTP: *Not listed*; IARC: *Not listed*; OSHA: *Not listed*

**MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:** None known.

**SIGNS AND SYMPTOMS OF EXPOSURE:** May result in slight skin and eye irritation.

<b>SECTION 3 COMPOSITION AND INFORMATION ON INGREDIENTS</b>
---

**PRODUCT IDENTITY:** Pyrofil™ Carbon Fiber Size Code “S”

**COMMON NAME:** Carbon Fiber, Size Code “S”

Ingredient	CAS Registry No.	Weight %	Exposure Limits
Carbon fiber	7440-44-0	≥ 98%	See Note 1 below
Epoxy resin	Trade Secret	≤ 1.2%	NE

Notes on Composition and Information on Ingredients

NE = Not established

<sup>1</sup> OSHA and ACGIH have not established air contaminant limits for carbon fibers. Under certain conditions, this substance may be a nuisance dust. OSHA has an established standard for particulates not otherwise regulated (nuisance dust) set at 5 mg/m<sup>3</sup> (respirable fraction) and 15 mg/m<sup>3</sup> (total dust). ACGIH has established an exposure value of 3 mg/m<sup>3</sup> (respirable fraction) and 10 mg/m<sup>3</sup> (inhalable fraction) for particulates not otherwise classified.

**SECTION 4**  
**FIRST AID MEASURES**

**FIRST AID MEASURES**

**SKIN:** Wash fibers off of skin with water and soap. If fibers are imbedded in the skin, remove with tweezers. Discard clothing that may contain imbedded fibers. Get medical attention if exposure results in adverse effects.

**EYES:** Immediately flush with a continuous water stream for at least 15 minutes. Washing immediately after exposure is expected to be effective in preventing damage to the eyes. Get medical attention.

**INHALATION:** If there is inhalation exposure to the fibers of this product, remove source of exposure and move victim to fresh air. If not breathing give artificial respiration. If there is breathing difficulty get immediate medical attention.

**INGESTION/SWALLOWED:** Not expected to occur since ingestion is not a likely route of exposure for this product. If ingestion does occur, do not induce vomiting. Nothing by mouth if unconscious. Get immediate medical attention.

**SECTION 5**  
**FIRE FIGHTING MEASURES**

**FLASH POINT:** Not applicable

**EXPLOSION/FLAMMABLE LIMITS:** Not applicable

**AUTOIGNITION TEMPERATURE:** Not applicable

**EXTINGUISHING MEDIA:**

**SUITABLE:** Carbon Dioxide, Dry Chemicals, Foam, Water Fog, Direct Water Spray

**UNSUITABLE:** None

This material is not expected to burn in a fire. If this product is present in a fire, fight fire based on the presence of combustible materials, i.e., packaging material and the sizing may burn off the fiber.

**SPECIAL EXPOSURE HAZARDS:** Fiber or dust may glow in an oxygen-containing atmosphere above 350°C. When glowing, and during combustion CO/CO<sub>2</sub> is generated as well as the potential release of degradation products such as NH<sub>3</sub>, HCN and small amounts of nitrogen oxides, carbon monoxide, organic compounds, and other potentially hazardous substances.

**SPECIAL FIRE FIGHTING PROCEDURES:** As in any fire, wear a self-contained breathing apparatus pressure demand (MSHA/NIOSH approved or equivalent) and full protective gear. Fight fires from a safe distance or protected areas. Fire hoses with fog nozzles may be used for controlling fires but care must be exercised not to spread flaming. Water may not always be effective for large fires.

**UNUSUAL FIRE AND EXPLOSION HAZARDS:** Under high heat (> 350 °C), this product may react with oxygen to give off carbon oxides and other decomposition products.

**OTHER INFORMATION:** This product is not expected to burn. Do not incinerate carbon fibers since airborne fibers may cause electrical malfunctions. See Section 13 – *Disposal Considerations* for additional information.

**SECTION 6  
ACCIDENTAL RELEASE MEASURES**

**PERSONAL PRECAUTIONS, PROTECTIVE EQUIPMENT:** Use proper PPE to protect eyes, skin and clothing. See Section 8 for controls and PPE details.

**ENVIRONMENTAL PRECAUTIONS:** Prevent product from entering drains. Do not contaminate surface water.

**CONTAINMENT AND CLEANING UP:** In case of spill, collect (*e.g.*, sweep up, vacuum, etc.) spilled material and dispose of in accordance with Federal, State & Local regulation. Carbon fibers may be slippery if spilled posing an accident risk. Wear personal protective equipment as described in Section 8 during cleanup activities.

**SECTION 7  
HANDLING AND STORAGE**

**HANDLING:** Wear appropriate protective equipment as described in Section 8 during handling activities. Wash hands with soap and water after handling.

**STORAGE:** Store in a cool, dry place. Carbon fiber is stable against acid and alkaline, but the sizing agent may degenerate.

**SECTION 8  
EXPOSURE CONTROLS AND PERSONAL PROTECTION**

**RESPIRATORY PROTECTION:** Normal use and processing of this product are not expected to generate carbon fiber dust. Respirable fibers of this product under certain very limited circumstances can be generated. In such circumstances, HEPA respiratory protection should be used to prevent exposure

**PROTECTIVE GLOVES:** Latex gloves should be worn when handling this product. Rinse and remove gloves after use, and wash hand thoroughly with soap and water. Gloves should be removed and replaced if there are any signs of degradation or breakthrough.



**PROTECTIVE CLOTHING:** Wear protective clothing to minimize the potential for skin contact. An emergency shower should be readily accessible. Discard any clothing that has become contaminated.



**EYE PROTECTION:** Wear safety goggles or glasses when handling or processing this product in any form.



**VENTILATION:** Use in well ventilated area.

**EXPOSURE GUIDELINES:** OSHA and ACGIH have not established air contaminant limits for carbon fibers. Under certain conditions, this substance may be a nuisance dust. OSHA has an established standard for particulates not otherwise regulated (nuisance dust) set at 5 mg/m<sup>3</sup> (respirable fraction) and 15 mg/m<sup>3</sup> (total

dust). ACGIH has established an exposure value of 3 mg/m<sup>3</sup> (respirable fraction) and 10 mg/m<sup>3</sup> (inhalable fraction) for particulates not otherwise classified.

**SECTION 9  
PHYSICAL AND CHEMICAL PROPERTIES**

Property		Property	
APPEARANCE (PHYSICAL STATE, COLOR, ETC.):	Black continuous fiber	Flammability (solid, gas):	NA
Odor:	None	Upper/lower flammability or explosive limits:	NA
Odor threshold:	NA	Vapor pressure:	NA
pH:	NA	Vapor density:	NA
Melting point/freezing point:	NA	Relative density (specific Gravity):	1.75 – 1.85
Initial boiling point and boiling range:	NA	Solubility(ies):	Insoluble in water
Flash point:	NA	Partition coefficient: n-octanol/water:	NA
Evaporation rate:	NA	Autoignition temperature:	NA

**Decomposition Temperature:** Fiber: Under high heat (> 350 °C), this product may react with oxygen to give off carbon oxides and other decomposition products, NH<sub>3</sub>, HCN and monomeric acrylonitrile.

**Decomposition Temperature:** Size/resin: temperatures > 350 °C can result in the release of small amounts of nitrogen oxides, carbon monoxide, organic compounds, and other potentially hazardous substances.

**SECTION 10  
STABILITY AND REACTIVITY**

**CHEMICAL STABILITY:** Stable.

**POSSIBILITY OF HAZARDOUS REACTIONS:**

CARBON FIBER is highly conductive and can cause electrical components to malfunction.

HAZARDOUS POLYMERIZATION: Will not occur.

**CONDITIONS TO AVOID:**

Do not incinerate carbon fibers since airborne fibers may cause electrical malfunctions.

Avoid high heat in oxygen atmosphere. See below decomposition products.

**INCOMPATIBILITY/MATERIALS TO AVOID:**

Carbon fiber is stable against acid and alkaline, but the sizing agent may degenerate  
**HAZARDOUS DECOMPOSITION OR BYPRODUCTS:**

Not expected under normal conditions of processing and use.

Thermal decomposition of sizing may begin to occur at high temperatures (> 350 °C) resulting in the release of small amounts of nitrogen oxides, carbon monoxide, organic compounds, and other potentially hazardous substances.

Thermal decomposition of Carbon Fiber is not expected under normal conditions of processing and use. Under high heat (> 350 °C), this product may react with oxygen to give off carbon oxides and other decomposition products, like NH<sub>3</sub>, and HCN

<b>SECTION 11 TOXICOLOGICAL INFORMATION</b>
---

**LIKELY ROUTES OF EXPOSURE:** See sections 2 and 4 for details.

**NUMERICAL MEASURES OF TOXICITY (SUCH AS ACUTE TOXICITY ESTIMATES):**

**ACUTE TOXICITY**

**ORAL/ DERMAL/ INHALATION/SKIN:**

ORAL (LD50): NO DATA AVAILABLE

SKIN (LD50): NO DATA AVAILABLE

**IRRITATION EYE:** CAUSES IRRITATION

**SKIN:** IRRITATION TO SKIN AND MUCOUS MEMBRANES

**SENSITIZATION:** SENSITIZATION POSSIBLE THROUGH SKIN CONTACT.

**SYMPTOMS RELATED TO THE PHYSICAL, CHEMICAL AND TOXICOLOGICAL CHARACTERISTICS;**

**SKIN:** REDDENING OF SKIN OR SIGNS OF RASH. DRY CRACKING SKIN.

**DELAYED AND IMMEDIATE EFFECTS AND ALSO CHRONIC EFFECTS FROM SHORT- AND LONG-TERM EXPOSURE:**

**SUBCHRONIC TOXICITY:** Two sub-chronic inhalation tests in rats exposed to carbon fibers have been conducted. In one test, rats were exposed to fibers for 16 weeks. Pulmonary function tests performed on the test animals before necropsy did not show any significant or consistent changes. The only pulmonary finding related to exposure was the occurrence of phagocytosis by alveolar macrophages. No inflammation or fibrosis was observed. In the second study, rats were also exposed to carbon fibers for 16 weeks. Based on clinical signs, no effects due to exposure were observed. Histopathological evaluation revealed non-fibrous particles in the pulmonary lymphoid clearance system and in alveolar macrophages. There were no signs of fibrosis.

**REPRODUCTIVE TOXICITY:** NO DATA ARE AVAILABLE.

**TERATOGENICITY (birth defects):** NO DATA ARE AVAILABLE.

**MUTAGENICITY:** Several *in vitro* mutagenicity tests have been performed on carbon fibers. Carbon fibers have been found to be negative in the gene mutation assay in bacteria (Ames test), did not cause sister chromatid exchanges in Chinese hamster ovary (CHO) cells, and did not cause unscheduled DNA synthesis in rat liver cells or forward mutations in studies with CHO cells.

**CHRONIC EFFECTS/CARCINOGENICITY:** NO DATA ARE AVAILABLE.

**SECTION 12**  
**ECOLOGICAL INFORMATION**

**ECOTOXICITY (AQUATIC AND TERRESTRIAL, WHERE AVAILABLE):** NO DATA ARE AVAILABLE.

**PERSISTENCE AND DEGRADABILITY:** NO DATA ARE AVAILABLE.

**BIOACCUMULATIVE POTENTIAL:** NO DATA ARE AVAILABLE.

**MOBILITY IN SOIL:** NO DATA ARE AVAILABLE.

**OTHER ADVERSE EFFECTS:** NO DATA ARE AVAILABLE.

**SECTION 13**  
**DISPOSAL CONSIDERATIONS**

**RCRA CLASSIFICATION:** If discarded in its manufactured form, this product is not expected to be a characteristic or specifically listed hazardous waste under RCRA. However, it is the responsibility of the user to determine at the time of disposal whether a material containing the product or derived from the product should be classified as a hazardous waste.

**SPECIAL INSTRUCTIONS:** Do not incinerate carbon fibers since airborne fibers may cause electrical malfunctions. Any disposal practices must be in compliance with federal, state, and local requirements.

**SECTION 14**  
**TRANSPORT INFORMATION**

**U.S./INTERNATIONAL SHIPPING INFORMATION UNDER DOT/IMO/IATA REGULATIONS:** This product is not regulated as dangerous or hazardous goods under DOT, IMO, ICAO, IATA, or UN shipping regulations.

**UN NUMBER:** NOT CLASSIFIED

**UN PROPER SHIPPING NAME:** NOT CLASSIFIED

**TRANSPORT HAZARD CLASS(ES):** NOT CLASSIFIED

**PACKING GROUP, IF APPLICABLE:** NA

**MARINE POLLUTANT (NO):** NA

**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:**

If carbon fiber is in an accident where it is being incinerated, carbon fibers may become airborne fibers and may cause electrical malfunctions. See Section 10 for details on hazardous decomposition and or byproducts.

**SECTION 15**  
**REGULATORY INFORMATION**

**REGULATORY STATUS:** This product, as well as its impurities, may trigger specific reporting, recordkeeping, and testing requirements under TSCA, EPCRA/SARA III, RCRA, CERCLA, CAA, SDWA, and CWA.

**CALIFORNIA PROPOSITION 65:** This product contains the following substances known to the State of California to cause cancer, birth defects or reproductive harm.

CAS No.	Component	By wt. of epoxy resin
106-89-8	Epichlorohydrin	< 10 ppm

This information is provided to assist users of this product that conduct business in California in discharging any warning obligations that that person may have under California Proposition 65.

**OTHER STATE CHEMICAL LISTS:**

CAS No.	Component	By wt. of epoxy resin
106-89-8	Epichlorohydrin	< 10 ppm

**EPCRA/SARA TITLE III SECTION 313:** This compound contains no toxic chemicals at or above the de-minimus threshold subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR 372.

**EU: Status under Registration Evaluation Authorization of Chemicals EU regulation (EC) No 1907/2006 (REACH)**

Continuous Carbon Fiber and cut Carbon Fibers are considered to be articles under REACH and therefore do not require pre-registration or registration.

This material does not contain chemicals designated as "CMR" toxins under REACH.

Carbon fiber size code "S" is in compliance with EU No. 1272/2013.

The maximum concentration of BPA present is 0.15 ppm.

**SECTION 16**  
**OTHER INFORMATION**

**DISCLAIMER:** This information is furnished without warranty, expressed or implied, except that it is believed to be accurate to the best knowledge of MRCFAC, Inc. The information presented in this MSDS is related only to the specific material designated herein. MRCFAC, Inc. assumes no legal responsibility for the use or reliance upon these data. The user should review any recommendation in the specific context of the intended use to determine whether appropriate.



## NFPA Diamond



### Health (Blue)

- 4 Materials that under emergency conditions can be lethal

### Flammability (Red)

- 1 All liquids, solids, and semi solids with flash points at or above 200F

### Reactivity (Yellow)

- 1 Materials which are normally stable but may become unstable in combination with other materials or at elevated temperatures and pressures.

## HMIS



### Health

1. Irritation or minor reversible injury possible.

### Flammability

1. Materials that must be preheated before ignition will occur. Includes liquids, solids and semi solids having a flash point above 200 °F (93 °C)

### Reactivity

1. Materials that are normally stable but can become unstable (self-react) at high temperatures and pressures.

### Protective Equipment

- B** See Section 8 for details on appropriate PPE.  
Safety glasses, nitrile gloves and cloths