SAFETY DATA SHEET

Mitsubishi Rayon Carbon Fiber and Composites, Inc.

SECTION 1
CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: Grafil Carbon Fiber

Product Code(s):	347W0614A	347W1214A	346R4812A	378W5410A
347R0312A	347R1207A	347R2412A	346W4807A	347R0612H
347W0314A	347R1212A	346W2407A	346W4814A	347W0612H
347R0612A	347W1203A	347W2407A	347R4812A	347W1212H
347W0612A	347W1207A	347W2414A	378W1810A	

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

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

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

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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 although there is trace amounts of bisphenol A-(epichlorohydrin). See section 15.

POTENTIAL HEALTH EFFECTS

Hazard symbols:

Irritant

R-phrases: R36 Irritate to eyes.
R-38 Irritating to skin

SKIN: May cause skin irritation. Mechanical irritation may occur from carbon fiber abrading or becoming imbedded in the skin. Chemical irritation 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 are 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.

INCOMPATIBILITY: None known.

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

SECTION 3
COMPOSITION AND INFORMATION ON INGREDIENTS

Ingredient	CAS Registry No.	Weight %	Exposure Limits
Carbon fiber	7440-44-0	99%	See Note 1 below
Epoxy resin	25068-38-6	0.5% - 1.4%	See Note 2 below

Notes on *Composition and Information on Ingredients*

NE = Not established

[1] 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^3 (respirable fraction) and 15 mg/m^3 (total dust). ACGIH has established an exposure value of 3 mg/m^3 (respirable fraction) and 10 mg/m^3 (inhalable fraction) for particulates not otherwise classified.
[2] This product contains trace impurities of bisphenol A-(epichlorohydrin), Regulatory information can be found in Section 15.

SECTION 4
FIRST AID MEASURES

FIRST AID MEASURES

S-phrases:

S24 Avoid contact with skin.
S25 Avoid contact with eyes.
S28 After contact with skin, wash immediately with plenty of soap-suds.
S33 Take precautionary measures against static discharges.

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 20 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, give oxygen. Get immediate medical attention for any respiratory problems.

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.

UNSUITABLE: Direct Water Spray

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 flammable 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/CO2 is generated as well as the potential release of degradation products such as NH3, HCN and monomeric acrylonitrile.

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 (> 750 °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

SPILL/RELEASE AND CLEANUP PROCEDURES: In case of spill, collect (*e.g.*, sweep up, vacuum, etc.) spilled material and either reuse or dispose of properly. Chopped or milled 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

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Store in a cool, dry place. Wash hands with soap and water after handling. Wear appropriate protective clothing as described in Section 8 during handling activities.

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.

AIR MONITORING: No information is available.

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^3 (respirable fraction) and 15 mg/m^3 (total dust). ACGIH has established an exposure value of 3 mg/m^3 (respirable fraction) and 10 mg/m^3 (inhalable fraction) for particulates not otherwise classified.

SECTION 9
PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Black continuous fiber
Odor:	None
Specific Gravity:	1.75 - 1.85
Vapor Pressure:	None
Melting Point:	Not applicable
Solubility in Water:	Insoluble

SECTION 10
STABILITY AND REACTIVITY

STABILITY: Stable.

CONDITIONS TO AVOID: None.

INCOMPATIBILITY/MATERIALS TO AVOID: Do not expose to strong oxidizing agents such as fluorine. Carbon fiber can react violently with such compounds.

HAZARDOUS DECOMPOSITION OR BYPRODUCTS: Not expected under normal conditions of processing and use. Thermal decomposition of sizing may begin to occur at high temperatures (> 120 °C) resulting in

the release of small amounts of nitrogen oxides, carbon monoxide, organic compounds, and other potentially hazardous substances.

HAZARDOUS POLYMERIZATION: Will not occur.

SECTION 11
TOXICOLOGICAL INFORMATION

ACUTE TOXICOLOGICAL DATA: There are no acute toxicological data available on this product. The oral, dermal, and inhalation acute toxicity are expected to be very low.

EYE IRRITATION DATA: No data are available.

SKIN IRRITATION DATA: No data are available.

SKIN SENSITIZATION DATA: No data are available.

SUBCHRONIC TOXICITY: Two subchronic 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

ECOTOXICOLOGICAL DATA: No data are available.

ENVIRONMENTAL FATE DATA: No data are available.

PHYSICAL/CHEMICAL PROPERTIES: 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.

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 epichlorohydrin, a substance known to the State of California to cause cancer and reproductive toxicity. The maximum level of epichlorohydrin in this product is 2 ppm. This product also contains phenyl glycidyl ether, a substance known to the State of California to cause cancer. The maximum level of phenyl glycidyl ether in this product is 6 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: This product contains epichlorohydrin and phenyl glycidyl ether at maximum levels of 2 ppm and 6 ppm, respectively. These chemicals are identified on several state chemical lists.

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. These materials do not contain any substances or preparations of high concern (SVHC) as per the list issued by the ECHA dated 19th December 2011, or are designated "CMR" toxins under REACH.

This product contains a branched nonylphenol ethoxylate sulfated ammonium salt [CAS RN 68649-55-8] which may be present at levels in excess of 0.1% in this product. EU Directive 2003/53/EC establishes certain use and threshold restrictions for nonylphenol and nonylphenol ethoxylates in nine specified sectors. Nonylphenol and nonylphenol ethoxylates may not be placed on the market or used as a substance or constituent of preparations in concentrations equal to or greater than 0.1% by mass for the nine sectors identified under this EU Directive. See EU Directive or applicable national legislation for the nine use sectors. These regulations do not apply to nonylphenol or nonylphenol ethoxylates for research and development or analytical purposes. Contact Mitsubishi Rayon Carbon Fiber and Composites, Inc. (MRCFAC, Inc.) for additional information on this requirement.

Canada: This product contains a branched nonylphenol ethoxylate sulfated ammonium salt [CAS RN 68649-55-8] which may be present at levels in excess of 0.1% in this product. Environment Canada published on December 4, 2004 rulemaking to reduce discharges and use of nonylphenol and nonylphenol ethoxylates in certain use sectors. Canada Gazette Vol. 138, No. 49. See Canadian regulations for the specific use sectors. Companies subject to this rule are required to track their volumes, make threshold calculations, and reduce their use of nonylphenol and nonylphenol ethoxylates. Contact MRCFAC, Inc. for additional information on this requirement.

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.