MATERIAL SAFETY DATA SHEET

Grafil, Inc.

SECTION 1
CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: Pyrofil™ Carbon Fiber

Product Codes: TR40, MR40, MR50, MR60
MS40, HR40, HS40, SR40, MRX40

Manufacturer's/Distributor's Name: Grafil, Inc.

Manufacturer's/Distributor's Address: 5900 88th Street
Sacramento, CA 95828 Telephone: (916) 3
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[9:00 am - 5:00 pm, M - F, PST]

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SECTION 2
COMPOSITION AND INFORMATION ON INGREDIENTS

Ingredient	CAS Registry No.	Weight %	Exposure Limits
Carbon fiber	7440-44-0	≥ 99%	See Note 1 below
Polyether resin	Trade secret	≤ 1.2%	NE

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.

SECTION 3
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.

POTENTIAL HEALTH EFFECTS

SKIN: May cause skin irritation. Mechanical irritation may occur from carbon fiber abrading or becomi imbedded in the skin. Chemical irritation may occur from exposure to sizing present on the carbon fibe

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

INHALATION: Inhalation exposure to respirable fibers of this product is not expected to occur under no 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 t respirable fibers of this product can occur and may result in respiratory tract irritation; prolonged expos 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: Not known.

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

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 twee 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 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 a 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 t product. If ingestion does occur, do not induce vomiting. Nothing by mouth if unconscious. Get immed

medical attention.

SECTION 5
FIRE FIGHTING MEASURES

FLASH POINT: Not applicable

EXPLOSION/FLAMMABLE LIMITS: Not applicable

AUTOIGNITION TEMPERATURE: Not applicable

EXTINGUISHING MEDIA: This material is not expected to burn in a fire. If this product is present in a fi
fight fire based on the presence of flammable materials.

SPECIAL FIRE FIGHTING PROCEDURES: As in any fire, wear a self-contained breathing apparatus pres
demand (MSHA/NIOSH approved or equivalent) and full protective gear. Fight fires from a safe distan
protected areas. Fire hoses with fog nozzles may be used for controlling fires but care must be exercise
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 airb
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.) sp
material and either reuse or dispose of properly. Chopped or milled carbon fibers may be slippery if spi
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 wi
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 c
fiber dust. Respirable fibers of this product under certain very limited circumstances can be generated.
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 gl
after use, and wash hand thoroughly with soap and water. Gloves should be removed and replaced if th
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 for

AIR MONITORING: No information is available.

EXPOSURE GUIDELINES: OSHA and ACGIH have not established air contaminant limits for carbon fib
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 (
dust). ACGIH has established an exposure value of 3 mg/m^3 (respirable fraction) and 10 mg/m^3 (inhala
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 processin
use. Thermal decomposition of sizing may begin to occur at high temperatures (> 120 °C) resulting in t
release of small amounts of nitrogen oxides, carbon monoxide, organic compounds, and other potential
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 or
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 or
test animals before necropsy did not show any significant or consistent changes. The only pulmonary fi
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

clinical signs, no effects due to exposure were observed. Histopathological evaluation revealed non-fib particles in the pulmonary lymphoid clearance system and in alveolar macrophages. There were no sig 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 fib 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 synt 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 t 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 i 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, recordke and testing requirements under TSCA, EPCRA/SARA III, RCRA, CERCLA, CAA, SDWA, and CWA.

CALIFORNIA PROPOSITION 65: This product contains no chemicals known to the state of California to cancer or reproductive toxicity.

OTHER STATE CHEMICAL LISTS: This product contains no chemicals known to be present on any 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.

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 Grafil, Inc. The information presented in this MSDS is related only to the specific material designated herein. Grafil, Inc. assumes no legal responsibility for tl or reliance upon these data. The user should review any recommendation in the specific context of the intended use to determine whether appropriate.