

MATERIAL SAFETY DATA SHEET

MSDS NO. 0503C

CHEMTREC EMERGENCY TELEPHONE NO. (800) 424-9300

EFFECTIVE DATE: 3/26/08

TOHO TENAX AMERICA, INC.
121 Cardiff Valley Road, Rockwood, TN 37854 USA
TENAX®
SIZED, CONTINUOUS, AND CHOPPED CARBON FIBERS

I. PRODUCT DESCRIPTION

Carbon Fibers are high strength carbon fibers produced from a polyacrylonitrile (PAN) precursor. The carbon fibers are surface treated to promote adhesion to organic polymers. The fibers are sized with a variety of proprietary sizes whose specific chemical identities are trade secrets.

DOT Hazard Classification: Not regulated.

Freight Classification: Yarn, synthetic fibers NOI.

CAS Number: 7440-44-0 (carbon).

All chemical components are listed in the EPA's TSCA Inventory.

II. HAZARDOUS INGREDIENTS

Epoxy resin size (see paragraph titled "Other Health Effects Data" in Section VI).

When carbon fibers are processed nuisance dust may be generated which can cause eye, skin, or respiratory irritation.

III. PHYSICAL AND CHEMICAL CHARACTERISTICS (TYPICAL VALUES)

Appearance: Black fibers negligible odor Density: 1.73 - 1.96 g/cm³

Filament Diameter: 4.5 - 8.4 microns Filament Count: 500 - 80,000

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IV. **PHYSICAL HAZARDS**

Electrical Hazard: Carbon fiber dust and fibrous particles are electrically conductive and can cause shorting in electrical equipment and computers. Explosive shorting of high voltage systems is possible.

Flash Point: Not applicable.

Fire Extinguishing Media: Water, carbon dioxide, dry chemical or foam (for cores & shipping containers).

Special Fire Fighting Procedures: None known.

Fire and Explosion Hazards: None known.

V. **REACTIVITY DATA**

Stability: Stable

Hazardous Decomposition Products: None known.

Hazardous Polymerization: Will not occur.

Materials to avoid: None known.

VI. **HEALTH HAZARDS**

Exposure Limits:

OSHA PEL: 15 mg/m³ (total) Particles not otherwise regulated Exposure (PNOR); 5 mg/m³ (respirable).

ACGIH TLV: 10 mg/m³ (inhalable) Particles not otherwise specified (PNOS); 3 mg/m³ (respirable).

Ingestion (swallowing): Chemically inert; no known hazard.

Inhalation (breathing): A 16-week repeat inhalation animal study with 7 micron diameter unsized carbon fiber did not produce any significant exposure-related effects or fibrogenic response. Dust may produce mechanical irritation to the mucus membranes of the nose, throat and upper respiratory tract.

Skin Contact: Mechanical irritation accompanied by itching or dermatitis may occur from exposure to broken filaments or loose particles of carbon fiber.

Eye Contact: Particulate matter may cause eye irritation.

First Aid & Emergency Procedures: If product irritates skin, wash area with mild soap and water. If particles get in eyes, flush with plenty of water for several minutes. If skin, eye or respiratory irritation persists, seek medical attention promptly.

HEALTH HAZARDS (Continued)

Other Health Effects Data: Liquid finishes containing epoxy of the type applied to these fibers have given positive results in Ames, mouse lymphoma and sister chromatid exchange "in vitro" (test tube) tests, implying a potential for genotoxicity. Of greater significance, live animal exposure to the liquid finish by inhalation produced no evidence of toxicity or increase in sister chromatid exchanges, and dermal exposure of live animals to the liquid finish produced no adverse effect on reproductive performance. Subacute dermal testing of the finish in live animals produced no toxicity or dermal irritation, but human patch testing showed a potential to produce dermal sensitization. The liquid finish produced no eye irritation in laboratory animals.

VII. SPILL OR LEAK PROCEDURES

Spilled product should be placed in sealed plastic bags. The actual clean-up of a spill should be accomplished with due regard to the electrically conductive nature of the product. Contamination of electrical equipment should be avoided. If a vacuum system is used in the clean-up, it should be fully capable of handling a conductive material with no risk of electrical shock to the operator.

WASTE DISPOSAL METHODS

Carbon fibers are not listed as hazardous waste not do they exhibit any of the hazardous characteristics contained in USA federal hazardous regulations (40CFR261). Waste carbon fibers should be disposed of in an approved landfill in accordance with existing national and local regulations.

VIII. SPECIAL PROTECTION INFORMATION

Respiratory Protection: When dust concentration exceeds recommended TLV of 10 mg/m³ (total dust) or 3 mg/m³ (respirable dust) wear NIOSH approved particulate respirator.

Local Exhaust: Recommended when appropriate to control employee exposure, especially at points where fragmentation or particulate generation may occur.

Mechanical (General) Ventilation: May not be adequate as the sole means of controlling dust or lint.

Protective Gloves: Wear gloves when handling.

Eye Protection: Wear safety goggles if dust or lint is present.

Other Protective Measures: Apply barrier cream or wear long sleeved shirt to prevent fibrous matter from contacting exposed skin. Wash work clothing frequently. Wash exposed skin areas before eating and at end of work day. Use good housekeeping practices to keep work area free of dust and fibers.

IX. **SPECIAL PRECAUTIONS**

Electrical equipment, enclosures and circuits in or near areas where carbon fibers are used should be protected against infiltration of or contact with airborne particles or filaments.

Store carbon fiber product in original containers. Avoid conditions that may generate carbon dust or lint.

As with all industrial products, selection of specific personal protective equipment (e.g., gloves, disposable, clothing, respirators) and general control (e.g., local exhaust ventilation) depends upon the type of operation and exposure potential. To avoid ingestion incidental to handling, food and tobacco should not be present in the work area. Wash skin contact areas with soap and water after handling.

To the best of our knowledge, the information contained in this publication is accurate; however, we do not assume any liability whatsoever for the accuracy or completeness of such information. Moreover, there is a need to reduce human exposure to many materials to the lowest practical limits in view of possible long-term adverse effects. To the extent that any hazards may have been mentioned in the publication, we neither suggest nor guarantee that such hazards are the only ones which exist. Final determination of the suitability of any information or product for the use contemplated by any user, the manner of that use and whether there is any infringement of any patents is the sole responsibility of the user. We recommend that anyone intending to rely on any recommendation or to use any equipment, processing technique or material mentioned in this publication should satisfy himself as to such suitability and that he can meet all applicable safety and health standards. We strongly recommend that users seek and adhere to the manufacturers' or suppliers' current instruction for handling each material they use.

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