



Fibers

# MATERIAL SAFETY DATA SHEET

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**MSDS IDENTIFICATION NAME:** HEXCEL<sup>®</sup> Carbon Fiber Unsized  
**MSDS NUMBER:** 437-3427-CAR0-UN00-04     **DATE:** June 1, 1998     **PAGE:** 1 OF 7  
**SUPERSEDES MSDS NUMBER:** 437-3427-CAR0-UN00-03

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## SECTION I: PRODUCT IDENTIFICATION

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**MANUFACTURER:** Hexcel Corporation  
5794 West Las Positas Boulevard  
P.O. Box 8181  
Pleasanton, CA 94588-8781

**EMERGENCY TELEPHONE NUMBER:** 800-433-5072 (24-Hour)

**INFORMATION TELEPHONE NUMBER:** 925-847-9500 (Normal Business Hours-PT)

**COMMON NAME:** HEXCEL<sup>®</sup> Carbon (Graphite) Fiber Unsized  
**CHEMICAL NAME:** Carbon (graphite) fiber, no sizing applied  
**CAS NUMBER:** 7440-44-0

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## SECTION II: HAZARDOUS INGREDIENTS AND EXPOSURE LIMITS

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MATERIAL OR COMPONENTS	CAS NUMBER	% BY WEIGHT	OSHA(PEL) (TWA)	ACGIH(TLV) (TWA)
Carbon (graphite), synthetic fiber, Polyacrylonitrile (PAN)-based, 92-99.7% carbon	7740-44-0	100	$\frac{15 \text{ mg/m}^3(\text{Total})}{5 \text{ mg/m}^3(\text{Respirable})}$	$\frac{10 \text{ mg/m}^3(\text{Total})}{3 \text{ mg/m}^3(\text{Respirable})}$

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## SECTION III: HAZARD IDENTIFICATION

### EMERGENCY OVERVIEW:

**APPEARANCE AND ODOR:** Black fiber, no significant odor at room temperature.

### STATEMENTS OF HAZARD:

**WARNING! THIS PRODUCT IS ELECTRICALLY CONDUCTIVE.**

**MAY CAUSE MILD, TEMPORARY MECHANICAL EYE AND SKIN IRRITATION.**

### PRIMARY ROUTE OF EXPOSURE/ENTRY:

Inhaling dusts and skin contact without skin absorption may occur. Following standard industrial hygiene and recommended procedures, entry of the material into the body is not expected.

### HMS RATINGS:

**HEALTH:** 1-slight     **FLAMMABILITY:** 0-minimal     **REACTIVITY:** 0-minimal

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## SECTION III: HAZARD IDENTIFICATION (CONTINUED)

### SIGNS AND SYMPTOMS OF OVEREXPOSURE IN THE WORKPLACE:

**EYES:** May cause mild, mechanical eye redness and irritation.

**SKIN:** May cause mild, mechanical skin redness, itching and drying of the skin.

**INHALATION:** : Inhaling dusts may cause respiratory irritation or a mechanical irritation of mucus membranes and the respiratory tract.

**INGESTION:** Although ingestion is not an expected route of industrial exposure and while this material may be a stomach (gastric) irritant, it is not expected

to cause any significant adverse effects.

**MEDICAL CONDITIONS GENERALLY RECOGNIZED AS BEING AGGRAVATED BY EXPOSURE:**  
Prolonged or repeated contact may cause skin irritation.

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**SECTION IV: FIRST AID MEASURES**

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**EMERGENCY & FIRST AID PROCEDURES:**

**EYES:** In case of contact, immediately flush with plenty of low-pressure water for 15 minutes. Remove any contact lenses to ensure thorough flushing. Call a physician.

**SKIN:** Promptly wash with soap and running water. Remove contaminated clothing. Wash clothing before reuse.

**INHALATION:** Remove to fresh air. If breathing has stopped, give artificial respiration, preferably mouth to mouth. If breathing is difficult, qualified personnel may administer oxygen. Get medical attention.

**INGESTION:** If swallowed, it is not necessary to induce vomiting.

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**SECTION V: FIRE FIGHTING MEASURES**

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**WARNING! THIS PRODUCT IS ELECTRICALLY CONDUCTIVE.**

**FLASH POINT:** Not determined

**FLAMMABLE LIMITS:** Not determined

**AUTOIGNITION TEMPERATURE:** Not determined

**EXTINGUISHING MEDIA:** Water spray, dry chemical, foam, carbon dioxide or halon

**SPECIAL FIREFIGHTING PROCEDURES:** Use self-contained breathing apparatus.

**UNUSUAL FIRE AND EXPLOSION HAZARDS:** None determined

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**SECTION VI: ACCIDENTAL RELEASE MEASURES**

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**SPILL PROCEDURES:**

If material is not contaminated, put it into clean containers for use. If it is contaminated, put it into containers for disposal.

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**SECTION VII: HANDLING AND STORAGE**

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**HANDLING AND STORAGE PRECAUTIONS:**

**THIS PRODUCT IS ELECTRICALLY CONDUCTIVE.**

Keep package sealed, away from dirt and moisture.

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**SECTION VIII: EXPOSURE CONTROLS/PERSONAL PROTECTION**

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**APPROPRIATE HYGIENIC PRACTICES:**

Avoid contact with eyes, skin and clothing.

Avoid breathing airborne fibers or dust.

Wash thoroughly after handling, and before eating, drinking or smoking.

Remove contaminated clothing promptly and clean thoroughly before reuse.

**PERSONAL PROTECTIVE EQUIPMENT:**

Wear coverall goggles, as necessary, to prevent irritation, if airborne dust or fibers are present.

Wear protective clothing such as a loose fitting, long sleeved shirt that covers to the base of the neck, long pants and gloves, as necessary to prevent irritation.

Respirators are not ordinarily required. If sufficient fibers or dust are generated during use of the product, use a NIOSH approved dust respirator.

**WORK PRACTICES:**

Eyewash fountains should be easily accessible.

**ENGINEERING CONTROLS:**

Adequate ventilation should be provided to keep fiber and dust concentrations below acceptable exposure limits. Discharge from the ventilation system should comply with applicable air pollution control regulations.

Electrical systems, in areas where this product is handled and potential fiber particles can become airborne, must be satisfactory for operation in an environment containing electrically conductive fiber.

**PROTECTIVE MEASURES DURING REPAIR AND MAINTENANCE:**

Completely isolate and thoroughly clean all equipment, piping or vessels before beginning maintenance or repairs.

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SECTION IX: PHYSICAL AND CHEMICAL PROPERTIES

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**THIS PRODUCT IS ELECTRICALLY CONDUCTIVE.**

**BOILING POINT:** Not determined      **SOLUBILITY IN WATER:** Negligible  
**VAPOR PRESSURE @ 20 °C:** Not determined      **SPECIFIC GRAVITY:** 1.7 - 1.8  
**VAPOR DENSITY:** Not determined      **PH:** Not determined  
**VOLATILE (% VOLUME):** Non-volatile      **EVAPORATION RATE:** Not determined  
**FREEZING POINT:** Not determined

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SECTION X: STABILITY AND REACTIVITY

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**STABILITY CONSIDERATIONS:** Stable  
**CONDITIONS TO AVOID:** None determined  
**INCOMPATIBILITY WITH:** None determined  
**HAZARDOUS PRODUCTS OF COMBUSTION AND DECOMPOSITION:** Products of combustion and decomposition depend on other materials present in the fire and the fire conditions. Burning will produce carbon monoxide, carbon dioxide and other unidentified gases and vapors which may be toxic. Avoid inhalation.  
**HAZARDOUS POLYMERIZATION:** Will not occur under normal conditions of use.  
**CONDITIONS TO AVOID:** None determined

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SECTION XI: TOXICOLOGY INFORMATION

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**CANCER INFORMATION:**

The components of this product are not listed as a carcinogen by (NTP), the National Toxicology Program. They are not regulated as carcinogens by (OSHA), the Occupational Safety & Health Administration and, except as noted below, have not been evaluated by (IARC), the International Agency for Research on Cancer.

Carbon (graphite) fibers were not carcinogenic in a standard lifetime test in mice. They behaved like inert materials when implanted in mice and rats for a lifetime.

One study reported tumors at the implant site in a lifetime study in rats. However these tumors are believed to be due to a chemical that had been added to the fibers prior to implanting them.

**REPORTED HUMAN EFFECTS:**

No reports have been received of adverse effects from workers exposed to this product, nor are any systemic toxicities known to occur upon exposure to it.

The principal health hazard associated with the handling of fibers is simple mechanical abrasion and irritation which is a direct result of the physico-mechanical properties of the fibers rather than a toxic-chemical reaction. Occupational dermatitis is not uncommon in workers handling these types of materials without proper skin protection, and inflammatory eruptions and drying of the skin have been noted.

Allergic or sensitizing reactions are not reported to occur when handling the unsized fibers; however, prepregs prepared from these fibers will carry with them the toxicological properties of the resin system.

**REPORTED ANIMAL EFFECTS:**

Studies have shown that polyacrylonitrile (PAN)-based carbon (graphite) fibers, were not carcinogenic when benzene suspensions were painted on the shaved backs of mice.

Studies have been reported on the long-term toxicity of carbon (graphite) fiber implants in rats for 24 months and mice for 18 months, including histological examination of all tissues in the implant area and other specific organs.

An interim report for one study indicated that there was a single malignant fibrosarcoma found near an implant. The fibrosarcoma was believed to be spontaneous and not caused by the implant. No tumors were found when the study was repeated.

In another study, guinea pigs were exposed to airborne, chopped carbon (graphite) fibers (99% non-fibrous and c. 1.0 micrometer in diameter) for periods of up to 104 hours and examined up to 27 weeks later. Of the remaining 1%, few of the fibers were in the respirable range (1.0-2.5 x < 10 micrometers), and most were larger than 10 x 100 micrometers. The non-fibrous

particles in the lung tissues were, for the most part, observed in macrophages, indicating a normal tissue reaction, and most of the fibers remained in the extracellular spaces; no tumors were found and scar tissue in the lungs was not observed.

Another study has been conducted to evaluate the exposure of rats to air with 20 mg/m<sup>3</sup> of carbon (graphite) fibers, 6 hours/day, 5 days/week for up to 4 months (fiber mean diameter 7 micrometers); no significant treatment-related effects or fibrogenic responses were seen at any time period during the study. Similar lack of toxic effects was seen when the study was repeated using carbon fibers 3 micrometers in diameter.

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**SECTION XI: TOXICOLOGY INFORMATION (CONTINUED)**

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**OTHER:**

Polyacrylonitrile (PAN)-based carbon (graphite) fibers were inactive in sister chromatid exchange (SCE) and unscheduled DNA synthesis assays which are both measures of carcinogenic potential in In-Vitro mammalian cell systems. Ground samples of unsized carbon (graphite) fiber were also negative in the Ames test using any of the 5 tester strains, and no polynuclear aromatic hydrocarbons, such as the carcinogenic benzo(a)pyrene, were detected in extracts of polyacrylonitrile (PAN)-based carbon (graphite) fibers with a detection limit greater than 50 PPB.

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**SECTION XII: ECOLOGICAL INFORMATION**

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No ecological data has been determined.

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**SECTION XIII: DISPOSAL CONSIDERATIONS**

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**WASTE DISPOSAL METHOD:**

Material for disposal should be placed in appropriate sealed containers to avoid potential human and environmental exposure. It is the responsibility of the generator to comply with all federal, state, provincial and local laws and regulations. We recommend that you contact an appropriate waste disposal contractor and environmental agency for relevant laws and regulations. Under the US, Resource Conservation and Recovery Act (RCRA), it is the responsibility of the user of the product to determine at the time of disposal, whether the product meets relevant waste classification and to assure proper disposal.

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**SECTION XIV: TRANSPORT INFORMATION**

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**DOT AND IATA:**

PROPER SHIPPING NAME...Not regulated  
HAZARD CLASS.....Not regulated  
IDENTIFICATION NUMBER...Not regulated  
PACKING GROUP.....Not regulated  
LABEL REQUIRED.....None

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**SECTION XV: REGULATORY INFORMATION**

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**PRODUCT COMPOSITION:**

PRODUCT (P) OR COMPONENT NO.	TRADE NAME OR CHEMICAL COMPONENT	CAS NUMBER	PERCENT BY WEIGHT
P	Hexcel <sup>®</sup> Carbon (Graphite), synthetic fiber unsized	7440-44-0	100

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**SECTION XV: REGULATORY INFORMATION**

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**SARA, TITLE III:**  
PRODUCT (P) OR SECT. 302 SECT. 304 SECT. 311/312 SECT. 313  
COMPONENT NO. EHS EHS HAZARD CATEGORY TOXIC CHEMICAL  
TPQ (lbs) RQ (lbs)

P No No (1) No

SECT. 302, 40 CFR, PART 355, EMERGENCY PLANNING AND NOTIFICATION REGULATIONS, THRESHOLD PLANNING QUANTITY (TPQ), EXTREMELY HAZARDOUS SUBSTANCE (EHS):

No: This chemical is not and does not contain over trace amounts of an EHS. Therefore, there is no Threshold Planning Quantity (TPQ).

SECT. 304, 40 CFR, PART 355, APPENDIX A, REPORTABLE QUANTITY (RQ) FOR RELEASES OF AN EXTREMELY HAZARDOUS SUBSTANCE (EHS):

No: This chemical is not and does not contain over trace amounts of an EHS. Therefore, there is no Reportable Quantity (RQ).

SECT. 311/312, 40 CFR, PART 370, HAZARDOUS CHEMICAL REPORTING REQUIREMENTS "HAZARD CATEGORIES":

- (1) IMMEDIATE (ACUTE) HEALTH HAZARD
- (2) DELAYED (CHRONIC) HEALTH HAZARD
- (3) FIRE HAZARD
- (4) SUDDEN RELEASE OF PRESSURE HAZARD
- (5) REACTIVE HAZARD

SECT. 313, 40 CFR, PART 372, TOXIC CHEMICAL RELEASE REPORTING REQUIREMENTS:

No: This component is not subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR, Part 372, Toxic Chemical Reporting requirements.

**CERCLA (40 CFR, PART 302.4, HAZARDOUS SUBSTANCE AND REPORTABLE QUANTITIES):**

This product does not contain any hazardous substances listed in 40 CFR, Part 302.4.

**RCRA INFORMATION:**

Currently, this product is not listed in federal hazardous waste regulations 40 CFR, Part 261.33, paragraphs (e) or (f), i.e. chemical products that are considered hazardous if they become wastes. It does not exhibit any of the hazardous characteristics listed in 40 CFR, Part 261, Subpart C. State or local hazardous waste regulations may apply if they are different from the federal regulation. It is the responsibility of the user of the product to determine at the time of disposal, whether the product meets relevant waste classification and to assure proper disposal.

**TSCA STATUS:**

The components of this product are either listed or are not required to be listed in the EPA, TSCA, Chemical Substance Inventory.

**OZONE DEPLETING SUBSTANCES:**

This product does not contain or is not manufactured with ozone depleting substances as identified in Title VI, Clean Air Act "Stratospheric Ozone Protection" and the regulations set forth in 40 CFR, Part 82.

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**SECTION XV: REGULATORY INFORMATION (CONTINUED)**

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**WHIMIS (CANADA):**

CLASSIFICATION:

None

INGREDIENT DISCLOSURE LIST:

None listed

**CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT OF 1986**

**(PROPOSITION 65):**

Warning! The state of California has determined that the following listed materials or components in this product are known to cause cancer, birth defects or other reproductive harm:

None detectable

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**SECTION XVI: OTHER INFORMATION**

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**EXPLANATION AND DISCLAIMER:** Wherever such words or phrases as "hazardous,"

"toxic," "carcinogen," etc. appear herein, they are used as defined or described under state employee right-to-know laws, Federal OSHA laws or the direct sources for these laws such as the International Agency for Research on Cancer (IARC), the National Toxicology Program (NTP), etc. The use of such words or phrases should not be taken to mean that we deem or imply any substance or exposure to be toxic, hazardous or otherwise harmful. **ANY EXPOSURE CAN ONLY BE UNDERSTOOD WITHIN THE ENTIRE CONTEXT OF ITS OCCURRENCE, WHICH INCLUDES SUCH FACTORS AS THE SUBSTANCE'S CHARACTERISTICS AS DEFINED IN THE MSDS, AMOUNT AND DURATION OF EXPOSURES, OTHER CHEMICALS PRESENT AND PREEXISTING INDIVIDUAL DIFFERENCES IN RESPONSE TO THE EXPOSURE.**

The data provided in this MSDS is based on the information received from our raw material suppliers and other sources believed to be reliable. We are supplying you this data solely in compliance with the Federal OSHA Hazard Communication Standard, 29 CFR 1910.1200 and other Federal and state laws as described in Section XV: Regulatory Information. The information contained in this MSDS is not to be used for purposes other than compliance with the Federal OSHA Hazard Communication Standard.

**LIABILITY, IF ANY, FOR USE OF THIS PRODUCT IS LIMITED TO THE TERMS CONTAINED IN OUR SALE TERMS AND CONDITIONS. WE DO NOT IN ANY WAY WARRANT (EXPRESSED OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY FOR MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE) THE DATA CONTAINED OR THE PRODUCT DESCRIBED IN THIS MSDS. ADDITIONALLY, WE DO NOT WARRANT THAT THE PRODUCT WILL NOT INFRINGE ANY PATENT OR OTHER PROPRIETARY OR PROPERTY RIGHTS OF OTHERS.**

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