

SDS Number: HX07-1

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SECTION 1 • PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME OR NUMBER:

- **HYTEX®-700** textiles; woven, knit, non-woven cloth, tape, rope, sleeving, yarn, thread and fiber.

These products are produced from blended yarns of Kevlar and glass fibers.

- **THERMOPAK®** custom fabricated products are made using one of one or more of the above listed products.

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SECTION 2 • HAZARDS IDENTIFICATION



(Acute): Exposure to glass fibers sometimes causes irritation of the skin. Less frequently irritation of the eyes, nose, or throat may occur. Ingestion may cause short-term irritation of the stomach and intestines. See section 8 of SDS for exposure controls.

(Chronic): There are no known health effects connected with long-term use or contact with this product. See section 11 of SDS for toxicological information.

Kevlar fibers are non-biodegradable and non-toxic to aquatic life; they pose no unusual environmental hazard in a spill or fire.

SECTION 3 • COMPOSITION / INFORMATION ON INGREDIENTS

CHEMICAL / COMMON NAME	C.A.S. NUMBER
• Aramid Staple Fiber: Poly(p-phenylenediamine terephalamide) (Kevlar® para-aramid polymer)	26125-61-1
• Continuous Filament Fiberglass:	65997-17-3
• Sizing	N/A

See section 8 of SDS for the data on exposure limits.

SECTION 4 • FIRST-AID MEASURES

EMERGENCY/FIRST AID PROCEDURES

EYE CONTACT: In case of eye contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if irritation persists or develops later.

INHALATION: If large amounts of fumes, dust or fibers are inhaled, remove to fresh air. If persistent cough or other symptoms develop, get medical attention.

SKIN CONTACT: Wash with soap and water. Wash contaminated clothing and gloves before reuse. Use hand creams to soothe and moisten irritated skin. Get medical attention if irritation persists after contact stops.

INGESTION: Not a probable route. However, in case of gastrointestinal distress, following accidental ingestion, call a physician.

SECTION 5 • FIRE-FIGHTING MEASURES

FIRE AND EXPLOSION HAZARDS: When forced to burn, Kevlar fibers produce hazardous gasses similar to those from wool. These are most commonly carbon dioxide, water, and oxides of nitrogen. However, carbon monoxide, small amounts of hydrogen cyanide and

various other chemical residues (some possibly toxic or irritating) may be produced, depending on conditions of burning. Off gasses from thermal decomposition of some fiber lubricants may contain very small amounts of such chemicals as formaldehyde, ethanol, acetic acid, acetone, etc. The conditions would not be expected to reach concentrations that present a significant health hazard. Small amounts of visible smoke are produced during combustion in air. Fiber dusts from either material does not present an explosion hazard.

EXTINGUISHING MEDIA: Water, foam, carbon dioxide (CO₂), or dry chemical.

SPECIAL FIRE FIGHTING INSTRUCTIONS: Wear self-contained breathing apparatus.

SECTION 6 • ACCIDENTAL RELEASE MEASURES

Review FIRE-FIGHTING MEASURES and HANDLING sections before proceeding with cleanup. (Sections 5 & 7)

Wash, shovel, or mop up fibers and place in solid waste containers. Avoid the use of dry sweeping or air-jet blowing of fibers and dust; these can re-suspend respirable dust in the air. Clean up dusts containing Kevlar fibrils with high-efficiency particulate air (HEPA) filtered vacuum equipment, or by wiping or wet cleaning.



Fibers are not biodegradable; do not flush down drains.

SECTION 7 • HANDLING AND STORAGE

Do not touch moving thread lines of Kevlar. Entanglement with these high-strength yarns can severely cut or even sever fingers.

Kevlar are degraded by ultraviolet light. Do not store in direct sunlight. Fluorescent lighting will cause discoloration, but will not affect fiber mechanical properties.

Waste disposal: Kevlar are not a hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). In general, dispose in accordance with all federal, state, & local laws.

PRECAUTIONS: Keep airborne dust concentrations below regulated levels. For optimum performance, store at 80°F (27°C) or less and relative humidity less than 65%. Not an electrical conductor. Can accumulate static charge.

SECTION 8 • EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS/WORK PRACTICES

Avoid breathing fibers, dust and fumes. Follow good industrial hygiene practices for ventilation during cleanup. In particular, avoid the use of air jets to blow off equipment.

If fumes, fiber fly or dusts are generated, use engineering controls (where technically feasible) whenever necessary to control exposure exposures below applicable limits. Isolation, enclosures, exhausts, ventilation, wetting and dust collection systems may be used.

PERSONAL PROTECTIVE EQUIPMENT/PROTECTIVE MEASURES

RESPIRATORY PROTECTION: Some applications of these products may not require respiratory protection for fiberglass. However, if airborne fibrous glass concentrations exceed the OSHA permissible limits or if irritation occurs, use a properly fitted NIOSH approved N95 particulate filtering respirator, or better. Use respiratory protection in accordance with your company's respiratory protection program, local regulations, and OSHA regulations under CFR 1910.134.

EYE PROTECTION: Splash-proof goggles are useful to prevent eye contact.

PROTECTIVE CLOTHING: Impervious gloves, aprons and other protective clothing as a preventative measure in case of potential exposure.

EXPOSURE GUIDELINES:

<u>COMPONENT</u>	<u>OSHA - PEL</u>	<u>ACGIH - TLV</u>
•Kevlar	NE	NE
• Fiberglass Continuous Filament		
ACGIH TLV: (8-hr TWA)	5 mg/m ³ inhalable fraction 1 f/cc respirable fibers	
OSHA PEL: (8-hr TWA)	15mg/m ³ total 5mg/m ³ respirable	

Note: OSHA does not prescribe a Permissible Exposure Limit (PEL), but relies on the PEL-TWA's for nuisance dust as noted.

SECTION 9 • PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE: Solid – continuous multi-filament yarns with a wide range of total denier and staple of varying denier per filament and cut length.

COLOR AND ODOR (natural state): Yellow to yellow brown, no odor.

pH: N/A

MELTING POINT: N/A

BOILING POINT: N/A

FLASH POINT: N/A

EVAPORATIVE RATE (n-Butyl Acetate = 1): N/A

EXPLOSIVE LIMITS: N/A

PERCENT SOLUBILITY IN WATER: Insoluble in water.

VAPOR PRESSURE: (mm Hg @ 20°C): N/A

SPECIFIC GRAVITY (water = 1): N/A

AUTO IGNITION TEMPERATURE: N/A

VISCOSITY: N/A

PERCENT VOLATILE BY VOLUME: N/A

POUR POINT: N/A

SECTION 10 • STABILITY AND REACTIVITY

STABILITY: Stable under normal conditions of use.

INCOMPATIBILITY: None are reasonably foreseeable.

HAZARDOUS DECOMPOSITION PRODUCTS: Begins to thermally degrade rapidly above 570°F (300°C). The thermal degradation includes CO₂, CO, a small amount of Hydrogen Cyanide, and other toxic gases depending on conditions. Avoid inhalation of decomposition gases.

HAZARDOUS POLYMERIZATION: Polymerization will not occur.

SECTION 11 • TOXICOLOGICAL INFORMATION

KEVLAR FIBER:

EYE EFFECTS: Kevlar are untested for eye irritancy. As with other particles, mechanical action of fibers in the eye may cause slight irritation.

SKIN EFFECTS: Kevlar brand fibers are not skin irritants, or skin sensitizers in animals. None of three tests using guinea pigs produced sensitization Kevlar.

Skin sensitization has not been observed in human patch tests or in industrial experience. Kevlar fibers have been used in direct contact with the skin in industrial gloves and protective apparel for many years.

The mechanical action of the fibers may cause slight skin irritation at clothing binding points. Repeated harsh rubbing of the skin with fibrous dust or supported fiber structures (e.g. sized, coated or impregnated fabrics, paper edges, etc.) may cause abrasion, with resulting irritation and rash. Symptoms disappear following cessation of skin contact.

ACUTE ORAL EFFECTS: Kevlar has very low toxicity by ingestion. Oral ALD >7500mg/kg in rats.

ACUTE INHALATION EFFECTS: Industrial experience shows that inhalation of fibrous dust and fly may cause mechanical irritation of the mucous membranes of the nose and throat with resulting dry cough, scratchy throat and runny nose. Symptoms cease upon cessation of exposure.

SUBCHRONIC INHALATION EFFECTS: In a two-week inhalation study with rats (1983), respirable fibrils (sub fibers) of Kevlar at concentrations of 1000-2000 fibrils per cubic centimeter (f/cc) caused mild non-progressive fibrosis (lung scarring that shrinks with cessation of exposure) and nonspecific effects such as weight loss, and irritation. There are no effects at concentrations of 280f/cc or less.

CHRONIC INHALATION EFFECTS: A two-year inhalation study with Kevlar pulp (refined to increase its respirable fibril content) showed fibrosis at concentrations of 25, 100 and 400 f/cc, and lung lesions in some rats in the group exposed to respirable fibers at concentrations of 100 and 400 f/cc. A panel of 12 pathologists from North American and Europe reviewed these lesions and diagnosed them as "proliferative keratin cysts." They agreed that the lesions are



not malignant neoplasms and are most likely not neoplastic. This unique lesion is not found in humans and may be indicative of a nonspecific biological response to the respirable material, rather than an indication of the toxicity of Kevlar. No fibrosis was seen in animals exposed to 2.5 f/cc for two years (and very little at 25f/cc). At no concentrations were fibers found to have migrated beyond the lungs and associated lymph system. Four experiments at fibril concentrations of 2.5 f/cc to 400 f/cc have shown that fibrils of Kevlar in the lungs of rats are shortened with time, probably by enzymatic clipping of the polymer chain. (This effect has been independently confirmed in rats by two other laboratories and by DuPont in hamsters. In-vitro tests show fibrils of Kevlar are shortened in proteolytic enzyme solutions). While not all fibrils disappear, long fibers are cut to an average of less than 5 micrometers and gradually removed. The lower the exposure, the faster fibrils are broken down.

IARC completed an in-depth review of all valid scientific data relating to para-aramid fibrils in October, 1996. They classified the fibrils as in Group 3, "not classifiable as to their carcinogenicity to humans". That is, the experts found no convincing evidence of carcinogenicity. (While IARC has no regulatory authority, its expert options are used for guidance by regulatory authorities worldwide).

No animal tests have been run to define mutagenic, developmental or reproductive hazards of Kevlar fibers.

FIBER GLASS FIBER:

Factors in fiber toxicity include fiber dimensions, durability, and degree of exposure.

FIBER DIMENSIONS: Fibers are either non-respirable or respirable. Respirable fibers can penetrate to the "deep" lung. According to the World Health Organization (WHO), man-made mineral fibers with diameters equal to or greater than (\geq) 3.0 microns are non-respirable (1). According to the National Institute for Occupational Safety and Health (NIOSH), fibers with diameters $> 3.5 \mu\text{m}$ are non-respirable (2). The narrow, bending passages of the human respiratory system do not permit the relatively larger, non-respirable fibers to enter the "deep" lung. Instead, they deposit on the surfaces of the upper respiratory tract, nose, or pharynx. They are then cleared through normal physiological mechanisms. As manufactured, continuous filament glass fibers are not respirable (>3.5 micrometers in diameter). Continuous filament glass products that are chopped, crushed, or severely mechanically processed during manufacturing or use may contain a very small amount of respirable particulate, some of which may be respirable fibers. Mechanical processing may cause the filaments to fracture, producing small pieces (fibers and particles) of the larger continuous filaments. There is no evidence that these fibers break longitudinally into smaller diameters. Upon breakage, the fibers may break horizontally into smaller lengths but not longitudinally into smaller diameters. As with any sanding/grinding activity, respirable and non-respirable particles may be generated.

DURABILITY: The term "durability" refers to how long a fiber will remain in the lung. E-glass composition has been found to be durable in the human lung; however, if fibers are non-respirable their durability is unimportant.

DEGREE OF EXPOSURE: The results in terms of airborne concentrations of glass fibers and total dust would indicate that the workmen's exposure to these materials is negligible" (1). See Section 2 of SDS for effects resulting from exposure.

CARCINOGENICITY: (Fiberglass, Continuous Filament) The International Agency for Research on Cancer (IARC) in 2002, categorized fiberglass continuous filament as not classifiable with respect to human carcinogenicity (Group 3). The evidence from human as well as animal studies was evaluated by IARC with results being insufficient to classify fiberglass continuous filament as a possible, probable, or confirmed cancer-causing material.

The ACGIH A4 classification, not classifiable as a human carcinogen, for respirable continuous filament glass fibers is based on inadequate data in terms of its carcinogenicity in humans and/or animals. For respirable continuous filament glass fibers, a TLV - TWA of 1 fiber/cc with an ACGIH A4 classification was adopted for non-respirable glass filament fiber, measured as inhalable dust, to prevent mechanical irritation of the upper respiratory tract.

Continuous filament fiberglass is not listed in the National Toxicology Program (NTP) 14th Annual Report on Carcinogens.

SECTION 12 • ECOLOGICAL INFORMATION

Kevlar fibers are essentially non-biodegradable in the environment, and do not leach material toxic to flora or fauna.

Fiberglass is generally considered to be an inert solid waste, and no special precautions should be taken in case it is released or spilled. These products do not contain, nor are manufactured with, Class I or Class II Ozone-Depleting Chemicals (CFCs) identified in the Clean Air Act Amendment, 1990 List of Ozone Depleting Chemicals.

SECTION 13 • DISPOSAL CONSIDERATION

WASTE DISPOSAL METHOD: Dispose solid waste in accordance with local, state, and federal regulations. Not considered a hazardous waste under RCRA regulations.

SECTION 14 • TRANSPORTATION INFORMATION

UN/NA CODE: None.

PROPER SHIPPING NAME: Not regulated.

HAZARD CLASS: Non-hazardous.

DOT INFORMATION: Not regulated.

LABELS REQUIRED: None.

BILL OF LADING DESCRIPTION: Product name.

SECTION 15 • REGULATORY INFORMATION

UNITED STATES: EPA Toxic Substances Control Act (TSCA): Fiberglass carries no Chemical Abstracts Index name, CAS registry number or EPA code designation number. Fiberglass is an "article" as defined in Section 710.2(f). It is exempt from Sections 5 and 8(b) reporting requirements. PPG considers these products exempt from EPA SARA Title III reporting requirements as they do not meet its health or physical hazards definitions nor contain any SARA 313 chemical ingredients in excess of EPA's de minimis concentrations. OSHA Hazard Communication Standard: Subject to the applicable requirements of this regulation. Per this SDS revision date, these fiberglass products are not known to contain chemical ingredients listed by the Pennsylvania, New Jersey or Massachusetts Right to Know Law in excess of amounts requiring reporting on such substances' SDS or labels.

CALIFORNIA PROP 65: Labeling is required. According to the National Toxicology Program (NTP), there is sufficient evidence of carcinogenicity from studies in experimental animals of inhalable glass wool fibers as a class and evidence from studies of fiber properties indicate that only certain fibers within this class - specifically, fibers that are biopersistent in the lung or tracheobronchial region - are reasonably anticipated to be human carcinogens.

CANADA: Exempt from Canadian Environmental Protection Act (CEPA) reporting on the Domestic Substances Lists as these products are considered "articles". Exempt from Workplace Hazardous Materials Information System (WHMIS) labeling & SDS requirements. However, fibrous glass is on the Ingredient Disclosure List. It must be listed as an ingredient on SDS for "controlled products" with fiberglass concentrations greater than 1.0%.



EUROPEAN ECONOMIC COMMITTEE (EEC) LABELING CLASSIFICATION: Fiberglass does not meet the classification for a "dangerous substance" according to 67/548/EEC and 97/69/EC. The E-glass composition has been incorporated in the EINECS under CAS number 65997-17-3 as a glass oxide.

JAPAN: Chemical Substances Control Law: Fiberglass is exempt from this law.

SECTION 16 • OTHER APPLICABLE INFORMATION

HMIS and NFPA Hazard Rating:

CATEGORY	HMIS	NFPA
Acute Health	1	1
Flammability	0	0
Reactivity	0	0

NFPA Unusual Hazards: None.

HMIS Personal Protection: To be supplied by user depending upon use.

DEFINITIONS

- 29 CFR 1910.134 & 1926.103:
OSHA Respiratory Protection Standards
- 29 CFR 1910.1200 & 1926.59:
OSHA Hazard Communication
- ACGIH American Conference of Governmental Industrial Hygienists
- ADR Carriage of Dangerous Goods by Road (International Regulation)
- CAA Clean Air Act
- CAS Chemical Abstract Services
- CERCLA Comprehensive Environmental Response, Compensation and Liability Act
- CFR Code of Federal Regulations
- DOT Department of Transportation
- DSL Domestic Substances List (Canada)
- EEC European Economic Committee
- EINECS European Inventory of Existing Commercial Chemical Substances
- EPA Environmental Protection Agency
- EU European Union
- HEPA High Efficiency Particulate Air
- HMIS Hazardous Materials Information System
- IARC International Agency for Research on Cancer
- IATA International Air Transport Association
- IMDG International Maritime Dangerous Goods Code
- LC Lethal Concentration
- LD Lethal Dose
- NFPA National Fire Protection Association
- NIOSH National Institute for Occupational Safety and Health
- NTP National Toxicology Program

- OSHA Occupational Safety and Health Administration
- PEL Permissible Exposure Limit
- PIN Product Identification Number
- PNOC Particulates Not Otherwise Classified
- PNOR Particulates Not Otherwise Regulated
- RCRA Resource Conservation and Recovery Act
- RID Carriage of Dangerous Goods by Rail (International Regulation)
- SARA Superfund Amendments and Reauthorization Act
- STEL Short Term Exposure Limit
- TCLP Toxic Chemical Leachate Program
- TDG Transportation of Dangerous Goods

TITLE III EMERGENCY PLANNING AND COMMUNITY RIGHT TO KNOW ACT – SECTION:

- 302 Extremely Hazardous Substances
- 303 Emergency Release
- 311 SDS/List of Chemicals
- 312 Emergency and Hazardous Inventory
- 313 Toxic Chemicals Release Reporting
- TLV Threshold Limit Value
- TSCA Toxic Substance Control Act
- TWA Time Weighted Average
- WHMIS Workplace Hazardous Materials Information System

- µm micrometer (micron)
- mm millimeter
- cm centimeter
- m meter
- f/cc fibers per cubic centimeter
- ml milliliter
- in inch
- oz ounce
- lb pound
- µg microgram
- mg milligram
- g gram
- kg kilogram
- µg/cm² micrograms per centimeters squared
- mg/m³ milligrams per cubic meter of air
- mppcf million particles per cubic foot
- ppm parts per million
- N/A Not Applicable
- ND No Data/Not Determined
- NE Not Established
- NR Not Regulated

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 that 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.