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**FOR CHEMICAL EMERGENCY  
CALL (800) 424-9300 24 HRS.**

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## SECTION 1 - PRODUCT IDENTIFICATION

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PRODUCT NAME: PART #2611 Braided Biaxial Kevlar Sleeve

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## SECTION 2 – HAZARDOUS IDENTIFICATION

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### EMERGENCY OVERVIEW

- **No health risks have so far become available when this fiber product has been handled/processed properly and used for its intended application.**
- **Wear appropriate personal protective equipment as needed (see section 8 for additional information).**

**Appearance and odor:** odorless yellow filament yard, spinning fiber, staple fiber, cut fiber

#### **Other Information – Fiber finish.**

The fiber product itself is not toxic. It may, however, contain up to 1.2% of a fiber finish. If the product is intended to special applications, e.g. in the food industry, please consult the manufacturer prior to application. So far no impairment of health has become known in cases where the product has been used for its intended application. The applied fiber finish may evaporate or decompose in cases where the product is heat-treated at temperatures of 266-374°F (130-190 °C). If water is used for further treatment, the waste water generated by the process must be treated in a water purification plant in compliance with local regulations.

Residual solvents: none.

Fibers and yarns are generally provided with finishes to facilitate processing. If necessary, these finishes, and also coning oils or sizing agents, can generally be removed in an aqueous medium.

#### **POTENTIAL HEALTH EFFECTS** (See Section 11 for additional information)

**Primary Route(s) of Exposure:** Eye contact, skin contact and inhalation

**Acute Exposure:** The fiber product (polymer) is non-toxic. Dust may be irritating to the respiratory tract and cause symptoms of bronchitis. This product has a low order of acute toxicity and ingestion is not expected to cause any harm.

**Carcinogenicity:** IARC, NTP, ACGIH or OSHA does not classify this material as a carcinogen or suspect carcinogen. IARC rated p-Aramid fibrils as "non-classifiable as to its carcinogenicity for animals or humans" (Class III).

**Medical conditions aggravated:** Inhalation of dust could aggravate existing respiratory condition.

#### **POTENTIAL ENVIRONMENTAL EFFECTS** (See Section 12 for additional information)

This product is not considered to be harmful to aquatic life, based on available data.

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## SECTION 3 – COMPOSITION/INFORMATION ON INGREDIENTS

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<b><u>INGREDIENTS</u></b> (See Section 8 for exposure limits)	<b><u>% (w/w)</u></b>	<b><u>CAS Number</u></b>
Poly-(para-phenylene terephthalamide)	≤ 100.0	26125-61-1

### **Additives:**

- All products may contain:
  - Fiber finish (<1.2%), sodium sulfate (<3%), absorbed water (<8)
- Specific types of products may contain:

• Water-blocking agents	<5%	only types 1052, 1002
• PTFE	<40%	only types 1030, 131
• Silicone oil	<22%	only types 1030
• Medical white oil	<10%	only types 1031
• Modified polyester resin	<7%	only types 1484, 1486 & 1488
• Epoxy composition	<0.4%	only types 1014, 1015 & 1016
• Polyether-polyurethane	<7%	only types 1684, 1686 & 1688
• Aliphatic polyester urethane	<6%	only types 2800
• Fiber finish of sodium and Potassium salts of carboxylic acid	<7%	only types 2255

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## SECTION 4 – FIRST AID MEASURES

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**Inhalation:** Remove victim to fresh air if person has been exposed to excessive quantities of fiber dust or fly. If breathing becomes difficult, oxygen may be given, preferable under physician's advice. Get medical attention if coughing or other symptoms develop.

**Eye Contact:** Flush eyes with large quantities of running water for a minimum of 15 minutes. If easy to do, remove contact lenses, if worn. Hold the eyelids apart during the flushing to ensure rinsing of the entire surface of the eye and lids with water. Get medical attention if eye irritation occurs.

**Skin Contact:** Remove contaminated clothing, shoes and equipment. Flush skin with plenty of water for at least 15 minutes. Wash contaminated clothing and shoes before reuse. Get medical attention if irritation occurs.

**Ingestion: Do not induce vomiting,** unless instructed by a physician. If victim is conscious, rinse mouth and give water to drink. If vomiting occurs, keep head below the hips to reduce risk of aspiration, Give fluids again. Never give anything by mouth to an unconscious person. Get medical attention as warranted.

**Note to Physician:** Attending physician should treat exposed patients symptomatically.

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## SECTION 5 – FIRE-FIGHTING MEASURES

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<b>Conditions of Flammability:</b>	not flammable or combustible
<b>Flash Point (Method):</b>	not determined
<b>Upper Flammable Limit (% by volume):</b>	not determined
<b>Lower Flammable Limit (% by volume):</b>	not determined
<b>Auto-Ignition Temperature:</b>	not determined

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## SECTION 6 – ACCIDENTAL RELEASE MEASURES

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**Spill of Leak:** Safely stop source of spill. Restrict non-essential personnel from area. All personnel involved in spill cleanup should avoid skin and eye contact by wearing appropriate personal protective equipment (see Section 8). Do not breathe dust.

**Cleanup:** Sweep or vacuum spilled solid material, being careful not to create dust. Return sweepings to stock or if contaminated, place into a chemical waste container for disposal according to local, state or federal regulations. To minimize dust, vacuum cleaning is preferred.

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## SECTION 7 – HANDLING AND STORAGE

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**Handling:** Avoid prolonged and/or repeated skin and eye contact. Do not breathe dust.

**Storage:** Store this material in a cool, dry and well-ventilated area. Observe good housekeeping practices. Contain and prevent dust collection. If airborne contaminants are generated when the material is heated or handled, sufficient ventilation in volume and air flow should be provided. (See Section 8).

**Maximum Storage Temperature:** Store in a cool and dry place at ambient temperature (below 25°C / 77°F).

**Other Precautions:** All cardboard containers, storage cartons, bobbins, bales and bags must be stored in compliance with relevant relations and in accordance with good handling and storage practice.

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## SECTION 8 – EXPOSURE CONTROLS/PERSONAL PROTECTION

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**Applicable Exposure Limits:** p-Aramid fibers as such are not subject to any exposure regulation. P-Aramid Respirable fiber-shaped particulates (RFP) may be released from pulp, cut-fiber and staple fiber or may be formed during abrasive processing and is not recommended to keep these levels below 1 RFP per cm<sup>3</sup> of air.

Chemical Name	OSHA – PELs (mg / m <sup>3</sup> )		ACGIH – TLVs (mg / m <sup>3</sup> )		NIOSH – RELs (mg / m <sup>3</sup> )		AIHA – WEELs (mg / m <sup>3</sup> )	
	TWA	STEL / CEIL	TWA	STEL / CEIL	TWA	STEL / CEIL	TWA	STEL / CEIL
Poly-(para-phenylene terephthalamide)	N/D	N/D	N/D	N/D	N/D	N/D	N/D	N/D

[Ref: ACGIH Guide to Occupational Exposure Values, 2009 Edition]

**Legend:**

CEIL: Ceiling Exposure Limit

STEL: Short Term Exposure Limit

N/D: Not determined

ACGIH: American Conference of Governmental Industrial Hygienists

AIHA: American Industrial Hygiene Association

NIOSH: National Institute for Occupational Safety and Health

OSHA: Occupational Safety and Health Administration

PEL: Permissible Exposure Limit

TLV: Threshold Limit Value

WEEL: Workplace Environmental Exposure Level

REL: Recommended Exposure Limit

TWA: Time-Weighted Average

**Engineering Controls – Ventilation:** Use extraction and ventilation equipment to reduce the occurrence of fiber fly, fiber dust and decomposition products of the finish.

**Personal Protective Equipment (PPE):** Handle in accordance with good industrial hygiene and safety practices. These practices include avoiding unnecessary exposure and removal of the material from the eyes, skin, and clothing.

- **Respiratory Protection:** MSHA/NIOSH approved respiratory protection should be worn when maximum concentration of 1 RFP (respirable fiber-shaped particulate) per cm<sup>3</sup> of air is exceeded.
- **Skin Protection:** Skin contact with the product should be minimized or prevented through the use of suitable protective clothing, gloves and footwear selected according to use condition exposure potential.
- **Eye Protection:** Safety glasses are generally not required when manually handling yarn. However, wear safety glasses with side shields in the vicinity of rapidly rotating yarn processing equipment.

**Other Protection – General Hygiene Considerations:** Wear aprons, boots, and other suitable body protection appropriate to the existing work environment. Yarns that are processed at high speeds can cause abrasions and cuts. Make eyewash stations, washing facilities, safety showers available in areas of use and handling. All food and smoking materials should be kept in a separate area away from the storage/use location. Eating, drinking and smoking should be prohibited in areas where there is a potential for significant exposure to this material. Wash hand before eating, drinking, smoking or using washroom. Adhere to sanitation requirements of 29CFR1910.141.

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## SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES

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Physical State / Appearance / Odor:	odorless yellow filament yarn, spinning fiber, staple fiber, cut fiber
Boiling Point:	not applicable
Bulk Density:	not applicable
Cloud Point:	not determined
Evaporation Rate (Butyl Acetate=1):	not applicable
Melting Point:	does not melt
Odor Threshold:	not determined
pH:	not determined
Partition Coefficient (n-octano/water):	not determined
Pour Point:	not determined
Solubility in water:	negligible
Solubility in other solvents:	not determined
Specific Gravity / Density:	1440kg/m <sup>3</sup>
Vapor Density (Air =1)	not applicable
Vapor Pressure:	not applicable
Viscosity:	not applicable
Conditions of Flammability:	not flammable or combustible
Flash Point (Method):	not applicable
Upper Flammable Limit (% by volume)	not applicable
Lower Flammable Limit (% by volume)	not applicable
Auto-Ignition Temperature:	not applicable

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## SECTION 10 – STABILITY AND REACTIVITY

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**Stability:** This product is stable at ambient temperatures and atmospheric pressures under recommended storage and handling conditions (see Section 7). It is not self-reactive and is not sensitive to physical impact.

**Conditions to avoid:** Temperatures over 932oF (500oC) will cause decomposition of the products and molecular disintegration. Strong bases and acids will cause chemical decomposition (hydrolysis) of the molecules if allowed to react for a relatively long duration.

**Incompatibilities:** Aromatic polyamides react with strong oxidizing agents. If allowed to act on the fibers for a relatively long time. UV light will cause a darkening of their inherent yellow color and will also adversely affect their strength.

**Polymerization:** Hazardous polymerization is not expected to occur under normal temperatures and pressures.

**Hazardous Decomposition Products:** Thermal decomposition may release toxic and/or hazardous products such as carbon oxides, organic compounds of low molecular weight and hydrogen cyanide in low concentration.

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## SECTION 11 – TOXICOLOGICAL INFORMATION

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The fiber product (polymer) is non-toxic. Usually the fibers are treated with about 1% finish. All additives are non-toxic according to the safety data sheets of their manufacturers.

### INHALATION

- **Acute exposure:** The acute LC<sub>50</sub> for this product is not available.
- **Repeated dose exposure:** The following information does not relate to the intact fibers but only to *respirable, fiber-shaped particulates (RFP)*, which may be found in small numbers in the workplace atmosphere due to abrasive processing. RFP are fragments with diameters of less than 3 µm, lengths up to 100 µm and a length/diameter ratio of at least 3:1.
  - **Subacute and subchronic exposure:** Short term and subchronic (3 months) inhalation studies in rats and hamsters with an extended followUp of up to nine months have demonstrated that p-Aramid RFP are not biopersistent. Long p-Aramid RFP are quickly transversely broken into smaller fragments and then removed from the lung. However, extremely high amounts of inhaled p-Aramid RFP may inhibit the clearance mechanism. 25 RFP/ml of air has been established as the "no observed adverse effect level" in subchronic study. Inhalation of high concentrations of RFP causes pulmonary inflammation in rats and hamsters and overload phenomena in rats.
  - **Chronic exposure:** Lifelong exposure to concentrations of 100 and 400 RFP/ml caused pulmonary fibrosis in rats. The fibrosis was largely reversible after cessation of exposure. No malignant tumors resulted from the lifelong inhalation tests in rats. Instead, proliferative cystic tissue changes were observed in rats after exposure to particulates. They occur mainly in (female) rats and have never been observed in human beings. These cysts were subject of scientific debate for an extended period of time, but current consensus holds that they are not malignant and that their occurrence in animals has no relevance to humans.
  - **Other routes of exposure:** Intraperitoneal injections of excessive amounts of p-Aramid RFP caused only a non significant increase in the observed number of mesotheliomas. The validity of the intraperitoneal test for the prediction of carcinogenicity is questionable.

### SKIN

**Acute Contact:** Dermal toxicity for this product is not available. Slight skin irritation has been observed in isolated cases.

**Chronic Contact:** No known effects for this product

**EYES:** While this product has not been tested, it is expected that it would be minimally irritating to the eyes based on tests with similar products.

### INGESTION

**Acute Exposure:** The oral LD<sub>50</sub> is not available for this product.

**Chronic Exposure:** No known effects

**Sensitization:** No data available for this product

**Carcinogenicity:** IARC, NTP, ACGIH or OSHA does not classify this material as a carcinogen or suspect carcinogen. IARC rated p-Aramid fibrils as "non-classifiable as to its carcinogenicity for animals or humans" (Class III)

**Mutagenicity / Teratogenicity / Embryotoxicity:** No data available

**Target Organs:** Skin, eyes and respiratory tract.

**Other Toxicological Effects:** In the event that the product is to be used in special areas of application, e.g. food industry or the medical/surgical sector, please consult manufacturer beforehand.

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## SECTION 12 – ECOLOGICAL INFORMATION

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**Ecotoxicity:** No experimental ecological data are available for this product. The fiber product (polymer) is ecologically safe. In cases where the product is heat-treated at temperatures above 120°C (248°F), the applied fiber finish may evaporate or decompose.

**Chemical Fate / Biodegradation:** No data available

**Other Ecotoxicity Information:** If water is used for further treatment, the waste water generated by the process must be treated in a water purification plant in compliance with local regulations. If necessary, these finishes can generally be removed in an aqueous medium.

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## SECTION 13 – DISPOSAL CONSIDERATIONS

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**Waste Disposal:** In its unused condition, this product is not considered to be a RCRA-defined hazardous waste by characteristics or listings. It is the responsibility of the waste generator to evaluate whether his wastes are hazardous by characteristic or listing. Dispose in accordance with all local, state and federal regulations. NOTE – State and local regulations may be more stringent than federal regulations.

**Container Disposal:** Containers should be cleaned of residual product before disposal or return. Since emptied containers retain product residue, follow label warnings even after container is emptied. Empty containers should be disposed of or shipping in accordance with all applicable laws and regulations.

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## SECTION 14 – TRANSPORT INFORMATION

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**Shipping Information:** Not regulated for transport.

**Required Labels:** No transport label required.

**Environmentally Hazardous Substances [49CFR 172.101, Appendix A]:** None

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## SECTION 15 – REGULATORY INFORMATION

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The components are subject to the following environmentally regulatory lists:

Substance Name	CAA	CERCLA	IARC	US State RTK Lists	CA Prop 65	SARA
Poly-(para-phenylene terephthalamide)	N/R	N/R	N/R	N/R	N/R	N/R

National Chemical Inventories Status:

Substance Name	US	Canada		EU	Australia	New Zealand	Japan	Philippines	China
	TSCA	DSL	NDSL	EINECS	AICS	NZIoC	ENCS	PICCS	IECSC
Poly-(para-phenylene terephthal amide)	X	X		Polymer		X	X	X	X

N/R = Non Regulated

X = Listed / Regulated

**Legend**

AICS	Australian Inventory of Chemical Substances
CA List	California – Directors List of Hazardous Substances
Ca Prop 65	California Proposition 65
CAA	Clean Air Act, Section 112
CERCLA	CERCLA Hazardous Substances
DSL	Domestic Substances List - Canada
EINECS	European Inventory of Existing Commercial Chemical Substances
ENCS	Japan Existing and New Chemical Substances
FL List	Florida – Substance List
IARC	International Agency for Research on Cancer – Carcinogens – Groups 1, 2A or 2B
IECSC	China – Inventory of Existing Chemical Substances
IL List	Illinois toxic Substances Disclosure to Employees Act
KECI	Korea Existing Chemicals Inventory
LA List	Louisiana Right-to-Know Reporting List
MA List	Massachusetts – R-T-K Substance List
MN List	Minnesota – Hazardous Substance List
NDSL	Non-Domestic Substances List - Canada
NJ R-T-K	New Jersey – R-T-K Hazard List
NZIoC	New Zealand Inventory of Chemicals
PA List	Pennsylvania Hazardous Substance List
PICCS	Philippines Inventory of Chemicals and Chemical Substances
RI List	Rhode Island – Hazardous Substance List
SARA	SARA Title III, Section 302 / 313
TSCA	Toxic Substances Control Act – USA

**WHMIS** (Workplace Hazardous Materials Information System – Canada): Not controlled

This product has been classified in accordance with the hazard criteria of the *Controlled Products Regulations (CPR)* and the MSDS contains all the information required by the CPR.

**Other Regulatory Information:** None available.

This MSDS contains valuable information critical to the safe handling and proper use of this product. This MSDS should be retained and made available to employees and other uses of this product.

## SECTION 16 – OTHER INFORMATION

Restrictions for use: Do not use DuPont materials in medical applications involving implantation in the human body or contact with internal body fluids or tissues unless the material has been provided from DuPont under a written contract that is consistent with DuPont policy regarding medical applications and expressly acknowledges the contemplated use. For further information, please contact your DuPont representative. You may also request a copy of the DuPont POLICY Regarding Medical Applications H-50103-3 and DuPont CAUTION Regarding Medical Application H-50102-3. It is recommended that additional information be requested if an unusual application of synthetic fibers is intended.

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## SECTION 17 – COMMENTS

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The information accumulated herein is believed to be accurate but is not warranted to be, whether originating with Fibre Glast Developments Corporation or not. Recipients are advised to confirm in advance of need that the information is current, applicable, and suitable to their circumstances.