

Safety Data Sheet (SDS)

Section 1: Identification

This section identifies the chemical(s) on the SDS as well as the recommended uses and contact information.

Polystrand, KEVLAR® Aramid and Polypropylene (Homopolymer) with or without UV additives, pigments, and coupling agents. "10 Series". Thermoplastic Composite Tape and Laminates

Polystrand Product Identifier includes "IE" followed by an alphanumeric code which defines the product in further detail.
Example TBA 8510 X

TBA: KEVLAR® Aramid Fiber;
2 digits: Fiber content by % Based on customer requirements, 60% to 85%.
"1": Polypropylene Homopolymer
1 digit: Fiber loading
Decimal: Revision based on Polystrand's Bill of Materials (UV, resin source, coupling agent, etc.)
Pigment: NA
Alpha code: Reference to laminate configuration (cross plied); X- Cross ply; T- Tri ply; Q for Quad Ply U-unidirectional

Manufacturer Information:	
Polystrand, Inc.	Phone: 303-515-7700
8375 Highfield Parkway	Fax: 303-515-7701
Englewood, Colorado USA 80112	www.Polystrand.com

Section 2: Hazard(s) Identification

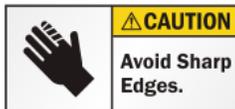
This section identifies the hazards of the chemical presented on the SDS and appropriate warning information

Hazard Classification: Oxidizing solid. May intensify fire; oxidizer.

Signal Word: Warning

Hazard Statement: May intensify fire, oxidizer: Code H272 Category 3
Processing or handling may produce airborne fibers causing respiratory tract irritation or lung damage.
Fibers and dust may cause mechanical skin and eye irritation.

Symbol:



Recycling Code OTHER

Precautionary Statements:

Keep away from open flame and heat sources.
Heated polymer: Skin/Eye contact can cause serious thermal burns.
Vapors formed when polymer is heated may be irritating to the eye.
In case of fire: Water, Dry Chemical Extinguisher (ABC or AB), Foam, or CO₂. Use water spray or fog.
Polypropylene may re-ignite itself after fire is extinguished. 15% to 45% of the composite is flammable.
No known acute effects of this product resulting from skin contact at room temperature.
Cut edges of the composite may be sharp. Use protective gloves when handling.
Polystrand Thermoplastics are 100% recyclable as a composite resin matrix and glass material.



Section 3: Composition / Information on Ingredients

This section identifies the ingredients contained in the product indicated on the SDS,

Substances:

Chemical Name(s):

Polypropylene Homopolymer
Kevlar® Yarn, poly-(paraphenylene-terephthalamide) with finish and traces of water.

Common Name:

Continuous Fiber Reinforced Thermoplastics, X-Ply, Tri-Ply, Quad Ply.

Chemical Abstracts Service (CAS) Number:

CAS Registry #	Component
9003-70-0	Polypropylene
26125-61-1	KEVLAR® Aramid Fiber

The specific chemical identity and percentage (concentration) of composition has been withheld as a trade secret.

Section 4: First Aid Measures

This section describes the initial care that should be given by untrained responders to an individual who has been exposed during processing.

Eye Contact:

Check for and remove contact lenses. Rinse eyes with water for 15 min. If irritation persists seek medical attention.

Skin contact:

Do not touch moving threadlines of KEVLAR® fiber.
Entanglement with this high strength fiber can severely cut or even sever fingers.
Wash affected area with mild soap and water. Wash contaminated clothing before reuse.
Use hand creams to sooth and moisten irritated skin. If irritation persists seek medical attention.
Heated composite: For serious burns from heated polymer, get medical attention. In case of skin contact immerse in or flush with clean, cold water.

Ingestion:

If ingested, rinse mouth with water (only if the person is conscious). Do not induce vomiting. If irritation persists seek medical attention/advice.

Inhalation:

Allow the victim to rest in a well ventilated area. If irritation persists seek medical attention.

Section 5: Fire Fighting Measures

This section provides recommendations for fighting a fire caused by the ignition of the composite.

Flammability of the product:

May be combustible at high temperature.

Auto Ignition Temperature:

Not Available

Flash Points:

Not Applicable

Auto-ignition:

Not Applicable

Explosive Limits:

Not Applicable



Section 5: Fire Fighting Measures (continued)

Products of combustion:

Burning KEVLAR® produces hazardous gases similar to those from wool. These are mostly carbon dioxide, nitrogen oxides and small amounts of hydrogen cyanide, ammonia, aldehydes, aliphatic hydrocarbons and other toxic gases, depending on conditions of burning.

Fire Fighting Media:

Water, Foam, Dry Chemical Extinguisher (ABC or AB), CO₂. Large Fire: Foam, or CO₂. Use water spray or fog.

Protective Clothing:

Firefighters should wear full protective gear.
Keep personnel removed and upwind of fire.

NFPA Ratings:

Hazard Rating Scale				
0= Minimal	1=Slight	2= Moderate	3=Serious	4=Severe

Health: 1 Fire: 0 Reactivity: 0

Section 6: Accidental Release Measures

This section provides recommendations on the appropriate response to spills.

General:

Polystrand tape and laminates are in sheeted or rolled form, and accidental releases of material pose no health threat. Safe and effective material handling procedures should be evaluated.

Containment Procedures:

Avoid creating dusts; maintain a clean work environment.

Clean-up Procedures:

Sweep material into a convenient waste container. Clean up dusts and pulp with air filtered vacuum equipment or by wet cleaning. Fiber is not biodegradable; do not flush to drains

Special Procedures: None.

Section 7: Handling and Storage

This section provides guidance on the safe handling practices and conditions for safe storage of materials.

Handling Procedures:

Avoid stepping on laminates as they pose a slip and fall hazard.
Sliding sheets across each other when un-stacking and unrolling of materials pose a potential static shock hazard.
Employ safe material handling processes.
When handled in bulk quantities, this product and its associated packaging may present a crushing hazard due to the large masses involved, possibly resulting in severe injury or death.
Avoid creating dusts; maintain a clean work environment.
Unbanding material in roll form may result in spring back or recoil. Use Caution!

Storage:

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

Section 8: Exposure Controls / Personal Protection

This section indicates the exposure limits, engineering controls, and personal protective measures (PPE) that can be used to minimize worker exposure.

Engineering Controls:

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

If ventilation and exhaust air is recirculated, it should be filtered and conditioned to eliminate respirable fibers, dust and fumes. While HEPA filters are effective for dust removal from local exhausts, they have high pressure drops and require frequent maintenance. Larger airflow can be effectively cleaned of non-respirable fibers and particles by screens and coarse filter media. However, respirable particles can be removed only by secondary filtration equipment designed for fine particles (less than 10 micrometers aerodynamic diameter) or water curtains. Where respirable fibrils may be generated, recirculated air should be periodically measured to determine if they are being adequately removed. Air monitoring should be done using the standard asbestos test method, NIOSH 7400 (B). Method 7400(A) can also be used, counting only fibers less than 3 micrometers in diameter.

Fumes and smoke from laser cutting or machining of fabrics and composites of KEVLAR® should be well exhausted or removed by ventilation.

Water jet cutting of fabric or composites of KEVLAR® produces respirable size fibrils in the cutting waste. If dried, this waste can become a source of airborne respirable fibers.

Rinse or wipe waste from floors, work surfaces and parts before it dries.

Personal Protection:

Eyes / Face: Safety glasses or dust goggles when cutting or processing where dust may be present.

Skin: Sleeves and Gloves to protect from abrasion/cuts. Thermally insulated gloves (leather) are required when handling at high temperature. When repeated forceful contact with KEVLAR® fiber structures is anticipated, wear protective gloves and sleeves to minimize skin abrasion and drying. If repeated handling of KEVLAR® leads to dry skin, use non-greasy moisturizing skin cream. (Barrier creams are not recommended, as they may actually cause fiber dust to stick to the skin.)

Respiratory: *Where airborne dust and fibril concentrations are expected to exceed applicable exposure limits, or where there is potential for irritation of the nasal passage by the mechanical action of the fibers*, NIOSH-approved respirators should be used. An air-purifying respirator with a dust/mist/fume cartridge or canister may be used under circumstances meeting the Respirator Standard. Disposable dust masks equivalent to 3M model N95 8210 may also be used.

Feet: Non-slip shoes

General: Eye wash fountain

Protective Equipment Symbols:

Where airborne dust and fibril concentrations are expected to exceed applicable exposure limits.



Safety Glasses



Gloves



Respirator as needed

Exposure Guidelines: Exposure Limit Values

Para-aramid

AEL * (DUPONT) 2fibers/cm³ 8 & 12 hr. TWA Respirable fibers.

AEL * (DUPONT) 5 mg/m³ 8 & 12 hr. TWA Non-fibrous particulate and/or nonrespirable fibres.

* AEL is DuPont's Acceptable Exposure Limit. Where governmentally imposed occupational exposure limits which are lower than the AEL are in effect, such limits shall take precedence.

**Section 9: Physical and Chemical Properties**

This section indicates the physical and chemical properties associated with the substance or mixture.

Physical Properties:

Appearance	Translucent to varied colors	Physical State	100% Solid
U/L flammability or explosive limits	NA	Melting Point / Freezing Point (NA)	126-136 °C (260-277 °F) Resin ND KEVLAR does not melt.
Odor	Odorless	Evaporation Rate	NA
Vapor Pressure	NA	Volatility	Negligible
Odor Threshold	NA	Partition coefficient	NA
Vapor density	NA	pH	ND
Auto ignition Temperature	ND	Decomposition Temperature	NA
Relative Density	PP (.91-.97) Glass (1.45 g/cc)	Viscosity	NA
Solubility (H ₂ O)	Insoluble	Flash Point	ND
Initial boiling point and range	NA	Flammability	Not an electrical conductor and may accumulate static charge.

NA – Not applicable ND-Not Disclosed or available

Section 10: Stability and Reactivity

This section describes the reactivity hazards of the material.

Stability:

The product is chemically stable.

Conditions to avoid:

When exposed to high temperatures may produce hazardous decomposition products.

Avoid temperatures above 300 °C (570 °F) Plastic will be flowing. Avoid dust formation.

Materials to avoid:

None known

Hazardous decomposition products:Under fire conditions: Hazardous thermal decomposition products:: Carbon dioxide nitrogen oxides (NO_x), Hydrogencyanide (gaseous), Ammonia, anhydrous Aldehydes, Hydrocarbons**Possibility of hazardous reactions:**

Under normal conditions of storage and use, hazardous reactions will not occur.

Section 11: Toxicological Information

This section identifies toxicological and health effects information or indicates that such data is not available.

Eye effects:

Non-irritant. As with other particles, mechanical action of fibers in the eye may cause slight irritation.

Chronic toxicity:Polypropylene shows **very low toxicity** to humans or animals.

Processing KEVLAR® or machining materials containing KEVLAR®, may create fiber dust in the air small enough to be breathed into the lungs. Based on animal tests, breathing this dust at very high concentrations repeatedly over long periods of time may cause lung injury (fibrosis).

Epidemiology Studies: A two-year inhalation study with KEVLAR® pulp (refined to increase its respirable fibril content) produced pulmonary fibrosis at concentrations of 25, 100, and 400 f/cc, as well as additional lung lesions. A panel of 12 pathologists from North America 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 non-specific biological response to the respirable material, rather than an indication of the toxicity of KEVLAR®. No fibrosis was seen



Product Code "10 Series" KEVLAR Aramid and PP resin system

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 2.5f/cc to 400f/cc have shown that KEVLAR® fibrils 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 KEVLAR® fibrils 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. (Ref. DuPont MSDS)

Carcinogenicity Classification:

Polypropylene components are not listed as a carcinogen by OSHA, NTP or IARC.

Continuous KEVLAR® is classified by the IARC = 3, Not listed as a carcinogen by NTP or OSHA.

Likely routes of exposure

Skin: Not a skin irritant.

Eyes: As with other particles, mechanical action of fibers in the eye may cause slight irritation.

Respiratory: Not available

Sensitization

Skin: Fibers do not cause sensitization. (allergic reaction)

Respiratory: Working unprotected in dusty conditions may cause upper respiratory irritation and cold-like symptoms.

Target organs:

Contains material which may cause damage to the following organs:

Upper respiratory tract, skin, eyes.

Section 12: Ecological Information

This section provides information to evaluate the environmental impact if it were released to the environment.

Environmental effects:

No known significant effects or critical hazards.

Not readily biodegradable. 100% recyclable.

Low mobility in soils.

Polypropylene is not expected to bioaccumulate through food chains in the environment.

Section 13: Disposal Considerations

This section provides guidance on proper disposal practices, recycling, and safe handling practices.

Waste Disposal:

The generation of waste should be avoided or minimized whenever possible.

Polystrand "10 Series" products are 100% recyclable.

General:

Dispose of surplus materials via a licensed waste disposal contractor. Disposal of this product should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional/local authority requirements.

Disposal should be in accordance with applicable regional, national and local laws and regulations. KEVLAR® fiber is not a hazardous waste as defined by regulations implementing the Resource Conservation and Recovery Act (RCRA). In general, waste materials of KEVLAR® may be treated, stored, transported and disposed of in accordance with the State and Local regulations governing the disposal of other common or non-RCRA regulated waste material.

Waste such as waterjet cutter sludge or dust from air filters may be enriched in respirable fibers. Bag securely, label as containing respirable fibers and dispose of it as non-hazardous industrial waste.

Since the fiber is essentially non-biodegradable, it should not be flushed to surface waters or sanitary sewer systems.

Section 14: Transport Information

This section provides guidance on classification information for shipping and transporting of hazardous chemicals by road, air, rail, or sea.

DOT Classification:	Not a DOT controlled material
IMDG Classification:	Not applicable (Marine)
TDG Classification:	Not a DOT controlled material (Canada)
UN Number:	Not applicable
Shipping Name:	Not applicable
Packaging Group:	Not applicable

When handled in bulk quantities, this product and its associated packaging may present a crushing hazard due to the large masses involved, possibly resulting in severe injury or death.

Section 15: Regulatory Information

This section identifies the safety, health and environmental regulations specific for the product that is not indicated anywhere else on the SDS.

HCS Classification: This product is not a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200

United States

SARA 302/304/311/312 extremely hazardous substances:	No products were found.
SARA 302/304 emergency planning and notification:	No products were found.
SARA 302/304/311/312 hazardous chemicals:	No products were found.

DSCL (EEC)	This product is not classified according to the EU legislation.
WHMIS	This product is not controlled under WHMIS (Canada)
TDG	This product is not TDG regulated (Canada)

Section 16: Other Information

This section indicates when the SDS was prepared with the last revision number. Changes to SDS are indicated with an explanation of the changes. Other useful information may be included.

Hazardous Material Information System (USA):

Health	0
Fire Hazard	1
Reactivity	0
Personal Protection	

National Fire Protection Association (USA):



Date of Previous MSDS: July 3, 2014

SDS prepared by: Polystrand Environmental Health and Safety
Validated on May 26, 2015 DV/CD

References:

- OSHA Brief; Hazard Communication Standard: Safety Data Sheets
<https://www.osha.gov/Publications/OSHA3514.html>
- Polypropylene Homopolymer Supplier SDS
- KEVLAR® Aramid Supplier SDS



Safety Data Sheet Polystrand Aramid 10 Series Rev 1.1 6/18/15

The information contained in this data sheet is based on present scientific and technological knowledge. The purpose of this information is to draw attention to the health and safety aspects concerning the products supplied by Polystrand, Inc. and to recommend precautionary measures for the storage and handling of the products. No warranty or guarantee, expressed or implied, is given in respect of the properties of the products. No liability can be accepted for any failure to observe precautionary measures described in this data sheet or for any misuse of the products.

The information herein is presented in good faith and is accurate as of the effective date given. It is the buyer's responsibility to ensure that its activities comply with Federal, State or Provincial, and local laws.

Key/Legend

ACGIH = American Conference of Governmental Industrial Hygienists;
EPA = Environmental Protection Agency;
IARC = International Agency for Research on Cancer;
NIOSH = National Institute for Occupational Safety and Health;
NJTSR = New Jersey Trade Secret Registry.
NTP = National Toxicology Program;
TSCA = Toxic Substance Control Act;

OSHA = Occupational Safety and Health Administration.,

END OF SAFETY DATA SHEET