N22L100X

Raw Material: BIAS: FG 450 ROVING HYBON 2026 (PPG)
Diameter: 1.00”
Braid Angle: +/- 45°
Braid Yield: 18.4 ft/lb
Areal Weight: 1017 GSM
Layer Thickness: 0.032 in (50% Fiber Volume)

Sharx® Braided Biaxial Sleevings
A&P Technology is the exclusive manufacturer of Sharx® brand braided reinforcement. Sharx® braided sleevings easily and repeatedly conform to the shape of products with changing geometries.

For more information please visit www.braider.com, or contact a sales representative at 513-688-3200

All technical information and data contained herein is believed accurate and reliable. However, the accuracy and completeness of this information is not guaranteed and is subject to change without notice. A&P Technology shall not be liable for injury, loss or damage whether direct or consequential arising out of the use of the data provided herein.
SAFETY DATA SHEET

Date of issue/Date of revision: 26 May 2015
Version: 3

Section 1. Identification

Product name: Fiber Glass Continuous Filament

Product code: 01014

Other means of identification:
- Product Family: Product Name:
  - Chopped Strand: ChopVantage®, ChopVantage® XM, ChopVantage® HP, ChopVantage® XM HP, Delta Chop®, Chopped Strands for Nonwovens
  - Direct Draw: HYBON®, TUFrov®, InnoFiber® NTY, LFT4000, LFT9000
  - Yarn: FiberGlass Yarn, L.E.X.® Yarn, TEXO® Yarn, InnoFiber® DCS
  - Mat: Chopped Strand Mat, MatVantage® II
  - Roving: Roving for Continuous Laminating, Roving for Pultrusion/Filament Winding, Roving for SMC, HYBON® Roving for Spray Up, HYBON® Woven Roving, PREFORMANCE™ ROVING
  - INNOFIBER®: CR, HP, LD, TS, XM
  - Insulation: Texo® HTM Mat
  - Recycled Products: Chop/Open ESM, Chop/Open Plastic Reinforcement, Chop/Open 10 micron, Chop/Open 900, Reject Roving, Reject Chopped Strand

Product type: Article

Relevant identified uses of the substance or mixture and uses advised against

Product use: Industrial applications.

Use of the substance/mixture: Industrial applications

Uses advised against: None identified.

Supplier: PPG Industries, Inc.
One PPG Place
Pittsburgh, PA 15272

PPG INDUSTRIES FIBER GLASS B.V.
Energieweg 3
NL 9608 PZ Westerbroek
The Netherlands
Telephone: 31 598 313 633 / 31 598 313 911 (24h/24h) PPG Fiber Glass EMEA Service Center/Centre

Emergency telephone number: (412) 434-4515 (U.S.)

Technical Phone Number: 1-800-432-7073 ext. 302 (Fiber Glass)
Section 2. Hazards identification

OSHA/HCS status: While this material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200), this SDS contains valuable information critical to the safe handling and proper use of the product. This SDS should be retained and available for employees and other users of this product.

Classification of the substance or mixture: Not classified.

GHS label elements

Signal word: No signal word.

Hazard statements: No known significant effects or critical hazards.

Precautionary statements

Prevention: Not applicable.
Response: Not applicable.
Storage: Not applicable.
Disposal: Not applicable.

Supplemental label elements

Hazards not otherwise classified: Emits toxic fumes when heated.

Section 3. Composition/information on ingredients

Substance/mixture: Article
Product name: Fiber Glass Continuous Filament

Other means of identification: Product Family: Product Name:

<table>
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<tr>
<th>Ingredient name</th>
<th>%</th>
<th>CAS number</th>
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<tbody>
<tr>
<td>glass, oxide, chemicals</td>
<td>95</td>
<td>65997-17-3</td>
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<tr>
<td>Organic Surface Binder/Sizing</td>
<td>5</td>
<td>Not available.</td>
</tr>
</tbody>
</table>

Some Fiberglass products contain Textured Polyester Filament Yarn
SUB codes represent substances without registered CAS Numbers.
Section 3. Composition/information on ingredients

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

If ingestion, irritation, any type of overexposure or symptoms of overexposure occur during or persists after use of this product, contact a POISON CONTROL CENTER, EMERGENCY ROOM OR PHYSICIAN immediately; have Safety Data Sheet information available. Never give anything by mouth to an unconscious or convulsing person.

Description of necessary first aid measures

Eye contact : Check for and remove any contact lenses. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. If irritation persists, seek medical attention.
Inhalation : None known.
Skin contact : Remove contaminated clothing and shoes. Gently wash with plenty of soap and water. If irritation persists, seek medical attention. If glass fiber becomes embedded, get medical attention.
Ingestion : Not a likely route of exposure.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact : Dusts from this product may cause temporary mechanical irritation.
Inhalation : Dusts from this product may cause mechanical irritation of the nose, throat and respiratory tract.
Skin contact : Dusts from this product may cause temporary mechanical irritation.
Ingestion : Although ingestion of this product is not likely to occur in industrial applications, accidental ingestion may cause illness or irritation of the mouth and gastrointestinal tract.

Over-exposure signs/symptoms

Eye contact : No specific data.
Inhalation : No specific data.
Skin contact : No specific data.
Ingestion : No specific data.

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
Specific treatments : No specific treatment.
Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training.

See toxicological information (Section 11)
Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media: Use an extinguishing agent suitable for the surrounding fire.

Unsuitable extinguishing media: None known.

Specific hazards arising from the chemical

Hazardous thermal decomposition products: No specific fire or explosion hazard. Material is not an electrical conductor and may accumulate static charge.

Fiberglass will not burn, but smoking of the product may occur at approximately 400 - 500 °F (approximately 200 - 260 °C) due to decomposition of the surface binder. Surface binders may decompose in a fire situation and release carbon monoxide, carbon dioxide and water. Additionally, there are many chemicals that can evolve during any partial decomposition of chemical products. The amounts or identities cannot be predicted and can differ in each situation.

Special protective actions for fire-fighters: Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

Special protective equipment for fire-fighters: Fiberglass itself will not support combustion, but in a sustained fire, proper protection against products of combustion from the fuel and sizing/binder must be worn.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel: No special protection is required.

For emergency responders: No special protection is required.

Environmental precautions: Fiberglass is generally considered to be an inert solid waste. No special precautions are needed in case of a release or spill.

Methods and materials for containment and cleaning up

Small spill: Vacuum or sweep up material and place in a designated, labeled waste container.

Large spill: Vacuum or sweep up material and place in a designated, labeled waste container.

Reference to other sections: See Section 1 for emergency contact information. See Section 8 for information on appropriate personal protective equipment. See Section 13 for additional waste treatment information.
Section 7. Handling and storage

Precautions for safe handling

**Protective measures**: Put on appropriate personal protective equipment (see Section 8).

**Advice on general occupational hygiene**: Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities: Store in accordance with local regulations.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

<table>
<thead>
<tr>
<th>Ingredient name</th>
<th>Exposure limits</th>
</tr>
</thead>
</table>
| Synthetic vitreous fibers       | OSHA PEL (United States).  
|                                 | TWA: 15 mg/m³  
|                                 | TWA: 5 mg/m³ Form: Respirable  
|                                 | TWA: 15 mg/m³ Form: Total dust  
|                                 | ACGIH TLV (United States).  
|                                 | TWA: 1 f/cc Form: Continuous filament glass fibers  
|                                 | TWA: 5 mg/m³, (Inhalable) Form: Continuous filament glass fibers  
|                                 | TWA: 3 mg/m³ Form: Respirable  
|                                 | TWA: 10 mg/m³ Form: Total dust  
|                                 | ACGIH TLV (United States, 6/2013).  
|                                 | TWA: 5 mg/m³ 8 hours. Form: Inhalable fraction  
|                                 | TWA: 1 f/cc 8 hours. Form: Respirable fibers: length greater than 5 μM; aspect ratio equal to or greater than 3:1 as determined by the membrane filter method at 400-450X magnification (4-mm objective) phase contrast illumination.

Key to abbreviations

- **A** = Acceptable Maximum Peak
- **ACGIH** = American Conference of Governmental Industrial Hygienists.
- **C** = Ceiling Limit
- **F** = Fume
- **IPEL** = Internal Permissible Exposure Limit
- **OSHA** = Occupational Safety and Health Administration.
- **R** = Respirable
- **Z** = OSHA 29CFR 1910.1200 Subpart Z - Toxic and Hazardous Substances
- **S** = Potential skin absorption
- **SR** = Respiratory sensitization
- **SS** = Skin sensitization
- **STEL** = Short term Exposure limit values
- **TD** = Total dust
- **TLV** = Threshold Limit Value
- **TWA** = Time Weighted Average

Consult local authorities for acceptable exposure limits.
Section 8. Exposure controls/personal protection

Recommended monitoring procedures: If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to appropriate monitoring standards. Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

Appropriate engineering controls
Environmental exposure controls: Good general ventilation should be sufficient to control worker exposure to airborne contaminants.

Individual protection measures
Hygiene measures: Good personal hygiene and the use of barrier creams, caps, protective gloves, cotton coveralls or long sleeved loose fitting clothing will maximize comfort. Appropriate techniques should be used to remove potentially contaminated clothing. Work clothing should be laundered separately from other clothing before reuse. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection: Safety glasses with side shields.

Skin protection
Hand protection: Use gloves to protect against physical irritation or injury if required by handling conditions.

Body protection: Wear clean, body-covering clothing.

Other skin protection: Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection: If dust is generated and ventilation is inadequate, use respirator that will protect against dust/mist. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Section 9. Physical and chemical properties

Appearance
Physical state: Solid.
Color: White to yellowish.
Odor: Odorless.
Odor threshold: Not available.
pH: Not available.
Melting point: Not available.
Boiling point: Not available.
Flash point: Closed cup: Not applicable. [Product does not sustain combustion.]
Auto-ignition temperature: Not available.
Decomposition temperature: Not available.
Section 9. Physical and chemical properties

- **Flammability (solid, gas)**: Not available.
- **Lower and upper explosive (flammable) limits**: Not available.
- **Evaporation rate**: Not available.
- **Vapor pressure**: Not available.
- **Vapor density**: Not available.
- **Relative density**: 2.65 to 2.7
- **Solubility**: Insoluble
- **Partition coefficient: n-octanol/water**: Not available.
- **Viscosity**: Not applicable.
- **Volatility**: Not available.
- **% Solid. (w/w)**: 100

Section 10. Stability and reactivity

- **Reactivity**: No specific test data related to reactivity available for this product or its ingredients.
- **Chemical stability**: The product is stable.
- ** Possibility of hazardous reactions**: Under normal conditions of storage and use, hazardous reactions will not occur.
- **Conditions to avoid**: When exposed to high temperatures may produce hazardous decomposition products. Refer to protective measures listed in sections 7 and 8.
- **Incompatible materials**: None known.
- **Hazardous decomposition products**: Fiberglass products may release small amounts of acetic acid and other organic materials at elevated temperatures.

Section 11. Toxicological information

**Information on toxicological effects**

**Acute toxicity**

- **Conclusion/Summary**: No known significant effects or critical hazards.

**Irritation/Corrosion**

- **Conclusion/Summary**: No known significant effects or critical hazards.

**Skin**

- **Conclusion/Summary**: No known significant effects or critical hazards.

**Eyes**

- **Conclusion/Summary**: No known significant effects or critical hazards.

**Respiratory**

- **Conclusion/Summary**: No known significant effects or critical hazards.

**Sensitization**

- **Conclusion/Summary**: No known significant effects or critical hazards.
Section 11. Toxicological information

**Skin**
- No known significant effects or critical hazards.

**Respiratory**
- No known significant effects or critical hazards.

**Mutagenicity**

**Conclusion/Summary**
- No known significant effects or critical hazards.

**Carcinogenicity**

**Conclusion/Summary**
- No known significant effects or critical hazards.

**Classification**

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>OSHA</th>
<th>IARC</th>
<th>NTP</th>
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<td>glass, oxide, chemicals</td>
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</table>

Carcinogen Classification code:
- IARC: 1, 2A, 2B, 3, 4
- NTP: Known to be a human carcinogen; Reasonably anticipated to be a human carcinogen
- OSHA: +
- Not listed/not regulated: -

**Reproductive toxicity**

**Conclusion/Summary**
- No known significant effects or critical hazards.

**Teratogenicity**

**Conclusion/Summary**
- No known significant effects or critical hazards.

**Specific target organ toxicity (single exposure)**
- Not available.

**Specific target organ toxicity (repeated exposure)**
- Not available.

**Target organs**
- Contains material which may cause damage to the following organs: upper respiratory tract, skin, eyes.

**Aspiration hazard**
- Not available.

**Information on the likely routes of exposure**

**Potential acute health effects**
- **Eye contact**: Dusts from this product may cause temporary mechanical irritation.
- **Inhalation**: Dusts from this product may cause mechanical irritation of the nose, throat and respiratory tract.
- **Skin contact**: Dusts from this product may cause temporary mechanical irritation.
- **Ingestion**: Although ingestion of this product is not likely to occur in industrial applications, accidental ingestion may cause illness or irritation of the mouth and gastrointestinal tract.

**Over-exposure signs/symptoms**
- **Eye contact**: No specific data.
- **Inhalation**: No specific data.
- **Skin contact**: No specific data.
- **Ingestion**: No specific data.

**Delayed and immediate effects and also chronic effects from short and long term exposure**
Section 11. Toxicological information

Conclusion/Summary: There are no known health effects from the long term use or contact with nonrespirable continuous filament fibers, which is the type of fiberglass that PPG produces. Nonrespirable fibers cannot reach the deep lung because they have a diameter of greater than 3.5 micrometers. Fibers of this diameter cannot penetrate the narrow, bending passages of the human respiratory tract to reach the lower regions of the lung and thus, have no possibility of causing serious pulmonary damage. Instead, they deposit on the surfaces of the upper respiratory tract, nose, or pharynx. These fibers are then cleared through normal physiological mechanisms.

Animal Study: In 2000, the Institute of Occupational Medicine (IOM) in Scotland published the results of a long term inhalation study in animals exposed to fibers that were manufactured to be RESPIRABLE. Animals were exposed to a very high concentration of these RESPIRABLE fibers (1022 fibers/cc for 5 hours/day, 7 days/week for 52 weeks). Exposure to these microfibers resulted in the development of fibrosis, lung cancer and mesothelioma as a result of the fibers being able to reach the lower regions of the lung.

Chopped, crushed or severely mechanically processed fiberglass may contain a very small amount of respirable fibers that could reach the deep lung. The measured airborne concentration of these respirable fibers in areas where severe processing of fiberglass occurred has been shown to be extremely low and well below the TLV. Repeated or prolonged exposure to respirable glass fibers may cause fibrosis, lung cancer and mesothelioma. PPG fiberglass, in the form supplied, does not contain respirable fibers.

Epidemiology Studies: Two major studies in the US (performed by the University of Pittsburgh) and Europe (performed by the International Agency for Research on Cancer) showed no increase in lung cancer or respiratory disease among people working in production facilities producing NONRESPIRABLE continuous filament fiberglass. An additional smaller study performed in Canada also did not show an association between exposure of workers to fiberglass and respiratory cancer.

Short term exposure
Potential immediate effects: No known significant effects or critical hazards.
Potential delayed effects: No known significant effects or critical hazards.

Long term exposure
Potential immediate effects: No known significant effects or critical hazards.
Potential delayed effects: No known significant effects or critical hazards.

Potential chronic health effects
General: No known significant effects or critical hazards.
Carcinogenicity: No known significant effects or critical hazards.
Mutagenicity: No known significant effects or critical hazards.
Teratogenicity: No known significant effects or critical hazards.
Developmental effects: No known significant effects or critical hazards.
Fertility effects: No known significant effects or critical hazards.

Numerical measures of toxicity
Acute toxicity estimates
Section 11. Toxicological information

Not available.

Section 12. Ecological information

Toxicity
Not available.

Persistence and degradability
Not available.

Bioaccumulative potential
Not available.

Mobility in soil

Soil/water partition coefficient ($K_{OC}$): Not available.

Section 13. Disposal considerations

Disposal methods:

The generation of waste should be avoided or minimized wherever possible. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products 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. Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees. Section 6. Accidental release measures

14. Transport information

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<th>Environmental hazards</th>
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<th>IMDG</th>
<th>IATA</th>
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<table>
<thead>
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<th>UN number</th>
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<th>IATA</th>
</tr>
</thead>
</table>
14. Transport information

Additional information
- DOT : None identified.
- IMDG : None identified.
- IATA : None identified.

Special precautions for user : -

Section 15. Regulatory information

United States inventory (TSCA 8b) : All components are listed or exempted.
Australia inventory (AICS) : All components are listed or exempted.
Canada inventory (DSL) : All components are listed or exempted.
China inventory (IECSC) : All components are listed or exempted.
Europe inventory (REACH) : Please contact your supplier for information on the inventory status of this material.
Japan inventory (ENCS) : All components are listed or exempted.
Korea inventory (KECI) : All components are listed or exempted.
New Zealand (NZIoC) : All components are listed or exempted.
Philippines inventory (PICCS) : All components are listed or exempted.

United States

SARA 302/304
SARA 304 RQ : Not applicable.
Composition/information on ingredients
No products were found.

SARA 311/312
Classification : Not applicable.
Composition/information on ingredients
No products were found.

Section 16. Other information

Hazardous Material Information System (U.S.A.)
Health : 1 Flammability : 0 Physical hazards : 0
( * ) - Chronic effects
Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings are not required on MSDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

The customer is responsible for determining the PPE code for this material.

National Fire Protection Association (U.S.A.)
Health : 1 Flammability : 0 Instability : 0
Other information : the PPG logo is a registered trademark of PPG Industries Ohio, Inc.
Section 16. Other information

Date of previous issue : 5/26/2015.
Organization that prepared the MSDS : EHS
Key to abbreviations : ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
UN = United Nations

Indicates information that has changed from previously issued version.

Disclaimer

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