Material Safety Data Sheet

Date of issue 9 June 2015
Version 8

1. Product and company identification

Product name: Fiber Glass Continuous Filament

Code: 01014

Synonym:
- 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

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)

2. Hazards identification

Emergency overview: WARNING!
Fiberglass may cause mechanical irritation to the skin, eye and upper respiratory tract. Use only with adequate ventilation. Wash thoroughly after handling.

Potential acute health effects

Inhalation: Dusts from this product may cause mechanical irritation of the nose, throat and respiratory tract.

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.

Skin: Dusts from this product may cause temporary mechanical irritation.

Eyes: Dusts from this product may cause temporary mechanical irritation.

Over-exposure signs/symptoms

Inhalation: No specific data.
Ingestion: No specific data.
Skin: No specific data.
Eyes: No specific data.
2. Hazards identification

Medical conditions aggravated by over-exposure: Pre-existing disorders involving any target organs mentioned in this MSDS as being at risk may be aggravated by over-exposure to this product.

This Material Safety Data Sheet has been prepared in accordance with Canada's Workplace Hazardous Materials Information System (WHMIS).
See toxicological information (Section 11)

3. Composition/information on ingredients

<table>
<thead>
<tr>
<th>Name</th>
<th>CAS number</th>
<th>% (w/w)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fibrous glass, continuous filament</td>
<td>65997-17-3</td>
<td>&gt;95</td>
</tr>
<tr>
<td>Organic Surface Binder/Sizing</td>
<td>Not available.</td>
<td>&lt;5</td>
</tr>
</tbody>
</table>

Some Fiberglass products contain Textured Polyester Filament Yarn

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.

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 Material Safety Data Sheet information available. Never give anything by mouth to an unconscious or convulsing person.

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.

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.

Inhalation: None known.

Ingestion: Not a likely route of exposure.

Notes to physician: Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

5. Fire-fighting measures

Flammability of the product: Material is not an electrical conductor and may accumulate static charge.

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

Suitable: None known.

Not suitable: None known.

Special exposure hazards: 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.

Hazardous combustion products: 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 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.
6. Accidental release measures

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

7. Handling and storage

Handling: Put on appropriate personal protective equipment (see Section 8). 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.
Storage: Store in accordance with local regulations.

8. Exposure controls/personal protection

<table>
<thead>
<tr>
<th>Name</th>
<th>Result</th>
<th>ACGIH</th>
<th>Ontario</th>
<th>Mexico</th>
<th>PPG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Synthetic vitreous fibers</td>
<td>TWA</td>
<td>10 MG/M3 TD 3 MG/M3 R 1 f/cc 5 mg/m³ (Inhalable) 1 f/cc R 5 mg/m³</td>
<td>1 f/cc R 5 mg/m³ 10 mg/m³</td>
<td>Not established</td>
<td>Not established</td>
</tr>
</tbody>
</table>

Key to abbreviations

A = Acceptable Maximum Peak
ACGIH = American Conference of Governmental Industrial Hygienists.
C = Ceiling Limit
F = Fume
IPEL = Internal Permissible Exposure Limit
R = Respirable
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.

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.

Engineering measures: Good general ventilation should be sufficient to control worker exposure to airborne contaminants.

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.

Personal protection

Eyes: Safety glasses with side shields.
Hands:
8. Exposure controls/personal protection

Use gloves to protect against physical irritation or injury if required by handling conditions.

Respiratory : 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.

Skin : Wear clean, body-covering clothing.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

9. Physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical state</td>
<td>Solid</td>
</tr>
<tr>
<td>Flash point</td>
<td>Closed cup: Not applicable. [Product does not sustain combustion.]</td>
</tr>
<tr>
<td>Color</td>
<td>White to yellowish.</td>
</tr>
<tr>
<td>Odor</td>
<td>Odorless.</td>
</tr>
<tr>
<td>pH</td>
<td>Not available.</td>
</tr>
<tr>
<td>Boiling/condensation point</td>
<td>Not available.</td>
</tr>
<tr>
<td>Melting/freezing point</td>
<td>Not available.</td>
</tr>
<tr>
<td>Specific gravity</td>
<td>2.65 to 2.7</td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>Not available.</td>
</tr>
<tr>
<td>Vapor density</td>
<td>Not available.</td>
</tr>
<tr>
<td>Volatility</td>
<td>0% (v/v), 0% (w/w)</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>Not available.</td>
</tr>
<tr>
<td>Viscosity</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Solubility</td>
<td>Insoluble</td>
</tr>
<tr>
<td>Partition coefficient: n-octanol/water</td>
<td>Not available.</td>
</tr>
<tr>
<td>% Solid. (w/w)</td>
<td>100</td>
</tr>
</tbody>
</table>

10. Stability and reactivity

Stability : The product is stable.

Conditions to avoid : When exposed to high temperatures may produce hazardous decomposition products.

Materials to avoid : None known.

Hazardous decomposition products : Fiberglass products may release small amounts of acetic acid and other organic materials at elevated temperatures.

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

11. Toxicological information

Acute toxicity

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

Chronic toxicity
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.

Irritation/Corrosion

- Skin: No known significant effects or critical hazards.
- Eyes: No known significant effects or critical hazards.
- Respiratory Sensitization: No known significant effects or critical hazards.

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

Carcinogenicity

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

Classification

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>ACGIH</th>
<th>IARC</th>
<th>NTP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Synthetic vitreous fibers</td>
<td>A4</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>Glass filament, continuous</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Carcinogen Classification code: ACGIH: A1, A2, A3, A4, A5
IARC: 1, 2A, 2B, 3, 4
NTP: Known to be a human carcinogen; Reasonably anticipated to be a human carcinogen
Not listed or regulated as a carcinogen: -

Mutagenicity

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

Teratogenicity

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

12. Ecological information

Environmental effects : No known significant effects or critical hazards.

13. Disposal considerations

Waste disposal : 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

<table>
<thead>
<tr>
<th></th>
<th>TDG</th>
<th>Mexico</th>
<th>IMDG</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN number</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>UN proper shipping</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>name</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transport hazard</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>class(es)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Packing group</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Environmental</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>hazards</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marine pollutant</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>substances</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Additional information

TDG : None identified.
Mexico : None identified.
IMDG : None identified.

Special precautions for user : -

15. Regulatory information

Canada inventory (DSL) : All components are listed or exempted.

Canada

WHMIS (Canada) : None identified.

Mexico

Classification
Flammability : 0  Health : 1  Reactivity : 0
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

Indicates information that has changed from the 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.