Material Safety Data Sheet (MSDS)

Section 1.1: Identification of Substance

Fiber Glass Product Trade Names:	Fiber Glass Product Descriptions: The products are bound fiber glass fiber strands which are:
Chopped Strand	**chopped to a specific length**
Hybon® Continuous Roving; Roving	wound onto a cylindrical forming package
Continuous Strand	**wound onto a cylindrical forming package**
Hybon® Woven Roving	woven to a heavy fabric
Needled Mat for AZDEL, Inc.	**formed into a mat**
MatVantage™ Continuous Strand Mat	formed into a mat
Combomat® Woven Roving Mat	**formed into a combination product consisting of a woven fabric ply and a chopped strand mat ply**
Chopped Strand Mat	chopped and formed into a mat
Yarn	**twisted onto a bobbin or wound onto a warp beam**
L.E.X.® Yarn	texturized and wound onto a tube
TEXO® Yarn	**texturized and wound onto a tube**
HercuFlex® Strand HF and HFO lines	coated with an off-white polymeric coating; also called impregnated yarn.

HercuFlex® is a registered trade mark of Hercules, Inc. licensed to PPG Industries

Chemical Name and Synonyms: **Continuous Filament Fiber Glass (Fibrous Glass, Glass Fibers)**
Chemical Formula: **E-glass**
Color: Yellow-white to white
Odor: No odor

Note: These products are not glass wool products (as used for home insulation materials). Consult the appropriate manufacturer of these materials for glass wool MSDS.

Section 1.2: Company Address

PPG Industries, Incorporated
Fiber Glass Products
One PPG Place
Pittsburgh, Pennsylvania 15272

Phone/Fax Numbers

Emergency 24 hours/7 days per week: 304-843-1300
MSDS: 412-434-2272 (week days 8-4:30p.m. eastern time)
Other Information: 412-967-2047, Fiber Glass Research Ctr.
Fax: 412-967-2111, Research Ctr., Safety Department

Section 2: Composition of Ingredients

Ingredients	% - Weight	Exposure Control Limits
Fibrous Glass (E-type, continuous filament) Composition principally of oxides of silicon, aluminum, calcium, boron and magnesium, fused in an amorphous vitreous state	84.5 (Min.)	10mg/m^3 ACGIH ® -TLVs ® fiber glass 15mg/m^3 OSHA-PEL total nuisance dust 5mg/m^3 OSHA-PEL respirable nuisance dust
Surface Sizing (complex mixture; in general, of one or more: starches (*), modified vegetable oils(*), or polymers)	≤1-22 (see pg. 2) (*) (")	
Surface Binder (complex polymer mixture)	0-6 (")	
Water	0-15 (")	

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Section 2: Composition of Ingredients (continued)

Product Name	% Fibrous Glass	Surface Sizing	Surface Binder	Water
Chopped Strand	84.5 - 99.1%	≤2.5%	—	0-15%
Hybon® Continuous Roving; Roving	99%	≤1%	—	—
Continuous Strand	≥99%	≤1%	—	—
Hybon® Woven Roving	≥99%	≤1%	—	—
Needled Mat for AZDEL, Inc.	≥99%	≤1%	—	—
MatVantage™; Continuous Strand Mat	≥95%	≤1%	≤4% (polyester)	—
Combimat® Woven Roving Mat	≥96.5%	≤1%	≤2.5% (polyester)	—
Chopped Strand Mat	≥93%	≤1%	≤6% (polyester)	—
Yarn	≥98%	≤2%(*)	—	—
L.E.X.® Yarn	≥98%	≤2%(*)	—	—
TEXO® Yarn	≥96.5%	≤3.5%(*)	—	—
HercuFlex® Strand HF and HFO Lines	≥87%	≤13%	—	—

Section 3: Hazards Identification

Emergency Overview: Stable and nonflammable under normal industrial conditions.
Primary Route(s) of Entry: Inhalation.
Symptoms of Overexposure: Rash, itching, conjunctivitis, coughing, sneezing.
Immediate (Acute) Health Hazards: Mechanical skin, eye, nose & throat irritant. Typically, skin irritation experienced by most persons newly exposed to fiber glass.
Long Term (Chronic) Health Hazards: None currently known; see Section 11.

Section 4: First-Aid Measures

Medical Conditions Aggravated by Exposure: None known.
Eye Contact: Flush eyes with water for at least 15 minutes - seek medical attention.
Skin Contact: Rinse contact areas with room temperature to cool water, then wash gently with mild soap. If glass fiber becomes embedded, seek medical attention.
Inhalation: If irritation persists, seek medical attention. **If Swallowed:** Seek medical attention.

Section 5: Fire-Fighting Measures

Flash Point, Flammable Limits, Extinguishing Media: Water is the preferred extinguishing media. Non-burning; ***except for MatVantage™ Mat and Needled Mat for AZDEL, Inc.,*** which will support combustion and have Flash Points>200°F. Exposing both products to an ignition source will burn-off surface binder leaving a bare glass residual similar to the initial product.
Unusual Fire and Explosion Hazards: Not applicable ***except for Needled Mat for AZDEL, Inc., which has a surface binder containing an organic peroxide and may burn in the absence of oxygen.***
Fire Fighting Procedures: In any sustained fire, wear self-contained breathing apparatus (SCBA). Every company should have written, NFPA & OSHA compliant, fire/evacuation policies including training for all facility employees.
Special Exposure Hazards From Fire: Hazardous decomposition products of combustion from sizing and binders may be released in a sustained fire. The larger part of the product is nonflammable E-glass. In a sustained fire, sizing and binders may decompose, releasing combustion products including carbon dioxide, carbon monoxide 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.

Section 6: Accidental Release Measures

Steps to be Taken upon Release or Spill: Use vacuuming or wet sweeping methods instead of dry sweeping.
Waste Disposal Method: Dispose in accordance with government regulations. Keep debris minimal by locating waste disposal equipment near work areas.

Section 7: Handling and Storage

Precautions: Keep airborne dust concentrations below regulated levels. For optimum performance, store at 25°C or less and relative humidity less than 65%. Not an electrical conductor. Can accumulate static charge.

Section 8: Exposure Controls/Personal Protection

Respiratory Protection: Some applications of these products may not require respiratory protection for fiber glass. However, if airborne fibrous glass concentrations exceed regulatory limits, respiratory protection approved for nuisance dusts is recommended.

Ventilation: Local exhaust ventilation (if needed) to maintain appropriate airborne dust levels.

Skin/Eye Protection: Good personal hygiene and the use of barrier creams, caps, protective gloves, cotton coveralls, or long sleeved loose fitting clothing will maximize comfort. Vacuum equipment may be used to remove fibers from clothes. Work clothing should be laundered separately from other clothing before reuse. Wear appropriate eye protection which may be safety glasses/side shields if there is a chance of airborne glass fibers contacting eyes.

Exposure Limits: The American Conference of Governmental Hygienists (ACGIH) has adopted a Threshold Limit Value (TLV) of 10 mg/m^3 for an 8 hour time weighted average (TWA) exposure for fibrous glass dust. The Occupational Safety and Health Administration (OSHA) does not prescribe a Permissible Exposure Limit (PEL) for fibrous glass but relies on the PEL-TWA's for nuisance dust of 15mg/m^3 (total) and 5mg/m^3 (respirable). Available air sampling/analytical methods: Gravimetric total dust NIOSH Sampling & Analytical Method 0500; the Gravimetric respirable dust NIOSH Method 0600 and the NIOSH 7400, B Fiber Counting Rules. The latter two methods may be performed as redundant verification that there are no respirable glass fibers.

Section 9: Stability and Reactivity

Stability:	Stable	**Conditions to Avoid:**	None known.
Incompatibility (Materials to Avoid):	None known.	**Hazardous Polymerization:**	Will not occur.

Section 10: Physical and Chemical Properties

Appearance/Odor: See Section 1.1 **pH**: Not applicable

Electrical Conductivity: E-glass is an electrical insulator. **Boiling/Freezing Points:** Not applicable.

Specific Gravity (bare glass): 2.6 (Water=1) **Melting Point (softening):** 800° C

Vapor Pressure/Density/Oxidation Risk: Not applicable **Octanol/Water Partition Coefficient:** Not applicable.

Flash Point/Flammability/Explosion Limits: See Section 5.0.

Percent Volatile (volume): None.

Solubility: Insoluble in water. For some applications (e.g. paper reinforcement) fibers are wetted and made water dispersible through their special sizing. Most other types disperse to some extent in organic solvents depending upon the application.

Section 11: Toxicological Information

Factors in fiber toxicity include: **fiber dimensions and degree of exposure.**

Fiber Dimensions Fibers are either non-respirable or respirable. Respirable fibers can penetrate to the "deep" lung area. According to the World Health Organization (WHO), man made-mineral fibers with diameters equal to or greater than ($\geq$) 3.0 microns (um) are nonrespirable.[1] According to the National Institute for Occupational Safety and Health (NIOSH), fibers with diameters $\geq$ 3.5 um are nonrespirable [3]. The narrow, bending passages of the human respiratory system, do not permit the relatively larger, nonrespirable fibers to enter the "deep" lung area. Instead, they strike the surfaces of the upper respiratory tract, nose or pharynx, and stop. They may then be filtered by nasal hairs or other natural mechanisms. Due to the manufacturing process used, these PPG Fiber Glass products have diameters greater than 3.5 and are considered to be nonrespirable. The fibers do not become respirable upon the sanding/machine processing activities typical of our customers. Upon breakage, the fibers break horizontally into smaller lengths but not longitudinally into smaller diameters.

Degree of Exposure: According to Johnson et. al., in a 1969 US study of four fibrous glass production plants, "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]

References:

1. IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, Man-made Mineral Fibers and Radon, Vol. 43, 1988, World Health Organization.
2. Threshold Limit Values® booklet, 1995-96, American Conference of Governmental Industrial Hygienists (ACGIH)
3. Occupational Exposure, Toxic Properties, and Work Practice Guidelines for Fiber Glass, by Bender, J., Konzen, J., and Devitt, G., American Industrial Hygiene Association No. 5 (AIHA), 1991.

Carcinogenicity: The International Agency for Research on Cancer (IARC) is part of the World Health Organization (WHO). IARC concludes that continuous fiber glass filaments are not classifiable as to their carcinogenicity in humans (Group 3) because there is inadequate evidence on the carcinogenicity of these materials in humans or experimental animals.[1] In a 1987 US epidemiological study (20 years latency) of glass filament workers, there was no excess of respiratory cancer found. In a 1987 European study (over 20 years latency) there was no excess of lung cancer found. In both studies there was no increasing trend with an estimated time-weighted measure of exposure. In a study administering large diameter glass filament (> 3 um) intraperitoneally to rats, no statistically significant tumor response was found. The American Conference of Governmental Industrial Hygienists (ACGIH) gives fibrous glass dust an A5 designation meaning the substance is not considered to be a carcinogen.[2] Continuous filament fiber glass is not listed in the National Toxicology Program (NTP) 7th Annual Report on Carcinogens, nor is it regulated by OSHA as a carcinogen.

References:
1. IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, Man-made Mineral Fibers and Radon, Vol. 43, 1988, World Health Organization.
2. Threshold Limit Values® booklet, 1995-96, American Conference of Governmental Industrial Hygienists (ACGIH)
3. Occupational Exposure, Toxic Properties, and Work Practice Guidelines for Fiber Glass, by Bender, J., Konzen, J., and Devitt, G., American Industrial Hygiene Association No. 5 (AIHA), 1991.

Section 12: Ecological Information

Fiber glass 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 & 14: Disposal and Transportation Considerations

Fiber Glass is considered non-hazardous per **EPA, RCRA 40CFR,Part 261, 1990**. Considered an inert solid waste. Local, state, and national regulations should be consulted to ensure proper disposal procedures. Fiber glass products which are part of a reinforced plastic or uncured resin system must be disposed of in accordance with applicable requirements for those plastics or resins where they exist. Not regulated by the **Department of Transportation (DOT).**

Section 15: Additional Regulatory Information

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 & MSDS requirements. However, fibrous glass is on the **Ingredient Disclosure List.** It must be listed as an ingredient on MSDS for "controlled products" with fiber glass concentrations greater than 1.0%.
European Economic Committee (EEC) Labeling Classification: Fiber Glass does *not* meet the classification for a "dangerous substance" according to 67/548/EEC. The E-glass composition has been incorporated in the EINECS under NR. 65997-17-3 as a generic substance.
Japan: Chemical Substances Control Law: Fiber Glass is exempt from this law.
United States: EPA Toxic Substances Control Act (TSCA): Fiber Glass carries no Chemical Abstracts Index name, CAS registry number or EPA code designation number. Fiber Glass 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 as they do not meet its health or physical hazards definitions nor contain any SARA 313 chemical ingredients in excess of EPA's de minimus concentrations. **OSHA Hazard Communication Standard:** Subject to the applicable requirements of this regulation. Per this MSDS revision date, these fiber glass products are not known to contain chemical ingredients listed by the Pennsylvania, New Jersey or Massachusetts **Right to Know Law** or **California's Proposition 65 Law** in excess of the amounts requiring reporting on such substances' MSDS or labels.

Health and safety wording on the product packaging label:
(other packaging labels with similar verbage are used for Canadian, New Jersey & European PPG Fiber Glass product shipments)
NOTICE: Contact with fibrous glass may cause temporary skin irritation. Wear long-sleeved, loose-fitting clothing when handling the material. Gloves and eye protection may be appropriate in certain operations. Wash with soap and warm water after handling. Use of a disposable mask in accordance with Occupational Safety and Health Administration 1910.134 respiratory protection requirements designed for nuisance dusts is advisable where high dust levels may be encountered. The International Agency for Research on Cancer (IARC) has designated continuous filament fiber glass as a group 3 "not classifiable as to human carcinogenicity", meaning that evidence is not sufficient to link that fiber to cancer.

Section 16: Other Information

For general information, OSHA proposed a rule in the Federal Register, Vol. 57, No. 114, on Friday, June 12, 1992, for fibrous glass. To date, that rule has not yet been finalized.