



MATERIAL SAFETY DATA SHEET

Section 1: Product and Company Information

Product Name(s): Beta[®] fibers, Cardable fiber, Chopped Strand, Conductive Roving, E-Glass Yarns, Multitex, S-1 Glass[®] fibers, S-2 Glass[®] fibers, S-3 Glass[®] fibers, Wax Bonded Strand, Polyester Combination Yarn, VeTron[™] fibers, Yarns, ZenTron[®] fibers, L-Glass[™] fibers, or S-1 HM Glass[™] fibers.

Manufacturer:

AGY World Headquarters
2556 Wagener Rd.
Aiken, SC 29801
Telephone: 1-803-643-1212 (8am to 5pm ET, weekdays)

Emergency Contacts:

CHEMTREC (24 hours everyday): 1-800-424-9300

Health and Technical Contacts:

1-888-434-0945 (8am to 5pm ET, weekdays)

Section 2: Composition and Ingredient Information

Common Name	CAS No.	Wt. %
Fiber Glass (non respirable)*1	65997-17-3	98 - 100
Size*2	NA	0 -2 %

Note: *1 – As manufactured continuous filament glass fibers are not respirable. Continuous filament glass products that are chopped, crushed or severely mechanically processed during manufacturing or use may contain a very small amount of respirable particulate, some of which may be glass shards. See Section 8 of Material Safety Data Sheet for exposure limit data.

*2 - See Section 15 of MSDS for concentrations of California Proposition 65 chemicals and other regulatory information relative to this product(s).

Component Related Regulatory Information

This product may be regulated, have exposure limits or other information identified as the following: glass wool fiber, fibrous glass and nuisance particulates.

Component Information/Information on Non-Hazardous Components

No additional information available.



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Section 3: Hazards Identification

Emergency Overview

No unusual conditions are expected from this product

Appearance and Odor: White/off-white colored solid with no odor.

Primary Route(s) of Exposure: Inhalation, lungs, skin, eye

Potential Health Effects:

Inhalation:

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

Skin Contact:

Dusts and fibers from this product may cause temporary mechanical irritation to the skin.

Eye Contact:

Dusts and fibers from this product may cause temporary mechanical irritation to the eyes.

Ingestion:

Ingestion of this product is unlikely. However, ingestion of product may produce gastrointestinal irritation and disturbances.

Medical Conditions Aggravated by Exposure:

Chronic respiratory and skin conditions may temporarily worsen from exposure to this product.

Chronic Conditions:

See Section 11 for additional information.

Section 4: First Aid Measures

Inhalation:

Move person to fresh air. Seek medical attention if irritation persists.

Skin Contact:

For skin contact, wash with mild soap and cold water. Do not wash with warm water because this will open up the pores of the skin, which will cause further penetration of the fibers. Use a washcloth to help remove fibers. To avoid further irritation, do not rub or



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scratch affected areas. Rubbing or scratching may force fibers into skin. If irritation persists get medical attention.

Eye Contact:

Immediately flush eyes with plenty of running water for at least 15 minutes. If irritation persists get medical attention.

Ingestion:

Ingestion of this material is unlikely. If it does occur, watch the person for several days to make sure that intestinal blockage does not occur.

Section 5: Fire Fighting Measures

Flash Point: None

Flash Point Method: Not determined

Upper Flammability Limit: None

Lower Flammability Limit: None

Flammability Classification: Non-flammable

Vapor Density (Air = 1): Not Applicable

Extinguishing Media: Water fog, foam, carbon dioxide(CO₂) or dry chemical.

Unusual Fire and Explosion Hazards: None known.

Fire Fighting Instructions: Use self-contained breathing apparatus (SCBA) and full bunker turnout gear in a sustained fire.

Hazardous Combustion Products: Primary combustion products are carbon monoxide, hydrogen, carbon dioxide and water. Other undetermined compounds could be released in small quantities.

Section 6: Accidental Release Measures

Containment Procedures: This material will settle out of air. If concentrated on land, it can be scooped up for disposal as non-hazardous waste. This material will sink and disperse along the bottom of waterways and ponds. It cannot easily be removed after it is waterborne; however, the material is non-hazardous in water.

Clean-Up Procedures: Scoop up material and put into a suitable container for disposal as a non-hazardous waste.

Response Procedures: Isolate area. Keep personnel away.

Special Procedures: None.



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Section 7: Handling and Storage

Handling Procedures: Keep product in its packaging, as long as practicable to minimize potential dust generation. Keep work areas clean. Avoid unnecessary handling of scrap materials. Wear PPE as described in Section 8.

Storage Procedures: No special procedures.

Section 8: Exposure Controls and Personal Protection

Exposure Guidelines:

A: General Product Information: Follow all applicable exposure limits.

B: Exposure Limits:

Fiber Glass Continuous Filament (65997-17-3)

Ingredient	OSHA PEL (8-hr TWA)	ACGIH TLV (8-hr TWA)
Non-respirable fibers and particulate	15 mg/m ³ (total dust)(a)	5 mg/m ³ (inhalable fraction)
Respirable particulate	5 mg/m ³ (respirable dust)(b)	3 mg/m ³ (PNOC)*
Respirable particulate with fiber like dimensions (glass shards)	None Established	1 fiber/cc aspect ratio >5:1
Size	None Established	None Established

*PNOC = Particles not otherwise classified

Ventilation: General dilution ventilation and/or local exhaust ventilation should be provided as necessary to maintain exposures below occupational exposure limits.

PERSONAL PROTECTIVE EQUIPMENT

Respiratory Protection: A properly fitted NIOSH approved N 95 series disposable dust respirator such as the 3M model 8210 (model 8271 in high humidity environments) or equivalent should be used when high dust levels are encountered, the level of glass fibers in the air exceeds the occupational exposure limits, or if irritation occurs.



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Skin Protection: Normal work clothing (long sleeved shirts and long pants) is recommended. Use gloves. Skin irritation is known to occur chiefly at pressure points such as around neck, wrists, waist, and between fingers.

Eye/Face Protection Equipment: Wear safety glasses, goggles or face shield.

Section 9: Physical and Chemical Properties

Appearance:	White/off-white Solid	Odor:	None
Physical State:	Solid	pH:	Not Applicable
Vapor Pressure (mm Hg @ 20°C):	Not Applicable	Vapor Density (Air = 1):	Not Applicable
Boiling Point:	Not Applicable	Solubility (H₂O):	Insoluble
Specific Gravity (Water=1):	2.60	Freezing Point:	Not Applicable
Evaporation Rate (n-Butyl Acetate = 1):	Not Applicable	Viscosity:	Not Applicable
VOC:	< 0.4%	Melting Point:	> 800 ⁰ C

Physical Properties: Additional Information

No additional information available.

Section 10: Chemical Stability and Reactivity Information

Stability: This is a stable material.

Conditions to Avoid: None known.

Incompatible Materials: None known.

Hazardous Decomposition Products: Sizings or binders may decompose in a fire. See Section 5 of MSDS for information on hazardous combustion products.

Hazardous Polymerization: Will not occur.



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Section 11: Toxicological Information

Acute Effects:

General Product Information

Dusts may cause mechanical irritation of the eyes and skin. Ingestion may cause transient irritation of throat, stomach and gastrointestinal tract. Inhalation may cause coughing, nose and throat irritation, and sneezing. People with pre-existing respiratory conditions, may experience difficulty breathing, congestion and chest tightness.

Carcinogenicity:

Fiber Glass Continuous Filament: The International Agency for Research on Cancer (IARC) in June, 1987, categorized fiber glass continuous filament as not classifiable with respect to human carcinogenicity (Group 3). The evidence from human as well as animal studies was evaluated by IARC as insufficient to classify fiber glass continuous filament as a possible, probable, or confirmed cancer causing material.

The American Conference of Governmental Industrial Hygienists (ACGIH) A4 classification, not classifiable as a human carcinogen, for respirable continuous filament glass fibers is based on inadequate data in terms of its carcinogenicity in humans and/or animals.

For respirable continuous filament glass fibers, a TLV-TWA of 1 fiber/cc was adopted to protect workers against mechanical irritation. The TLV-TWA of 5 mg/m³ was adopted for nonrespirable glass filament fiber, measured as inhalable dust, to prevent mechanical irritation of the upper respiratory tract.

Note: There are no known chronic health effects connected with long-term use or contact with these products.

Products that are chopped, crushed or severely mechanically processed during manufacture or use may contain a very small amount of respirable glass fiber-like fragments. NIOSH defines "respirable fibers" as greater than 5 microns in length and less than 3 microns in diameter with an aspect ratio of $\geq 5:1$ (length-to-width ratio).

Chronic Study in Animals

A laboratory test was conducted with a different product (special application glass fiber) with comparable composition and durability. Test animals breathing very high concentrations of respirable fibers on a long-term basis developed fibrosis, lung cancer and mesothelioma.

About 23% of the rats (n=43) exposed to 1022 f/cc for 5 hrs/day, 7 days/week for 52 weeks developed lung tumors (adenoma and carcinoma). Five percent (5%) of the unexposed control group (n=38) developed lung tumors (adenoma and carcinoma).

Five percent (5%) of the rats in the exposed group developed mesothelioma and 12.5% developed advanced fibrosis. None of the rats in the unexposed control group developed mesothelioma and 0.6 % developed advanced fibrosis.



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A second group of rats was exposed to a similar concentration of asbestos (respirable amosite fibers) for 5 hours/day, 7 days a week for 52 weeks. 38% of the rats developed lung tumors (adenoma and carcinoma) and 5 % developed mesothelioma. 14.5 % developed advance fibrosis.

Importantly, this result, that is similar disease rates for the special application fiber and amosite asbestos, had been predicted in a 1996 scientific paper (Inhal. Tox. 8:323-343, 1996 ref). That paper specifically stated that in rats all fibers which were durable enough to remain in a rat lung for two (2) years or more, would produce the same disease rates if the exposures were the same. While the special application fiber is much less durable than asbestos, it is stable enough to remain in the rat lung for more than the two (2) year time period. The results of the current study are therefore not unexpected, and they do not indicate that similar disease rates would be seen in longer lived species or humans, exposed to these fibers.

B: Component Carcinogenicity

Fiber Glass Continuous Filament (65997-17-3)

ACGIH: A4 – Not classified as a human carcinogen.

IARC: Group 3 “not classifiable as to its carcinogenicity to humans”
October 2001 meeting

Section 12: Ecological Information

No data available for this product. This material is not anticipated to harm animals, plants or fish.

Section 13: Disposal Considerations

US EPA Waste Number & Descriptions:

A: General Product Information

Material, if discarded, is not expected to be a characteristic hazardous waste under RCRA.

B: Component Waste Numbers

No EPA Waste Numbers are applicable for this product's components.

Disposal Instructions

Dispose of waste material according to Local, State, Federal, and Provincial Environmental Regulations.



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Section 14: Transport Information

US DOT/TDG (Canada) Information

Shipping Name: Not regulated for transport
Hazard Class: None
UN/NA #: None
Packing Group: None
Required Labels: None

Additional Transportation Regulations:
No additional information available.

Section 15: Regulatory Information

US Federal Regulations:

A: General Product Information

No additional information available.

B: Component Analysis

No additional information available.

The following is provided to aid in the preparation of SARA 311 and 312 reports.

SARA 311/312

Acute Health Hazard: Yes
Chronic Health Hazard: No
Fire Hazard: No
Sudden Release of Pressure Hazard: No
Reactive Hazard: No

C: Clean Air Act

The following components appear on the Clean Air Act – 1990 Hazardous Air Pollutants List:
None

State Regulations:

A: General Product Information

No additional information available.



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B: Component Analysis – California

California Proposition 65: Chemical	CAS Number:	Concentration - Parts Per Billion (PPB) Maximum
1, 4-Dioxane	123-91-1	< 5.0
Acetaldehyde	75-07-0	< 5.0
Ethylene Oxide	75-21-8	< 5.0
Formaldehyde	50-00-0	< 12.1

Other Regulations:

A: General Product Information

No additional information available.

B: Component Analysis - Inventory

Component	CAS #	TSCA	DSL	EINECS
Fiber Glass (Continuous Filament)	65997-17-3	Yes	Yes	266-046-0

C: Component Analysis – WHMIS IDL

The following components are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

None

WHMIS Status: Not controlled

WHMIS Classification: None

D: Other Government Regulations

Continuous filament glass products are not classified as a “Dangerous Substance” or a “Dangerous Preparations” under the EU Directive 88/379/EEC.

- 1. Classification and Labeling (EEC)** – This product is not required to be labeled under Council Directives 88/379EEC, 67/548/EEC, Annex I, and 97/69/EC.
- 2. CERTIFICATION STATEMENT for:**
Directive 2002/95/EC for RoHS and Directive 2002/96/EC for WEEE
Based on our current glass analyses, AGY certifies that our fiberglass yarns are well below the requirements of both of these Directives.



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Section 16: Other Information

HMIS and NFPA Hazard Ratings:	Category	HMIS	NFPA
	Acute Health	1	1
	Flammability	0	0
	Reactivity	0	0

NFPA Unusual Hazards: None.

HMIS Personal Protection: To be supplied by user depending upon use.

Reasonable care has been taken in the preparation of this information, but the manufacturer makes no warranty of the merchantability or any other warranty, expressed or implied, with respect to this information. The manufacturer makes no representations and assumes no liability for any direct, incidental or consequential damages resulting from its use.



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MSDS Change Log

Effective Date	Revisions to Section:	Supercedes
August 09, 1999		**NEW**
August 31, 1999	1 – Added Trade Mark ® names	August 09, 1999
March 14, 2001	Reviewed entire MSDS & added California Proposition Chemicals data in Section 15	August 31, 1999
April 12, 2002	Reviewed entire MSDS & added VeTron™ Trade Mark in Section 1	March 14, 2001
April 14, 2004	Reviewed entire MSDS & Changed name to “AGY”	April 12, 2002
April 12, 2005	Reviewed entire MSDS & added “Other Chemicals” data to Section 15	April 14, 2004
May 22, 2006	Reviewed entire MSDS & amended “Other Chemicals” data in Section 15 to remove use of Tributyl Tin Oxide (TBTO) compounds and to update per modified European Directive on Restriction of Hazardous Substances.	April 12, 2005
June 18, 2007	Added certification statement for RoHS & removed large table from Section 15. Length reduced from 15 pages to 13 pages.	May 22, 2006
October 23, 2007	Clarified certification statements for Directive 2002/95/EC for RoHS and Directive 2002/96/EC for WEEE. Length reduced from 13 pages to 11 pages.	June 18, 2007
June 23, 2008	Added E-Glass Yarns and S-1 Glass ® Fibers to product name(s).	October 23, 2007
August 1, 2008	Revised Section 8 – added ACGIH exposure limits for glass fibers.	June 23, 2008
April 8, 2010	Added S-3 Glass ® fibers and L-Glass ™ fibers to Product Name(s).	August 1, 2008
January 13, 2012	Adjusted registration marks and added S-1 HM Glass ™ fibers.	April 8, 2010