

## Varglas Non-Fray Sleeving

### Flexible Fiberglass Sleeving

(-60°C to +316°C) (-140°F to +600°F)

#### Description

Varglas Non-Fray Sleeving is flexible, high-temperature secondary insulation made from closely braided, continuous filament fiberglass which has been heat-cleaned to remove impurities in the yarn and to retard fraying. There are four types available all of which are noncorrosive and nonflammable and not attacked by fungus.

**Type H:** Heat cleaned only. Since it is not treated with sizing or pigments after heat cleaning, it is available only in the natural (silver) color.

**Type HO:** Heat cleaned and treated with an acrylic resin binder (natural or pigmented).

**Type HP:** Heat cleaned and treated with an acrylic resin binder (natural or pigmented) that is slightly more flexible than Type HO

**Type HM:** Heat cleaned and treated with an oleoresinous varnish binder (natural or pigmented).

Binders are applied to further retard fraying and to hold sleeving round for cutting. Types HO, HP and HM are available in a variety of colors which may be less vivid after exposure to 150°C. All four types are available in various wall thicknesses. All will serve as secondary insulation unaffected indefinitely through a temperature range from -60°C to 316°C and withstand up to 616°C for shorter periods. Since there is no impregnant that will provide dielectric protection at those extremes, these sleeveings require heavy or multiple-wall thicknesses if used as primary insulation.

#### Specifications

Varglas Non-Fray Sleeveings conform to NEMA TF-2 and are made from glass fibers conforming to Military Specification MIL-Y-1140 (latest revision), Class C, Form 1 (continuous filament yarns).

Under the Component Program of Underwriters Laboratories, all Varglas Non-Fray Sleeveings comply with VW-1 flammability requirements under UL File #E53690. They are incorporated in systems work, per UL Safety Standard 1446, to facilitate product acceptance by UL.

#### Applications

Varglas Non-Fray Sleeveings are used for thermal and mechanical protection in consumer, commercial and industrial applications where flexibility, abrasion resistance or additional secondary insulation is required and particularly when temperature extremes prohibit the use of other materials. These would include such applications as heating appliances, electric motors, resistors, lighting fixture transformers and ballasts, etc.

Non-Fray's greater flexibility and expandability find extensive use in wire harness assemblies where its ease of installation over irregular shapes and wire bundles provides definite assembly advantages.

In 1/32" Wall, Non-Fray is used as primary insulation in low-voltage applications such as coffeemakers, hand irons, toasters, hot plates, range units and other appliances.

#### Sizes

AWG #24 through 2" I.D. Other sizes subject to inquiry.

#### Standard Color

Natural - All 4 types. Other colors in Types HO, HP and HM made to order. Not available in white.

#### Standard Packaging

Coils - All 4 types. Spools where specified. Cut pieces are available, subject to cutting charges, in types HO, HP and HM only.

## Varglas Non-Fray Typical Properties

Property	Performance
<b>Physical</b>	
Specific Gravity, g/cu. cm.	2.55 – 2.58
Elongation at Break, percent	4.5 – 4.9
Tensile Strength, psi @ 22°C	500,000 - 550,000
Water Absorbency @ 22°C, 65% R.H.	None
<b>Chemical</b>	
Resistance to Acids and Alkalies	Good resistance to most alkalies. Resistance to acids is fair.
Effect of Bleaches and Solvents	Unaffected
Resistance to Mildew, Aging and Sunlight	Excellent resistance to sunlight and aging. Not attacked by mildew.
<b>Electrical</b>	
Dielectric Strength	Provides only space factor electrical insulation of approximately 1100 volts for standard wall and 1500 volts for 1/32" wall.
Volume Resistivity @ 22°C and 500 volts dc, ohm-cm	$10^{15} - 10^{16}$
Dielectric Constant @ 22°C, 60 Hz	6.5 – 6.8
Dissipation Factor @ 22°C, 1 MHz	0.001 - 0.005
<b>Thermal</b>	
Thermal Endurance	Up to 316°C indefinitely; up to 616°C for shorter periods.
Cold Bend	- 60°C per UL 1441
Flame Resistance	Passes UL 1441 (VW-1). Will not burn.
<b>Notes:</b>	

Average properties of bulk E Glass, as reported in Owens-Corning Publication No. 5-TEX-18027. considered to be applicable to bare glass filaments. Information contained here is precise and reliable. However, being unique, each end-use should be evaluated to satisfy its specific requirements.



### Electrical Insulating Sleeving

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