Celanese
The chemistry inside innovation™

FRIANYL® B3 GF25 V0 - PA6

Description

Polyamide 6 compound, 25% glass fiber reinforced, heat resistant, based on flame retardants halogen and red phosphorous free. UL listed V0@0.75mm all color, with the additional ratings 5VA@3.0mm and V0@0.4mm for BK color only.
Designed for Electrical applications requiring self-extinguishing properties combined with good mechanical performances, this grade meets the most stringent safety requirements for insulating materials.

Physical properties	Value	Unit	Test Standard
Density	**83.7**	lb/ft³	ISO 1183
Melt volume rate, MVR	**8**	cm³/10min	ISO 1133
MVR temperature	**446**	°F	ISO 1133
MVR load	**11**	lb	ISO 1133
Molding shrinkage, parallel (flow)	**0.3 - 0.6**	%	ISO 294-4, 2577
Molding shrinkage, transverse normal	**0.6 - 0.9**	%	ISO 294-4, 2577
Water absorption, 23°C-sat	**5.2**	%	Sim. to ISO 62
Humidity absorption, 23°C/50%RH	**1.5**	%	ISO 62
Viscosity number (PA), H2SO4	**140**	ml/g	ISO 307 (PA)

Mechanical properties	Value	Unit	Test Standard
Tensile modulus	**1.28E6/826717**	psi	ISO 527-1, -2
Tensile stress at break, 5mm/min	**17400/12300**	psi	ISO 527-1, -2
Tensile strain at break, 5mm/min	**3/7.5**	%	ISO 527-1, -2
Flexural modulus, 23°C	**1.23E6/-**	psi	ISO 178
Flexural strength, 23°C	**29000/-**	psi	ISO 178
Charpy impact strength, 23°C	**>60/>60**	ft-lb/in²	ISO 179/1eU
Charpy notched impact strength, 23°C	**4.76/6.66**	ft-lb/in²	ISO 179/1eA
Charpy notched impact strength, -30°C	**3.33/4.28**	ft-lb/in²	ISO 179/1eA
Ball indentation hardness, 30s	**30500**	psi	ISO 2039-1

Thermal properties	Value	Unit	Test Standard
Melting temperature, 20°C/min	**437**	°F	ISO 11357-1/-3
DTUL at 1.8 MPa	**374**	°F	ISO 75-1, -2
DTUL at 0.45 MPa	**410**	°F	ISO 75-1, -2
FMVSS	**SE**	-	ISO 3795 (FMVSS 302)
Flammability @3.2mm nom. thickn.	**V-0**	class	UL 94
Flammability @1.6mm nom. thickn.	**V-0**	class	UL 94
Flammability @0.8mm nom. thickn.	**V-0**	class	UL 94
Glow wire ignition temperature, 0.8 mm	**1430**	°F	IEC 60695-2-13
Glow wire ignition temperature, 2.0 mm	**1470**	°F	IEC 60695-2-13
Glow wire ignition temperature, 3.2 mm	**1470**	°F	IEC 60695-2-13
Glow wire ignition temperature, 1.5 mm	**1470**	°F	IEC 60695-2-13
Glow wire flammability index, 0.8 mm	**1760**	°F	IEC 60695-2-12
Glow wire flammability index, 2.0 mm	**1760**	°F	IEC 60695-2-12
Glow wire flammability index, 3.2 mm	**1760**	°F	IEC 60695-2-12
Ball pressure test	**347**	°F	IEC 60695-10-2
RTI - electrical @ 0.8mm nom. Thickn.	**120**	°C	UL 746B
RTI - electrical @ 1.6mm nom. Thickn.	**120**	°C	UL 746B
RTI - electrical @ 3.2mm nom. Thickn.	**120**	°C	UL 746B
RTI - impact @ 0.8mm nom. Thickn.	**100**	°C	UL 746B
RTI - impact @ 1.6mm nom. Thickn.	**100**	°C	UL 746B
RTI - impact @ 3.2mm nom. Thickn.	**105**	°C	UL 746B
RTI - str @ 0.8mm nom. Thickn.	**125**	°C	UL 746B
RTI - str @ 1.6mm nom. Thickn.	**125**	°C	UL 746B
RTI - str @ 3.2mm nom. Thickn.	**130**	°C	UL 746B

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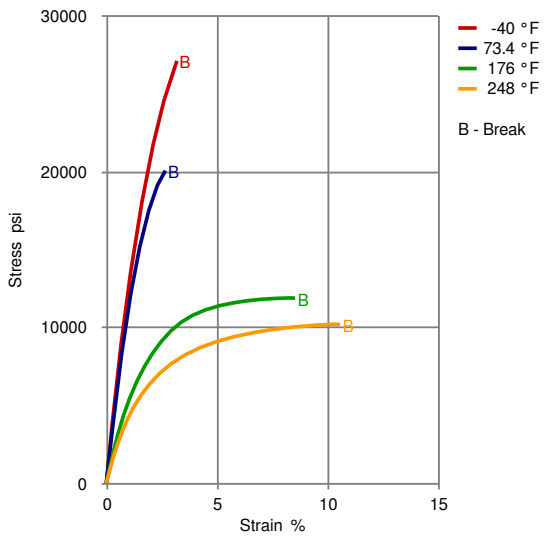
Electrical properties	Value	Unit	Test Standard
Volume resistivity, 23 °C	**>1E12/-**	Ohm*m	IEC 62631-3-1
Surface resistivity, 23 °C	**>1E13/-**	Ohm	IEC 62631-3-2
Electric strength, 23 °C (AC)	**1240/-**	kV/in	IEC 60243-1
Comparative tracking index	**PLC 0/-**	-	UL 746
Comparative tracking index	**Group I**	-	IEC 60112
CTI 50 drops	**600**	V	IEC 60112
CTI 100 drops	**600**	V	IEC 60112
Hot wire ignition @ 0.4mm nom. thickn.	**PLC 0**	class	UL 746A
Hot wire ignition @ 0.8mm nom. thickn.	**PLC 0**	class	UL 746A
Hot wire ignition @ 1.6mm nom. thickn.	**PLC 0**	class	UL 746A
Hot wire ignition @ 3.2mm nom. thickn.	**PLC 0**	class	UL 746A
High ampere arc ignition @ 0.4mm nom. thickn.	**PLC 0**	class	UL 746A
High ampere arc ignition @ 0.8mm nom. thickn.	**PLC 0**	class	UL 746A
High ampere arc ignition @ 1.6mm nom. thickn.	**PLC 0**	class	UL 746A
High ampere arc ignition @ 3.2mm nom. thickn.	**PLC 0**	class	UL 746A

VDA Properties	Value	Unit	
FMVSS	**SE**		ISO 3795 (FMVSS 302)

Diagrams

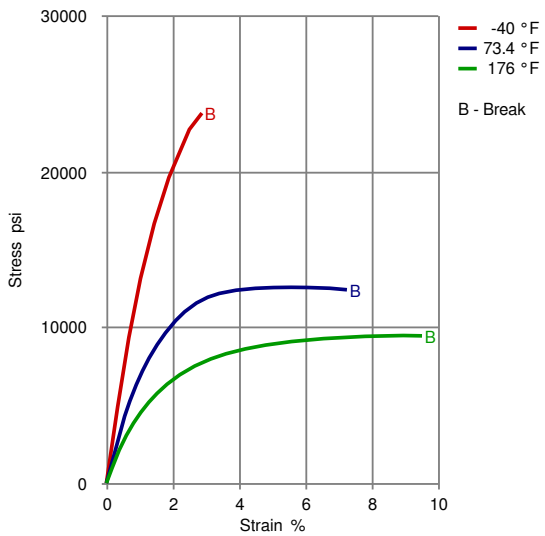
Stress-strain (dry)



Dry samples are dry as molded

Conditioned samples are conditioned according to ISO 1110

Stress-strain (cond.)



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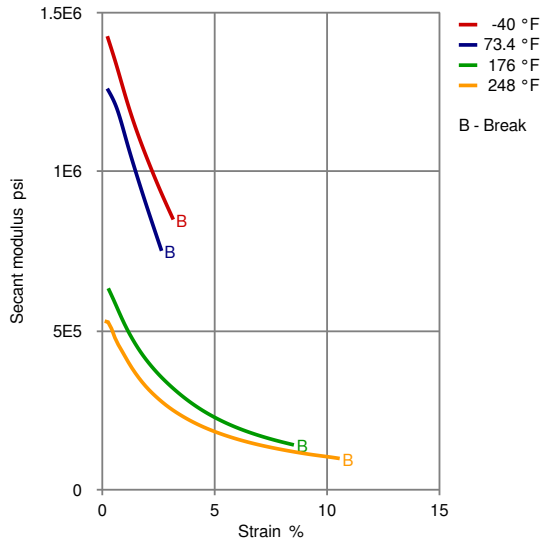
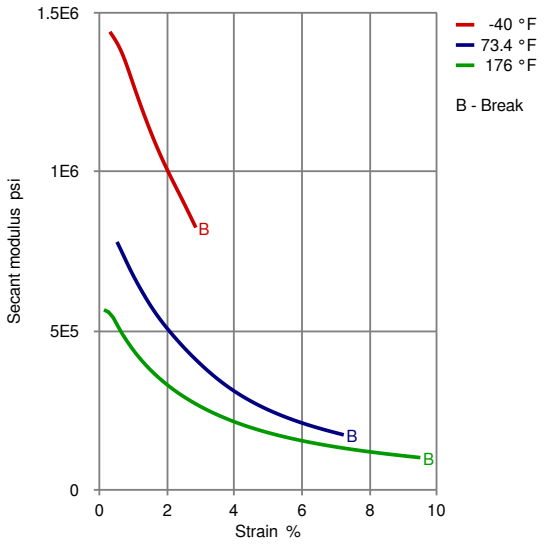
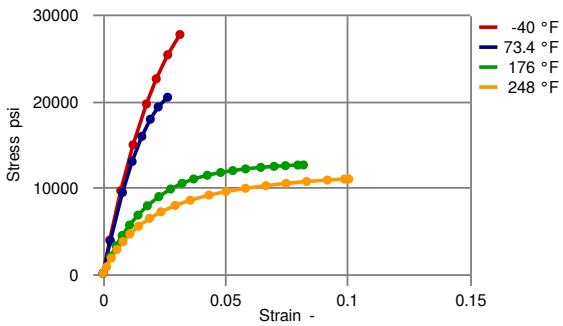
Secant modulus-strain (dry)



Secant modulus-strain (cond.)



True Stress-strain (dry)

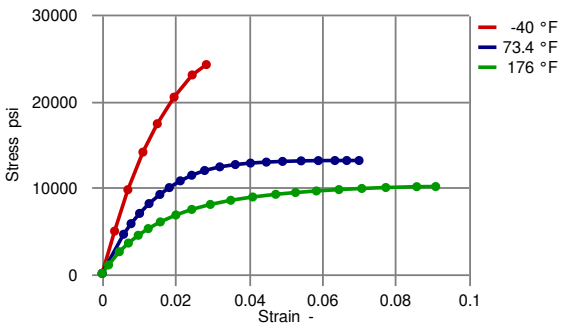


Dry samples are dry as molded
· no yield at -40 and 23 °C
· 80 °C yield at 0.07978 strain, 86.487 stress
· 120 °C yield at 0.09891 strain, 75.249 stress

Conditioned samples are conditioned according to ISO 1110
· no yield at -40 °C
· 23 °C yield at 0.05434 strain, 89.912 stress
· 80 °C yield at 0.08591 strain, 69.287 stress

Poisson's Ratio used is 0.35

True Stress-strain (cond.)



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Typical injection molding processing conditions

Temperature	Value	Unit
Melt temperature	**≤509**	°F

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Other text information

Injection Molding Preprocessing

PA materials, stocked in a moisture-proof packaging, can be processed without drying; however, it is always recommended drying the product that comes from a large package (e.g. Octabin). The moisture content suggested for the injection molding process should be lower than 0.15%, according to the grade and to the molded part characteristics. The materials containing flame retardants should have moisture content below 0.10%. Red phosphorous containing grades must always be dried below 0.08%. The drying time depends on the moisture content and the drying conditions. Typically, 4-8 hours at 80-90°C using dehumidified air (dew point of -20°C) are suitable conditions for a starting moisture content of 0.20%-0.40%.

Injection molding

The following conditions apply to a standard injection molding process. Machine temperatures: barrel 265-290°C (PA66), 235-270°C (PA6), nozzle and hot runners up to 300°C (up to 290°C products with flame retardants). Mold temperatures: 60-80°C, (80-100°C highly reinforced grades). Back pressure: typically, 5-10 bar (hydraulic pressure). Temperatures exceeding 300°C and long residence time could lead to additives degradation and brittleness of the material. In case of gas generation in the melt, please verify moisture content and processing temperatures. Usage of regrind is possible depending on the molded part characteristics. For further details, please refer to the document 'Instructions for injection molding' or contact our technical support team.

Injection Molding Postprocessing

PA materials reach their final performance with a water content of about 1.5 to 3.5% by weight, depending on the type. This percentage corresponds to the point of equilibrium between the rates of absorption and desorption of moisture. After molding, in favorable environmental conditions, a part can quickly absorbs moisture up to 0.5-1.0%, while the equilibrium will be reached during its life. A conditioning treatment can accelerate further the initial water absorption of the molded parts. Conditioning is usually carried out in hot and humid environment (for example 50°C, 100% RH), inside climatic chambers. Slight dimensional variations (increase in volume due to the water absorbed) must be considered, especially in unfilled grades. Post-treatments of parts may also include the annealing (60-80°C in oven, up to four hours). This procedure can be useful to relax any internal stresses.

Characteristics

Special Characteristics	Flame retardant, Heat resistant
Product Categories	Glass reinforced
Processing	Injection molding
Delivery Form	Granules
Additives	Flame retarding agent

Other Approvals

OEM	Specification	Additional Information
VW Group*	VW50134	* best fitting grade to PA6-6-A, not officially approved

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General Disclaimer

NOTICE TO USERS: Values shown are based on testing of laboratory test specimens and represent data that fall within the standard range of properties for natural material. These values alone do not represent a sufficient basis for any part design and are not intended for use in establishing maximum, minimum, or ranges of values for specification purposes. Colorants or other additives may cause significant variations in data values. Properties of molded parts can be influenced by a wide variety of factors including, but not limited to, material selection, additives, part design, processing conditions and environmental exposure. Any determination of the suitability of a particular material and part design for any use contemplated by the users and the manner of such use is the sole responsibility of the users, who must assure themselves that the material as subsequently processed meets the needs of their particular product or use.To the best of our knowledge, the information contained in this publication is accurate; however, we do not assume any liability whatsoever for the accuracy and completeness of such information. The information contained in this publication should not be construed as a promise or guarantee of specific properties of our products. It is the sole responsibility of the users to investigate whether any existing patents are infringed by the use of the materials mentioned in this publication.Moreover, there is a need to reduce human exposure to many materials to the lowest practical limits in view of possible adverse effects. To the extent that any hazards may have been mentioned in this publication, we neither suggest nor guarantee that such hazards are the only ones that exist. We recommend that persons intending to rely on any recommendation or to use any equipment, processing technique or material mentioned in this publication should satisfy themselves that they can meet all applicable safety and health standards.We strongly recommend that users seek and adhere to the manufacturer’s current instructions for handling each material they use, and entrust the handling of such material to adequately trained personnel only. Please call the telephone numbers listed for additional technical information. Call Customer Services for the appropriate Materials Safety Data Sheets (MSDS) before attempting to process our products. The products mentioned herein are not intended for use in medical or dental implants.

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