

FRIANYL® A3 V2XI - PA66
Description

Polyamide 66 compound, heat stabilized, unfilled, flame retardant with halogens PBB and PBDE free. UL listed V2@0.4mm.
 Designed for Electrical applications requiring self-extinguishing properties combined with ignition resistance, this grade meets the most stringent safety requirements for insulating materials for the household appliance industry.

| Physical properties | Value | Unit | Test Standard |
|--------------------------------------|-----------|-------------------|-----------------|
| Density | 1330 | kg/m ³ | ISO 1183 |
| Molding shrinkage, parallel (flow) | 0.8 - 1.2 | % | ISO 294-4, 2577 |
| Molding shrinkage, transverse normal | 0.8 - 1.2 | % | ISO 294-4, 2577 |
| Water absorption, 23°C-sat | 6 | % | Sim. to ISO 62 |
| Humidity absorption, 23°C/50%RH | 1 | % | ISO 62 |

| Mechanical properties | Value | Unit | Test Standard |
|----------------------------------|--------|-------------------|---------------|
| Tensile modulus | 3550/- | MPa | ISO 527-1, -2 |
| Tensile stress at break, 5mm/min | 60/- | MPa | ISO 527-1, -2 |
| Tensile strain at break, 5mm/min | 4.3/- | % | ISO 527-1, -2 |
| Flexural modulus, 23°C | 2700/- | MPa | ISO 178 |
| Flexural stress at max. force | 110/- | MPa | ISO 178 |
| Charpy impact strength, 23°C | 65/- | kJ/m ² | ISO 179/1eU |
| Izod impact notched, 23°C | 4.4/- | kJ/m ² | ISO 180/1A |
| Izod impact unnotched, 23°C | 44/- | kJ/m ² | ISO 180/1U |

| Thermal properties | Value | Unit | Test Standard |
|--|-------|-------|-------------------------|
| DTUL at 1.8 MPa | 100 | °C | ISO 75-1, -2 |
| DTUL at 0.45 MPa | 235 | °C | ISO 75-1, -2 |
| FMVSS | SE | - | ISO 3795 (FMVSS 302) |
| Flammability @3.2mm nom. thickn. | V-2 | class | UL 94 |
| Flammability @1.6mm nom. thickn. | V-2 | class | UL 94 |
| Flammability @0.8mm nom. thickn. | V-2 | class | UL 94 |
| Flammability @0.4mm nom. thickn. | V-2 | class | UL 94 |
| Continuous service temperature | 110 | °C | DIN/IEC 60216-1 |
| Glow wire ignition temperature, 0.8 mm | 875 | °C | IEC 60695-2-13 |
| Glow wire ignition temperature, 1.0 mm | 900 | °C | IEC 60695-2-13 |
| Glow wire ignition temperature, 3.2 mm | 900 | °C | IEC 60695-2-13 |
| Glow wire flammability index, 0.8 mm | 850 | °C | IEC 60695-2-12 |
| Glow wire flammability index, 1.0 mm | 960 | °C | IEC 60695-2-12 |
| Glow wire flammability index, 3.2 mm | 960 | °C | IEC 60695-2-12 |
| Ball pressure test | 230 | °C | IEC 60695-10-2 |
| RTI - electrical @ 0.8mm nom. Thickn. | 140 | °C | UL 746B |
| RTI - electrical @ 1.6mm nom. Thickn. | 140 | °C | UL 746B |
| RTI - electrical @ 3.2mm nom. Thickn. | 140 | °C | UL 746B |
| RTI - impact @ 0.8mm nom. Thickn. | 90 | °C | UL 746B |
| RTI - impact @ 1.6mm nom. Thickn. | 90 | °C | UL 746B |
| RTI - impact @ 3.2mm nom. Thickn. | 90 | °C | UL 746B |
| RTI - str @ 0.8mm nom. Thickn. | 115 | °C | UL 746B |
| RTI - str @ 1.6mm nom. Thickn. | 115 | °C | UL 746B |
| RTI - str @ 3.2mm nom. Thickn. | 115 | °C | UL 746B |

| Electrical properties | Value | Unit | Test Standard |
|--|------------|-------|---------------|
| Comparative tracking index | PLC 1/- | - | UL 746 |
| Comparative tracking index | Group IIIa | - | IEC 60112 |
| CTI 50 drops | 375 | V | IEC 60112 |
| 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 |

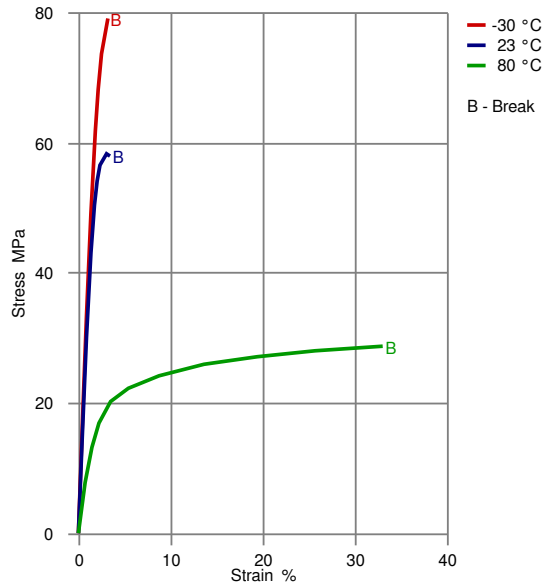
FRIANYL® A3 V2XI - PA66

High ampere arc ignition @ 0.8mm nom. Thickn.
High ampere arc ignition @ 1.6mm nom. Thickn.
High ampere arc ignition @ 3.2mm nom. Thickn.

| | | |
|-------|-------|---------|
| PLC 0 | class | UL 746A |
| PLC 0 | class | UL 746A |
| PLC 0 | class | UL 746A |

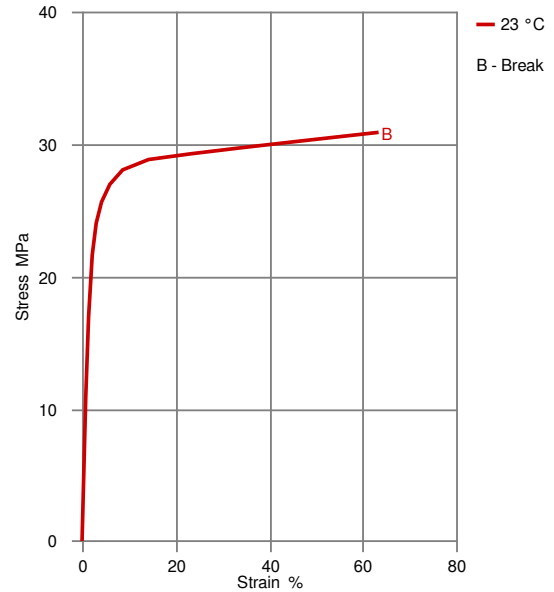
Diagrams

Stress-strain (dry)



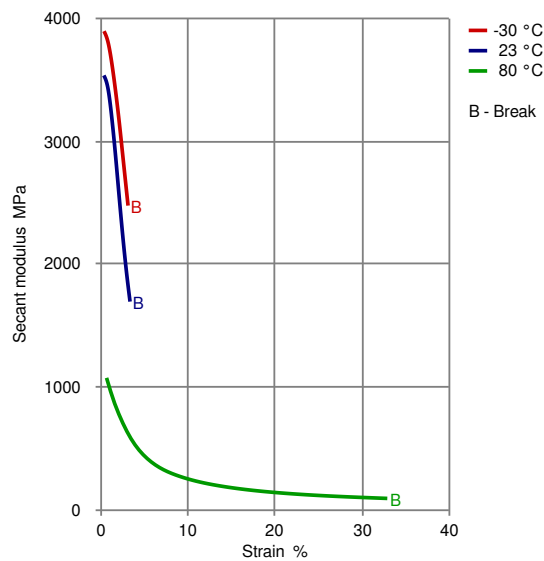
Dry samples are dry as molded
Conditioned sample is conditioned according to ISO 1110

Stress-strain (cond.)

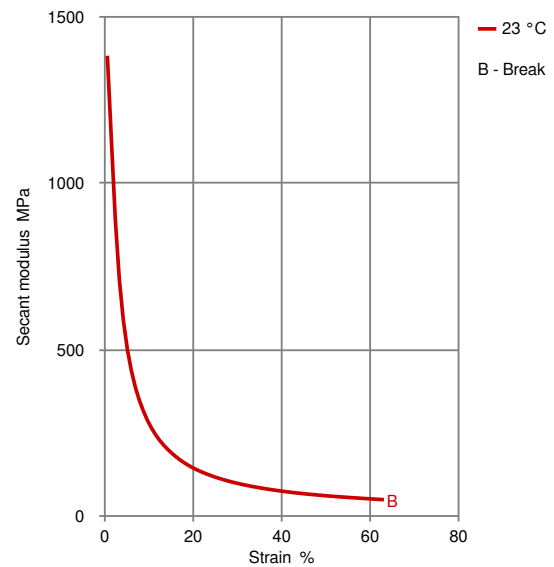


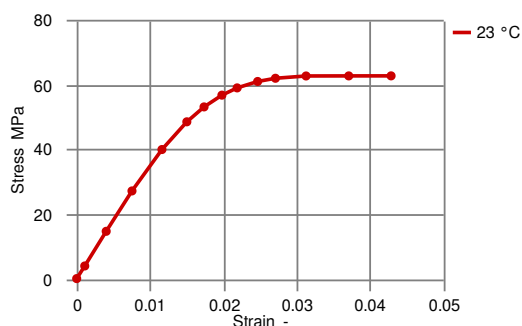
Dry samples are dry as molded
Conditioned sample is conditioned according to ISO 1110

Secant modulus-strain (dry)



Secant modulus-strain (cond.)



True Stress-strain (dry)

dry sample is dry as molded
23 °C yield at 0.03132 strain, 62.627 stress
Poisson ratio used: 0.38

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 absorb 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.

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Characteristics

| | |
|--------------------------------|---------------------------------|
| Special Characteristics | Flame retardant, Heat resistant |
| Product Categories | Unfilled |
| Processing | Injection molding |
| Delivery Form | Granules |
| Additives | Flame retarding agent |

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General Disclaimer

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