# ForTii™ F11

PPA-GF30 FR(40) Envalior

## Product Texts

30% Glass Reinforced, PA4T, Electro-friendly, Halogen free and free of red phosphorous, Certified V-0 at 0.2mm

ISO 1043 PPA-GF30 FR(40)

ForTii F11 has an excellent balance in flow, toughness and stiffness, enabling thin walls or complicated geometries for E&E applications. F11 is all-color VDE approved, has a high RTI electrical rating of 140°C at 0.75 mm and a CTI ≥800V rating to secure thermal ageing and electrical performance.

| Rheological properties | dry / cond | Unit | Test Standard |
|---|---|---|---|
| **ISO Data** | | | |
| Molding shrinkage, parallel | 0.3 / * | % | ISO 294-4, 2577 |
| Molding shrinkage, normal | 1.2 / * | % | ISO 294-4, 2577 |

| Mechanical properties | dry / cond | Unit | Test Standard |
|---|---|---|---|
| **ISO Data** | | | |
| Tensile Modulus | 11500 / 12000 | MPa | ISO 527 |
| Stress at break | 150 / 140 | MPa | ISO 527 |
| Strain at break | 2 / 1.9 | % | ISO 527 |
| Charpy impact strength, +23°C | 50 / 50 | kJ/m² | ISO 179/1eU |
| Charpy notched impact strength, +23°C | 7.5 / 7.5 | kJ/m² | ISO 179/1eA |

| Thermal properties | dry / cond | Unit | Test Standard |
|---|---|---|---|
| **ISO Data** | | | |
| Melting temperature, 10°C/min | 325 / * | °C | ISO 11357-1/-3 |
| Glass transition temperature, 10°C/min | 125 / * | °C | ISO 11357-1/-2 |
| Temp. of deflection under load, 1.80 MPa | 305 / * | °C | ISO 75-1/-2 |
| Temp. of deflection under load, 0.45 MPa | 323 / * | °C | ISO 75-1/-2 |
| Coeff. of linear therm. expansion, parallel | 20 / * | E-6/K | ISO 11359-1/-2 |
| Coeff. of linear therm. expansion, normal | 65 / * | E-6/K | ISO 11359-1/-2 |
| Burning behav. at 1.5 mm nom. thickn. | V-0 / * | class | IEC 60695-11-10 |
| Thickness tested | 1.5 / * | mm | - |
| Yellow Card available | yes / * | - | - |
| Burning behav. at thickness h | V-0 / * | class | IEC 60695-11-10 |
| Thickness tested | 3.0 / * | mm | - |
| Yellow Card available | yes / * | - | - |
| Oxygen index | 39 / * | % | ISO 4589-1/-2 |

| Electrical properties | dry / cond | Unit | Test Standard |
|---|---|---|---|
| **ISO Data** | | | |
| Relative permittivity, 100Hz | 4.2 / 4.2 | - | IEC 62631-2-1 |
| Relative permittivity, 1MHz | 3.9 / 3.9 | - | IEC 62631-2-1 |
| Dissipation factor, 100Hz | 64 / 64 | E-4 | IEC 62631-2-1 |
| Dissipation factor, 1MHz | 176 / 176 | E-4 | IEC 62631-2-1 |
| Volume resistivity | >1E13 / >1E13 | Ohm*m | IEC 62631-3-1 |
| Surface resistivity | * / >1E15 | Ohm | IEC 62631-3-2 |
| Electric strength | 33 / 33 | kV/mm | IEC 60243-1 |
| Comparative tracking index | 600 / 600 | - | IEC 60112 |

| Other properties | dry / cond | Unit | Test Standard |
|---|---|---|---|
| **ISO Data** | | | |
| Water absorption | 4.1 / * | % | Sim. to ISO 62 |



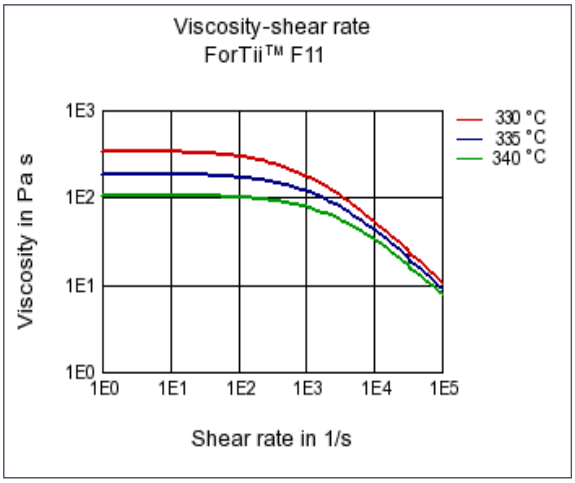
Our product information and suggestions are based on analyses, empirical values, and data from the product manufacturer in question and are therefore provided with our best knowledge and accountability. We do not, however, assume any liability or warranty, be it for defects in title, quality and suitability of the products for a specific purpose, or non-infringement of industrial property rights. We do not warrant the use or processing of the products and information, or consequences of any kind arising from product descriptions, suggestions, and recommendations. The responsibility for appropriate usage, as well as final suitability testing of the raw material is exclusively the responsibility of the customer as part of sampling/final qualification of a manufactured molded part. The specified data are only indicative and are not to be interpreted as legally binding specifications.

| | | | |
|---|---|---|---|
| Humidity absorption | 1.6 / * | % | Sim. to ISO 62 |
| Density | 1460 / - | kg/m³ | ISO 1183 |

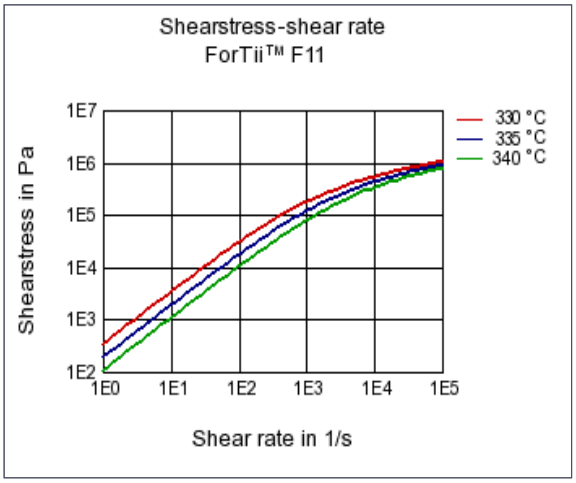
| Material specific properties | dry / cond | Unit | Test Standard |
|---|---|---|---|
| **ISO Data** | | | |
| Viscosity number | 86 / * | cm³/g | ISO 307, 1157, 1628 |

## Diagrams

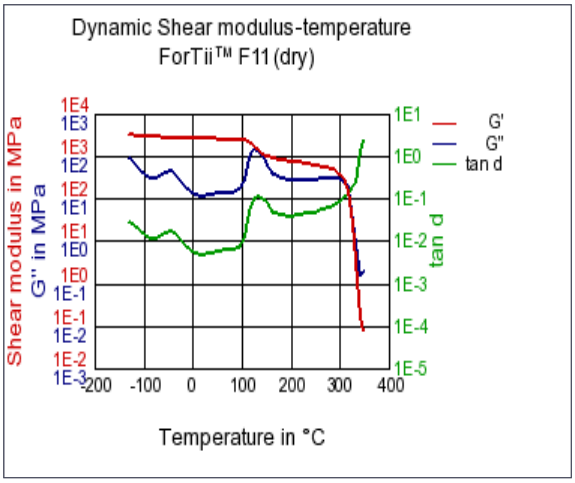
### Viscosity-shear rate



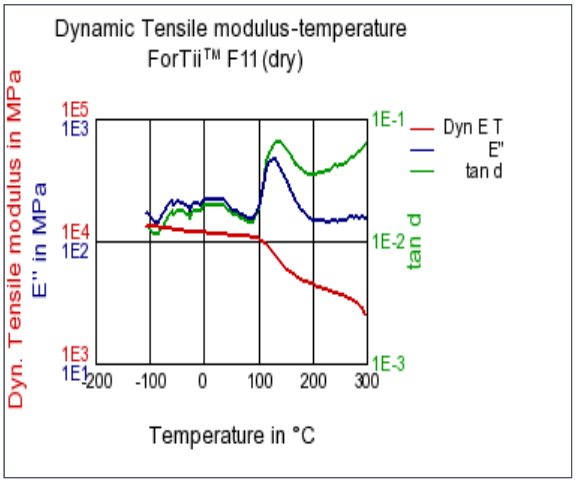

### Shearstress-shear rate




### Dynamic Shear modulus-temperature



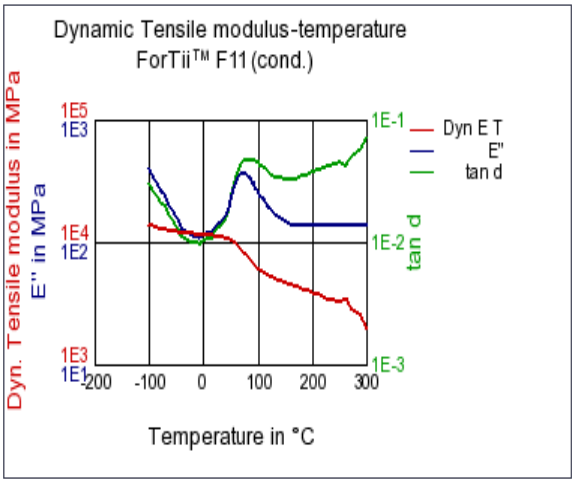

### Dynamic Tensile modulus-temperature



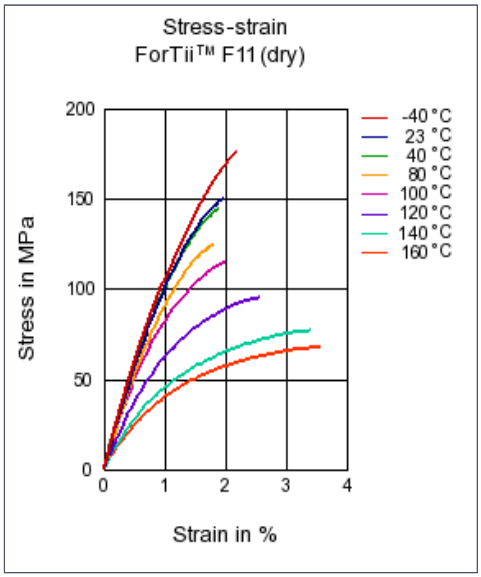


Our product information and suggestions are based on analyses, empirical values, and data from the product manufacturer in question and are therefore provided with our best knowledge and accountability. We do not, however, assume any liability or warranty, be it for defects in title, quality and suitability of the products for a specific purpose, or non-infringement of industrial property rights. We do not warrant the use or processing of the products and information, or consequences of any kind arising from product descriptions, suggestions, and recommendations. The responsibility for appropriate usage, as well as final suitability testing of the raw material is exclusively the responsibility of the customer as part of sampling/final qualification of a manufactured molded part. The specified data are only indicative and are not to be interpreted as legally binding specifications.

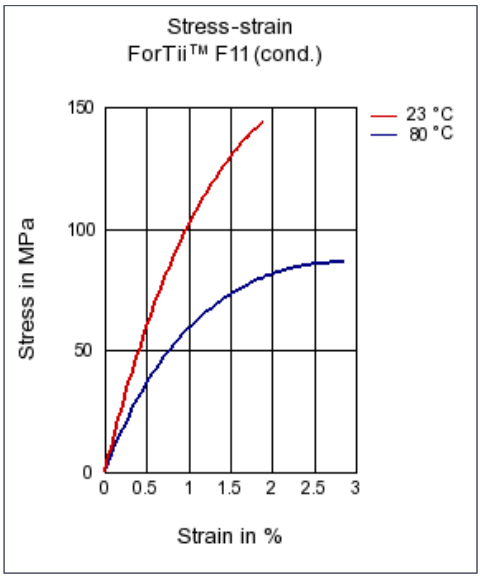
## Dynamic Tensile modulus-temperature



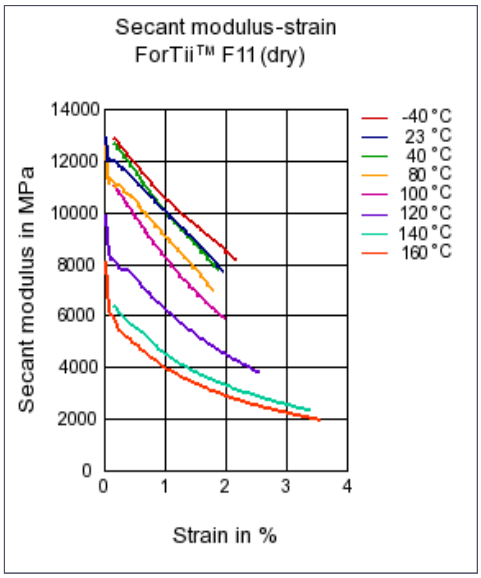

## Stress-strain




## Stress-strain



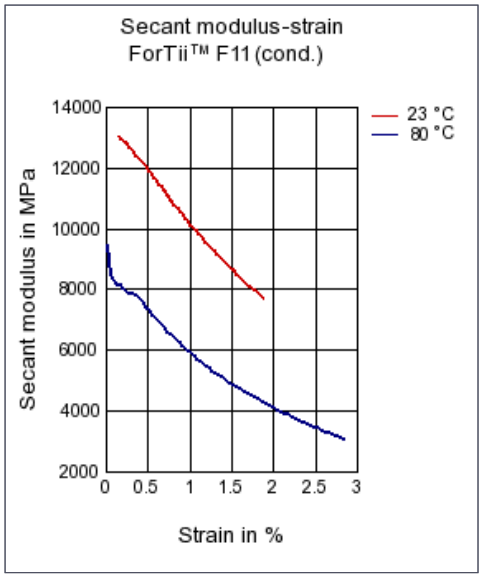

## Secant modulus-strain



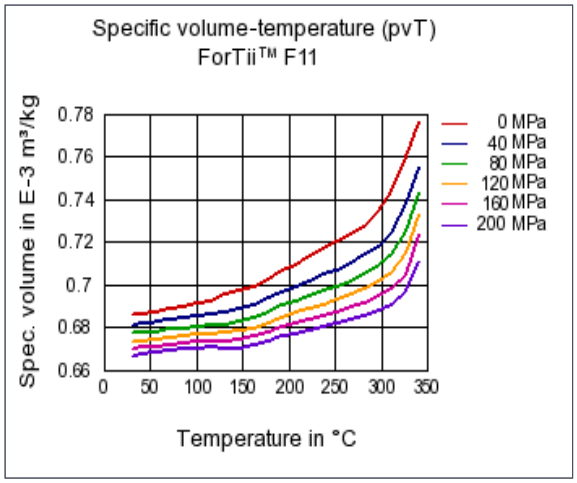


Our product information and suggestions are based on analyses, empirical values, and data from the product manufacturer in question and are therefore provided with our best knowledge and accountability. We do not, however, assume any liability or warranty, be it for defects in title, quality and suitability of the products for a specific purpose, or non-infringement of industrial property rights. We do not warrant the use or processing of the products and information, or consequences of any kind arising from product descriptions, suggestions, and recommendations. The responsibility for appropriate usage, as well as final suitability testing of the raw material is exclusively the responsibility of the customer as part of sampling/final qualification of a manufactured molded part. The specified data are only indicative and are not to be interpreted as legally binding specifications.

## Secant modulus-strain




## Specific volume-temperature (pvT)




## Characteristics

**Processing**
Injection Molding

**Special Characteristics**
Flame retardant

**Delivery form**
Granules

## Other text information

**Injection Molding**
Injection Molding Recommendations
Hot runner recommendations for molding high heat performance Engineering Materials
Steel recommendations for molds screws and barrels
Trouble shooting guideline for injection molding

## Chemical Media Resistance

**Alcohols**
- Methanol (23°C)
- Ethanol (23°C)

**Hydrocarbons**
- Toluene (23°C)

**Ketones**
- Acetone (23°C)

**Ethers**
- Diethyl ether (23°C)

**Other**
- Ethyl Acetate (23°C)
- Water (23°C)


Our product information and suggestions are based on analyses, empirical values, and data from the product manufacturer in question and are therefore provided with our best knowledge and accountability. We do not, however, assume any liability or warranty, be it for defects in title, quality and suitability of the products for a specific purpose, or non-infringement of industrial property rights. We do not warrant the use or processing of the products and information, or consequences of any kind arising from product descriptions, suggestions, and recommendations. The responsibility for appropriate usage, as well as final suitability testing of the raw material is exclusively the responsibility of the customer as part of sampling/final qualification of a manufactured molded part. The specified data are only indicative and are not to be interpreted as legally binding specifications.