# VICTREX FG™ 300 Series

## Product Description

High performance Food Grade thermoplastic material, unreinforced and reinforced **P**oly**E**ther**E**ther**K**etone (PEEK), semi crystalline, granules for injection moulding and extrusion, colour natural/beige and black.

## Regulatory

Food Contact compliance for EU 10/2011 (FG300 & FG325), FDA 21CFR 177.2415 (FG300, FG320, FG325 & FG340), China (FG300 & FG325) and South America (FG300 & FG325).
Drinking water compliance to WRAS (UK).

## Typical Application Areas

The VICTREX FG™ 300 family of materials is intended for applications needing WEAR resistance: wear and abrasion resistance for bearing and wear service and low coefficient of thermal expansion for metal replacement. Chemically resistant to aggressive environments, suitable for sterilisation for food contact applications.

| MATERIAL PROPERTIES | | | | | | | |
|---|---|---|---|---|---|---|---|
| | CONDITIONS | TEST METHOD | UNITS | FG300 | FG320 | FG325 | FG340 |
| **Tribological Data** | | | | | | | |
| Wear Rate | Pad-on-Ring, 2MPa, 7.5m/s | ASTM G176 | $mm^3/Nm \times 10^{-6}$ | | 1.8 | | 0.4 |
| Coefficient of Friction | | | | | 0.36 | | 0.10 |
| Shore D hardness | 23°C | ISO 868 | | 84 | 83 | 81 | 85 |
| **Mechanical Data** | | | | | | | |
| Tensile Strength | @yield, 23°C | ISO 527 | MPa | 95 | | 78 | |
| | @break, 23°C | | | | 150 | | 195 |
| Tensile Elongation | @break, 23°C | ISO 527 | % | 60 | 2.3 | 25 | 1.9 |
| Flexural Strength | @yield, 23°C | ISO 178 | MPa | 155 | | 125 | |
| | @break, 23°C | | | | 230 | | 290 |
| | 125°C | | | 85 | 160 | 70 | 220 |
| | 175°C | | | 16 | 80 | 18 | 140 |
| Flexural Modulus | 23°C | ISO 178 | GPa | 3.6 | 11.5 | 3.2 | 17 |
| Compressive Strength | 23°C | ISO 604 | MPa | 120 | 170 | 105 | 250 |
| | 120°C | | | 65 | 110 | 65 | 175 |
| **Thermal Data** | | | | | | | |
| Melting Point | | ISO 11357 | °C | 343 | 343 | 343 | 343 |
| Glass Transition (Tg) | Onset | ISO 11357 | °C | 143 | 143 | 143 | 143 |
| | Midpoint | | | 150 | 150 | 150 | 147 |
| Coefficient of Thermal Expansion | Along flow below Tg | ISO 11359 | $ppm\ K^{-1}$ | 45 | 15 | 40 | 9 |
| | Average below Tg | | | 65 | 45 | 60 | 35 |
| | Along flow above Tg | | | 125 | 20 | 120 | 10 |
| | Average above Tg | | | 160 | 115 | 140 | 85 |
| Heat Deflection Temperature | 1.8 MPa | ISO 75A-f | °C | 152 | 315 | 150 | 343 |
| Thermal Conductivity | Average, 23°C | ISO 22007-4 | $W\ m^{-1}\ K^{-1}$ | 0.29 | 0.85 | | 1.3 |
| **Miscellaneous** | | | | | | | |
| Density | Crystalline | ISO 1183 | $g\ cm^{-3}$ | 1.30 | 1.45 | 1.40 | 1.44 |
| Water Absorption by immersion | Saturation, 23°C | ISO 62-1 | % | 0.45 | 0.35 | 0.45 | 0.3 |
| | Saturation, 100°C | | | 0.55 | 0.45 | 0.55 | 0.6 |
| **Electrical Properties** | | | | | | | |
| Volume Resistivity | 23°C | IEC 60093 | Ω cm | $10^{16}$ | $10^{10}$* | $10^{16}$ | $10^{6}$* |
| Dielectric Strength | 2mm thickness | IEC 60243-1 | $kV\ mm^{-1}$ | 23 | - | 26 | - |

*This property provided for informational purposes only – resistivity is not controlled

| Typical Processing | | | | |
|---|---|---|---|---|
| **Conditions** | **FG300** | **FG320** | **FG325** | **FG340** |
| Drying Temperature / Time | 150°C / 3h or 120°C / 5h (residual moisture <0.02%) | | | |
| Temperature settings | 375 / 380 / 385 / 390 / 395°C (Nozzle) | 365 / 370 / 375 / 380 / 385°C (Nozzle) | 355 / 360 365 / 370 / 375°C (Nozzle) | 370 / 375 / 380 / 385 / 390°C (Nozzle) |
| Hopper Temperature | Not greater than 100°C | | | |
| Mould Temperature | 170°C - 200°C (max 250°C) | 170°C - 200°C (max 250°C) | 170°C - 200°C (max 250°C) | 180°C - 210°C (max 250°C) |
| Runner | Die / nozzle >3mm, manifold >3.5mm | | | |
| Gate | >1mm or 0.5 x part thickness | >2mm or 0.5 x part thickness | >2mm or 0.5 x part thickness | >2mm or 0.5 x part thickness |

| Mould Shrinkage + Spiral Flow | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Conditions** | | **Method** | **Units** | **FG300** | **FG320** | **FG325** | **FG340** |
| Nozzle Temperature | | | °C | 395 | 385 | 375 | 390 |
| Tool temperature | | | °C | 180 | 200 | 180 | 200 |
| Spiral Flow | 1mm thick section | Victrex | mm | 125 | 80 | 130 | 135 |
| | 3mm thick section | Victrex | mm | 630 | 380 | | |
| Mould Shrinkage | Along flow | ISO 294-4 | % | 0.9 | 0.3 | 1.2 | 0.0 |
| | Across flow | | | 1.3 | 0.7 | 1.7 | 0.5 |

**Important notes:**

1. Processing conditions quoted in our datasheets are typical of those used in our processing laboratories
   - *Data for mould shrinkage should be used for material comparison. Actual mould shrinkage values are highly dependent on part geometry, mould configuration, and processing conditions.*
   - *Mould shrinkage differs for along flow and across flow directions. "Along flow" direction is taken as the direction the molten material is travelling when it exits the gate and enters the mould.*
   - *Mould shrinkage is expressed as a percent change in dimension of a specimen in relation to mould dimensions.*
2. Data are generated in accordance with prevailing national, international and internal standards, and should be used for material comparison. Actual property values are highly dependent on part geometry, mould configuration and processing conditions. Properties may also differ for along flow and across flow directions.