

# VICTREX™ PEEK POLYMER 650G

## General Information

### Product Description

High performance thermoplastic material, unreinforced PolyEtherEtherKetone (PEEK), semi crystalline, granules for injection moulding and extrusion, low flow, colour natural/beige.

Applications for higher strength and stiffness as well as enhanced ductility. Chemically resistant to aggressive environments, suitable for sterilisation for medical and food contact applications.

## Material Properties

| Physical                                | Nominal Value | Unit              | Test Method     |
|-----------------------------------------|---------------|-------------------|-----------------|
| Density (Crystalline)                   | 1.30          | g/cm <sup>3</sup> | ISO 1183        |
| Spiral Flow                             |               |                   | Internal Method |
| -- 1                                    | 12.5          | cm                |                 |
| -- 2                                    | 63.0          | cm                |                 |
| -- 3                                    | 70.0          | cm                |                 |
| Molding Shrinkage <sup>4</sup>          |               |                   | ISO 294-4       |
| Across Flow                             | 1.3           | %                 |                 |
| Flow                                    | 0.90          | %                 |                 |
| Water Absorption (Saturation, 23°C)     | 0.45          | %                 | ISO 62          |
| Water Absorption Saturation (100°C)     | 0.55          | %                 | ISO 62          |
| Mechanical                              | Nominal Value | Unit              | Test Method     |
| Tensile Modulus (23°C)                  | 3900          | MPa               | ISO 527-1       |
| Tensile Stress (Yield, 23°C)            | 95.0          | MPa               | ISO 527-2       |
| Tensile Strain (Break, 23°C)            | 32            | %                 | ISO 527-2       |
| Flexural Modulus (23°C)                 | 3600          | MPa               | ISO 178         |
| Flexural Stress                         |               |                   | ISO 178         |
| 3.5% Strain, 23°C                       | 120           | MPa               |                 |
| 23°C <sup>5</sup>                       | 155           | MPa               |                 |
| 125°C                                   | 85.0          | MPa               |                 |
| 175°C                                   | 16.0          | MPa               |                 |
| 275°C                                   | 9.00          | MPa               |                 |
| Compressive Stress                      |               |                   | ISO 604         |
| 23°C                                    | 120           | MPa               |                 |
| 120°C                                   | 65.0          | MPa               |                 |
| Impact                                  | Nominal Value | Unit              | Test Method     |
| Charpy Notched Impact Strength (23°C)   | 10.0          | kJ/m <sup>2</sup> | ISO 179/eA      |
| Charpy Unnotched Impact Strength (23°C) | No Break      |                   | ISO 179         |
| Notched Izod Impact Strength (23°C)     | 7.2           | kJ/m <sup>2</sup> | ISO 180/A       |
| Unnotched Izod Impact Strength (23°C)   | No Break      |                   | ISO 180         |
| Hardness                                | Nominal Value | Unit              | Test Method     |
| Shore Hardness (Shore D, 23°C)          | 84.0          |                   | ISO 868         |
| Thermal                                 | Nominal Value | Unit              | Test Method     |
| Deflection Temperature Under Load       |               |                   | ISO 75-2/Af     |
| 1.8 MPa, Unannealed                     | 152           | °C                |                 |
| 1.8 MPa, Annealed <sup>6</sup>          | 168           | °C                |                 |

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| Thermal                               | Nominal Value | Unit    | Test Method    |
|---------------------------------------|---------------|---------|----------------|
| Glass Transition Temperature          |               |         | ISO 11357-2    |
| Onset                                 | 143           | °C      |                |
| Midpoint                              | 150           | °C      |                |
| Melting Temperature                   | 343           | °C      | ISO 11357-3    |
| CLTE - Flow                           |               |         | ISO 11359-2    |
| < 143°C                               | 45            | ppm/K   |                |
| > 143°C                               | 125           | ppm/K   |                |
| CLTE - Average                        |               |         | ISO 11359-2    |
| < 143°C                               | 65            | ppm/K   |                |
| > 143°C                               | 160           | ppm/K   |                |
| Thermal Conductivity                  |               |         | ISO 22007-4    |
| 23°C <sup>7</sup>                     | 0.29          | W/m/K   |                |
| 23°C <sup>8</sup>                     | 0.32          | W/m/K   |                |
| Electrical                            | Nominal Value | Unit    | Test Method    |
| Volume Resistivity                    |               |         | IEC 60093      |
| 23°C                                  | 1.0E+16       | ohms·cm |                |
| 125°C                                 | 1.0E+15       | ohms·cm |                |
| 275°C                                 | 1.0E+9        | ohms·cm |                |
| Dielectric Strength (2.00 mm)         | 23.0          | kV/mm   | IEC 60243-1    |
| Dielectric Constant (23°C, 1 kHz)     | 3.10          |         | IEC 60250      |
| Dissipation Factor (23°C, 1 MHz)      | 5.0E-3        |         | IEC 60250      |
| Comparative Tracking Index            | 150           | V       | IEC 60112      |
| Flammability                          | Nominal Value | Unit    | Test Method    |
| Glow Wire Flammability Index (2.0 mm) | 960           | °C      | IEC 60695-2-12 |
| Fill Analysis                         | Nominal Value | Unit    | Test Method    |
| Melt Viscosity (400°C)                | 475           | Pa·s    | ISO 11443      |

## Typical Processing Information

| Injection          | Nominal Value | Unit |
|--------------------|---------------|------|
| Drying Temperature | 120 to 150    | °C   |
| Drying Time        | 3.0 to 5.0    | hr   |
| Hopper Temperature | < 100         | °C   |
| Rear Temperature   | 375           | °C   |
| Middle Temperature | 380 to 385    | °C   |
| Front Temperature  | 390           | °C   |
| Nozzle Temperature | 395           | °C   |
| Mould Temperature  | 170 to 200    | °C   |

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## Injection Notes

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Runner: Die / nozzle >3mm, manifold >3.5mm

Gate: >2mm or 0.5 x part thickness

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.

Detailed data available on our website [www.victrex.com](http://www.victrex.com) or upon request.

## Notes

<sup>1</sup> Mould Temperature: 180°C, Melt Temperature: 395°C, 1.00 mm

<sup>2</sup> Mould Temperature: 180°C, Melt Temperature: 395°C, 3.00 mm

<sup>3</sup> Mould Temperature: 180°C, Melt Temperature: 415°C, 3.00 mm

<sup>4</sup> 395°C nozzle, 180°C tool

<sup>5</sup> At yield

<sup>6</sup> 200°C/4h

<sup>7</sup> Average

<sup>8</sup> Along flow

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