

# VICTREX™ PEEK POLYMER 90HMF40

## General Information

### Product Description

High performance thermoplastic material, 40% carbon fibre reinforced PolyEtherEtherKetone (PEEK), semi crystalline, granules for injection moulding, easy flow, colour black.

Complex geometries with thinner cross sections or longer flow length where superior strength in a static or dynamic system is required. Excellent wear resistance, low coefficient of friction, low coefficient of thermal expansion. Chemically resistant to aggressive environments.

## Material Properties

| Physical                                | Nominal Value | Unit              | Test Method     |
|-----------------------------------------|---------------|-------------------|-----------------|
| Density (Crystalline)                   | 1.45          | g/cm <sup>3</sup> | ISO 1183        |
| Spiral Flow <sup>1</sup>                | 10.0          | cm                | Internal Method |
| Molding Shrinkage <sup>2</sup>          |               |                   | ISO 294-4       |
| Across Flow                             | 0.40          | %                 |                 |
| Flow                                    | 0.0           | %                 |                 |
| Water Absorption (Saturation, 23°C)     | 0.30          | %                 | ISO 62          |
| Water Absorption Saturation (100°C)     | 0.40          | %                 | ISO 62          |
| Mechanical                              | Nominal Value | Unit              | Test Method     |
| Tensile Modulus (23°C)                  | 43000         | MPa               | ISO 527-1       |
| Tensile Stress                          |               |                   | ISO 527-2       |
| Break, 23°C                             | 330           | MPa               |                 |
| Break, 120°C                            | 220           | MPa               |                 |
| Break, 180°C                            | 145           | MPa               |                 |
| Break, 275°C                            | 85.0          | MPa               |                 |
| Tensile Strain (Break, 23°C)            | 1.2           | %                 | ISO 527-2       |
| Flexural Modulus (23°C)                 | 37000         | MPa               | ISO 178         |
| Flexural Stress                         |               |                   | ISO 178         |
| 23°C                                    | 475           | MPa               |                 |
| 120°C                                   | 350           | MPa               |                 |
| 180°C                                   | 220           | MPa               |                 |
| 275°C                                   | 120           | MPa               |                 |
| Compressive Stress                      |               |                   | ISO 604         |
| 23°C                                    | 310           | MPa               |                 |
| 120°C                                   | 250           | MPa               |                 |
| 200°C                                   | 120           | MPa               |                 |
| Impact                                  | Nominal Value | Unit              | Test Method     |
| Charpy Notched Impact Strength (23°C)   | 8.0           | kJ/m <sup>2</sup> | ISO 179/1eA     |
| Charpy Unnotched Impact Strength (23°C) | 60.0          | kJ/m <sup>2</sup> | ISO 179/1U      |
| Notched Izod Impact Strength (23°C)     | 10.5          | kJ/m <sup>2</sup> | ISO 180/A       |
| Unnotched Izod Impact Strength (23°C)   | 60.0          | kJ/m <sup>2</sup> | ISO 180         |
| Hardness                                | Nominal Value | Unit              | Test Method     |
| Shore Hardness (Shore D, 23°C)          | 88.5          |                   | ISO 868         |

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| Thermal                                                  | Nominal Value | Unit    | Test Method |
|----------------------------------------------------------|---------------|---------|-------------|
| Deflection Temperature Under Load<br>1.8 MPa, Unannealed | 349           | °C      | ISO 75-2/Af |
| Glass Transition Temperature (Onset)                     | 143           | °C      | ISO 11357-2 |
| Melting Temperature                                      | 343           | °C      | ISO 11357-3 |
| CLTE - Flow                                              |               |         | ISO 11359-2 |
| > 143°C                                                  | 1             | ppm/K   |             |
| < 143°C                                                  | 3             | ppm/K   |             |
| CLTE - Average                                           |               |         | ISO 11359-2 |
| < 143°C                                                  | 35            | ppm/K   |             |
| > 143°C                                                  | 80            | ppm/K   |             |
| Thermal Conductivity                                     |               |         | ISO 22007-4 |
| 23°C <sup>3</sup>                                        | 2.0           | W/m/K   |             |
| 23°C <sup>4</sup>                                        | 4.3           | W/m/K   |             |
| Electrical                                               | Nominal Value | Unit    | Test Method |
| Volume Resistivity <sup>5</sup> (23°C)                   | 1.0E+5        | ohms·cm | ASTM D4496  |
| Fill Analysis                                            | Nominal Value | Unit    | Test Method |
| Melt Viscosity (400°C)                                   | 300           | 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   |
| Suggested Max Moisture | 0.020         | %    |
| Hopper Temperature     | < 100         | °C   |
| Rear Temperature       | 365           | °C   |
| Middle Temperature     | 370 to 375    | °C   |
| Front Temperature      | 380           | °C   |
| Nozzle Temperature     | 385           | °C   |
| Mould Temperature      | 190 to 200    | °C   |

### Injection Notes

Drying Temperature / Time: 150°C / 3h or 120°C / 5h (residual moisture <0.02%)

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.

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## Notes

|              |                                                            |
|--------------|------------------------------------------------------------|
| <sup>1</sup> | Mould Temperature: 190°C, Melt Temperature: 380°C, 1.00 mm |
| <sup>2</sup> | 380°C nozzle, 190°C tool                                   |
| <sup>3</sup> | Average                                                    |
| <sup>4</sup> | Along flow                                                 |
| <sup>5</sup> | 1V                                                         |

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