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# SHIMTEQ™ TP CB159

## Unidirectional Carbon Fiber Prepreg (CF/PEEK)

### SUMMARY

A high-performance semi-crystalline engineering plastic of polyether ether ketone (PEEK)-impregnated material reinforced with unidirectionally aligned carbon fibers can be molded (formed) by hot pressing and de-molded after cooling. PEEK shows high mechanical properties, and excellent resistance to heat and chemicals. The molded material has unique physical and mechanical properties due to its anisotropic nature. This empowers customers to design products with flexibility.

### SPECIFICATIONS

Fiber tensile modulus [GPa]	290	Material configuration	Sheet roll
Fiber areal weight [g/m <sup>2</sup> ]	59	Package configuration	Cardboard with 3" core
Resin areal weight [g/m <sup>2</sup> ]	33	Sheet length [m]	200
V <sub>f</sub> [%]	57	Sheet width [mm]	230
RC [%]	36	Matrix resin Melting point [°C]	335
T <sub>g</sub> [°C]	143	Thickness [μm]	58

### MATERIAL CONFIGURATION

	Material	Configuration
Reinforcement	CF	Uni-direction
Matrix	PEEK	N/A

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## APPLICATION EXAMPLES

Light-weight, impact-resistance, chemical-proof, long-life and/or very high mechanical-/physical-strength-demanding fields (e.g., automotive, aerospace, and infrastructures) molded by press-molding, autoclaves, or fiber placement.

## MATERIAL PROPERTIES

Test condition: 23±3°C, 50±10%RH

Test items	Test Results	Test Method
0° tensile strength [MPa]	2400	JIS K 7165
0° tensile modulus [GPa]	165	JIS K 7165
Compression strength [MPa]	950	ASTM D 6641
Compression modulus [GPa]	140	ASTM D 6641

## MOLDING PROCESS (EXAMPLE OF PRESS MOLDING)

1. Materials are charged in a release-treated mold die.
2. The mold die is closed and pressured up to 3±0.1 MPa. Material-charged cavity is heated up to 390±5°C at a rate of 3–10°C/min.
3. Pressure is maintained for 10±5 min.
4. Mold die is cooled to <140°C while maintaining the pressure.

## ATTENTION

- Cooling shrinkage would occur because PEEK is semi-crystalline polymer. The cooling process parameters of both temperature and pressure should be controlled because they will have an impact on the polymer crystallinity.
- White turbidity on surfaces would occur depending on cooling process by the crystallinity differences of PEEK. Proper cooling process control would be required, if surface appearance is important.

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