### Product Information VESTAKEEP<sup>®</sup> 2000 FC30

# CARBON FIBER-REINFORCED, GRAPHITE AND PTFE-FILLED POLYETHER ETHER KETONE



**VESTAKEEP\* 2000 FC30** is a medium-viscosity, carbon fiber-reinforced, graphite and PTFE filled polyether ether ketone for injection molding.

The semi-crystalline polymer features superior mechanical, thermal, and chemical resistance. Parts made from VESTAKEEP<sup>®</sup> 2000 FC30 are of low flammability.

Parts made of this resin can be used for bearing bushing or gearbox parts, due to the self-lubricating effect.

VESTAKEEP\* 2000 FC30 can be processed by common injection-molding machines for thermoplastics.

We recommend a melt temperature between 370°C and 380°C during the injection molding process. The mold temperature should be within a range of 160°C to 200°C, preferably 180°C. If temperatures exceed 380°C, toxic gases can be released. Adequate ventilation and protective equipment must be provided.

VESTAKEEP\* 2000 FC30 is supplied as cylindrical pellets in 25 kg boxes with moisture-proof polyethylene liners.

Inside the original and undamaged packaging, the product has a shelf life of at least 2 years when stored in dry rooms at temperatures not exceeding 30°C.

Pigmentation may affect values.

For information about processing of VESTAKEEP<sup>®</sup> 2000 FC30, please follow the general recommendations in our brochure "VESTAKEEP<sup>®</sup> PEEK Processing Guidelines".

The values presented are typical or average values, they do not constitute a specification.

#### **Key Features**

Industrial Sector Automotive and Mobility, Industry and Engineering

Processing Injection molding

**Delivery form** Pellets, Granules Resistance to Heat (thermal stability)

Additives Carbon fibers



Tensile modulus12600MPaISO 527Tensile strength145MPaISO 527Stress at break150MPaISO 527Strain at break, B2%ISO 527Charpy impact strength, +23°C40k/m²ISO 179/1eUType of failureCCharpy impact strength, +30°C40k/m²ISO 179/1eUType of failureCCharpy notched impact strength, +23°C6k/m²ISO 179/1eAType of failureCCharpy notched impact strength, +23°C6k/m²ISO 179/1eAType of failureCCharpy notched impact strength, -30°C5k/m²ISO 179/1eAType of failureCThermal propertiesdryUnitTest StandardMelting temperature340°CISO 11357-1/-3Temp. of deflection under load A, 1.80 MPa337°CISO 306Vicat softening temperature A, 10 N, 50 K/h335°CISO 306Vicat softening temperature B, 50 N, 50 K/h335°CISO 11359-1/-2Physical propertiesdryUnitTest StandardDensity1450kg/m³ISO 1133Density1450kg/m³ISO 1183				
Tensile strength     145     MPa     ISO 527       Stress at break     150     MPa     ISO 527       Strain at break, B     2     %     ISO 527       Charpy impact strength, +23°C     40     k//m²     ISO 179/1eU       Type of failure     C     -     -       Charpy impact strength, -30°C     40     k//m²     ISO 179/1eU       Type of failure     C     -     -       Charpy notched impact strength, +23°C     6     k//m²     ISO 179/1eU       Type of failure     C     -     -       Charpy notched impact strength, +23°C     6     k//m²     ISO 179/1eA       Type of failure     C     -     -       Charpy notched impact strength, -30°C     S     k//m²     ISO 179/1eA       Type of failure     C     -     -     -       Themal properties     dry     Vinit     Test Standard       Melting temperature     340     °C     ISO 17357-1/-3       Temp. of deflection under load A, 1.80 MPa     320     °C     ISO 306  V	Mechanical properties ISO	dry	Unit	Test Standard
Stress at break150MPaISO 527Strain at break, B2%ISO 527Charpy impact strength, +23°C40k/m²ISO 179/1eUType of failureCCharpy impact strength, -30°C40k/m²ISO 179/1eUType of failureCCharpy notched impact strength, +23°C6k/m²ISO 179/1eAType of failureCCharpy notched impact strength, -30°C5k/m²ISO 179/1eAType of failureCCharpy notched impact strength, -30°C5k/m²ISO 179/1eAType of failureCType of failureSK/m²ISO 1357-1/-2Type of failure340°CISO 75-1/-2Temp. of deflection under load A, 1.80 MPa335°CISO 306Vicat softening temperature A, 10 N, 50 K/h335°CISO 306Coeff. of linear thern. expansion, 23°C to 55 °C, parallel20E-6/KISO 11357-1/-2Phy	Tensile modulus	12600	MPa	ISO 527
Strain at break, B2%ISO 527Charpy impact strength, +23°C40k//m²ISO 179/1eUType of failureCCharpy impact strength, -30°C40k//m²ISO 179/1eUType of failureCCharpy notched impact strength, +23°C6k//m²ISO 179/1eAType of failureCCharpy notched impact strength, -30°CSk//m²ISO 179/1eAType of failureCCharpy notched impact strength, -30°CSk//m²ISO 179/1eAType of failureCThermal propertiesdryUnitTest StandardMelting temperature340°CISO 175-1/-2Temp. of deflection under load A, 1.80 MPa320°CISO 306Yicat softening temperature A, 10 N, 50 K/h340°CISO 306Vicat softening temperature A, 10 N, 50 K/h340°CISO 11357-1/-2Weiting Temperature B, 50 N, S0 K/h340°CISO 11359-1/-2Melting Temperature B, 50 N, S0 K/h340°CISO 11359-1/-2Melting Temperature B, 50 N, 50 K/h340°CASTM D 3418Bensityhysical propertiesdryUnitTest StandardMelting Temperature340°CNT D 3418Melting Temperature649Kg/m³ISO 1183	Tensile strength	145	MPa	ISO 527
Charpy impact strength, +23°C40k/m²ISO 179/1eUType of failureCCharpy impact strength, -30°C40k/m²ISO 179/1eUType of failureCCharpy notched impact strength, +23°C6k/m²ISO 179/1eAType of failureCCharpy notched impact strength, -30°C5k/m²ISO 179/1eAType of failureCCharpy notched impact strength, -30°C5k/m²ISO 179/1eAType of failureCThermal propertiesdryUnitTest StandardMelting temperature340°CISO 1357-1/-3Temp. of deflection under load A, 1.80 MPa320°CISO 306Vicat softening temperature A, 10 N, 50 K/h340°CISO 306Vicat softening temperature B, 50 N, 50 K/h340°CISO 306Coeff. of linear therm. expansion, 23°C to 55 °C, parallel20E-6/KISO 11359-1/-2Melting Temperature340°CASTM D 3418Physical propertiesdryUnitTest StandardDensity1450kg/m³ISO 1183	Stress at break	150	MPa	ISO 527
Type of failureC-Charpy impact strength, -30°C40kJ/m²ISO 179/1eUType of failureCCharpy notched impact strength, +23°C6kJ/m²ISO 179/1eAType of failureCCharpy notched impact strength, -30°C5kJ/m²ISO 179/1eAType of failureCCharpy notched impact strength, -30°C5kJ/m²ISO 179/1eAType of failureCCharpy notched impact strength, -30°C5kJ/m²ISO 179/1eAType of failureCType of failureGType of failureSO 179/1eAISO 179/1eAType of failureGType of failureGType of failureGType of failureGType of failureGType of failureGType of failureGTot of deflection under load A, 1.80 MPa337°CISO 306Vicat softening temperature A, 10 N, 50 K/h335°CISO 306Coeff. of linear therm.	Strain at break, B	2	%	ISO 527
Charpy impact strength, -30°C40kJ/m²ISO 179/1eUType of failureCCharpy notched impact strength, +23°C6kJ/m²ISO 179/1eAType of failureCCharpy notched impact strength, -30°C5kJ/m²ISO 179/1eAType of failureCCharpy notched impact strength, -30°C5kJ/m²ISO 179/1eAType of failureCType of failureCTermal propertiesdryUnitTest StandardMelting temperature340°CISO 175-1/-3Temp. of deflection under load A, 1.80 MPa320°CISO 75-1/-2Temp. of deflection under load B, 0.45 MPa337°CISO 306Vicat softening temperature B, 50 N, 50 K/h335°CISO 306Vicat softening temperature B, 50 N, 50 K/h335°CISO 306Coeff. of linear therm. expansion, 23°C to 55 °C, parallel20E-6/KISO 11359-1/-2Melting Temperature340°CSO 11359-1/-2Physical propertiesdryUnitTest StandardDensity1450kg/m³ISO 1183Wet absorption0.4%Sim. to ISO 62	Charpy impact strength, +23°C	40	kJ/m²	ISO 179/1eU
Type of failureC-Charpy notched impact strength, +23°C6kJ/m²ISO 179/1eAType of failureCCharpy notched impact strength, -30°C5kJ/m²ISO 179/1eAType of failureCType of failureCType of failureCThermal propertiesdryUnitTest StandardMelting temperature340°CISO 11357-1/-3Temp. of deflection under load A, 1.80 MPa320°CISO 75-1/-2Temp. of deflection under load B, 0.45 MPa337°CISO 306Vicat softening temperature A, 10 N, 50 K/h340°CISO 306Vicat softening temperature B, 50 N, 50 K/h335°CISO 306Coeff. of linear therm. expansion, 23°C to 55 °C, parallel20E-6/KISO 11359-1/-2Melting Temperature440°CNST 1359-1/-2Melting Temperature340°CSion 11359-1/-2Melting Temperature340°CNST 1359-1/-2Melting Tempe	Type of failure	с	-	-
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Charpy notched impact strength, -30°CSkJ/m²ISO 179/1eAType of failureCThermal propertiesdryUnitTest StandardMelting temperature340°CISO 11357-1/-3Temp. of deflection under load A, 1.80 MPa320°CISO 75-1/-2Temp. of deflection under load B, 0.45 MPa337°CISO 75-1/-2Vicat softening temperature A, 10 N, 50 K/h340°CISO 306Vicat softening temperature B, 50 N, 50 K/h335°CISO 11359-1/-2Melting Temperature340°CASTM D 3418Physical propertiesdryUnitTest StandardDensity1450kg/m³ISO 1183Water absorption0.4%Sim. to ISO 62	Charpy notched impact strength, +23°C	6	kJ/m²	ISO 179/1eA
Type of failureC-Thermal propertiesdryUnitTest StandardMelting temperature340°CISO 11357-1/-3Temp. of deflection under load A, 1.80 MPa320°CISO 75-1/-2Temp. of deflection under load B, 0.45 MPa337°CISO 75-1/-2Vicat softening temperature A, 10 N, 50 K/h340°CISO 306Vicat softening temperature B, 50 N, 50 K/h335°CISO 306Coeff. of linear therm. expansion, 23°C to 55 °C, parallel20E-6/KISO 11359-1/-2Melting Temperature340°CASTM D 3418Density1450kg/m³ISO 1183Water absorption0.4%Sim. to ISO 62	Type of failure	с	-	-
Image: AntipartitiesdryUnitTest StandardMelting temperature340°CISO 11357-1/-3Temp. of deflection under load A, 1.80 MPa320°CISO 75-1/-2Temp. of deflection under load B, 0.45 MPa337°CISO 75-1/-2Vicat softening temperature A, 10 N, 50 K/h340°CISO 306Vicat softening temperature B, 50 N, 50 K/h335°CISO 306Coeff. of linear therm. expansion, 23°C to 55 °C, parallel20E-6/KISO 11359-1/-2Melting Temperature340°CASTM D 3418Physical propertiesdryUnitTest StandardDensity1450kg/m³ISO 1183Water absorption0.4%Sim. to ISO 62	Charpy notched impact strength, -30°C	5	kJ/m²	ISO 179/1eA
Melting temperature340°CISO 11357-1/-3Temp. of deflection under load A, 1.80 MPa320°CISO 75-1/-2Temp. of deflection under load B, 0.45 MPa337°CISO 75-1/-2Vicat softening temperature A, 10 N, 50 K/h340°CISO 306Vicat softening temperature B, 50 N, 50 K/h335°CISO 306Coeff. of linear therm. expansion, 23°C to 55 °C, parallel20E-6/KISO 11359-1/-2Melting Temperature340°CASTM D 3418Physical propertiesdryUnitTest StandardDensity1450kg/m³ISO 1183Water absorption0.4%Sim. to ISO 62	Type of failure	с	-	-
Melting temperature340°CISO 11357-1/-3Temp. of deflection under load A, 1.80 MPa320°CISO 75-1/-2Temp. of deflection under load B, 0.45 MPa337°CISO 75-1/-2Vicat softening temperature A, 10 N, 50 K/h340°CISO 306Vicat softening temperature B, 50 N, 50 K/h335°CISO 306Coeff. of linear therm. expansion, 23°C to 55 °C, parallel20E-6/KISO 11359-1/-2Melting Temperature340°CASTM D 3418Physical propertiesDensity1450kg/m³ISO 1183Water absorption0.4%Sim. to ISO 62				
Temp. of deflection under load A, 1.80 MPa320°CISO 75-1/-2Temp. of deflection under load B, 0.45 MPa337°CISO 75-1/-2Vicat softening temperature A, 10 N, 50 K/h340°CISO 306Vicat softening temperature B, 50 N, 50 K/h335°CISO 306Coeff. of linear therm. expansion, 23°C to 55 °C, parallel20E-6/KISO 11359-1/-2Melting Temperature340°CASTM D 3418Physical propertiesdryUnitTest StandardDensity1450kg/m³ISO 1183Water absorption0.4%Sim. to ISO 62	Thermal properties	dry	Unit	Test Standard
Temp. of deflection under load B, 0.45 MPa337°CISO 75-1/-2Vicat softening temperature A, 10 N, 50 K/h340°CISO 306Vicat softening temperature B, 50 N, 50 K/h335°CISO 306Coeff. of linear therm. expansion, 23°C to 55 °C, parallel20E-6/KISO 11359-1/-2Melting Temperature340°CASTM D 3418Physical propertiesdryUnitTest StandardDensity1450kg/m³ISO 1183Water absorption0.4%Sim. to ISO 62	Melting temperature	340	°C	ISO 11357-1/-3
Vicat softening temperature A, 10 N, 50 K/h340°CISO 306Vicat softening temperature B, 50 N, 50 K/h335°CISO 306Coeff. of linear therm. expansion, 23°C to 55 °C, parallel20E-6/KISO 11359-1/-2Melting Temperature340°CASTM D 3418Physical propertiesDensity1450kg/m³ISO 1183Water absorption0.4%Sim. to ISO 62	Temp. of deflection under load A, 1.80 MPa	320	°C	ISO 75-1/-2
Vicat softening temperature B, 50 N, 50 K/h335°CISO 306Coeff. of linear therm. expansion, 23°C to 55 °C, parallel20E-6/KISO 11359-1/-2Melting Temperature340°CASTM D 3418Physical propertiesDensity1450kg/m³ISO 1183Water absorption0.4%Sim. to ISO 62	Temp. of deflection under load B, 0.45 MPa	337	°C	ISO 75-1/-2
Coeff. of linear therm. expansion, 23°C to 55 °C, parallel20E-6/KISO 11359-1/-2Melting Temperature340°CASTM D 3418Physical propertiesdryUnitTest StandardDensity1450kg/m³ISO 1183Water absorption0.4%Sim. to ISO 62	Vicat softening temperature A, 10 N, 50 K/h	340	°C	ISO 306
Melting Temperature   340   °C   ASTM D 3418     Physical properties   dry   Unit   Test Standard     Density   1450   kg/m³   ISO 1183     Water absorption   0.4   %   Sim. to ISO 62	Vicat softening temperature B, 50 N, 50 K/h	335	°C	ISO 306
Physical propertiesdryUnitTest StandardDensity1450kg/m³ISO 1183Water absorption0.4%Sim. to ISO 62	Coeff. of linear therm. expansion, 23°C to 55 °C, parallel	20	E-6/K	ISO 11359-1/-2
Density1450kg/m³ISO 1183Water absorption0.4%Sim. to ISO 62	Melting Temperature	340	°C	ASTM D 3418
Density1450kg/m³ISO 1183Water absorption0.4%Sim. to ISO 62				
Water absorption <b>0.4</b> % Sim. to ISO 62	Physical properties	dry	Unit	Test Standard
	Density	1450	kg/m³	ISO 1183
Density <b>1450</b> kg/m <sup>3</sup> ASTM D 792	Water absorption	0.4	%	Sim. to ISO 62
	Density	1450	kg/m³	ASTM D 792



Burning Behav.	dry	Unit	Test Standard
Burning behav. at 1.5 mm nom. thickn.	V-0	class	IEC 60695-11-10
Thickness tested	1.6	mm	-
Oxygen index	44	%	ISO 4589-1/-2
Limiting Oxygen Index	44	%	ASTM D 2863
Electrical properties	dry	Unit	Test Standard
Volume resistivity, V	100000	Ohm*m	IEC 62631-3-1
Surface resistivity, E	1000000	Ohm	IEC 62631-3-2
Relative permittivity, 100Hz	5.9	-	IEC 62631-2-1
Relative permittivity, 1MHz	4.9	-	IEC 62631-2-1
Dissipation factor, 100Hz	700	E-4	IEC 62631-2-1
Dissipation factor, 1MHz	200	E-4	IEC 62631-2-1
Rheological properties	dry	Unit	Test Standard
Melt volume-flow rate, MVR	20	cm³/10min	ISO 1133
Temperature	380	°C	-
Load	5	kg	-
Molding shrinkage, parallel	0.1	%	ISO 294-4, 2577
Molding shrinkage, normal	0.4	%	ISO 294-4, 2577
Test specimen production	dry	Unit	Test Standard
Injection Molding, melt temperature	380	°C	ISO 294
Injection Molding, mold temperature	180	°C	ISO 294
Injection Molding, injection velocity	200	mm/s	ISO 294
Injection Molding, pressure at hold	120	MPa	ISO 294



#### **Characteristics**

Applications Electrical and Electronical

#### **Chemical Media Resistance**

#### Acids

- Acetic Acid (5% by mass) (23°C)
- ✓ Citric Acid solution (10% by mass) (23°C)
- ✓ Hydrochloric Acid (36% by mass) (23°C)
- ✗ Nitric Acid (40% by mass) (23°C)
- ✓ Sulfuric Acid (5% by mass) (23°C)
- ✓ Chromic Acid solution (40% by mass) (23°C)

#### Bases

- ✓ Sodium Hydroxide solution (35% by mass) (23°C)
- ✓ Sodium Hydroxide solution (1% by mass) (23°C)
- ✓ Ammonium Hydroxide solution (10% by mass) (23°C)

#### Alcohols

- ✓ Isopropyl alcohol (23°C)
- ✓ Methanol (23°C)
- ✓ Ethanol (23°C)

#### Hydrocarbons

- ✓ n-Hexane (23°C)
- ✓ Toluene (23°C)
- ✓ iso-Octane (23°C)

#### Ketones

Acetone	(23°C)
	Acetone

#### Ethers

✓ Diethyl ether (23°C)

#### Mineral oils

- ✓ SAE 10W40 multigrade motor oil (23°C)
- ✓ Insulating Oil (23°C)

Evonik Operations GmbH VESTAKEEP<sup>®</sup> 2000 FC30 |



Special Characteristics Medium viscosity

#### **Standard Fuels**

- ✓ Standard fuel without alcohol (pref. ISO 1817 Liquid C) (23°C)
- ✓ Standard fuel with alcohol (pref. ISO 1817 Liquid 4) (23°C)
- ✓ Diesel fuel (pref. ISO 1817 Liquid F) (23°C)

#### Salt solutions

- ✓ Sodium Chloride solution (10% by mass) (23°C)
- ✓ Sodium Hypochlorite solution (10% by mass) (23°C)
- ✓ Sodium Carbonate solution (20% by mass) (23°C)
- ✓ Sodium Carbonate solution (2% by mass) (23°C)
- ✓ Zinc Chloride solution (50% by mass) (23°C)

#### Other

- ✓ Ethyl Acetate (23°C)
- ✓ Hydrogen peroxide (23°C)
- ✓ Ethylene Glycol (50% by mass) in water (108°C)
- ✓ Water (23°C)
- ✓ Deionized water (90°C)

Rheological calculation properties	dry	Unit	Test Standard
Min. mold temperature	160	°C	-
Max. mold temperature	200	°C	-
Min. melt temperature	380	°C	-
Max. melt temperature	400	°C	-