Product Information VESTAKEEP[®] 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[®] 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^{*} 2000 FC30, please follow the general recommendations in our brochure "VESTAKEEP^{*} PEEK Processing Guidelines".

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

FOR FURTHER INFORMATION PLEASE CONTACT US AT <u>EVONIK-HP@EVONIK.COM</u> OR VISIT OUR PRODUCT AT <u>WWW.INDUSTRIAL.VESTAKEEP.COM</u>

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



Mechanical properties ISO	dry	Unit	Test Standard
Tensile modulus	12600	MPa	ISO 527
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	kJ/m²	ISO 179/1eU
Type of failure	с	-	-
Charpy impact strength, -30°C	40	kJ/m²	ISO 179/1eU
Type of failure	с	-	-
Charpy notched impact strength, +23°C	6	kJ/m²	ISO 179/1eA
Type of failure	С	-	-
Charpy notched impact strength, -30°C	5	kJ/m²	ISO 179/1eA
Type of failure	с	-	-
Thermal properties	dry	Unit	Test Standard
Melting temperature	340	°C	ISO 11357-1/-3
Temp. of deflection under load A, 1.80 MPa	320	°C	ISO 75-1/-2
Temp. of deflection under load B, 0.45 MPa	337	°C	ISO 75-1/-2
Vicat softening temperature A, 10 N, 50 K/h	340	°C	ISO 306
Vicat softening temperature B, 50 N, 50 K/h	335	°C	ISO 306
Coeff. of linear therm. expansion, 23°C to 55 °C, parallel	20	E-6/K	ISO 11359-1/-2
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
Density	1450	kg/m³	ASTM D 792



Thickness tested1.6mm-Oxygen index44%ISO 4589-1/-2Limiting Oxygen Index44%ASTM D 2863Electrical propertiesdryUnitTest StandardVolume resistivity, V100000Ohm*mIEC 62631-3-1Surface resistivity, E1000000Ohm*mIEC 62631-3-2Relative permittivity, 100Hz5.9-IEC 62631-2-1Dissipation factor, 100Hz700E-4IEC 62631-2-1Dissipation factor, 100Hz200E-4IEC 62631-2-1Melt volume-flow rate, MVR20cm³/10minISO 1133Temperature380°C-Load5kg-Molding shrinkage, parallel0.1%ISO 294-4, 2577				
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Oxygen index44%ISO 4589-1/-2Limiting Oxygen Index44%ASTM D 2863Electrical propertiesdryUnitTest StandardVolume resistivity, V100000Ohm*mIEC 62631-3-1Surface resistivity, E1000000OhmIEC 62631-3-2Relative permittivity, 100Hz5.9-IEC 62631-2-1Relative permittivity, 100Hz5.9-IEC 62631-2-1Dissipation factor, 100Hz700E-4IEC 62631-2-1Dissipation factor, 100Hz700E-4IEC 62631-2-1Dissipation factor, 100Hz200Cn-4IEC 62631-2-1Dissipation factor, 100Hz200Cn-1IEC 62631-2-1Dissipation factor, 100Hz200Cn-1IEC 62631-2-1Dissipation factor, 100Hz200Cn-1IEC 62631-2-1Dissipation factor, 100Hz200Cn-1IEC 62631-2-1Melt volume-flow rate, MVR20cm ³ /10minISO 1133Temperature380°C-Load5kg-Molding shrinkage, parallel0.1%ISO 294-4, 2577Molding shrinkage, normal0.4%ISO 294-4, 2577Injection Molding, melt temperature380°CISO 294Injection Molding, melt temperature180°CISO 294	Burning behav. at 1.5 mm nom. thickn.	V-0	class	IEC 60695-11-10
Limiting Oxygen Index44%ASTM D 2863Electrical propertiesdryUnitTest StandardVolume resistivity, V100000Ohm*mIEC 62631-3-1Surface resistivity, E1000000OhmIEC 62631-3-2Relative permittivity, 100Hz5.9-IEC 62631-2-1Relative permittivity, 100Hz5.9-IEC 62631-2-1Dissipation factor, 100Hz700E-4IEC 62631-2-1Dissipation factor, 100Hz700E-4IEC 62631-2-1Melt volume-flow rate, MVR200E-4IEC 62631-2-1Load5kg-Molding shrinkage, parallel0.1%ISO 294-4, 2577Molding shrinkage, normal0.4%ISO 294-4, 2577Injection Molding, melt temperature380°C1Injection Molding, mold temperature180°CISO 294	Thickness tested	1.6	mm	-
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, 100Hz 4.9 - IEC 62631-2-1 Dissipation factor, 100Hz 700 E-4 IEC 62631-2-1 Dissipation factor, 100Hz 700 E-4 IEC 62631-2-1 Net volume-flow rate, MVR 200 Cm ³ /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 Injection Molding, melt temperature 380 °C - 10 So 294 So 294 So 294	Oxygen index	44	%	ISO 4589-1/-2
Volume resistivity, V100000Ohm*mIEC 62631-3-1Surface resistivity, E1000000OhmIEC 62631-3-2Relative permittivity, 100Hz5.9-IEC 62631-2-1Relative permittivity, 100Hz4.9-IEC 62631-2-1Dissipation factor, 100Hz700E-4IEC 62631-2-1Dissipation factor, 10Hz200E-4IEC 62631-2-1Melt volume-flow rate, MVR20cm³/10minISO 1133Temperature380°C-Load5kg-Molding shrinkage, parallel0.1%ISO 294-4, 2577Molding shrinkage, normal0.4%ISO 294-4, 2577Injection Molding, melt temperature380°C-Injection Molding, mold temperature180°C150 294	Limiting Oxygen Index	44	%	ASTM D 2863
Volume resistivity, V100000Ohm*mIEC 62631-3-1Surface resistivity, E1000000OhmIEC 62631-3-2Relative permittivity, 100Hz5.9-IEC 62631-2-1Relative permittivity, 100Hz4.9-IEC 62631-2-1Dissipation factor, 100Hz700E-4IEC 62631-2-1Dissipation factor, 10Hz700E-4IEC 62631-2-1Dissipation factor, 10Hz200E-4IEC 62631-2-1Melt volume-flow rate, MVR20cm³/10minISO 1133Temperature380°C-Load5kg-Molding shrinkage, parallel0.1%ISO 294-4, 2577Molding shrinkage, normal0.4%ISO 294-4, 2577Injection Molding, melt temperature380°C-Injection Molding, mold temperature180°CISO 294				
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Relative permittivity, 100Hz5.9-IEC 62631-2-1Relative permittivity, 1MHz4.9-IEC 62631-2-1Dissipation factor, 100Hz700E-4IEC 62631-2-1Dissipation factor, 1MHz200E-4IEC 62631-2-1Rheological propertiesdryUnitTest StandardMelt volume-flow rate, MVR20cm³/10minISO 1133Temperature380°C-Load5kg-Molding shrinkage, parallel0.1%ISO 294-4, 2577Molding shrinkage, normal0.4%ISO 294-4, 2577Injection Molding, molt temperature380°CISO 294Injection Molding, mold temperature180°CISO 294	Volume resistivity, V	100000	Ohm*m	IEC 62631-3-1
Relative permittivity, 1MHz4.9-IEC 62631-2-1Dissipation factor, 100Hz700E-4IEC 62631-2-1Dissipation factor, 1MHz200E-4IEC 62631-2-1Rheological propertiesdryUnitTest StandardMelt volume-flow rate, MVR20cm³/10minISO 1133Temperature380°C-Load5kg-Molding shrinkage, parallel0.1%ISO 294-4, 2577Molding shrinkage, normal0.4%ISO 294-4, 2577Injection Molding, melt temperature380°CStandardInjection Molding, mold temperature180°CStandard	Surface resistivity, E	1000000	Ohm	IEC 62631-3-2
Dissipation factor, 100Hz700E-4IEC 62631-2-1Dissipation factor, 1MHz200E-4IEC 62631-2-1Rheological propertiesdryUnitTest StandardMelt volume-flow rate, MVR20cm³/10minISO 1133Temperature380°C-Load5kg-Molding shrinkage, parallel0.1%ISO 294-4, 2577Molding shrinkage, normal0.4%ISO 294-4, 2577Injection Molding, melt temperature380°Ciso 294-4, 2577Injection Molding, mold temperature180°CISO 294	Relative permittivity, 100Hz	5.9	-	IEC 62631-2-1
Dissipation factor, 1MHz200E-4IEC 62631-2-1Rheological propertiesdryUnitTest StandardMelt volume-flow rate, MVR20cm³/10minISO 1133Temperature380°C-Load5kg-Molding shrinkage, parallel0.1%ISO 294-4, 2577Molding shrinkage, normal0.4%ISO 294-4, 2577Injection Molding, melt temperature380°CISO 294-4, 2577Injection Molding, mold temperature180°CISO 294	Relative permittivity, 1MHz	4.9	-	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	Dissipation factor, 100Hz	700	E-4	IEC 62631-2-1
Melt volume-flow rate, MVR20cm³/10minISO 1133Temperature380°C-Load5kg-Molding shrinkage, parallel0.1%ISO 294-4, 2577Molding shrinkage, normal0.4%ISO 294-4, 2577Test specimen productiondryUnitTest StandardInjection Molding, melt temperature380°CISO 294Injection Molding, mold temperature180°CISO 294	Dissipation factor, 1MHz	200	E-4	IEC 62631-2-1
Melt volume-flow rate, MVR20cm³/10minISO 1133Temperature380°C-Load5kg-Molding shrinkage, parallel0.1%ISO 294-4, 2577Molding shrinkage, normal0.4%ISO 294-4, 2577Test specimen productiondryUnitTest StandardInjection Molding, melt temperature380°CISO 294Injection Molding, mold temperature180°CISO 294				
Temperature380°C-Load5kg-Molding shrinkage, parallel0.1%ISO 294-4, 2577Molding shrinkage, normal0.4%ISO 294-4, 2577Test specimen productiondryUnitTest StandardInjection Molding, melt temperature380°CISO 294Injection Molding, mold temperature180°CISO 294	Rheological properties	dry	Unit	Test Standard
Load5kg-Molding shrinkage, parallel0.1%ISO 294-4, 2577Molding shrinkage, normal0.4%ISO 294-4, 2577Test specimen productiondryUnitTest StandardInjection Molding, melt temperature380°CISO 294Injection Molding, mold temperature180°CISO 294	Melt volume-flow rate, MVR	20	cm³/10min	ISO 1133
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	Temperature	380	°C	-
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	Load	5	kg	-
Test specimen productiondryUnitTest StandardInjection Molding, melt temperature380°CISO 294Injection Molding, mold temperature180°CISO 294	Molding shrinkage, parallel	0.1	%	ISO 294-4, 2577
Injection Molding, melt temperature380°CISO 294Injection Molding, mold temperature180°CISO 294	Molding shrinkage, normal	0.4	%	ISO 294-4, 2577
Injection Molding, melt temperature380°CISO 294Injection Molding, mold temperature180°CISO 294				
Injection Molding, mold temperature 180 °C ISO 294	Test specimen production	dry	Unit	Test Standard
	Injection Molding, melt temperature	380	°C	ISO 294
Injection Molding, injection velocity 200 mm/s 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	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)

Ethers

✓ Diethyl ether (23°C)

Mineral oils

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



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	-



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