Product Information

VESTAKEEP® 4000 FC30

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



VESTAKEEP® 4000 FC30 is a carbon fiber reinforced, graphite and PTFE-filled polyether ether ketone for injection molding. Parts made of this resin can be used for bearing bushing or gearbox parts due to the selflubricating effect.

The semi-crystalline polymer features superior mechanical, thermal, and chemical resistance. Parts made from VESTAKEEP® 4000 FC30 are of low flammability.

VESTAKEEP® 4000 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. If temperatures exceed 380°C, toxic gases can be released. Adequate ventilation and protective equipment must be provided. The mold temperature should be within a range of 160°C to 200°C, preferably 180°C.

VESTAKEEP® 4000 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® 4000 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 EVONIK-HP@EVONIK.COM OR VISIT OUR PRODUCT AT WWW.INDUSTRIAL.VESTAKEEP.COM

Key Features

Industrial Sector
Automotive and Mobility, Industry and Engineering

Processing
Injection molding, Extrusion

Delivery form
Pellets, Granules

Resistance to
Heat (thermal stability), Fire / burn

Additives
Carbon fibers

Mechanical properties ISO	Value	Unit	Test Standard
Tensile modulus	**12500**	MPa	ISO 527

EVONIK Leading Beyond Chemistry

Tensile strength	**160**	MPa	ISO 527
Stress at break	**160**	MPa	ISO 527
Strain at break, B	**2**	%	ISO 527
Charpy impact strength, +23°C	**45**	kJ/m²	ISO 179/1eU
Type of failure	**C**	-	-
Charpy impact strength, -30°C	**45**	kJ/m²	ISO 179/1eU
Type of failure	**C**	-	-
Charpy notched impact strength, +23°C	**8**	kJ/m²	ISO 179/1eA
Type of failure	**C**	-	-
Charpy notched impact strength, -30°C	**7**	kJ/m²	ISO 179/1eA
Type of failure	**C**	-	-
Flexural strength, 23°C	**240**	MPa	ISO 178
Flexural modulus, var. temp.	**10300**	MPa	ISO 178

Thermal properties	**Value**	**Unit**	**Test Standard**
Melting temperature	**340**	°C	ISO 11357-1/-3
Temp. of deflection under load A, 1.80 MPa	**310**	°C	ISO 75-1/-2
Temp. of deflection under load B, 0.45 MPa	**330**	°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	**Value**	**Unit**	**Test Standard**
Density	**1450**	kg/m³	ISO 1183
Water absorption	**0.4**	%	Sim. to ISO 62
Moisture content	**0.05**	Gew.-%	ISO 15512
Density	**1450**	kg/m³	ASTM D 792

Shore D hardness, 1s, annealed	**83.5**	-	ASTM D 2240

Burning Behav.	Value	Unit	Test Standard
UL Yellow Card available	yes	-	-
Burning behav. at 1.5 mm nom. thickn.	**V-0**	class	IEC 60695-11-10
Thickness tested	**1.5**	mm	-
Burnin behav. at thickness h	**V-0**	class	IEC 60695-11-10
Thickness tested	**3.0**	mm	-
Burning behav. at thickness h	**V-0**	class	IEC 60695-11-10
Thickness tested	**0.8**	mm	-
Burnin behav. at thickness h	**V-0**	class	IEC 60695-11-10
Thickness tested	**0.4**	mm	-
Oxygen index	**44**	%	ISO 4589-1/-2
Limiting Oxygen Index	**44**	%	ASTM D 2863
Glow Wire Flammability Index (GWFI)	**960**	°C	IEC 60695-2-12
Glow Wire Ignition Temperature (GWIT)	**900**	°C	IEC 60695-2-13
Hot Wire Ignition (HWI)	**4**	PL-Klasse	IEC 60695-2-20
HWI - thickness tested	**0.4**	mm	-
Hot Wire Ignition (HWI)	**2**	PL-Klasse	IEC 60695-2-20
HWI - thickness tested	**0.8**	mm	-
Hot Wire Ignition (HWI)	**1**	PL-Klasse	IEC 60695-2-20
HWI - thickness tested	**1.5**	mm	-
Hot Wire Ignition (HWI)	**1**	PL-Klasse	IEC 60695-2-20
HWI - thickness tested	**3.0**	mm	-

Electrical properties	Value	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	**600**	E-4	IEC 62631-2-1
Dissipation factor, 1MHz	**200**	E-4	IEC 62631-2-1
CTI, Performance Level Categories, PLC	**4**	class	ASTM D 3638

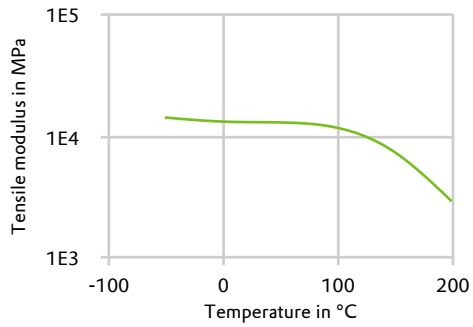
Rheological properties	Value	Unit	Test Standard
Melt volume-flow rate, MVR	**38**	cm^3/10min	ISO 1133
Temperature	**400**	°C	-
Load	**21.6**	kg	-
Melt volume-flow rate, MVR	**38**	cm^3/10min	ISO 1133
Temperature	**400**	°C	-
Load	**21.6**	kg	-
Molding shrinkage, parallel	**0.2**	%	ISO 294-4, 2577
Molding shrinkage, normal	**0.4**	%	ISO 294-4, 2577

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

Test specimen production	Value	Unit	Test Standard
Injection Molding, melt temperature	**410**	°C	ISO 294
Injection Molding, mold temperature	**200**	°C	ISO 294
Injection Molding, injection velocity	**200**	mm/s	ISO 294
Injection Molding, pressure at hold	**120**	MPa	ISO 294

Diagrams

Tensile modulus-temperature



Characteristics

Applications
Electrical and Electronical, Encapsulation

Special Characteristics
Semi-crystalline

Color
Natural color

Additives
External lubrication

Chemical Resistance
General chemical resistance

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)

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)

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