

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.

Key Features

Industrial Sector

Automotive and Mobility, Industry and Engineering

Resistance to

Heat (thermal stability), Fire / burn

Processing

Injection molding, Extrusion

Additives

Carbon fibers

Delivery form

Pellets, Granules

Mechanical properties ISO	dry	Unit	Test Standard
Tensile modulus	1.81E6	psi	ISO 527
Tensile strength	23200	psi	ISO 527
Stress at break	23200	psi	ISO 527
Strain at break, B	2	%	ISO 527
Charpy impact strength, +23°C	21.4	ftlb/in ²	ISO 179/1eU
Type of failure	C	-	-
Charpy impact strength, -30°C	21.4	ftlb/in ²	ISO 179/1eU
Type of failure	C	-	-
Charpy notched impact strength, +23°C	3.81	ftlb/in ²	ISO 179/1eA
Type of failure	C	-	-
Charpy notched impact strength, -30°C	3.33	ftlb/in ²	ISO 179/1eA
Type of failure	C	-	-
Flexural strength, 23°C	34800	psi	ISO 178
Flexural modulus, var. temp.	1.49E6	psi	ISO 178

Thermal properties	dry	Unit	Test Standard
Melting temperature	644	°F	ISO 11357-1/-3
Temp. of deflection under load A, 1.80 MPa	590	°F	ISO 75-1/-2
Temp. of deflection under load B, 0.45 MPa	626	°F	ISO 75-1/-2
Vicat softening temperature A, 10 N, 50 K/h	644	°F	ISO 306
Vicat softening temperature B, 50 N, 50 K/h	635	°F	ISO 306
Coeff. of linear therm. expansion, 23°C to 55 °C, parallel	1.11E-5	in/in/°F	ISO 11359-1/-2
Melting Temperature	644	°F	ASTM D 3418

Physical properties	dry	Unit	Test Standard
Density	1.45	g/cm ³	ISO 1183
Water absorption	0.4	%	Sim. to ISO 62

Moisture content	0.05	wt.-%	ISO 15512
Density	1.45	g/cm ³	ASTM D 792
Shore D hardness, 1s, annealed	83.5	-	ASTM D 2240

Burning Behav.	dry	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	0.0591	in	-
Burnin behav. at thickness h	V-0	class	IEC 60695-11-10
Thickness tested	0.1181	in	-
Burning behav. at thickness h	V-0	class	IEC 60695-11-10
Thickness tested	0.0295	in	-
Burnin behav. at thickness h	V-0	class	IEC 60695-11-10
Thickness tested	0.0157	in	-
Oxygen index	44	%	ISO 4589-1/-2
Limiting Oxygen Index	44	%	ASTM D 2863
Glow Wire Flammability Index (GWFI)	1760	°F	IEC 60695-2-12
Glow Wire Ignition Temperature (GWIT)	1650	°F	IEC 60695-2-13
Hot Wire Ignition (HWI)	4	PLC	IEC 60695-2-20
HWI - thickness tested	0.0157	in	-
Hot Wire Ignition (HWI)	2	PLC	IEC 60695-2-20
HWI - thickness tested	0.0295	in	-
Hot Wire Ignition (HWI)	1	PLC	IEC 60695-2-20
HWI - thickness tested	0.0591	in	-
Hot Wire Ignition (HWI)	1	PLC	IEC 60695-2-20
HWI - thickness tested	0.1181	in	-

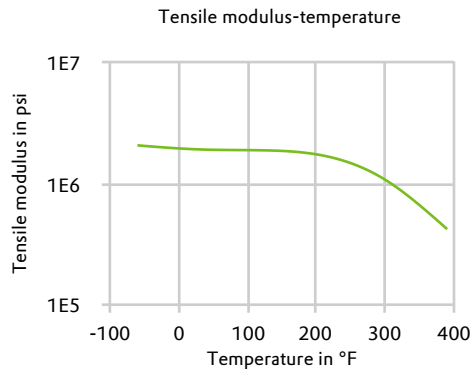
Electrical properties	dry	Unit	Test Standard
Volume resistivity, V	100000	Ohm*m	IEC 62631-3-1
Surface resistivity, E	1000000	Ohm	IEC 62631-3-2
Relative permittivity, 100Hz	5.9	-	IEC 62631-2-1
Relative permittivity, 1MHz	4.9	-	IEC 62631-2-1
Dissipation factor, 100Hz	600	E-4	IEC 62631-2-1
Dissipation factor, 1MHz	200	E-4	IEC 62631-2-1
CTI, Performance Level Categories, PLC	4	class	ASTM D 3638

Rheological properties	dry	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	752	°F	-
Load	47.6	lb	-
Molding shrinkage, parallel	0.2	%	ISO 294-4, 2577
Molding shrinkage, normal	0.4	%	ISO 294-4, 2577

Test specimen production	dry	Unit	Test Standard
Injection Molding, melt temperature	770	°F	ISO 294
Injection Molding, mold temperature	392	°F	ISO 294
Injection Molding, injection velocity	7.87	in/s	ISO 294
Injection Molding, pressure at hold	17400	psi	ISO 294

Diagrams

Tensile modulus-temperature



Characteristics

Applications

Electrical and Electronical, Encapsulation

Color

Natural color

Special Characteristics

Semi-crystalline

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)

Rheological calculation properties

	dry	Unit	Test Standard
Min. mold temperature	320	°F	-
Max. mold temperature	392	°F	-
Min. melt temperature	716	°F	-
Max. melt temperature	752	°F	-