Product Information

# VESTAKEEP® 4000 CF30

## CARBON FIBER-REINFORCED (30%), HIGH VISCOSITY POLYETHER ETHER KETONE



**VESTAKEEP® 4000 CF30** is a carbon fiber reinforced (30%) polyether ether ketone for injection molding.

The semi-crystalline polymer features superior mechanical, thermal, and chemical resistance. Parts made from VESTAKEEP® 4000 CF30 are of low flammability.

VESTAKEEP® 4000 CF30 can be processed by common injection molding machines for thermoplastics.

We recommend a melt temperature between 380°C and 400°C during the injection molding process. The mold temperature should be within a range of 160°C to 200°C, preferably 180°C.

VESTAKEEP® 4000 CF30 is supplied as granules 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 VESTAKEEP® 4000 CF30, please follow the general recommendations in our brochure "VESTAKEEP® PEEK Processing Guidelines."

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

| Mechanical properties ISO | dry | Unit | Test Standard |
|---|---|---|---|
| Tensile Modulus | **23000** | MPa | ISO 527 |
| Tensile Strength | **240** | MPa | ISO 527 |
| Stress at break | **240** | MPa | ISO 527 |
| Strain at break, εB | **2** | % | ISO 527 |
| Charpy impact strength, +23°C | **60** | kJ/m² | ISO 179/1eU |
| Type of failure | **C** | - | - |
| Charpy impact strength, -30°C | **60** | kJ/m² | ISO 179/1eU |
| Type of failure | **C** | - | - |

| | | | |
|---|---|---|---|
| Charpy notched impact strength, +23°C | **10** | kJ/m² | ISO 179/1eA |
| Type of failure | **C** | - | - |
| Charpy notched impact strength, -30°C | **9** | kJ/m² | ISO 179/1eA |
| Type of failure | **C** | - | - |

| **Mechanical properties ASTM** | **dry** | **Unit** | **Test Standard** |
|---|---|---|---|
| tensile modulus, annealed | **23304.2** | MPa | ASTM D 638 |
| Stress at break, 23°C, annealed | **2** | % | ASTM D 638 |
| Strain at break, 23°C, annealed | **248000** | Pa | ASTM D 638 |

| **Thermal properties** | **dry** | **Unit** | **Test Standard** |
|---|---|---|---|
| Melting temperature | **340** | °C | ISO 11357-1/-3 |
| Temp. of deflection under load A, 1.80 MPa | **325** | °C | ISO 75-1/-2 |
| Temp. of deflection under load B, 0.45 MPa | **335** | °C | ISO 75-1/-2 |
| Vicat softening temperature A, 10 N, 50 K/h | **343** | °C | ISO 306 |
| Vicat softening temperature B, 50 N, 50 K/h | **340** | °C | ISO 306 |
| Coeff. of linear therm. expansion, 23°C to 55 °C, parallel | **10** | E-6/K | ISO 11359-1/-2 |

| **Physical properties** | **dry** | **Unit** | **Test Standard** |
|---|---|---|---|
| Water absorption | **0.4** | % | Sim. to ISO 62 |
| Density | **1400** | kg/m³ | ISO 1183 |

| **Burning Behav.** | **dry** | **Unit** | **Test Standard** |
|---|---|---|---|
| Burning behav. at thickness h | **V-0** | class | IEC 60695-11-10 |
| Thickness tested | **0.8** | mm | - |
| Burning behav. at 1.5 mm nom. thickn. | **V-0** | class | IEC 60695-11-10 |
| Thickness tested | **1.6** | mm | - |
| Oxygen index | **47** | % | ISO 4589-1/-2 |
| Glow Wire Flammability Index (GWFI) | **960** | °C | IEC 60695-2-12 |

| | | | |
|---|---|---|---|
| Glow Wire Ignition Temperature (GWIT) | **850** | °C | IEC 60695-2-13 |
| Limiting Oxygen Index | **47** | % | ASTM D 2863 |

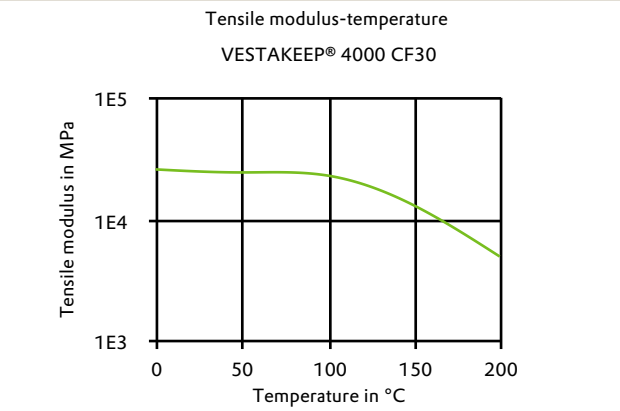
| **Electrical properties** | **dry** | **Unit** | **Test Standard** |
|---|---|---|---|
| Relative permittivity, 1MHz | **17** | - | IEC 62631-2-1 |
| Dissipation factor, 1MHz | **230** | E-4 | IEC 62631-2-1 |
| Volume resistivity, ρV | **10000** | Ohm*m | IEC 62631-3-1 |
| Surface resistivity, σE | **1000000** | Ohm | IEC 62631-3-2 |

| **Rheological properties** | **dry** | **Unit** | **Test Standard** |
|---|---|---|---|
| Melt volume-flow rate, MVR | **20** | $cm^3$/10min | ISO 1133 |
| Temperature | **380** | °C | - |
| Load | **21.6** | kg | - |
| Melt volume-flow rate, MVR | **23.1** | $cm^3$/10min | ISO 1133 |
| Temperature | **400** | °C | - |
| Load | **21.6** | kg | - |
| Molding shrinkage, parallel | **0** | % | ISO 294-4, 2577 |
| Molding shrinkage, normal | **0.4** | % | ISO 294-4, 2577 |

| **Polymer analytics** | **dry** | **Unit** | **Test Standard** |
|---|---|---|---|
| Moisture content | **0.04** | Gew.-% | ISO 15512 |

## Diagrams

### Tensile modulus-temperature




## Characteristics

**Key Feature, Industrial Sector**
Aircraft and Aerospace, Electrical and Electronical, Instustry and Building Construction, Oil and Gas

**Key Feature, Processing**
Injection Molding, Extrusion

**Key Feature, Resistance to**
Heat (Thermal Stability), Fire / Burn

**Key Feature, Additives**
Carbon fibre

**Applications**
Encapsulation

**Features**
General Chemical Resistance

**Color**
Natural Color

**Delivery form**
Pellets, Granules

## 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) |

This information and all technical and other advice are based on Evonik's present knowledge and experience. However, Evonik assumes no liability for such information or advice, including the extent to which such information or advice may relate to third party intellectual property rights. Evonik reserves the right to make any changes to information or advice at any time, without prior or subsequent notice. Evonik disclaims all representations and warranties, whether express or implied, and shall have no liability for, merchantability of the product or its fitness for a particular purpose (even if Evonik is aware of such purpose), or otherwise. EVONIK SHALL NOT BE RESPONSIBLE FOR CONSEQUENTIAL, INDIRECT OR INCIDENTAL DAMAGES (INCLUDING LOSS OF PROFITS) OF ANY KIND. It is the customer's sole responsibility to arrange for inspection and testing of all products by qualified experts. Reference to trade names used by other companies is neither a recommendation nor an endorsement of the corresponding product, and does not imply that similar products could not be used.

® is a registered trademark of Evonik Industries AG or one of its subsidiaries

**Evonik Operations GmbH**
**Smart Materials**
**High Performance Polymers**
45772 Marl / Germany
Tel: +49 2365 49-9878
evonik-hp@evonik.com

www.plastics-database.com