Product Information

# VESTAKEEP® 4000 GF30

## GLASS FIBER-REINFORCED (30%) POLYETHER ETHER KETONE



**VESTAKEEP® 4000 GF30** is a glass 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 GF30 are of low flammability.

VESTAKEEP® 4000 GF30 can be processed on common injection molding machines for thermoplastics.

We recommend a melt temperature of 380°C to 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 GF30 is supplied as cylindrical pellets in 25kg 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 the values.

For guidance processing of VESTAKEEP® 4000 GF30 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 | **11000** | MPa | ISO 527 |
| Tensile Strength | **160** | MPa | ISO 527 |
| Stress at break | **160** | MPa | ISO 527 |
| Strain at break, εB | **2** | % | ISO 527 |
| Charpy impact strength, +23°C | **70** | kJ/m² | ISO 179/1eU |
| Type of failure | **C** | - | - |
| Charpy impact strength, -30°C | **75** | kJ/m² | ISO 179/1eU |
| Type of failure | **C** | - | - |

| | | | |
|---|---|---|---|
| Charpy notched impact strength, +23°C | **11** | 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** | - | - |

| **Thermal properties** | **dry** | **Unit** | **Test Standard** |
|---|---|---|---|
| Melting temperature | **340** | °C | ISO 11357-1/-3 |
| Temp. of deflection under load A, 1.80 MPa | **312** | °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 | **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 | **30** | E-6/K | ISO 11359-1/-2 |

| **Physical properties** | **dry** | **Unit** | **Test Standard** |
|---|---|---|---|
| Water absorption | **0.4** | % | Sim. to ISO 62 |
| Density | **1500** | kg/m³ | ISO 1183 |

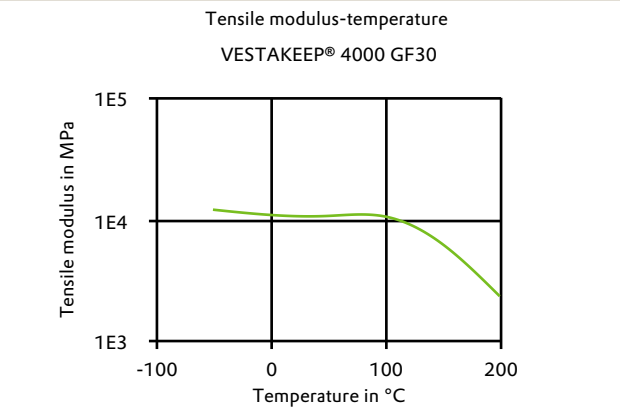
| **Burning Behav.** | **dry** | **Unit** | **Test Standard** |
|---|---|---|---|
| Burnin behav. at thickness h | **V-0** | class | IEC 60695-11-10 |
| Thickness tested | **3.2** | mm | - |
| Burning behav. at 1.5 mm nom. thickn. | **V-0** | class | IEC 60695-11-10 |
| Thickness tested | **1.6** | mm | - |
| Oxygen index | **45** | % | ISO 4589-1/-2 |
| Glow Wire Flammability Index (GWFI) | **960** | °C | IEC 60695-2-12 |
| GWFI - thickness tested (1) | **2** | mm | - |
| Glow Wire Ignition Temperature (GWIT) | **825** | °C | IEC 60695-2-13 |
| GWIT - thickness tested (1) | **2** | mm | - |
| Limiting Oxygen Index | **45** | % | ASTM D 2863 |

| Electrical properties | dry | Unit | Test Standard |
|---|---|---|---|
| Relative permittivity, 1MHz | **3.3** | - | IEC 62631-2-1 |
| Dissipation factor, 1MHz | **40** | E-4 | IEC 62631-2-1 |
| Volume resistivity, ρV | **>1E13** | Ohm*m | IEC 62631-3-1 |
| Surface resistivity, σE | **1E15** | Ohm | IEC 62631-3-2 |
| Surface resistance, RSD | **1E14** | Ohm | IEC 62631-3-2 |
| Electric strength, AC, S20/S20 | **19** | kV/mm | IEC 60243-1 |
| Electric strength, AC, S20/P50 | **16** | kV/mm | Sim. to IEC 60243-1 |
| CTI, test solution A, 50 drops value | **200** | - | IEC 60112 |

| Rheological properties | dry | Unit | Test Standard |
|---|---|---|---|
| Melt volume-flow rate, MVR | **32** | $cm^3$/10min | ISO 1133 |
| Temperature | **400** | °C | - |
| Load | **21.6** | kg | - |
| Melt volume-flow rate, MVR | **2** | $cm^3$/10min | ISO 1133 |
| Temperature | **380** | °C | - |
| Load | **5** | kg | - |
| Molding shrinkage, parallel | **0.3** | % | ISO 294-4, 2577 |
| Molding shrinkage, normal | **0.7** | % | ISO 294-4, 2577 |
| Mold temperature | **180** | °C | - |
| Melt temperature | **380** | °C | - |

## Diagrams

### Tensile modulus-temperature




## Characteristics

**Key Feature, Industrial Sector**
Automotive, 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

**Applications**
Encapsulation

**Special Characteristics**
Low Warpage / Low Shrinkage

**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) |

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