

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.

### 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

| <b>Mechanical properties ISO</b>      | <b>dry</b>   | <b>Unit</b>       | <b>Test Standard</b> |
|---------------------------------------|--------------|-------------------|----------------------|
| Tensile modulus                       | <b>12600</b> | MPa               | ISO 527              |
| Tensile strength                      | <b>145</b>   | MPa               | ISO 527              |
| Stress at break                       | <b>150</b>   | MPa               | ISO 527              |
| Strain at break, B                    | <b>2</b>     | %                 | ISO 527              |
| Charpy impact strength, +23°C         | <b>40</b>    | kJ/m <sup>2</sup> | ISO 179/1eU          |
| Type of failure                       | <b>C</b>     | -                 | -                    |
| Charpy impact strength, -30°C         | <b>40</b>    | kJ/m <sup>2</sup> | ISO 179/1eU          |
| Type of failure                       | <b>C</b>     | -                 | -                    |
| Charpy notched impact strength, +23°C | <b>6</b>     | kJ/m <sup>2</sup> | ISO 179/1eA          |
| Type of failure                       | <b>C</b>     | -                 | -                    |
| Charpy notched impact strength, -30°C | <b>5</b>     | kJ/m <sup>2</sup> | ISO 179/1eA          |
| Type of failure                       | <b>C</b>     | -                 | -                    |

| <b>Thermal properties</b>                                  | <b>dry</b> | <b>Unit</b> | <b>Test Standard</b> |
|--|------------|-------------|----------------------|
| Melting temperature  | <b>340</b> | °C          | ISO 11357-1/-3       |
| Temp. of deflection under load A, 1.80 MPa                 | <b>320</b> | °C          | ISO 75-1/-2          |
| Temp. of deflection under load B, 0.45 MPa                 | <b>337</b> | °C          | ISO 75-1/-2          |
| Vicat softening temperature A, 10 N, 50 K/h                | <b>340</b> | °C          | ISO 306              |
| Vicat softening temperature B, 50 N, 50 K/h                | <b>335</b> | °C          | ISO 306              |
| Coeff. of linear therm. expansion, 23°C to 55 °C, parallel | <b>20</b>  | E-6/K       | ISO 11359-1/-2       |
| Melting Temperature  | <b>340</b> | °C          | ASTM D 3418          |

| <b>Physical properties</b> | <b>dry</b>  | <b>Unit</b>       | <b>Test Standard</b> |
|----------------------------|-------------|-------------------|----------------------|
| Density                    | <b>1450</b> | kg/m <sup>3</sup> | ISO 1183             |
| Water absorption           | <b>0.4</b>  | %                 | Sim. to ISO 62       |
| Density                    | <b>1450</b> | kg/m <sup>3</sup> | ASTM D 792           |

| <b>Burning Behav.</b>                 | <b>dry</b> | <b>Unit</b> | <b>Test Standard</b> |
|---------------------------------------|------------|-------------|----------------------|
| Burning behav. at 1.5 mm nom. thickn. | <b>V-0</b> | class       | IEC 60695-11-10      |
| Thickness tested                      | <b>1.6</b> | mm          | -                    |
| Oxygen index                          | <b>44</b>  | %           | ISO 4589-1/-2        |
| Limiting Oxygen Index                 | <b>44</b>  | %           | ASTM D 2863          |

| <b>Electrical properties</b> | <b>dry</b>     | <b>Unit</b> | <b>Test Standard</b> |
|------------------------------|----------------|-------------|----------------------|
| Volume resistivity, V        | <b>100000</b>  | Ohm*m       | IEC 62631-3-1        |
| Surface resistivity, E       | <b>1000000</b> | Ohm         | IEC 62631-3-2        |
| Relative permittivity, 100Hz | <b>5.9</b>     | -           | IEC 62631-2-1        |
| Relative permittivity, 1MHz  | <b>4.9</b>     | -           | IEC 62631-2-1        |
| Dissipation factor, 100Hz    | <b>700</b>     | E-4         | IEC 62631-2-1        |
| Dissipation factor, 1MHz     | <b>200</b>     | E-4         | IEC 62631-2-1        |

| <b>Rheological properties</b> | <b>dry</b> | <b>Unit</b>            | <b>Test Standard</b> |
|-------------------------------|------------|------------------------|----------------------|
| Melt volume-flow rate, MVR    | <b>20</b>  | cm <sup>3</sup> /10min | ISO 1133             |
| Temperature                   | <b>380</b> | °C                     | -                    |
| Load                          | <b>5</b>   | kg                     | -                    |
| Molding shrinkage, parallel   | <b>0.1</b> | %                      | ISO 294-4, 2577      |
| Molding shrinkage, normal     | <b>0.4</b> | %                      | ISO 294-4, 2577      |

| <b>Test specimen production</b>       | <b>dry</b> | <b>Unit</b> | <b>Test Standard</b> |
|---------------------------------------|------------|-------------|----------------------|
| Injection Molding, melt temperature   | <b>380</b> | °C          | ISO 294              |
| Injection Molding, mold temperature   | <b>180</b> | °C          | ISO 294              |
| Injection Molding, injection velocity | <b>200</b> | mm/s        | ISO 294              |
| Injection Molding, pressure at hold   | <b>120</b> | MPa         | ISO 294              |

## Characteristics

### Applications

Electrical and Electronical

### Special Characteristics

Medium viscosity

## 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 | <b>160</b> | °C   | -             |
| Max. mold temperature | <b>200</b> | °C   | -             |
| Min. melt temperature | <b>380</b> | °C   | -             |
| Max. melt temperature | <b>400</b> | °C   | -             |