

Product Information

**VESTAKEEP® 4000 CC20**

**CERAMIC-FILLED (20%), HIGH VISCOSITY POLYETHER ETHER KETONE**



VESTAKEEP® 4000 CC20 is a ceramic-filled (20%) polyether ether ketone for injection molding and extrusion.

The semi-crystalline polymer features superior mechanical, thermal, and chemical resistance. Parts made from VESTAKEEP® 4000 CC20 are of low flammability.

VESTAKEEP® 4000 CC20 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 in a range of 160°C to 200°C, preferably 180°C.

VESTAKEEP® 4000 CC20 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 the values.

For information about processing of VESTAKEEP® 4000 CC20, 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

**Delivery form**

Pellets, Granules

**Processing**

Injection molding, Extrusion

**Resistance to**

Heat (thermal stability), Fire / burn

**Mechanical properties ISO**

	<b>dry</b>	<b>Unit</b>	<b>Test Standard</b>
Tensile modulus	<b>4300</b>	MPa	ISO 527
Tensile strength	<b>95</b>	MPa	ISO 527
Yield stress	<b>95</b>	MPa	ISO 527

Yield strain	<b>5</b>	%	ISO 527
Stress at break	<b>75</b>	MPa	ISO 527
Nominal strain at break, tB	<b>20</b>	%	ISO 527
Charpy impact strength, +23°C	<b>N</b>	kJ/m <sup>2</sup>	ISO 179/1eU
Charpy notched impact strength, +23°C	<b>7</b>	kJ/m <sup>2</sup>	ISO 179/1eA
Type of failure	<b>C</b>	-	-
Charpy notched impact strength, -30°C	<b>7</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
Glass transition temperature, DSC	<b>153</b>	°C	ISO 11357-1/-2
Temp. of deflection under load A, 1.80 MPa	<b>155</b>	°C	ISO 75-1/-2
Temp. of deflection under load B, 0.45 MPa	<b>210</b>	°C	ISO 75-1/-2
Vicat softening temperature A, 10 N, 50 K/h	<b>335</b>	°C	ISO 306
Vicat softening temperature B, 50 N, 50 K/h	<b>305</b>	°C	ISO 306
Coeff. of linear therm. expansion, 23°C to 55 °C, parallel	<b>45</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>1490</b>	kg/m <sup>3</sup>	ISO 1183
Water absorption	<b>0.4</b>	%	Sim. to ISO 62
Moisture content	<b>0.02</b>	Gew.-%	ISO 15512
Density	<b>1490</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	-

<b>Electrical properties</b>	<b>dry</b>	<b>Unit</b>	<b>Test Standard</b>
Relative permittivity, 1MHz	<b>3.8</b>	-	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>10</b>	cm <sup>3</sup> /10min	ISO 1133
Temperature	<b>380</b>	°C	-
Load	<b>5</b>	kg	-
Molding shrinkage, parallel	<b>0.7</b>	%	ISO 294-4, 2577
Molding shrinkage, normal	<b>1.0</b>	%	ISO 294-4, 2577

<b>Polymer analytics</b>	<b>dry</b>	<b>Unit</b>	<b>Test Standard</b>
Ash content	<b>19.7</b>	%	ISO 3451

<b>Test specimen production</b>	<b>dry</b>	<b>Unit</b>	<b>Test Standard</b>
Injection Molding, melt temperature	<b>385</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

#### Color

Natural color

#### Special Characteristics

Semi-crystalline, High heat resistant, High viscosity

#### 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)

<b>Rheological calculation properties</b>	<b>dry</b>	<b>Unit</b>	<b>Test Standard</b>
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	-