

Product Information

# VESTORAN® 1900 GF20 BK 2.7026

## MODIFIED POLYPHENYLENE ETHER (PPE), HEAT RESISTANT, GLASS FIBER-REINFORCED, SUITABLE FOR PLASTIC/RUBBER COMPOSITES MANUFACTURED BY THE K+K PROCESS

**VESTORAN® 1900GF20 BK 2.7206** is the registered trademark of Evonik Operations GmbH for molding compounds containing poly-2,6-dimethyl-1,4-phenylene ether as polymeric constituent (polyphenylene ether, PPE, also referred to as PPO). As a material of amorphous structure VESTORAN® 1900GF20 shows very small mold shrinkage. Therefore molded parts have a very low tendency to warp.

Moldings of VESTORAN® 1900GF20 are dimensionally stable and hydrolysis resistant even in hot water, but are more sensitive to organic solvents than semi-crystalline plastics. VESTORAN® 1900GF20 is resistant to aqueous alkalines and acids, certain alcohols, and glycol solutions.

Glass fiber reinforcement of this molding material combines outstanding heat deflection temperature under load with high strength and rigidity.

The even smaller shrinkage compared to non-reinforced VESTORAN® depends on the orientation of the glass fibers in the molded parts.

VESTORAN® 1900GF20 is particularly suitable for the adhesion promoter-free manufacturing of plastic/rubber composites by the Evonik Degussa GmbH-patented K&K process ("direct-bonding to rubber").

Compared to VESTORAN® 1900, VESTORAN® 1900GF20 offers higher rigidity and strength.

Colored material contains only cadmium-free pigments.

VESTORAN® 1900GF20 is supplied as cylindrical granules in polyethylene packaging.

Processing advice is given in a separate product information.

### Key Features

**Industrial Sector**

Automotive and Mobility

**Resistance to**

Heat (thermal stability), Hydrolysis / hot water

**Processing**

Injection molding, Extrusion

**Conformity**

Automotive

**Delivery form**

Pellets, Granules

**Additives**

Glass fibers

<b>Mechanical properties ISO</b>	<b>dry</b>	<b>Unit</b>	<b>Test Standard</b>
Tensile modulus	<b>5800</b>	MPa	ISO 527
Tensile strength	<b>110</b>	MPa	ISO 527
Yield stress	<b>110</b>	MPa	ISO 527
Yield strain	<b>2.8</b>	%	ISO 527
Stress at break	<b>106</b>	MPa	ISO 527
Nominal strain at break, tB	<b>3</b>	%	ISO 527
Tensile creep modulus, 0,5% Strain, 1h	<b>5100</b>	MPa	ISO 899-1
Tensile creep modulus, 0,5% Strain, 1000h	<b>2300</b>	MPa	ISO 899-1
Charpy impact strength, +23°C	<b>50</b>	kJ/m <sup>2</sup>	ISO 179/1eU
Type of failure	<b>C</b>	-	-
Charpy notched impact strength, +23°C	<b>12</b>	kJ/m <sup>2</sup>	ISO 179/1eA
Type of failure	<b>C</b>	-	-
Charpy notched impact strengt, -20°C	<b>12</b>	kJ/m <sup>2</sup>	ISO 179/1eA
Type of failure	<b>C</b>	-	-
Tensile-impact strength, notched, atN +23°C	<b>260</b>	kJ/m <sup>2</sup>	ISO 8256/1
Flexural modulus, 23°C	<b>5700</b>	MPa	ISO 178

<b>Thermal properties</b>	<b>dry</b>	<b>Unit</b>	<b>Test Standard</b>
Glass transition temperature, DSC	<b>190</b>	°C	ISO 11357-1/-2
Temp. of deflection under load A, 1.80 MPa	<b>185</b>	°C	ISO 75-1/-2
Temp. of deflection under load B, 0.45 MPa	<b>190</b>	°C	ISO 75-1/-2
Vicat softening temperature A, 10 N, 50 K/h	<b>200</b>	°C	ISO 306
Vicat softening temperature B, 50 N, 50 K/h	<b>193</b>	°C	ISO 306
Coeff. of linear therm. expansion, 23°C to 55 °C, parallel	<b>40</b>	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, 23°C to 55 °C, normal	<b>50</b>	E-6/K	ISO 11359-1/-2

Physical properties	dry	Unit	Test Standard
Density	<b>1190</b>	kg/m <sup>3</sup>	ISO 1183
Water absorption	<b>0.35</b>	%	Sim. to ISO 62
Density	<b>1190</b>	kg/m <sup>3</sup>	ASTM D 792

Burning Behav.	dry	Unit	Test Standard
Burning behav. at 1.5 mm nom. thickn.	<b>HB</b>	class	IEC 60695-11-10
Thickness tested	<b>1.6</b>	mm	-
Burning behav. at thickness h	<b>HB</b>	class	IEC 60695-11-10
Thickness tested	<b>0.8</b>	mm	-
Oxygen index	<b>29</b>	%	ISO 4589-1/-2
Limiting Oxygen Index	<b>29</b>	%	ASTM D 2863

Electrical properties	dry	Unit	Test Standard
Volume resistivity, V	<b>1E11</b>	Ohm*m	IEC 62631-3-1
Surface resistivity, E	<b>1E13</b>	Ohm	IEC 62631-3-2
Surface resistance, RSD	<b>1E13</b>	Ohm	IEC 62631-3-2
Relative permittivity, 100Hz	<b>2.9</b>	-	IEC 62631-2-1
Relative permittivity, 1MHz	<b>2.7</b>	-	IEC 62631-2-1
Dissipation factor, 100Hz	<b>8</b>	E-4	IEC 62631-2-1
Dissipation factor, 1MHz	<b>180</b>	E-4	IEC 62631-2-1
Dielectric strength, AC, S20/P50	<b>33</b>	kV/mm	Sim. to IEC 60243-1
CTI, test solution A, 50 drops value	<b>175</b>	-	IEC 60112
Assessment of the insulation group	<b>III a</b>	-	DIN EN 60664-1

Rheological properties	dry	Unit	Test Standard
Melt volume-flow rate, MVR	<b>24</b>	cm <sup>3</sup> /10min	ISO 1133
Temperature	<b>300</b>	°C	-
Load	<b>21.6</b>	kg	-

Molding shrinkage, parallel	<b>0.5</b>	%	ISO 294-4, 2577
Molding shrinkage, normal	<b>0.6</b>	%	ISO 294-4, 2577
Mold temperature	<b>80</b>	°C	-
Melt temperature	<b>320</b>	°C	-

Test specimen production	dry	Unit	Test Standard
Injection Molding, melt temperature	<b>320</b>	°C	ISO 294
Injection Molding, mold temperature	<b>80</b>	°C	ISO 294
Injection Molding, injection velocity	<b>200</b>	mm/s	ISO 294

### Characteristics

#### Processing

Profile extrusion, Sheet extrusion, K&K process

#### Color

Black

#### Special Characteristics

Amorphous, High heat resistant, Low warpage / Low shrinkage

#### Chemical Resistance

Acid resistance, Alkali 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)

#### 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**

✘ Toluene (23°C)

**Ketones**

✘ Acetone (23°C)

**Mineral oils**

- ✘ SAE 10W40 multigrade motor oil (130°C)
- ✘ SAE 80/90 hypoid-gear oil (130°C)
- ✘ Motor oil OS206 304 Ref.Eng.Oil, ISP (135°C)
- ✘ Automatic hypoid-gear oil Shell Donax TX (135°C)
- ✘ Hydraulic oil Pentosin CHF 202 (125°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)

**Other**

- ✘ DOT No. 4 Brake fluid (130°C)
- ✘ DOT No. 4 Brake fluid (120°C)
- ✓ Water (23°C)
- ✓ Deionized water (90°C)

<b>Rheological calculation properties</b>	<b>dry</b>	<b>Unit</b>	<b>Test Standard</b>
Density of melt	<b>1020</b>	kg/m <sup>3</sup>	-
Thermal conductivity of melt	<b>0.23</b>	W/(m K)	-
Spec. heat capacity of melt	<b>1690</b>	J/(kg K)	-
Min. mold temperature	<b>70</b>	°C	-
Max. mold temperature	<b>120</b>	°C	-
Min. melt temperature	<b>280</b>	°C	-
Max. melt temperature	<b>320</b>	°C	-