

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

Processing

Injection molding, Extrusion

Delivery form

Pellets, Granules

Resistance to

Heat (thermal stability), Hydrolysis / hot water

Conformity

Automotive

Additives

Glass fibers

Mechanical properties ISO	dry	Unit	Test Standard
Tensile modulus	841000	psi	ISO 527
Tensile strength	16000	psi	ISO 527
Yield stress	16000	psi	ISO 527
Yield strain	2.8	%	ISO 527
Stress at break	15400	psi	ISO 527
Nominal strain at break, tB	3	%	ISO 527
Tensile creep modulus, 0,5% Strain, 1h	740000	psi	ISO 899-1
Tensile creep modulus, 0,5% Strain, 1000h	334000	psi	ISO 899-1
Charpy impact strength, +23°C	23.8	ftlb/in ²	ISO 179/1eU
Type of failure	C	-	-
Charpy notched impact strength, +23°C	5.71	ftlb/in ²	ISO 179/1eA
Type of failure	C	-	-
Charpy notched impact strengt, -20°C	5.71	ftlb/in ²	ISO 179/1eA
Type of failure	C	-	-
Tensile-impact strength, notched, atN +23°C	124	ftlb/in ²	ISO 8256/1
Flexural modulus, 23°C	827000	psi	ISO 178

Thermal properties	dry	Unit	Test Standard
Glass transition temperature, DSC	374	°F	ISO 11357-1/-2
Temp. of deflection under load A, 1.80 MPa	365	°F	ISO 75-1/-2
Temp. of deflection under load B, 0.45 MPa	374	°F	ISO 75-1/-2
Vicat softening temperature A, 10 N, 50 K/h	392	°F	ISO 306
Vicat softening temperature B, 50 N, 50 K/h	379	°F	ISO 306
Coeff. of linear therm. expansion, 23°C to 55 °C, parallel	2.22E-5	in/in/°F	ISO 11359-1/-2
Coeff. of linear therm. expansion, 23°C to 55 °C, normal	2.78E-5	in/in/°F	ISO 11359-1/-2

Physical properties	dry	Unit	Test Standard
Density	1.19	g/cm ³	ISO 1183
Water absorption	0.35	%	Sim. to ISO 62
Density	1.19	g/cm ³	ASTM D 792

Burning Behav.	dry	Unit	Test Standard
Burning behav. at 1.5 mm nom. thickn.	HB	class	IEC 60695-11-10
Thickness tested	0.0630	in	-
Burning behav. at thickness h	HB	class	IEC 60695-11-10
Thickness tested	0.0315	in	-
Oxygen index	29	%	ISO 4589-1/-2
Limiting Oxygen Index	29	%	ASTM D 2863

Electrical properties	dry	Unit	Test Standard
Volume resistivity, V	1E11	Ohm*m	IEC 62631-3-1
Surface resistivity, E	1E13	Ohm	IEC 62631-3-2
Surface resistance, RSD	1E13	Ohm	IEC 62631-3-2
Relative permittivity, 100Hz	2.9	-	IEC 62631-2-1
Relative permittivity, 1MHz	2.7	-	IEC 62631-2-1
Dissipation factor, 100Hz	8	E-4	IEC 62631-2-1
Dissipation factor, 1MHz	180	E-4	IEC 62631-2-1
Dielectric strength, AC, S20/P50	838	V/mil	Sim. to IEC 60243-1
CTI, test solution A, 50 drops value	175	-	IEC 60112
Assessment of the insulation group	III a	-	DIN EN 60664-1

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

Molding shrinkage, parallel	0.5	%	ISO 294-4, 2577
Molding shrinkage, normal	0.6	%	ISO 294-4, 2577
Mold temperature	176	°F	-
Melt temperature	608	°F	-

Test specimen production	dry	Unit	Test Standard
Injection Molding, melt temperature	608	°F	ISO 294
Injection Molding, mold temperature	176	°F	ISO 294
Injection Molding, injection velocity	7.87	in/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)

Rheological calculation properties	dry	Unit	Test Standard
Density of melt	63.7	lb/ft ³	-
Thermal conductivity of melt	1.6	BTU in/(hr ft ² °F)	-
Spec. heat capacity of melt	0.635	BTU/(lb-F)	-
Min. mold temperature	158	°F	-
Max. mold temperature	248	°F	-
Min. melt temperature	536	°F	-
Max. melt temperature	608	°F	-