Product Information

VESTAKEEP® L 4000 G

HIGH VISCOSITY, UNREINFORCED POLYETHER ETHER KETONE



VESTAKEEP® L 4000 G is a high viscosity, unreinforced lubricated polyether ether ketone for injection molding and extrusion.

The semi-crystalline polymer features superior, thermal and chemical resistance. Parts made from VESTAKEEP® L4000G are of low flammability.

VESTAKEEP® L 4000 G can be processed by common machines for thermoplastics.

The additional lubrication agent improves the feeding process.

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.

VESTAKEEP® L 4000 G is supplied as granules 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 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	**3600**	MPa	ISO 527
Tensile Strength	**96**	MPa	ISO 527
Yield stress	**94**	MPa	ISO 527
Yield strain	**5**	%	ISO 527
Nominal strain at break, εtB	**30**	%	ISO 527
Charpy impact strength, +23°C	**N**	kJ/m²	ISO 179/1eU
Charpy impact strength, -30°C	**N**	kJ/m²	ISO 179/1eU
Charpy notched impact strength, +23°C	**7**	kJ/m²	ISO 179/1eA

EVONIK Leading Beyond Chemistry

Type of failure	**C**	-	-
Charpy notched impact strength, -30°C	**6**	kJ/m²	ISO 179/1eA
Type of failure	**C**	-	-
Flexural modulus, 23°C	**3450**	MPa	ISO 178
Flexural stress at conv. deflection, 23°C	**114**	MPa	ISO 178
Flexural strain at flexural strength, 23°C	**7**	%	ISO 178
Flexural stress at break, 23°C	**N**	MPa	ISO 178
Flexural strain at break, 23°C	**N**	%	ISO 178

Mechanical properties ASTM	**dry**	**Unit**	**Test Standard**
Tensile Modulus, var. test speed	**4070**	MPa	ASTM D 638
Yield stress, var. test speed	**96.5**	MPa	ASTM D 638
Yield strain, var. test speed	**6.5**	%	ASTM D 638
Stress at break, var. test speed	**89.6**	MPa	ASTM D 638
Nominal strain at break, var. test speed	**75**	%	ASTM D 638
tensile modulus, annealed	**4067.9**	MPa	ASTM D 638
Yield stress, 23°C, annealed	**100**	MPa	ASTM D 638
Yield strain, 23°C, annealed	**6.4**	%	ASTM D 638
Nominal strain at break, 23°C, annealed	**40**	%	ASTM D 638
Flexural Modulus, 23°C, annealed	**3690**	MPa	ASTM D 790
Flexural strength, 23°C, annealed	**179**	MPa	ASTM D 790
Flexural stress at 5% fiber strain, 23°C, annealed	**165**	MPa	ASTM D 790

Thermal properties	**dry**	**Unit**	**Test Standard**
Melting temperature	**340**	°C	ISO 11357-1/-3
Temp. of deflection under load A, 1.80 MPa	**155**	°C	ISO 75-1/-2
Temp. of deflection under load B, 0.45 MPa	**205**	°C	ISO 75-1/-2
Vicat softening temperature A, 10 N, 50 K/h	**335**	°C	ISO 306

Vicat softening temperature B, 50 N, 50 K/h	**305**	°C	ISO 306
Coeff. of linear therm. expansion, 23°C to 55 °C, parallel	**60**	E-6/K	ISO 11359-1/-2

Physical properties	**dry**	**Unit**	**Test Standard**
Water absorption	**0.5**	%	Sim. to ISO 62
Density	**1300**	kg/m³	ISO 1183
Shore D hardness, 1s, annealed	**87**	-	ASTM D 2240

Burning Behav.	**dry**	**Unit**	**Test Standard**
Burnin behav. at thickness h	**V-0**	class	IEC 60695-11-10
Thickness tested	**3.2**	mm	-
YellowCard available	yes	-	-
Burning behav. at 1.5 mm nom. thickn.	**V-0**	class	IEC 60695-11-10
Thickness tested	**1.6**	mm	-
Yellow Card available	yes	-	-
Oxygen index	**38**	%	ISO 4589-1/-2
Limiting Oxygen Index	**38**	%	ASTM D 2863

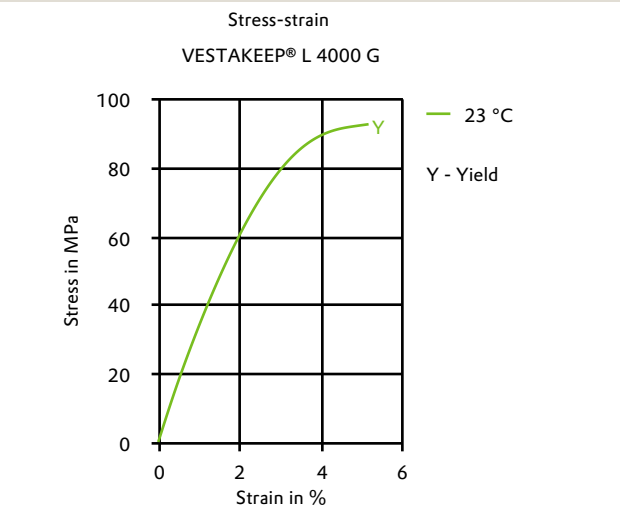
Electrical properties	**dry**	**Unit**	**Test Standard**
Relative permittivity, 100Hz	**2.8**	-	IEC 62631-2-1
Relative permittivity, 1MHz	**2.8**	-	IEC 62631-2-1
Dissipation factor, 1MHz	**50**	E-4	IEC 62631-2-1
Volume resistivity, ρV	**>1E13**	Ohm*m	IEC 62631-3-1
Surface resistivity, σE	**1E15**	Ohm	IEC 62631-3-2
CTI, test solution A, 50 drops value	**200**	-	IEC 60112

Rheological properties	**dry**	**Unit**	**Test Standard**
Melt volume-flow rate, MVR	**12**	cm³/10min	ISO 1133
Temperature	**380**	°C	-

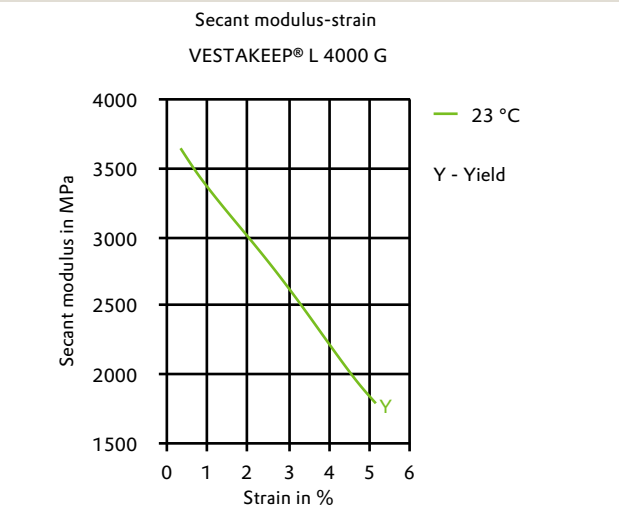
Load	**5**	kg	-
Molding shrinkage, parallel	**0.9**	%	ISO 294-4, 2577
Molding shrinkage, normal	**1.1**	%	ISO 294-4, 2577

Diagrams

Stress-strain



Secant modulus-strain



Characteristics

Key Feature, Industrial Sector
Automotive, Electrical and Electronical, Oil and Gas

Key Feature, Processing
Injection Molding, Extrusion

Key Feature, Certificate / Licence
Food contact

Processing
Film Extrusion, Profile Extrusion

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 (38% 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
Thermal conductivity of melt	**0.18**	W/(m K)	-
Spec. heat capacity of melt	**2110**	J/(kg K)	-

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Evonik Operations GmbH
Smart Materials
High Performance Polymers
45772 Marl / Germany
Tel: +49 2365 49-9878
evonik-hp@evonik.com

www.plastics-database.com