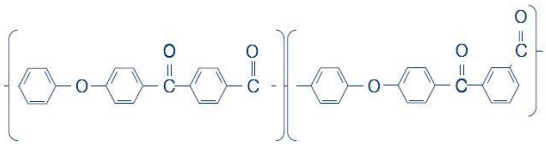
KEPSTAN®



Technical Data – KEPSTAN® 7000 Series

PRODUCT DESCRIPTION

KEPSTAN® is a high-performance thermoplastic material, based on *PolyEtherKetoneKetone* (PEKK) highly stable chemical backbone. Its semi crystalline structure in solid state offers an outstanding combination of mechanical and thermal strength together with chemical and fire resistance.

Among the KEPSTAN® family, the 7000 Series benefits uniquely from PEKK crystalline capabilities while reducing significantly processing temperatures compared to the more crystalline 8000 Series. With a lower melting temperature and a Tg still above 160°C, the KEPSTAN® 7000 Series resins are very valued in all processes where a delayed or slower crystallization is key to ease thermoforming, to improve interlayer adhesion and to reduce internal stresses. They are for instance highly enabling in the field of continuous fiber composites for structural applications, and in filament additive manufacturing technologies with or without continuous fibers.

KEPSTAN® 7000 Series includes a very low flow grade, KEPSTAN® 7001, a medium flow grade, KEPSTAN® 7002, and a high flow grade, KEPSTAN® 7003, all unfilled PEKK resins designed to meet the requirements of a broad range of melt processing technologies, including among others extrusion, thermoforming, injection molding, fiber impregnation, composite consolidation and forming technologies, filament additive manufacturing.

KEPSTAN® is available in pellet form as well as in flake and in powder form with different particle sizes.
Standard packaging includes 20 kg boxes for pellets and 10 kg boxes for powders.

MATERIAL PROPERTIES

	Conditions	Test method	Unit	Typical Value		
Grades				**7001**	**7002**	**7003**
Flow level				**Very Low**	**Medium**	**High**
General						
Density	23°C	ISO 1183	g/cm³	1.29	1.29	1.29
Color	-	-	-	Grey Beige	Grey Beige	Grey Beige
Water absorption	23°C, RH50%, equilibrium	ISO 62	%	0.4	0.4	0.4
	23°C, RH50%, 24 h, 2 mm		%	0.05	0.05	0.05
	23°C, immersion, equilibrium		%	0.7	0.7	0.7
	23°C, immersion, 24 h, 2 mm		%	0.11	0.11	0.11
Melt volume flow rate	380°C / 5 kg	ISO 1133	cm³/10min	7	-	-
	380°C / 1 kg		cm³/10min	-	6	12
Thermal						
Melting point	20°C/min, 2nd heating	DSC	°C	325	336	336
Glass transition	20°C/min		°C	162	162	162
Specific heat capacity	23°C		J/g/K	1.02	1.02	1.02
Heat deflection temperature	1.8 MPa	ISO 75f	°C	160	164	164
	0.45 MPa		°C	Tbd	Tbd	Tbd
Coefficient of thermal expansion	Average, -100°C to Tg	DMA, tension	µm/m/K	24	24	24
	Average, Tg to 300°C		µm/m/K	230	230	230
Mechanical						
Tensile modulus	23°C, 1 mm/min	ISO 527-1BA	GPa	3.7	3.9	4.0
Tensile strength (yield point)			MPa	110	114	100 - 120
Elongation at yield	23°C, 25 mm/min	ISO 527-1BA	%	5.6	5.5	n/a
Elongation at break			%	>20	>15	3 - 10
Tensile strength (yield point) at HT	125°C, 25 mm/min	ISO 527-1BA	MPa	61	Tbd	Tbd
Elongation at break at HT	125°C and above, 25 mm/min	ISO 527-1BA	%	> 100	Tbd	Tbd
Compression modulus	23°C, 1 mm/min	ISO 604	GPa	3.7	3.8	3.8
Compression strength	23°C, 5 mm/min	ISO 604	MPa	145	149	Tbd

Flexural modulus	23°C	ISO 178-93	GPa	3.8	3.9	Tbd
Flexural strength (max)	23°C		MPa	160	168	Tbd
Charpy impact strength – Unnotched	23°C	ISO 179/1eU	kJ/m²	62	62	22
	- 30°C		kJ/m²	41	41	18
Charpy impact strength – Notched	23°C	ISO 179/1eA	kJ/m²	6	5	4.5
	- 30°C		kJ/m²	6	5.5	5

All data measured on injection molded specimens, without further annealing or tempering.

Fire

Flammability rating	-	UL 94	-	V-0 @ 0.8mm	V-0 @ 0.8 mm	V-0 @ 0.8 mm
Limiting Oxygen Index	3.2 mm	ISO 4589-2	%O2	38	38	38

Electrical

Dielectric strength	100 µm thickness	IEC 60243-1	kV/mm	84	84	84
Relative permittivity	23°C – 1 MHz	IEC 60250	-	3.0	3.0	3.0
Loss tangent	23°C – 1 kHz	IEC 60250	-	0.002	0.002	0.002
Volume resistivity	23°C	ASTM D257	Ohm.cm	10^{16}	10^{16}	10^{16}
Surface resistivity	23°C	ASTM D257	Ohm	10^{16}	10^{16}	10^{16}

Recommended processing conditions

Drying temperature and time	150°C during 3 to 4 hours, or 120°C during 6 to 8 hours
Processing temperature	340 – 360°C
Temperature settings - Injection	Rear 320°C / Centre 340°C / Front 350°C / Nozzle 360°C
Mold temperature	230 to 250°C, to facilitate skin and core crystallization
Temperature settings - Extrusion	Zones 1/2/3/4 : 290°C/ 320°C/ 350°C / 340°C/ Die : 340°C

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