LARPEEK 10

Product made of Polyetheretherketone (PEEK). Unfilled. Intrinsically flame retardant. Very good chemical resistance. Very good thermal properties. Low smoke density and low toxicity index. PFAS-free product.

Versions of product mentioned herein are suitable for applications in contact with foodstuffs or for toy manufacturing. Nevertheless, manufactured parts have to be verified according to the specific directives.

Versions of product mentioned herein may support applications in the pharmaceutical, medical or dental sector. Nevertheless, manufactured parts have to be verified according to the specific directives.

Material properties are obtained by tests based on same standards used for injection moulded samples.

PHYSICAL PROPERTIES	STANDARD	VALUE	MEASURE UNITS
Density	ISO 1183	**1.30**	g/cm³
Linear shrinkage at moulding			
Longitudinal (2.0mm/60MPa)	ISO 294-4	**0.80 ÷ 1.20**	%
Transversal (2.0mm/60MPa)	ISO 294-4	**0.90 ÷ 1.30**	%
Dimensional stability	---	**85**	
Moisture absorption			
equilibrium, in air	ISO 62-4	**0.10**	%
MECHANICAL PROPERTIES	**STANDARD**	**VALUE**	**MEASURE UNITS**
CHARPY impact strength			
Unnotched, at 23°C	ISO 179-1eU	**NB**	kJ/m²
Notched, at 23°C	ISO 179-1eA	**6.0**	kJ/m²
MECHANICAL PROPERTIES	**STANDARD**	**VALUE**	**MEASURE UNITS**
Tensile elongation			
At yield (5 mm/min), 23°C	ISO 527	**5.5**	%
At yield (5 mm/min), 60°C	ISO 527	**4.4**	%
At yield (5 mm/min), 90°C	ISO 527	**3.9**	%
At yield (5 mm/min), 120°C	ISO 527	**3.0**	%
At yield (5 mm/min), 150°C	ISO 527	**2.0**	%
At break (5 mm/min), 23°C	ISO 527	**20.0**	%
At break (5 mm/min), 60°C	ISO 527	**>50**	%
At break (5 mm/min), 90°C	ISO 527	**>50**	%
At break (5 mm/min), 120°C	ISO 527	**>50**	%
At break (5 mm/min), 150°C	ISO 527	**>50**	%
Tensile strength			
At yield (5 mm/min), 23°C	ISO 527	**95**	MPa
At yield (5 mm/min), 60°C	ISO 527	**80**	MPa
At yield (5 mm/min), 90°C	ISO 527	**60**	MPa
At yield (5 mm/min), 120°C	ISO 527	**50**	MPa
At yield (5 mm/min), 150°C	ISO 527	**35**	MPa
At break (5 mm/min), 23°C	ISO 527	**75**	MPa
At break (5 mm/min), 60°C	ISO 527	**65**	MPa
At break (5 mm/min), 90°C	ISO 527	**NB**	MPa
At break (5 mm/min), 120°C	ISO 527	**NB**	MPa
At break (5 mm/min), 150°C	ISO 527	**NB**	MPa

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MECHANICAL PROPERTIES	STANDARD	VALUE	MEASURE UNITS
Elastic modulus			
Tensile (1 mm/min), 23°C	ISO 527	**3500**	MPa
Tensile (1 mm/min), 60°C	ISO 527	**3300**	MPa
Tensile (1 mm/min), 90°C	ISO 527	**3200**	MPa
Tensile (1 mm/min), 120°C	ISO 527	**3100**	MPa
Tensile (1 mm/min), 150°C	ISO 527	**2300**	MPa
THERMAL PROPERTIES	**STANDARD**	**VALUE**	**MEASURE UNITS**
Coefficient of linear thermal expansion (CLTE)			
30°C to 100°C (longitudinal)	ISO 11359	**45**	$\times 10^{-6}$ K^{-1}
30°C to 100°C (transversal)	ISO 11359	**50**	$\times 10^{-6}$ K^{-1}
VICAT - Softening point			
50 N (heating rate 120°C/h)	ISO 306	**280**	°C
HDT - Heat Deflection Temperature			
0.45 MPa	ISO 75	**205**	°C
1.81 MPa	ISO 75	**155**	°C
Thermal conductivity			
in plane	ASTM E 1461-92	**0.3**	W/(m·K)
through plane	ASTM E 1461-92	**0.3**	W/(m·K)
FLAMMABILITY	**STANDARD**	**VALUE**	**MEASURE UNITS**
Oxygen Index	ASTM D 2863	**35**	%
Flammability rating			
3 mm thickness	UL 94	**V-0**	
1.5 mm thickness	UL 94	**V-0**	
GWFI - Glow Wire Flammability Index			
2 mm thickness	IEC 60695-2-12	**960**	°C
GWIT - Glow Wire Ignition Test			
2 mm thickness	IEC 60695-2-13	**825**	°C
ELECTRICAL PROPERTIES	**STANDARD**	**VALUE**	**MEASURE UNITS**
CTI - Comparative Tracking Index			
solution A (without surfactant)	IEC 60112	**175**	V
Electrical resistivity			
surface, dry	IEC 62631	**1E12**	ohm
Dielectric strength (short period)			
2 mm thickness, 23°C, dry	ASTM D 149	**22**	kV/mm
TRIBOLOGICAL PROPERTIES	**STANDARD**	**VALUE**	**MEASURE UNITS**
Wear Factor (speed 0.126 m/s, load 10N, path length 13.6km)	LATI (ISO 7148-2)	**160**	10^{-8}(mm^3/N m)
Friction Coefficient (speed 0.126 m/s, load 10N)			
static	LATI (ISO 7148-2)	**0.32**	
dynamic	LATI (ISO 7148-2)	**0.26**	

STORAGE

Best storage conditions of sealed, undamaged packages are cool environmental temperature and dry storage facilities able to protect from weather and accidental damage.

HANDLING AND SAFETY

Detailed information about a safe treatment of the material are indicated in the "Material Safety Data Sheet" (MSDS) furnished with the first material supply. The MSDS may be also sent again in case of loss.

PREDRYING CONDITIONS (Hot-air dryer)

Predrying needed. Predrying conditions are: at least 3 hours at 150 ÷ 160°C. Increase time in case of wet material. Maximum suggested moisture content: 0.05%. Use of desiccant dryers or vacuum ovens allows a reduction in drying time.

BARREL TEMPERATURE PROFILE

Suggested barrel temperature profile (zone 1 - zone 2 - zone 3 - nozzle): 350-360-370-380°C.

RESIDENCE TIME

Maximum allowable residence time: 30 minutes. Do not exceed this limit. Maximum number of complete shots (in the barrel) suggested: 2 ÷ 5

MELT TEMPERATURE

Suggested range of melt temperature: 360 ÷ 390°C. On small machines, running short cycles, it is possible to use higher melt temperatures to improve plastification, fluidity and surface appearance, paying attention to any indication of material degradation.

MOULD TEMPERATURE

Suggested range of mould temperature: 160 ÷ 200°C. This can be significantly different from the tool settings, due to the cooling system efficiency and the accuracy of the temperature control on the tool. If moulding temperature is lower than suggested, part annealing may be necessary.

INJECTION SPEED

Advisable injection speed: medium to high. Best results are achieved by using an injection profile.

TANGENTIAL SCREW VELOCITY (V)

Maximum suggested tangential velocity (V): 0.1 ÷ 0.2 m/s. The maximum rotational speed (in rpm) may be calculated by means of the following equation: rpm = V/d*19100, where d is the screw diameter (mm).

INJECTION PRESSURE

Maximum advisable injection pressure at nozzle: 50 ÷ 90 MPa. Please, check on manual of injection moulding machine the ratio between specific pressure (at nozzle) and hydraulic pressure (of oil).

PACKING PRESSURE

Typical suggested packing pressure (at nozzle): 60 ÷ 90% of injection pressure.

CUSHION

Minimum suggested cushion: 3 ÷ 5 mm.

BACK PRESSURE

Suggested backpressure: 20 ÷ 80 bar (hydraulic pressure).

REGRIND USAGE

Maximum suggested regrind percentage: 15%. In-loop regrind is suggested. Regrind must be dried.

HOT RUNNER MOULDS

Hot runner moulds can be used when a very tight temperature control is assured.

VALVE GATES / SMALL GATES

Valve gates or small injection gates can be used.

EQUIPMENT WEAR AND CORROSION

Usually, critical processing conditions (high injection rate, high back pressure and high screw rotating speed, etc.) and/or disadvantageous geometric conditions (low wall thickness, low diameters, sharp fillet radius, etc.) generate wear on equipment. Wear increases in case of filled materials (particularly fibres filled ones). Appropriate surface treatments of equipment are suggested in these cases, as well as a proper venting to avoid material overheating. Steel types containing a high chrome percentage (Cr > 13%) or a specific surface treatment (e.g. Chrome or Nickel electroplating) are suggested. Standard steel can be used to make the mould.

Check the proper "Moulding guide" for further details.

APPROVALS

Please, check our site or contact LATI for details.

CONTACTS

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