

LAPEX R

Product made of Polyphenylsulphone (PPSU). Unfilled. Intrinsically flame retardant. 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.

PHYSICAL PROPERTIES	STANDARD	VALUE MEASURE UNITS
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Density	ISO 1183	1.30 g/cm ³
Linear shrinkage at moulding		
Longitudinal (2.0mm/60MPa)	ISO 294-4	0.80 ÷ 1.00 %
Transversal (2.0mm/60MPa)	ISO 294-4	0.85 ÷ 1.05 %
Dimensional stability	---	80
Moisture absorption		
saturation, in air	ISO 62-4	0.50 %
at saturation, in water	ISO 62-4	1.20 %
Melt Flow Index (MFI) - 400°C/2.16kg	ASTM D 1238	16.00 g/10'

MECHANICAL PROPERTIES	STANDARD	VALUE MEASURE UNITS
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CHARPY impact strength		
Unnotched, at 23°C	ISO 179-1eU	NB kJ/m ²
Notched, at 23°C	ISO 179-1eA	70.0 kJ/m ²

MECHANICAL PROPERTIES	STANDARD	VALUE MEASURE UNITS
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Tensile elongation		
At yield (5 mm/min), 23°C	ISO 527	7.8 %
At yield (5 mm/min), 60°C	ISO 527	6.9 %
At yield (5 mm/min), 90°C	ISO 527	6.1 %
At yield (5 mm/min), 120°C	ISO 527	5.5 %
At yield (5 mm/min), 150°C	ISO 527	5.0 %
At break (5 mm/min), 23°C	ISO 527	>50 %
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	70 MPa
At yield (5 mm/min), 60°C	ISO 527	65 MPa
At yield (5 mm/min), 90°C	ISO 527	55 MPa
At yield (5 mm/min), 120°C	ISO 527	50 MPa
At yield (5 mm/min), 150°C	ISO 527	40 MPa
At break (5 mm/min), 23°C	ISO 527	NB MPa
At break (5 mm/min), 60°C	ISO 527	NB 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	2400 MPa
Tensile (1 mm/min), 60°C	ISO 527	2000 MPa
Tensile (1 mm/min), 90°C	ISO 527	1900 MPa
Tensile (1 mm/min), 120°C	ISO 527	1700 MPa
Tensile (1 mm/min), 150°C	ISO 527	1500 MPa
THERMAL PROPERTIES		
Coefficient of linear thermal expansion (CLTE)		
30°C to 100°C (longitudinal)	ISO 11359	55 × 10 ⁻⁶ K ⁻¹
30°C to 100°C (transversal)	ISO 11359	50 × 10 ⁻⁶ K ⁻¹
VICAT - Softening point		
50 N (heating rate 120°C/h)	ISO 306	215 °C
HDT - Heat Deflection Temperature		
0.45 MPa	ISO 75	210 °C
1.81 MPa	ISO 75	195 °C
Thermal conductivity		
in plane	ASTM E 1461-92	0.2 W/(m·K)
through plane	ASTM E 1461-92	0.2 W/(m·K)
FLAMMABILITY		
Oxygen Index		
	ASTM D 2863	39 %
Flammability rating		
3 mm thickness	UL 94	V-0
1.5 mm thickness	UL 94	V-0
ELECTRICAL PROPERTIES		
CTI - Comparative Tracking Index		
solution A (without surfactant)	IEC 60112	65 V
Electrical resistivity		
surface, dry	ASTM D 257 / ASTM D4496	1E12 ohm
Dielectric strength (short period)		
2 mm thickness, 23°C, dry	ASTM D 149	25 kV/mm

STORAGE

Best storage conditions of sealed, undamaged packages are warm environmental temperature in 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 130 ÷ 170°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): 330-350-370-370°C.

RESIDENCE TIME

Maximum allowable residence time: 15 minutes. Do not exceed this limit. Maximum number of complete shots (in the barrel) suggested: 3.

MELT TEMPERATURE

Suggested range of melt temperature: 345 ÷ 375°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: 140 ÷ 175°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: low to medium. Best results are achieved by using an injection profile.

TANGENTIAL SCREW VELOCITY (V)

Maximum suggested tangential velocity (V): 0.2 ÷ 0.3 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: 100 ÷ 200 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): 50 ÷ 90% of injection pressure.

CUSHION

Minimum suggested cushion: 3 ÷ 6 mm.

BACK PRESSURE

Suggested backpressure: 3 ÷ 5 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. It is advisable to use a wear-resistant steel to make the mould.

Check the proper "Moulding guide" for further details.

APPROVALS

Please, check our site or contact LATI for details.

CONTACTS

LATI Industria Termoplastici S.p.A.