

LARAMID G/60

Compound based on Semi-aromatic polyamide (PPA). Glass fibres. 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.

The products mentioned herein are not suitable for applications in the pharmaceutical, medical or dental sector.

PHYSICAL PROPERTIES

	STANDARD	VALUE MEASURE UNITS
Density	ISO 1183	1.78 g/cm ³
Linear shrinkage at moulding		
Longitudinal (2.0mm/60MPa)	ISO 294-4	0.15 ÷ 0.40 %
Transversal (2.0mm/60MPa)	ISO 294-4	0.55 ÷ 0.75 %
Dimensional stability	---	64
Moisture absorption		
saturation, in air	ISO 62-4	0.70 %

MECHANICAL PROPERTIES

	STANDARD	VALUE MEASURE UNITS
CHARPY impact strength		
Unnotched, at 23°C	ISO 179-1eU	70.0 kJ/m ²
Notched, at 23°C	ISO 179-1eA	15.0 kJ/m ²

MECHANICAL PROPERTIES

	STANDARD	VALUE MEASURE UNITS
Tensile elongation		
At break (5 mm/min), 23°C	ISO 527	1.8 %
At break (5 mm/min), 60°C	ISO 527	1.9 %
At break (5 mm/min), 90°C	ISO 527	2.2 %
At break (5 mm/min), 120°C	ISO 527	3.3 %
At break (5 mm/min), 150°C	ISO 527	5.0 %
Tensile strength		
At break (5 mm/min), 23°C	ISO 527	275 MPa
At break (5 mm/min), 60°C	ISO 527	240 MPa
At break (5 mm/min), 90°C	ISO 527	215 MPa
At break (5 mm/min), 120°C	ISO 527	165 MPa
At break (5 mm/min), 150°C	ISO 527	100 MPa
Elastic modulus		
Tensile (1 mm/min), 23°C	ISO 527	24000 MPa
Tensile (1 mm/min), 60°C	ISO 527	19600 MPa
Tensile (1 mm/min), 90°C	ISO 527	18400 MPa
Tensile (1 mm/min), 120°C	ISO 527	13000 MPa
Tensile (1 mm/min), 150°C	ISO 527	7000 MPa

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THERMAL PROPERTIES	STANDARD	VALUE MEASURE UNITS
Coefficient of linear thermal expansion (CLTE)		
30°C to 100°C (longitudinal)	ISO 11359	15 × 10 ⁻⁶ K ⁻¹
30°C to 100°C (transversal)	ISO 11359	30 × 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	305 °C
1.81 MPa	ISO 75	280 °C
FLAMMABILITY	STANDARD	VALUE MEASURE UNITS
Oxygen Index	ASTM D 2863	42 %
Flammability rating		
3 mm thickness	UL 94	HB
1.5 mm thickness	UL 94	HB
0.75 mm thickness	UL 94	HB
GWFI - Glow Wire Flammability Index		
1 mm thickness	IEC 60695-2-12	750 °C
ELECTRICAL PROPERTIES	STANDARD	VALUE MEASURE UNITS
CTI - Comparative Tracking Index		
solution A (without surfactant)	IEC 60112	600 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. PAY ATTENTION! Material is prone to absorb moisture.

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 4 hours at $120 \div 130^{\circ}\text{C}$. Increase time in case of wet material. Maximum suggested moisture content: 0.08%. 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): $310\text{-}315\text{-}320\text{-}325^{\circ}\text{C}$.

RESIDENCE TIME

Maximum allowable residence time: $7 \div 8$ minutes. Do not exceed this limit. Maximum number of complete shots (in the barrel) suggested: $2 \div 6$

MELT TEMPERATURE

Suggested range of melt temperature: $320 \div 345^{\circ}\text{C}$. 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: $150 \div 170^{\circ}\text{C}$. 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): $0.1 \div 0.2$ m/s. The maximum rotational speed (in rpm) may be calculated by means of the following equation: $\text{rpm} = V/d \cdot 19100$, where d is the screw diameter (mm).

INJECTION PRESSURE

Maximum advisable injection pressure at nozzle: $70 \div 140$ 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): $70 \div 90\%$ of injection pressure.

CUSHION

Minimum suggested cushion: $3 \div 6$ mm.

BACK PRESSURE

Suggested backpressure: $3 \div 5$ 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 has to be evaluated, but usually can be used, if a tight temperature control is assured, cross-section area thicknesses are adequate and cycle time is short.

VALVE GATES / SMALL GATES

Use of valve gates or small injection gates is not recommended due to risk of clogging.

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. It is advisable to use a high 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.