LATI® HIGH PERFORMANCE THERMOPLASTICS

# LASULF

Product made of Polysulphone (PSU). Unfilled. 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 |
|---|---|---|---|
| **Density** | ISO 1183 | **1.24** | g/cm³ |
| **Linear shrinkage at moulding** | | | |
| Longitudinal (2.0mm/60MPa) | ISO 294-4 | **0.60 ÷ 0.80** | % |
| Transversal (2.0mm/60MPa) | ISO 294-4 | **0.65 ÷ 0.85** | % |
| **Dimensional stability** | --- | **85** | |
| **Moisture absorption** | | | |
| saturation, in air | ISO 62-4 | **0.30** | % |
| at saturation, in water | ISO 62-4 | **0.80** | % |
| **Melt Flow Index (MFI) - 343°C/2.16kg** | ASTM D 1238 | **7.00** | g/10' |

| MECHANICAL PROPERTIES | STANDARD | VALUE | MEASURE UNITS |
|---|---|---|---|
| **CHARPY impact strength** | | | |
| Unnotched, at 23°C | ISO 179-1eU | **NB** | kJ/m² |
| Unnotched, at -20°C | ISO 179-1eU | **NB** | kJ/m² |
| Notched, at 23°C | ISO 179-1eA | **5.0** | kJ/m² |
| Notched, at -20°C | ISO 179-1eA | **1.5** | kJ/m² |

| MECHANICAL PROPERTIES | STANDARD | VALUE | MEASURE UNITS |
|---|---|---|---|
| **Tensile elongation** | | | |
| At yield (5 mm/min), 23°C | ISO 527 | **0.8** | % |
| At yield (5 mm/min), 60°C | ISO 527 | **0.7** | % |
| At yield (5 mm/min), 90°C | ISO 527 | **0.6** | % |
| At yield (5 mm/min), 120°C | ISO 527 | **0.6** | % |
| At yield (5 mm/min), 150°C | ISO 527 | **0.3** | % |
| 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** | % |

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| MECHANICAL PROPERTIES | STANDARD | VALUE | MEASURE UNITS |
|---|---|---|---|
| **Tensile strength** | | | |
| At yield (5 mm/min), 23°C | ISO 527 | **20** | MPa |
| At yield (5 mm/min), 60°C | ISO 527 | **18** | MPa |
| At yield (5 mm/min), 90°C | ISO 527 | **16** | MPa |
| At yield (5 mm/min), 120°C | ISO 527 | **14** | MPa |
| At yield (5 mm/min), 150°C | ISO 527 | **7** | MPa |
| At break (5 mm/min), 23°C | ISO 527 | **75** | MPa |
| At break (5 mm/min), 60°C | ISO 527 | **70** | MPa |
| At break (5 mm/min), 90°C | ISO 527 | **60** | MPa |
| At break (5 mm/min), 120°C | ISO 527 | **50** | MPa |
| At break (5 mm/min), 150°C | ISO 527 | **35** | MPa |

| MECHANICAL PROPERTIES | STANDARD | VALUE | MEASURE UNITS |
|---|---|---|---|
| **Elastic modulus** | | | |
| Tensile (1 mm/min), 23°C | ISO 527 | **2600** | MPa |
| Tensile (1 mm/min), 60°C | ISO 527 | **2300** | MPa |
| Tensile (1 mm/min), 90°C | ISO 527 | **2200** | MPa |
| Tensile (1 mm/min), 120°C | ISO 527 | **2000** | MPa |
| Tensile (1 mm/min), 150°C | ISO 527 | **1900** | MPa |

| THERMAL PROPERTIES | STANDARD | VALUE | MEASURE UNITS |
|---|---|---|---|
| **Coefficient of linear thermal expansion (CLTE)** | | | |
| 30°C to 100°C (longitudinal) | ISO 11359 | **55** | $\times 10^{-6}$ $K^{-1}$ |
| 30°C to 100°C (transversal) | ISO 11359 | **55** | $\times 10^{-6}$ $K^{-1}$ |
| **VICAT - Softening point** | | | |
| 50 N (heating rate 120°C/h) | ISO 306 | **175** | °C |
| **HDT - Heat Deflection Temperature** | | | |
| 0.45 MPa | ISO 75 | **180** | °C |
| 1.81 MPa | ISO 75 | **165** | °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 | STANDARD | VALUE | MEASURE UNITS |
|---|---|---|---|
| **Oxygen Index** | ASTM D 2863 | **26** | % |
| **Flammability rating** | | | |
| 3 mm thickness | UL 94 | **HB** | |
| 1.5 mm thickness | UL 94 | **HB** | |
| **GWFI - Glow Wire Flammability Index** | | | |
| 2 mm thickness | IEC 60695-2-12 | **960** | °C |
| 1 mm thickness | IEC 60695-2-12 | **960** | °C |

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| ELECTRICAL PROPERTIES | STANDARD | VALUE | MEASURE UNITS |
|---|---|---|---|
| **CTI - Comparative Tracking Index** | | | |
| solution A (without surfactant) | IEC 60112 | **125** | 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 | **17** | kV/mm |

# LASULF - Moulding parameters

## 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 4 hours at 120 ÷ 130°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): 320-325-335-330°C.

## RESIDENCE TIME

Maximum allowable residence time: 15 minutes. Do not exceed this limit. Maximum number of complete shots (in the barrel) suggested: 1 ÷ 3

## MELT TEMPERATURE

Suggested range of melt temperature: 300 ÷ 330°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: 120 ÷ 160°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 ÷ 150 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 ÷ 75% 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. 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.**