

## LATILUB 88/10-15T K/30

Self-lubricating product based on Polyetheretherketone (PEEK). PTFE. Carbon fibres. Intrinsically flame retardant. High stiffness.

The products mentioned herein are not suitable for applications in contact with foodstuffs or for potable water transportation, or for toy manufacturing.

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

| PHYSICAL PROPERTIES                 | STANDARD    | VALUE MEASURE UNITS           |
|-------------------------------------|-------------|-------------------------------|
| <b>Density</b>                      | ISO 1183    | <b>1.48</b> g/cm <sup>3</sup> |
| <b>Linear shrinkage at moulding</b> |             |                               |
| Longitudinal (2.0mm/60MPa)          | ISO 294-4   | <b>0.15 ÷ 0.30</b> %          |
| Transversal (2.0mm/60MPa)           | ISO 294-4   | <b>0.95 ÷ 1.25</b> %          |
| <b>Dimensional stability</b>        | ---         | <b>52</b>                     |
| <b>Moisture absorption</b>          |             |                               |
| saturation, in air                  | ISO 62-4    | <b>0.06</b> %                 |
| MECHANICAL PROPERTIES               | STANDARD    | VALUE MEASURE UNITS           |
| <b>CHARPY impact strength</b>       |             |                               |
| Unnotched, at 23°C                  | ISO 179-1eU | <b>40.0</b> kJ/m <sup>2</sup> |
| Unnotched, at -20°C                 | ISO 179-1eU | <b>35.0</b> kJ/m <sup>2</sup> |
| Notched, at 23°C                    | ISO 179-1eA | <b>8.0</b> kJ/m <sup>2</sup>  |
| Notched, at -20°C                   | ISO 179-1eA | <b>7.0</b> kJ/m <sup>2</sup>  |
| MECHANICAL PROPERTIES               | STANDARD    | VALUE MEASURE UNITS           |
| <b>Tensile elongation</b>           |             |                               |
| At break (5 mm/min), 23°C           | ISO 527     | <b>1.6</b> %                  |
| At break (5 mm/min), 60°C           | ISO 527     | <b>1.6</b> %                  |
| At break (5 mm/min), 90°C           | ISO 527     | <b>1.6</b> %                  |
| At break (5 mm/min), 120°C          | ISO 527     | <b>1.8</b> %                  |
| At break (5 mm/min), 150°C          | ISO 527     | <b>2.8</b> %                  |
| <b>Tensile strength</b>             |             |                               |
| At break (5 mm/min), 23°C           | ISO 527     | <b>210</b> MPa                |
| At break (5 mm/min), 60°C           | ISO 527     | <b>175</b> MPa                |
| At break (5 mm/min), 90°C           | ISO 527     | <b>170</b> MPa                |
| At break (5 mm/min), 120°C          | ISO 527     | <b>150</b> MPa                |
| At break (5 mm/min), 150°C          | ISO 527     | <b>115</b> MPa                |
| <b>Elastic modulus</b>              |             |                               |
| Tensile (1 mm/min), 23°C            | ISO 527     | <b>22800</b> MPa              |
| Tensile (1 mm/min), 60°C            | ISO 527     | <b>22000</b> MPa              |
| Tensile (1 mm/min), 90°C            | ISO 527     | <b>20000</b> MPa              |
| Tensile (1 mm/min), 120°C           | ISO 527     | <b>17600</b> MPa              |
| Tensile (1 mm/min), 150°C           | ISO 527     | <b>13200</b> 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           | 5 × 10 <sup>-6</sup> K <sup>-1</sup>       |
| 30°C to 100°C (transversal)                                 | ISO 11359           | 25 × 10 <sup>-6</sup> K <sup>-1</sup>      |
| VICAT - Softening point                                     |                     |                                            |
| 50 N (heating rate 120°C/h)                                 | ISO 306             | 340 °C                                     |
| HDT - Heat Deflection Temperature                           |                     |                                            |
| 0.45 MPa                                                    | ISO 75              | 340 °C                                     |
| 1.81 MPa                                                    | ISO 75              | 330 °C                                     |
| Thermal conductivity                                        |                     |                                            |
| in plane                                                    | ASTM E 1461-92      | 0.7 W/(m·K)                                |
| through plane                                               | ASTM E 1461-92      | 0.4 W/(m·K)                                |
| Flammability                                                | Standard            | Value Measure Units                        |
| 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                        |
| Electrical resistivity                                      |                     |                                            |
| surface, dry                                                | ASTM D 257 / D 4496 | 1E2 ohm                                    |
| Dielectric strength (short period)                          |                     |                                            |
| 2 mm thickness, 23°C, dry                                   | ASTM D 149          | 2 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)   | 85 10 <sup>-8</sup> (mm <sup>3</sup> /N m) |
| Friction Coefficient (speed 0.126 m/s, load 10N)            |                     |                                            |
| static                                                      | LATI (ISO 7148-2)   | 0.26                                       |
| dynamic                                                     | LATI (ISO 7148-2)   | 0.30                                       |

## 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  $150 \div 160^{\circ}\text{C}$ . 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. Vacuum ovens, desiccant dryers or forced ventilation ovens are suggested. Wet material appears darker.

## BARREL TEMPERATURE PROFILE

Suggested barrel temperature profile (zone 1 - zone 2 - zone 3 - nozzle):  $360\text{-}365\text{-}380\text{-}390^{\circ}\text{C}$ .

## RESIDENCE TIME

Maximum allowable residence time: 15 minutes. Do not exceed this limit. Maximum number of complete shots (in the barrel) suggested:  $2 \div 5$

## MELT TEMPERATURE

Suggested range of melt temperature:  $370 \div 400^{\circ}\text{C}$ . 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. PAY ATTENTION! Do not exceed the suggested maximum temperature.

## MOULD TEMPERATURE

Suggested range of mould temperature:  $160 \div 210^{\circ}\text{C}$ . 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. High mould temperature is suggested. Low mould temperature is suggested.

## INJECTION SPEED

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

## TANGENTIAL SCREW VELOCITY (V)

Maximum suggested tangential velocity (V):  $0.1 \div 0.15 \text{ m/s}$ . 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:  $60 \div 150 \text{ MPa}$ . 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):  $70 \div 100\%$  of injection pressure.

## CUSHION

Minimum suggested cushion:  $3 \div 5 \text{ mm}$ .

## BACK PRESSURE

Suggested backpressure:  $20 \div 80 \text{ bar}$  (hydraulic pressure).

## REGRIND USAGE

Maximum suggested regrind percentage: 15%. In-loop regrind is suggested. Regrind must be dried. Unless otherwise specified in yellow card, UL guidelines allow up to 25% regrind to be used without affecting the rating. Otherwise, it is recommended that Customer downloads the yellow card and attaches it to this documentation. In any case, LATI advises not to use more than 15%.

## VALVE GATES / SMALL GATES

Valve gates or small injection gates can be used.

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#### **MATERIAL HANDLING**

Pneumatic conveyor systems should be avoided to prevent the separation of the steel bundles from the base resin. Avoid use of pneumatic conveyor systems or forced air dryers to prevent separation between resin and additives.

#### **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- and corrosion-resistant steel to make the mould.

#### **APPROVALS**

**Please, check our site or contact LATI for details.**

#### **CONTACTS**

**LATI Industria Termoplastici S.p.A.**