

## LAPEX A

Polyether Sulphone (PES).

Unfilled. Low smoke density and low toxicity index. Very high dimensional stability.

| PHYSICAL PROPERTIES                 | STANDARD    | VALUE MEASURE UNITS    |
|-------------------------------------|-------------|------------------------|
| Density                             | ISO 1183    | 1.37 g/cm <sup>3</sup> |
| <b>Linear shrinkage at moulding</b> |             |                        |
| Longitudinal (2.0mm/60MPa)          | ISO 294-4   | 0.70 ÷ 0.85 %          |
| Transversal (2.0mm/60MPa)           | ISO 294-4   | 0.75 ÷ 0.90 %          |
| Dimensional stability               | ---         | 81                     |
| <b>Moisture absorption (in air)</b> |             |                        |
| after 24hrs                         | ISO 62-4    | 0.20 %                 |
| MECHANICAL PROPERTIES               | STANDARD    | VALUE MEASURE UNITS    |
| <b>CHARPY impact strength</b>       |             |                        |
| Unnotched, at +23°C                 | ISO 179-1eU | NB                     |
| Unnotched, at -20°C                 | ISO 179-1eU | NB                     |
| Notched, at +23°C                   | ISO 179-1eA | 6.5 kJ/m <sup>2</sup>  |
| Notched, at -20°C                   | ISO 179-1eA | 2.5 kJ/m <sup>2</sup>  |
| <b>Tensile elongation</b>           |             |                        |
| At yield (5 mm/min), 23°C           | ISO 527 (1) | 6.3 %                  |
| At yield (5 mm/min), 60°C           | ISO 527 (1) | 5.5 %                  |
| At yield (5 mm/min), 90°C           | ISO 527 (1) | 4.7 %                  |
| At yield (5 mm/min), 120°C          | ISO 527 (1) | 4.0 %                  |
| At yield (5 mm/min), 150°C          | ISO 527 (1) | 3.2 %                  |
| At break (5 mm/min), 23°C           | ISO 527 (1) | >100.0                 |
| At break (5 mm/min), 60°C           | ISO 527 (1) | >100.0                 |
| At break (5 mm/min), 90°C           | ISO 527 (1) | >100.0                 |
| At break (5 mm/min), 120°C          | ISO 527 (1) | >100.0                 |
| At break (5 mm/min), 150°C          | ISO 527 (1) | >100.0                 |
| <b>Tensile strength</b>             |             |                        |
| At yield (5 mm/min), 23°C           | ISO 527 (1) | 85 MPa                 |
| At yield (5 mm/min), 60°C           | ISO 527 (1) | 80 MPa                 |
| At yield (5 mm/min), 90°C           | ISO 527 (1) | 75 MPa                 |
| At yield (5 mm/min), 120°C          | ISO 527 (1) | 65 MPa                 |
| At yield (5 mm/min), 150°C          | ISO 527 (1) | 50 MPa                 |
| At break (5 mm/min), 23°C           | ISO 527 (1) | NB                     |
| At break (5 mm/min), 60°C           | ISO 527 (1) | NB                     |
| At break (5 mm/min), 90°C           | ISO 527 (1) | NB                     |
| At break (5 mm/min), 120°C          | ISO 527 (1) | NB                     |
| At break (5 mm/min), 150°C          | ISO 527 (1) | NB                     |
| <b>Elastic modulus</b>              |             |                        |
| Tensile (speed 1 mm/min), at 23°C   | ISO 527 (1) | 2900 MPa               |
| Tensile (speed 1 mm/min), at 60°C   | ISO 527 (1) | 2700 MPa               |
| Tensile (speed 1 mm/min), at 90°C   | ISO 527 (1) | 2300 MPa               |
| Tensile (speed 1 mm/min), at 120°C  | ISO 527 (1) | 2100 MPa               |
| Tensile (speed 1 mm/min), at 150°C  | ISO 527 (1) | 2000 MPa               |

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| THERMAL PROPERTIES                                    | STANDARD         | VALUE MEASURE UNITS |
|---|------------------|---------------------|
| <b>Coefficient of linear thermal expansion (CLTE)</b> |                  |                     |
| -30°C to +30°C (longitudinal)                         | ISO 11359-2      | 53 µm/(m·°C)        |
| -30°C to +30°C (transversal)                          | ISO 11359-2      | 57 µm/(m·°C)        |
| +30°C to +100°C (longitudinal)                        | ISO 11359-2      | 50 µm/(m·°C)        |
| <b>VICAT - Softening point</b>                        |                  |                     |
| 50 N (heating rate 50°C/h)                            | ISO 306          | 215 °C              |
| <b>HDT - Heat Deflection Temperature</b>              |                  |                     |
| 0.45 MN/m <sup>2</sup>                                | ISO 75           | 210 °C              |
| 1.81 MN/m <sup>2</sup>                                | ISO 75           | 195 °C              |
| <b>C.U.T. - Continuous Use Temperature</b>            |                  |                     |
| Long period (20,000h)                                 | ASTM E1641/E1877 | 180 °C              |
| <b>FLAMMABILITY</b>                                   |                  |                     |
| <b>Oxygen Index</b>                                   |                  |                     |
|   | ASTM D 2863      | 39 %                |
| <b>Flammability rating</b>                            |                  |                     |
| 3.00 mm thickness                                     | UL 94            | V-0                 |
| 1.50 mm thickness                                     | UL 94            | V-0                 |
| <b>ELECTRICAL PROPERTIES</b>                          |                  |                     |
| <b>Electrical resistivity</b>                         |                  |                     |
| Surface   | ASTM D 257       | 1E12 ohm            |

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### MATERIAL - STORAGE

Sealed, undamaged packages has to be kept in dry storage facilities, providing they are also able to protect them 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

At least 3 hours at 140 ÷ 180°C

These are the suggested conditions to reduce the moisture content to adequate levels. Temperature and drying time can be reduced by using vacuum ovens. Particularly wet material may need a longer drying time.

### ACTUAL MELT TEMPERATURE

340 ÷ 370°C

The injection moulding machine settings needed to obtain the suggested melt temperature will depend greatly on shot size and machine capacity, as well as other moulding parameters such as: injection speed, screw RPM, back pressure, etc. 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

140 ÷ 165°C

The mould temperature suggested above is the actual tool steel temperature. 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.

### INJECTION SPEED

High

The advisable injection speed greatly depends on cavity geometry and injection moulding machine size. The use of high injection speed can improve the surface appearance, but it can also cause outgassing and burn marks due to overheating through shear stress.

### REGRIND USAGE

The use of regrind is possible, but should be assessed on the basis of the project, moulding parameters, and type of grinding used. The effect of using regrind on material properties must be evaluated by the customer on its specific project and process. High percentages of regrind may cause a reduction in viscosity, reducing mechanical properties, first resilience.

### HOT RUNNER MOULDS

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

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### TO AVOID

In order to prevent any material degradation, over-dimensioned machines should be avoided.

### NOTES

**Versions of product mentioned herein are suitable for applications in contact with foodstuff or for potable water transportation, or for toy manufacturing. However, 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.**

### APPROVALS

USA (NSF51): Product versions approved according NSF51 recommendations are available.

### CONTACTS

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

Via F. Baracca, 7 - I - 21040 VEDANO OLONA (VA)

Tel. +39-0332-409111 - Fax +39-0332-409260

[email: techserv@it.lati.com](mailto:techserv@it.lati.com)

<http://www.lati.com>

<http://lambda.lati.it>

Values shown are based on testing of injection moulded laboratory test specimens, conditioned according to the standard and represent data that fall within the standard range of properties for non-coloured material, if not otherwise specified. As they may be subject to variations, these values do not represent a sufficient basis for any part design and are not intended for use in establishing values for specification purposes. Properties of moulded parts can be influenced by a wide range of factors including, but not limited to, colorants, part design, processing conditions, post-treatment conditions, environmental conditions and usage of regrind during the moulding process. If data are explicitly indicated as provisional, range of properties has to be considered wider. This information and technical assistance are provided as a convenience for informational purposes only and are subject to change without notice. The customer shall always ensure that the latest release of technical information is at his own disposal. Lati S.p.A. extends no warranties or guarantee, including a warranty of merchantability of whatever use is made of the product, and make no representations as to the accuracy, suitability, reliability, completeness and sufficiency of the information provided, and assume no responsibility regarding the consequences of its use or for any printing errors. It is the customer's responsibility to inspect and test our products in order to determine to his own satisfaction whether they are suitable for his intended uses and applications or used in conjunction with third-party materials. This application-specific analysis shall at least include preliminary testing to determine the suitability for the customer's particular purpose from a technical as well as health, safety, and environmental standpoint. Such testing has not necessarily been done by us as the manner in which the customer uses and the purpose to which utilises our products are beyond our control. Lati S.p.A. does not accept and hereby disclaims liability for any damages whatsoever in connection with the use of or reliance on this information. No one is authorised to make any warranties, issue any immunities or assume any liabilities on behalf of Lati S.p.A. except in a writing signed by a specifically authorised Lati S.p.A. executive. Unless otherwise agreed in writing, the exclusive remedy for all claims is replacement of the product or refund of the purchase price at Lati's option, and in no event shall Lati S.p.A. be liable for special, consequential, incidental, punitive or exemplary damages. No information herein can be considered as a suggestion to use any product in conflict with intellectual property rights. Lati S.p.A. disclaims any liability that may be claimed for infringement or alleged infringement of patents. Unless specifically stated in writing, the products mentioned herein are not suitable for applications in the pharmaceutical, medical or dental sector, in contact with foodstuff or for potable water transportation. For any other issues Lati S.p.A. Conditions of Sales apply.