

# PE-HD LITEN<sup>®</sup> ML 57

## TECHNICAL DATASHEET

### PE-HD FOR INJECTION MOULDING

MFR (190/2,16): 4 g/10 min

Liten ML 57 is a high-density polyethylene produced by Unipetrol RPA using UNIPOL gas-phase technology.

#### Characteristics

- C6 - copolymer
- narrow MWD
- UV stabilization
- natural pellets
- meets European Pharmacopoeia 8 (Ph.Eur. 8, 3.1.3)

#### International designation

ISO 17855-PE-HD,ML,50-D045

#### Application

- technical parts
- pallets
- containers
- dustbins

#### Material properties (typical values, do not perform a specification of given grade)

| Parameter                                 | Test method    | Unit              | Value             |     |
|---|----------------|-------------------|-------------------|-----|
| <b>RHEOLOGICAL PROPERTIES</b>             |                |                   |                   |     |
| Melt Mass Flow Rate (190 °C/2,16 kg)      | ISO 1133-1     | g/10 min          | 4                 |     |
| Melt Mass Flow Rate (190 °C/5 kg)         |                | g/10 min          | 12                |     |
| Melt Mass Flow Rate Ratio (21,6/2,16)     |                | -                 | 25                |     |
| Shrinkage                                 | parallel       | ISO 294-3,4       | %                 | 2,5 |
|   | normal         |                   |                   | 1,8 |
| <b>MECHANICAL PROPERTIES</b>              |                |                   |                   |     |
| Flexural Modulus                          | ISO 178        | MPa               | 850               |     |
| Tensile Modulus                           | ISO 527-1,2    | MPa               | 900               |     |
| Yield Stress                              |                | MPa               | 22                |     |
| Yield Strain                              |                | %                 | 10                |     |
| Tensile Creep Modulus at                  | 1 h            | ISO 899-1         | MPa               | 540 |
|   | 1000 h         |                   |                   | 270 |
| Charpy Notched Impact Strength at         | 23 °C          | ISO 179-1         | kJ/m <sup>2</sup> | 12  |
|   | -30 °C         |                   |                   | 5,5 |
| <b>THERMAL PROPERTIES</b>                 |                |                   |                   |     |
| Melting Temperature (DSC)                 | ISO 11357-1, 3 | °C                | 134               |     |
| Vicat Softening Temperature (VST)         | ISO 306        | °C                | 126               |     |
| HDT (1,8 MPa)                             | ISO 75-1,2     | °C                | 43                |     |
| <b>OTHER PROPERTIES</b>                   |                |                   |                   |     |
| Density (23±1) °C                         | ISO 1183-2     | kg/m <sup>3</sup> | 952               |     |
| ESCR, F <sub>50</sub> (55 °C; 6 MPa; 10%) | ISO 22088-2    | h                 | 12                |     |
| Hardness Shore D                          | ISO 868        | -                 | 58                |     |

#### Processing conditions

| Parameter         | Recommend Value | Unit |
|-------------------|-----------------|------|
| Melt Temperature  | 200 - 260       | °C   |
| Mould Temperature | 20 - 60         | °C   |
| Screw Length      | min. 15 d*      | -    |

\*Screw diameter



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### Appearance properties

PE Liten is delivered in the form of natural pellets. Typical pellet length is (2 - 6) mm. Typical bulk density of PE pellets is (520 - 580) kg/m<sup>3</sup>.

### Temperature properties

The products made of PE Liten may commonly be used up to 100 °C. For products with higher requirements on mechanical strength and stiffness the temperature should not permanently exceed 70 °C, intermittently 90 °C. The level of temperature stability is such that during common processing method, no material degradation occurs. With decreasing temperature, the toughness of the material decreases and below -30 °C, the materials becomes substantially brittle.

### Physical-chemical properties

PE Liten exhibits high chemical resistance at both normal and raised temperatures, due to its non-polar character. Within a broad range of temperatures and concentrations it resists to majority of acids, bases and salt solutions. It dissolves only in some solvents at raised temperature (e.g. in aromatic and halogenated hydrocarbons); furthermore, it doesn't resist to strongly oxidizing agents (e.g. nitric acid, oleum, halogens). Liten has practically no hygroscopicity, so it can be used in environments with variable relative humidity, without any risk of dimensional changes or changes of mechanical properties of the products. During processing, problems may be caused by moisture condensation during transfer of the material from a cooler to a warmer environment. At storage temperatures below 20 °C, it is recommended to condition the material about 24 hours prior to processing in the production hall.

### Hygienic approval

PE Liten meets the requirements of the following regulations (as amended):

- Decree of the Ministry of Health No. 38/2001 of the Journal of Laws;
- Regulation of the European Parliament and the Council No. 1935/2004;
- Commission Regulation (EU) No. 10/2011;

### Fire & Safety characteristics

PE Liten is not classified as a dangerous substance in accordance with the Regulation (EC) 1272/2008 (CLP), nor does it satisfy any of the other conditions set out in Article 31 of the Regulation (EC) 1907/2006 (REACH). Therefore, the producer is not obliged to provide a Material Safety Datasheet. Information in accordance with Article. 32 of the Regulation (EC) 1907/2006 (REACH) and further details are provided in "Announcement", available on [www.unipetrolrpa.cz](http://www.unipetrolrpa.cz) or upon request.

### Packaging, storage, transportation and delivery

PE Liten is delivered in PE-LD (>PE-LD<) bags, mass 25 kg. 55 pieces of these bags are deposited on one pallet, fixed by a shrinkable PE-LD (>PE-LD<) film, protecting the product from damage and extending its lifetime. The pallets are intended for stocking into two, exceptionally into three layers. PE Liten can be alternatively delivered bulk loaded in car tanks. Alternative packaging or transportation is possible based on agreement with the customer.

PE Liten is stored in dry, ventilated, roofed storing facility, the premises of which are protected against direct sunlight. Recommended range of storage temperatures is -20 °C to +50 °C. The product distance from any source of heat shall be at least 1 m.

The recommended storage time for PE Liten in closed (sealed) bags at defined storage conditions is one year. At longer storage time, it is recommended to check the material properties prior to processing.

### Packages

The packages used by producer for packaging of PE Liten grades are designed and manufactured in compliance with technical regulations for weight and volume of the product. Material of the packages does not contain any classified hazardous substances. The total amount of heavy metals (Pb, Cd, Hg and Cr VI) does not exceed the limiting value of 100 ppm. Recommended methods of waste utilization are material utilization, energy utilization.

### Instructions for waste disposal from PE processing

Products and non-contaminated waste during PE Liten processing can be recycled and further processed into products. Material designation >PE< is used in compliance with ISO 11469. Material designation on products enables material identification during collecting, classification, utilization or disposal of consumer waste. PE Liten does not contain any lead, cadmium, mercury or hexavalent chromium, i.e. total amount of these heavy metals does not exceed 100 ppm.

The PE waste is classified by the waste producer in accordance with the valid legal regulations.

Recommended methods of waste utilization are material utilization and energy utilization.