

Elastollan[®] TPU

Technical Data Sheet

January 2019



Elastollan[®] 1175AW

Polyether-based Grade

Elastollan[®] 1175AW is a polyether-based thermoplastic polyurethane (TPU) containing a plasticizer. It contains a non-halogenated flame retardant. It exhibits excellent abrasion resistance, toughness, transparency, very good low temperature flexibility, hydrolytic stability and fungus resistance. It has excellent damping characteristics and outstanding resistance to tear propagation. Elastollan[®] 1175AW is supplied uncolored in pellet form.

| Typical Properties of Elastollan [®] | ASTM Test Method | Units | Typical Values |
|---|------------------------|--------------------------|----------------|
| All the physical properties reported here are measured on injection molded samples. Properties of sheet or film samples of this product are also available upon request. | | | |
| Specific Gravity | ASTM D 792 | g/cm ³ | 1.14 |
| Shore Hardness | ASTM D 2240 | Shore A or D | 75A |
| Taber Abrasion | ASTM D 4060 | mg loss | 20 |
| DIN Abrasion | DIN 53516 | mm ³ loss | 45 |
| E-Modulus | ASTM D 412 | psi | 1300 |
| Flexural Modulus | ASTM D 790 | psi | 1500 |
| Tensile Strength | ASTM D 412 | psi | 3800 |
| Tensile Stress at 100% Elongation | ASTM D 412 | psi | 830 |
| Tensile Stress at 300% Elongation | ASTM D 412 | psi | 2600 |
| Ultimate Elongation | ASTM D 412 | % | 600 |
| Tear Strength | ASTM D 624, Die C | lb/in | 460 |
| Compression Set 22h at 70°C 22h at 23 °C | ASTM D 395 "B" | % of original deflection | 45 20 |
| Glass Transition temperature* | BASF Analytical Method | °C | -48 |
| Vicat Softening Temperature | ASTM D 1525 / 1B | °C | 80 |
| DMA Softening Temperature | BASF Analytical Method | °C | 60 |

*Measured with Dynamic Mechanical Analysis (DMA). DMA profile is available upon request.
Above values are shown as typical values and should not be used as specifications.

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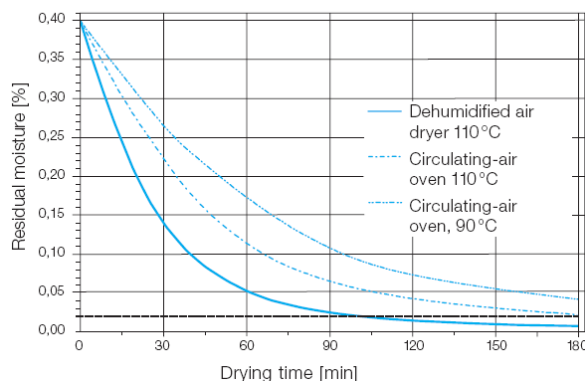
Polyether-based Grade

MELT FLOW INDEX (MFI): The following table shows MFI information of Elastollan® 1175AW. "ASTM D 1238, B" MFI test method is used for generation of data.

| Elastollan® Name | MFI Conditions | MFI, g/10min |
|------------------|----------------|--------------|
| 1175AW | 190 °C, 10 kg | 20-50 |

DRYING: Elastollan® materials are hygroscopic, i.e. dry Elastollan® will rapidly absorb moisture when exposed to atmosphere. Polyether-based Elastollan® grades absorb moisture more rapidly than polyester-based Elastollan® grades. As with all TPU products, Elastollan® 1175AW must be dried before processing. The drying step is required to maintain a low moisture content until the product enters the processing equipment. The water content must be less than 0.03% before and during processing.

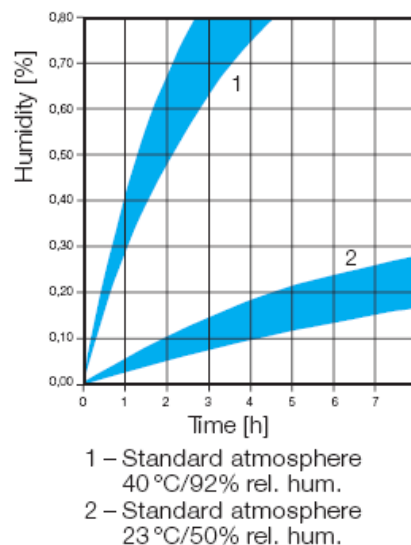
Drying diagram for Elastollan



| Elastollan® Hardness | Drying Time | Drying Temperature | |
|----------------------|-------------|--------------------|------------------|
| | | Circulating air | Dehumidified Air |
| 78A to 90A | 2 to 3 h | 100 to 110 °C | 80 to 90 °C |
| > 90A | 2 to 3 h | 110 to 120 °C | 90 to 120 °C |

STORAGE: Elastollan® 1175AW can be stored for up to one year in its original container. Containers should be stored in a cool and dry area. Containers should be tightly closed after use. Granulates should be exposed to the surrounding air only for as long as absolutely essential; it is therefore important to cover the feed hopper of the processing machine. Drying is recommended if the container has been opened several times. In order to prevent condensation, materials stored in cool conditions should be brought to room temperature before opening the container.

Moisture absorption Polyether-TPU Hardness 80 Shore A – 64 Shore D



PROCESSING RECOMMENDATIONS: Single screw extruder with a compression ratio of 1:2 to 1:3, preferably 1: 2.5, are recommended for processing Elastollan®. BASF experience shows that three section screws with an L/D ratio of 25 to 30 are most suitable. Three section screws should have continued constant pitch of 1D. The radial clearance between screw and barrel should be 0.1 to 0.2 mm. For processing Elastollan®, multizone screws, e.g. barrier screws, have also proven suitable. Short screws with high compression ratio are unsuitable for Elastollan®. Use of breaker plates and screen packs is recommended. Depending on the screw diameter and type of die, breaker plates should have holes of 1.5 to 5 mm in diameter. Since thermoplastic polyurethanes are shear sensitive, excessively high screw speeds may lead to reduction in product properties.

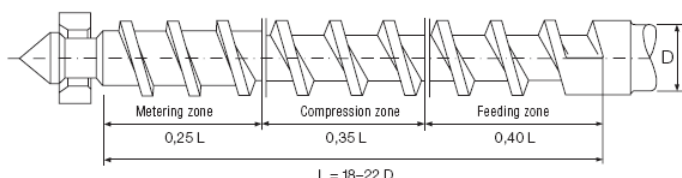
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Screw configuration (diagrammatic view)

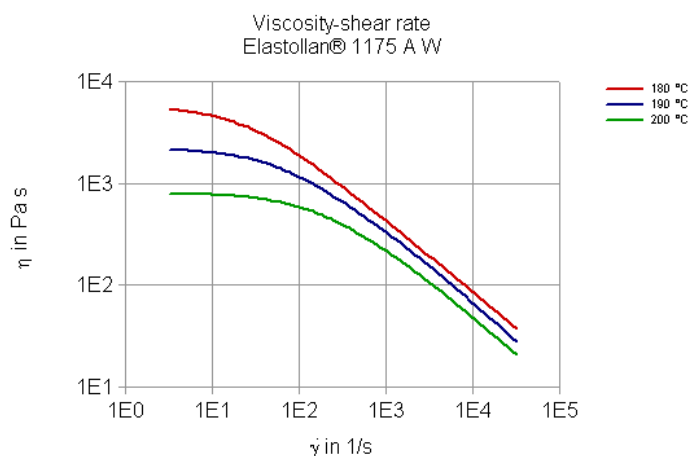


TYPICAL PROCESSING CONDITIONS: Elastollan® 1175AW can be used for injection molding or extrusion conditions. Typical processing conditions are listed in the table below. We recommend you to call our technical service helpdesk for more information or troubleshooting.

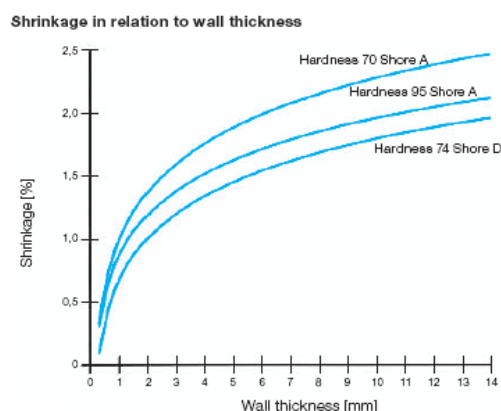
| INJECTION MOLDING | | |
|---------------------------------------|--------------------|---------|
| Recommended barrel temperatures in °C | | |
| Elastollan® Hardness | Barrel Temperature | Nozzle |
| 60A- 80A | 170-210 | 200-210 |
| 85A- 95A | 190-220 | 210-225 |
| 98A-74D | 210-230 | 220-240 |

| EXTRUSION | | | |
|---------------------------------------|---------|---------|----------|
| Recommended barrel temperatures in °C | | | |
| Elastollan® Hardness | Barrel | Adapter | Die Head |
| 60A to 70A | 140-175 | 160-175 | 165-170 |
| 75A to 85A | 160-200 | 175-200 | 175-205 |
| 90A to 98A | 170-210 | 200-220 | 195-215 |

VISCOSITY CURVE:



SHRINKAGE: This graph can be used for estimated shrinkage values of Elastollan® products in relation to the wall thickness. Please remember that depending on the molding conditions and part design these values can change. We recommend you to call technical service group for further information.



CHALLENGE US: Please contact us for more information on Elastollan® products.

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You can reach our technical team at 1-800-527-8324 or infopoint.northamerica@basf.com.

For Further information, the following detailed brochures are available upon request:

- Elastollan[®] Material Properties
- Elastollan[®] Product Range
- Elastollan[®] Processing Recommendations
- Elastollan[®] Electrical Properties
- Elastollan[®] Chemical Resistance

DISPOSAL: Elastollan[®] materials are fully reacted and present no hazard to the environment. Waste can therefore be disposed at public waste disposal sites. The official regulations on waste disposal should be observed. For further information, please see BASF material safety data sheets.

CAUTION: Contact with product dusts from regrinding operations may cause temporary irritation of the eyes and the respiratory tract. Use with local exhaust. Under hot melt processing conditions (170-230°C), wear personal protective equipment to prevent thermal burns.

FIRST AID: Eyes-Flush eyes with flowing water at least 15 minutes. If irritation develops, consult a physician. *Skin*-Skin contact with hot melt may cause thermal burns. Call a physician immediately. *Inhalation*-If vapors generated from the hot melt process are inhaled, move to fresh air. Aid in breathing. If breathing difficulties develop, see a physician immediately.

In case of fire: Use water fog, foam, CO₂, or dry chemical extinguishing media. Firefighters should be equipped with self-contained breathing apparatus and turnout gear.