Ertalon® 4.6

Compared with conventional nylons, Ertalon® 4.6 features a better retention of stiffness and creep resistance over a wide range of temperatures as well as superior heat aging resistance. Therefore, applications for Ertalon® 4.6 are situated in the "higher temperature area" (80 - 150 °C) where stiffness, creep resistance, heat aging resistance, fatigue strength and wear resistance of PA 6, PA 66, POM and PET fall short.

Physical properties (indicative values *)

**Propertiy**

- Colour - Reddish Brown
- Density ISO 1183-1 g/cm³ 1.19
- Water absorption:
  - after 24 immersion in water of 23 °C (1) ISO 62 % 1.30
  - at saturation in water of 23 °C % 9.5
- Thermal Conductivity (2) W/(K.mm)

<table>
<thead>
<tr>
<th>Temperature</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISO 11357-1/-3 °C</td>
<td>0.30</td>
</tr>
<tr>
<td>ISO 11357-1/-2 °C</td>
<td>290</td>
</tr>
</tbody>
</table>

**Mechanical Properties at 23 °C (7)**

- Tensile test (8)
  - tensile strength (9) ISO 527-1/-2 MPa 105
  - tensile strain at yield(9) ISO 527-1/-2 % 18
  - tensile strain at break (9) ISO 527-1/-2 % 25
  - tensile modulus of elasticity (10) ISO 527-1/-2 MPa 3200

**Dynamic Coefficient of Friction (-)**

- Static friction coefficient:
  - according to UL 94 (3 mm thickness) HB

**Electrical Properties at 23 °C**

- Electric strength (16) kV/mm IEC 60243-1 25
- Volume resistivity Ohm.cm IEC 60933 >10E14
- Surface resistivity mΩ ANISO/EDS STM 11.11 Ohm/sq. >10E13
- Relative permittivity ε:
  - at 1 MHz IEC 60250 4.30
  - at 50 Hz IEC 60250 4.30
- Dielectric dissipation factor tan δ: - at 1 MHz IEC 60250 0.019

**Note:** 1 g/cm³ = 1.00 kg/m³ ; 1 MPa = 1 N/mm² ; 1 kV/mm = 1 MV/m.

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**Polyamides**

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**PRODUCT DATA SHEET**

This product data sheet and any data and specifications presented on our website shall provide promotional and general information about the Engineering Plastic Products (the "Products") manufactured and offered by Mitsubishi Chemical Advanced Materials and shall serve as a preliminary guide. All data and descriptions relating to the Products are of an indicative nature only. Neither this data sheet nor any data and specifications presented on our website shall create or be implied to create any legal or contractual obligation.

Any illustration of the possible fields of application of the Products shall merely demonstrate the potential of these Products, but any such description does not constitute any kind of covenant whatsoever. Irrespective of any tests that Mitsubishi Chemical Advanced Materials may have carried out with respect to any Product, Mitsubishi Chemical Advanced Materials does not possess expertise in evaluating the suitability of its materials or Products for use in specific applications or products manufactured or offered by the customer respectively. The choice of the most suitable plastics material depends mainly on the extent to which the material is subjected to unfavourable impact conditions and may consequently not be considered as being the absolute practical limit.

It has to be noted that reinforced and filled material shows an anisotropic behaviour (properties differ when measured parallel and perpendicular to the manufacturing direction).

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**Legend:**

1) According to method 1 of ISO 62 and done on discs Ø 50 mm x 3 mm.
2) The figures given for these properties are for the most part derived from raw material supplier data and other publications.
3) Values for this property are only given here for amorphous materials and for materials that do not show a melting temperature (PBI, PAl, PIP).
4) Temperature resistance over a period of min. 20,000 hours. After this period of time, there is a decrease in tensile strength – measured at 23 °C – of about 50 % as compared with the original value. The temperature value given here is thus based on the thermal-oxidative degradation which takes place and causes a reduction in properties. Note, however, that the maximum allowable service temperature depends in many cases essentially on the duration and the magnitude of the mechanical stresses to which the material is subjected.
5) Impact strength decreasing with decreasing temperature, the minimum allowable service temperature is usually determined by the extent to which the material is subjected to impact. The value given here is based on unfavourable impact conditions and may consequently not be considered as being the absolute practical limit.
6) These estimated ratings, derived from raw material supplier data and other publications, are not intended to reflect hazards presented by the material under actual fire conditions. There is no 'UL File Number' available for these stock shapes.
7) Most of the figures given for these mechanical properties of the materials are average values of tests run on dry test specimens machined either out of plate 15-20 mm thick or rod diameter 40-50mm, the test specimens were then taken from the stock shape with their length in longitudinal direction (parallel to the extrusion direction).
8) Test specimens: Type 1 B
9) Test speed: either 5 or 50 mm/min [chosen acc. to ISO 527-1/-2] – function the ductile behaviour of the material (tough or brittle)
10) Test speed: 1 mm/min.
11) Test specimens: cylinders Ø 8 mm x 16 mm
12) Test specimens: bars 4 mm (thickness) x 10 mm x 80 mm ; test speed: 2 mm/min ; span: 64 mm.
13) Pendulum used: 4 J.
14) Measured on 10 mm thick test specimens.
15) Test procedure similar to Test Method A: “Pin-on-disk” as described in ISO 7148-2. Load 3MPa, slide velocity 0.33 m/s, mating plate steel Ra= 0.7-0.9 µm, tested at 23 °C, 50%RH.
16) Electrode configuration: Ø 25 mm / Ø 75 mm coaxial cylinders ; in transformer oil according to IEC 60296 ; 1 mm thick test specimens.

This table is a valuable help in the choice of a material. The data listed here fall within the normal range of product properties of dry material. However, they are not guaranteed and they should not be used to establish material specification limits nor used alone as the basis of design.

If it has to be noted that reinforced and filled material shows an anisotropic behaviour (properties differ when measured parallel and perpendicular to the manufacturing direction).