SYMALIT PVDF ESD is a highly crystalline conductive grade of polyvinylidene fluoride (PVDF) combining good mechanical, thermal and electrical properties with excellent chemical resistance.

SYMALIT PVDF ESD is a versatile engineering material especially suitable for the manufacture of components for the petro-chemical, chemical, metallurgical, paper, textile, and nuclear industries.

<table>
<thead>
<tr>
<th>Physical properties (indicative values *)</th>
<th>Test methods</th>
<th>Units</th>
<th>VALUES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colour</td>
<td>-</td>
<td>black</td>
<td></td>
</tr>
<tr>
<td>Density</td>
<td>ASTM D 792</td>
<td>g/cm³</td>
<td>1.78 - 1.83</td>
</tr>
<tr>
<td>Water absorption:</td>
<td>ASTM D 570</td>
<td>%</td>
<td>-</td>
</tr>
<tr>
<td>- after 24 h immersion in water of 23°C</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Thermal Properties**

- Melting temperature
  - ISO 1183 °C
  - 150 - 170

- Glass transition temperature
  - DMTA °C
- Thermal conductivity at 23°C
  - ASTM D 433 W/(K.m)

- Coefficient of linear thermal expansion:
  - average value between 23 and 100°C
  - ASTM D 696 m/(m.K)
  - 12.5 - 14 x 10⁻⁵

- Specific Heat Capacity
  - DSC kJ/(kg.K)
- Viscous Point B
  - DIN 53407 °C
  - -

- Temperature of deflection under load:
  - method A: 1.82 MPa
  - ASTM D 648 °C
  - -

- Max. allowable service temperature in air:
  - continuously: for min. 20,000 h
  - °C
  - -

- Min. service temperature
  - °C
  - -

- Fiammability:
  - Oxygen Index
  - ASTM D 2863
  - %
  - 43

- according to UL 94
  - -
  - V-0

**Mechanical Properties at 23°C**

- Tension test:
  - tensile stress at yield
  - ISO 527-1/2 MPa
  - 40
  - tensile strength
  - ISO 527-1/2 MPa
  - -
  - tensile strain at break
  - ISO 527-1/2 %
  - 15 - 30
  - tensile modulus of elasticity
  - ISO 527-1/2 MPa
  - 1800 - 2200

- Flexural Modulus
  - ISO 178 MPa
  - -

- Compression test:
  - compressive stress
  - ASTM D 695 MPa
  - -

- Charpy impact strength - notched
  - ISO 180 kJ/m²
  - 8

- Hardness Shore D
  - ISO 868
  - 76

- Abrasion Resistance Taber
  - Taber CS 171 kg mg/1000 rev.
  - -

- Friction Coefficient:
  - -
  - -

**Electrical Properties at 23 °C**

- Dielectric strength
  - ASTM D 149 kV/mm
  - -

- Surface resistivity
  - IEC 93 Ohm
  - < 10¹⁰

- Dielectric constant at 1 MHz
  - ASTM D 150
  - -

- Dielectric dissipation factor tan δ at 1 MHz
  - ASTM D 150
  - -

Note: 1 g/cm³ = 1,000 kg/m³; 1 MPa = 1 N/mm²; 1 kV/mm = 1 MV/m.

**AVAILABILITY**

- Round Rods: Ø 10 - 200 mm
- Sheets and Plates: Thicknesses 0.8 - 25 mm
- Lining Laminates: Thickness 1.5 - 6 mm
- Pipes: Ø 25 - 200 mm
- Welding Rods: Thicknesses 3 - 4 mm

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**Legend:**

All values are results of tests made by raw material suppliers and Quadrant EPP AG and from literature. Most of the figures given in the table are results of tests made on extruded or injection molded sheets. Lining laminates can only be tested if the fabric backing is removed carefully by machining. Otherwise the fabric backing influences the results. These values are average values and can vary depending on product, production method and specimen preparation.

All tests are done according to the standards mentioned in the table or equivalent standards of other organisations (ISO, ASTM, DIN).

This table is a valuable help in the choice of a material. The data listed here fall within a 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.

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