

TECASINT 5111 natural - Stock Shapes (rods, plates, tubes)

Chemical Designation

PI (Polyimide)

Colour

black

Density

1.33 g/cm³

Main features

- very good electrical insulation
- high thermal and mechanical capacity
- good wear resistance
- high creep resistance
- resistance against high energy radiation
- sensitive to hydrolysis in higher thermal range

Target Industries

- semiconductor technology
- electrical engineering
- aircraft and aerospace technology
- cryogenic engineering
- mechanical engineering
- nuclear and vacuum technology

Mechanical properties

| Mechanical properties | parameter | value | unit | norm | comment |
|---------------------------------------|------------------|--------------|-------------------|------------------|----------------|
| Tensile strength | 50 mm/min | 140 | MPa | DIN EN ISO 527-1 | (1) eU |
| Modulus of elasticity (tensile test) | 1 mm/min | 3800 | MPa | DIN EN ISO 527-1 | |
| Elongation at break (tensile test) | 50 mm/min | 5.3 | % | DIN EN ISO 527-1 | |
| Flexural strength | 10 mm/min | 205 | MPa | DIN EN ISO 178 | |
| Modulus of elasticity (flexural test) | 2 mm/min | 3600 | MPa | DIN EN ISO 178 | |
| Compression strength | 10 mm/min | 440 | MPa | EN ISO 604 | |
| Compressive strain at break | 10 mm/min | 48 | % | EN ISO 604 | |
| Impact strength (Charpy) | max 7.5 J | 70 | kJ/m ² | DIN EN ISO 179-1 | (1) |
| Shore hardness | Shore D | 91 | | DIN EN ISO 868 | |

Thermal properties

| Thermal properties | parameter | value | unit | norm | comment |
|------------------------------|------------------|--------------|----------------------------------|----------------------|------------------------------------|
| Glass transition temperature | | 330 | °C | - | (1) |
| Heat distortion temperature | 1,8 MPa | 335 | °C | DIN 53 461 | (1) DMA, maximum loss factor tan δ |
| Thermal expansion (CLTE) | 50-200 °C | 4.6 / - | 10 ⁻⁵ K ⁻¹ | DIN EN ISO 11359-1;2 | (2) Thermal expansion XY/Z axis |
| Thermal expansion (CLTE) | 100-150 °C | 4.5 / - | 10 ⁻⁵ K ⁻¹ | DIN EN ISO 11359-1;2 | (3) Thermal expansion XY/Z axis |
| Thermal expansion (CLTE) | 23-100°C | 4.1 / - | 10 ⁻⁵ K ⁻¹ | DIN EN ISO 11359-1;2 | (4) Thermal expansion XY/Z axis |
| Specific heat | | 1.116 | J/(g*K) | DIN EN 821 | |
| Thermal conductivity | | 0.215 | W/(K*m) | DIN EN 821 | |

Electrical properties

| Electrical properties | parameter | value | unit | norm | comment |
|------------------------------|------------------|--------------------|-------------|---------------|----------------|
| surface resistivity | 23°C | > 10 ¹⁵ | Ω | DIN IEC 60093 | |
| volume resistivity | 23°C | > 10 ¹⁴ | Ω*cm | DIN IEC 60093 | |

Other properties

| Other properties | parameter | value | unit | norm | comment |
|-------------------------|---------------------|--------------|-------------|----------------------|----------------|
| Water absorption | 24 h in water, 23°C | 0.82 | % | DIN EN ISO 62 | |
| Flammability (UL94) | corresponding to | V0 | | DIN IEC 60695-11-10; | (1) |

→ TECASINT 5000 series show significant water uptake. Parts have to be pre-dried before fast heating to above 200 °C (drying process: 2 h per 3 mm wall thickness at 150 °C).

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