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## Technical Data Sheet

# PI Polyimide Tecasint® 1011 natural

Polyimide (PI), unfilled

### Typical Properties

- High thermal and mechanical load capacity
- Very good thermal stability
- Good chemical resistance
- Very good electrical insulation
- Resistance against high-energy radiation
- Low outgassing (ECSS-Q-70-02)
- High creep resistance
- Sensitive to hydrolysis at elevated temperatures

### Typical Industries

- Mechanical engineering
- Precision engineering
- Aircraft and aerospace technology
- Cryogenic engineering
- Electronics
- Electrical engineering
- Nuclear and vacuum technology
- Semiconductor technology

| | Test Method | Unit | Value |
|---|---|---|---|
| **General Properties** | | | |
| Chemical Designation | | | PI (Polyimide) |
| Colour | | | black |
| Density | | g / cm³ | 1.34 |
| Water absorption (24 h in water, 23 °C) | DIN EN ISO 62 | % | 1.3 |
| Water absorption (24 h in water, 80 °C) | DIN EN ISO 62 | % | 3.8 |
| Outgassing in high vacuum | ECSS-Q-70-02 | | passed |
| Flammability | DIN IEC 60695-11-10 | UL94 | V0 |
| **Mechanical Properties** | | | |
| Tensile strength (50 mm/min) | DIN EN ISO 527-1 | MPa | 116 |
| Modulus of elasticity, tensile (1 mm/min) | DIN EN ISO 527-1 | MPa | 3600 |
| Elongation at break (50 mm/min) | DIN EN ISO 527-1 | % | 3.8 |
| Flexural strength (10 mm/min) | DIN EN ISO 178 | MPa | 170 |
| Modulus of elasticity, flexural (2 mm/min) | DIN EN ISO 178 | MPa | 3450 |
| Compressive strength (10 mm/min) | EN ISO 604 | MPa | 450 |
| Compressive strength at 10% strain (10 mm/min) | EN ISO 604 | MPa | 190 |
| Compression modulus (1 mm/min) | EN ISO 604 | MPa | 3647 |
| Compressive strain at break (10 mm/min) | EN ISO 604 | % | 45 |


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| | Test Method | Unit | Value |
|---|---|---|---|
| Impact strength, Charpy (max. 7.5 J) | DIN EN ISO 179-1 | kJ / m | 75.8 |
| Notched impact strength, Charpy (max. 7.5 J) | DIN EN ISO 179-1 | kJ / m | 5 |
| Shore hardness | DIN EN ISO 868 | Shore D | 90 |
| **Thermal Properties** | | | |
| Glass transition temperature | DMA | °C | 383 |
| Heat distortion temperature (1.85 MPa) | DIN 53 461 | °C | 368 |
| Thermal expansion, CLTE (50–200 °C) | DIN 53752 | $10^{-5}$ $K^{-1}$ | 4.3 / 4.3 |
| Thermal expansion, CLTE (200–300 °C) | DIN 53752 | $10^{-5}$ $K^{-1}$ | 5.3 / 5.3 |
| Specific heat | | J / (g * K) | 1.04 |
| Thermal conductivity (40 °C) | ISO 8302 | W / (K * m) | 0.22 |
| **Electrical Properties** | | | |
| Surface resistivity (23 °C) | DIN IEC 60093 | Ω | $>10^{15}$ |
| Volume resistivity (23 °C) | DIN IEC 60093 | Ω * cm | $>10^{15}$ |
| Electric strength DC (23 °C) | ISO 60243-1 | kV / mm | >35 |
| Dielectric dissipation factor (50 Hz) | DIN 53483-1 | | $2.2 \cdot 10^{-2}$ |
| Dielectric dissipation factor (1 kHz) | DIN 53483-1 | | $2.5 \cdot 10^{-2}$ |
| Dielectric dissipation factor (1 MHz) | DIN 53483-1 | | $1.5 \cdot 10^{-3}$ |
| Dielectric constant (50 Hz) | DIN 53483-1 | | 3.8 |
| Dielectric constant (1 kHz) | DIN 53483-1 | | 3.9 |
| Dielectric constant (1 MHz) | DIN 53483-1 | | 3.7 |

PI Polyimide Tecasint 1011 natural shows significant water uptake. If parts are to undergo rapid heating above 200 °C, they must be pre-dried (drying process: 2 hours per 3 mm wall thickness at 150 °C). The values stated are guideline values for material selection and are not guaranteed minimum or maximum values in the sense of a specification. Since the properties also depend on the dimensions and orientation of the semi-finished product, application-specific individual testing is required; responsibility for suitability in the specific application lies with the customer. The product is not intended for medical or dental implants.


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