

## TECASINT 1011 natural - Stock Shapes (rods, plates, tubes)

### Chemical Designation

PI (Polyimide)

### Colour

black

### Density

1.34 g/cm<sup>3</sup>

### Main features

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

### Target Industries

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

Mechanical properties	condition	value	test method	comment
Tensile strength	50 mm/min	116 MPa	DIN EN ISO 527-1	(1) eU (2) eA (3) Ensinger Standard
Modulus of elasticity (tensile test)	1 mm/min	3600 MPa	DIN EN ISO 527-1	
Elongation at break (tensile test)	50 mm/min	3.8 %	DIN EN ISO 527-1	
Flexural strength	10 mm/min	170 MPa	DIN EN ISO 178	
Modulus of elasticity (flexural test)	2 mm/min	3450 MPa	DIN EN ISO 178	
Elongation at break (flexural test)	10 mm/min	6 %	DIN EN ISO 178	
Compression strength	10 mm/min	450 MPa	EN ISO 604	
Compression strength	10mm/min, 10% strain	190 MPa	EN ISO 604	
Compressive strain at break	10 mm/min	45 %	EN ISO 604	
Compression modulus	1 mm/min	1950 MPa	EN ISO 604	
Impact strength (Charpy)	max 7.5 J	75.8 kJ/m <sup>2</sup>	DIN EN ISO 179-1	1)
Notched impact strength (Charpy)	max 7.5 J	5 kJ/m <sup>2</sup>	DIN EN ISO 179-1	2)
Shore hardness	Shore D	90	-	3)
Thermal properties	condition	value	test method	comment
Glass transition temperature		383 °C	-	1)
Heat distortion temperature	1.85 MPa	368 °C	DIN 53 461	(1) DMA, maximum loss factor tan δ (2) Found in public sources. Individual testing regarding application conditions is mandatory.
Service temperature	long term	- °C	-	2)
Thermal expansion (CLTE)	50-200°C	4.3 / 4.3 10 <sup>-5</sup> K <sup>-1</sup>	DIN 53 752	3)
Thermal expansion (CLTE)	200-300°C	5.3 / 5.3 10 <sup>-5</sup> K <sup>-1</sup>	DIN 53 752	4)
Specific heat		1.04 J/(g*K)	-	
Thermal conductivity	40°C	0.22 W/(K*m)	ISO 8302	
Electrical properties	condition	value	test method	comment
surface resistivity	23°C	> 10 <sup>15</sup> Ω	DIN IEC 60093	
volume resistivity	23°C	> 10 <sup>15</sup> Ω*cm	DIN IEC 60093	
Electric strength DC	23°C	> 35 kV*mm <sup>-1</sup>	ISO 60243-1	
Dielectric loss factor	50 Hz	2.2*10 <sup>-2</sup>	DIN 53483-1	
Dielectric loss factor	1 kHz	2.5*10 <sup>-3</sup>	DIN 53483-1	
Dielectric loss factor	1 MHz	1.5*10 <sup>-2</sup>	DIN 53483-1	
Dielectric constant	50 Hz	3.8	DIN 53483-1	
Dielectric constant	1 kHz	3.9	DIN 53483-1	
Dielectric constant	1 MHz	3.7	DIN 53483-1	
Other properties	condition	value	test method	comment
Water absorption	24 h in water, 23°C	1.3 %	DIN EN ISO 62	(1) Corresponding means no listing at UL (yellow card). The information might be taken from resin, stock shape or estimation.
Water absorption	24 h in water, 80°C	3.8 %	DIN EN ISO 62	Individual testing regarding application conditions is mandatory.
Flammability (UL94)	corresponding to	V0	DIN IEC 60695-11-10;	1)

→ TECASINT 1000 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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