

## 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	parameter	value	unit	norm	comment
Tensile strength	50 mm/min, 23°C	116	MPa	DIN EN ISO 527-1	(1) eU
Modulus of elasticity (tensile test)	1 mm/min, 23°C	3600	MPa	DIN EN ISO 527-1	(2) eA (3) Ensinger Standard
Elongation at break (tensile test)	50 mm/min, 23°C	3.8	%	DIN EN ISO 527-1	
Elongation at break (tensile test)	10 mm/min, 23°C	6	%	DIN EN ISO 178	
Flexural strength	10 mm/min, 23°C	170	MPa	DIN EN ISO 178	
Modulus of elasticity (flexural test)	2 mm/min, 23°C	3450	MPa	DIN EN ISO 178	
Compression strength	10 mm/min, 23°C	450	MPa	EN ISO 604	
Compression strength	10mm/min, 10% strain, 23°C	190	MPa	EN ISO 604	
Compression modulus	1 mm/min, 23°C	1950	MPa	EN ISO 604	
Compressive strain at break	10 mm/min, 23°C	45	%	EN ISO 604	
Impact strength (Charpy)	max 7.5 J, 23°C	75.8	kJ/m <sup>2</sup>	DIN EN ISO 179-1	1)
Notched impact strength (Charpy)	max 7.5 J, 23°C	5	kJ/m <sup>2</sup>	DIN EN ISO 179-1	2)
Shore hardness	Shore D, 23°C	90	-	-	3)
Thermal properties	parameter	value	unit	norm	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.
Service temperature	long term	280	°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)	-	The information regarding application conditions is mandatory. (3) Thermal expansion XY/Z axis (4) Thermal expansion XY/Z axis
Thermal conductivity	40°C	0.22	W/(K*m)	ISO 8302	
Electrical properties	parameter	value	unit	norm	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, 23°C	2.2*10 <sup>-2</sup>		DIN 53483-1	
Dielectric loss factor	1 kHz, 23°C	2.5*10 <sup>-3</sup>		DIN 53483-1	
Dielectric loss factor	1 MHz, 23 °C	1.5*10 <sup>-2</sup>		DIN 53483-1	
Dielectric constant	50 Hz, 23°C	3.8		DIN 53483-1	
Dielectric constant	1 kHz, 23°C	3.9		DIN 53483-1	
Dielectric constant	1 MHz, 23 °C	3.7		DIN 53483-1	
Other properties	parameter	value	unit	norm	comment
Water absorption	24 h in water, 23°C	1.3	%	DIN EN ISO 62	(1) Corresponding means no listing at UL (yellow card).
Water absorption	24 h in water, 80°C	3.8	%	DIN EN ISO 62	The information might be taken from resin, stock shape or estimation. 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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Date: 2019/12/06

Version: AC