

## 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

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

Mechanical properties	condition	value	unit	test method	comment
Tensile strength	0.40 inch/min	128	MPa	ASTM D 638	(1) eU (2) eA
Modulus of elasticity (tensile test)	0.04 inch/min	3864	MPa	ASTM D 638	
Elongation at break (tensile test)	0.40 inch/min	5.0	%	ASTM D 638	
Flexural strength	0.54 inch/min	206	MPa	ASTM D 790	
Modulus of elasticity (flexural test)	0.54 inch/min	3783	MPa	ASTM D 790	
Compression strength	0.05 inch/min, 10% strain	207	MPa	ASTM D 695	
Compression modulus	0.05 inch/min	3801	MPa	ASTM D 695	
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		DIN EN ISO 868	
Thermal properties	condition	value	unit	test method	comment
Glass transition temperature		721	°F	-	1)
Heat distortion temperature	1.85 MPa	694	°F	DIN 53 461	(1) DMA, maximum loss factor tan d (2) Thermal expansion XY/Z axis
Thermal expansion (CLTE)	122-392°F	43 / 43	10 <sup>-6</sup> K <sup>-1</sup>	DIN 53 752	2)
Thermal expansion (CLTE)	392-572°F	53 / 53	10 <sup>-6</sup> K <sup>-1</sup>	DIN 53 752	3)
Specific heat		1.04	J/(g*K)	-	(3) Thermal expansion XY/Z axis
Thermal conductivity	104°F	0.22	W/(K*m)	ISO 8302	
Electrical properties	condition	value	unit	test method	comment
surface resistivity	73°F	> 10 <sup>15</sup>	Ω	DIN IEC 60093	
volume resistivity	73°F	> 10 <sup>15</sup>	Ω*cm	DIN IEC 60093	
Electric strength DC	73°F	> 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	unit	test method	comment
Water absorption	24 h in water, 73°F	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. Individual testing regarding application conditions is mandatory.
Water absorption	24 h in water, 176°F	3.8	%	DIN EN ISO 62	
Outgassing in high vacuum		passed		ECSS-Q-70-02	
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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