

## TECASINT 4011 natural - Stock Shapes (rods, plates, tubes)

### Chemical Designation

PI (Polyimide)

### Colour

yellow

### Density

1.42 g/cm<sup>3</sup>

### Main features

- very high thermal and oxidative resistance
- very low water absorption
- high thermal and mechanical capacity
- high creep resistance
- low outgassing
- good chemical resistance
- resistance against high energy radiation
- sensitive to hydrolysis in higher thermal range

### Target Industries

- mechanical engineering
- precision engineering
- electronics
- electrical engineering
- conveyor technology
- semiconductor technology

### Mechanical properties

	condition	value	unit	test method	comment
Tensile strength	0.40 inch/min	134	MPa	ASTM D 638	(1) eU (2) eA (3) Specimen in 4mm thickness
Modulus of elasticity (tensile test)	0.04 inch/min	4083	MPa	ASTM D 638	
Elongation at break (tensile test)	0.40 inch/min	6.9	%	ASTM D 638	
Flexural strength	0.54 inch/min	207	MPa	ASTM D 790	
Modulus of elasticity (flexural test)	0.54 inch/min	4299	MPa	ASTM D 790	
Compression strength	0.05 inch/min, 10% strain	188	MPa	ASTM D 695	
Compression modulus	0.05 inch/min	4325	MPa	ASTM D 695	
Impact strength (Charpy)	max 7.5 J	87	kJ/m <sup>2</sup>	DIN EN ISO 179-1	1)
Notched impact strength (Charpy)	max 7.5 J	9.6	kJ/m <sup>2</sup>	DIN EN ISO 179-1	2)
Shore hardness	Shore D	88		DIN EN ISO 868	
Ball indentation hardness		265	MPa	ISO 2039-1	3)

### Thermal properties

	condition	value	unit	test method	comment
Glass transition temperature		500	°F	DIN EN ISO 11357	
Heat distortion temperature	1.82 MPa	680	°F	ASTM D 648	
Thermal expansion (CLTE)	122-392°F	46 / 56	10 <sup>-6</sup> K <sup>-1</sup>	DIN 53 752	1)
Thermal expansion (CLTE)	392-572°F	62 / 76	10 <sup>-6</sup> K <sup>-1</sup>	DIN 53 752	2)
Thermal expansion (CLTE)	572-662°F	85 / 112	10 <sup>-6</sup> K <sup>-1</sup>	DIN 53 752	3)
Specific heat		1.22	J/(g*K)	ASTM E1461	
Thermal conductivity	104°F	0.4	W/(K*m)	ASTM E1461	

### Electrical properties

	condition	value	unit	test method	comment
surface resistivity	73°F	10 <sup>16</sup>	Ω	ASTM D 257	
volume resistivity	73°F	10 <sup>16</sup>	Ω*cm	ASTM D 257	
Electric strength DC	73°F	18	kV*mm <sup>-1</sup>	ASTM D 149	
Dielectric loss factor	1 kHz	1*10 <sup>-3</sup>		ASTM D 150	
Dielectric constant	1 kHz	3.59		ASTM D 150	

### Other properties

	condition	value	unit	test method	comment
Water absorption	24 h in water, 73°F	0.16	%	DIN EN ISO 62	
Water absorption	24 h in water, 176°F	0.6	%	DIN EN ISO 62	
Outgassing in high vacuum		passed		ECSS-Q-70-02	
Flammability (UL94)	corresponding to	V0		DIN IEC 60695-11-10; 1)	
Oxygen Index		49	%	EN ISO 4589-2	

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