

## 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	parameter	value	unit	norm	comment
Tensile strength	50 mm/min	130	MPa	DIN EN ISO 527-1	(1) eU
Modulus of elasticity (tensile test)	1 mm/min	4300	MPa	DIN EN ISO 527-1	(2) eA (3) Specimen in 4mm thickness
Elongation at break (tensile test)	50 mm/min	4.5	%	DIN EN ISO 527-1	
Flexural strength	10 mm/min	180	MPa	DIN EN ISO 178	
Modulus of elasticity (flexural test)	2 mm/min	4000	MPa	DIN EN ISO 178	
Compression strength	10mm/min, 10% strain	185	MPa	EN ISO 604	
Compression modulus	1 mm/min	4123	MPa	EN ISO 604	
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	parameter	value	unit	norm	comment
Glass transition temperature		260	°C	DIN EN ISO 11357	(1) Thermal expansion XY/Z axis
Heat distortion temperature	1.82 MPa	360	°C	ASTM D 648	(2) Thermal expansion XY/Z axis
Thermal expansion (CLTE)	50-200°C	4.6 / 5.6	10 <sup>-5</sup> K <sup>-1</sup>	DIN 53 752	1) (3) Thermal expansion XY/Z axis
Thermal expansion (CLTE)	200-300°C	6.2 / 7.6	10 <sup>-5</sup> K <sup>-1</sup>	DIN 53 752	2)
Thermal expansion (CLTE)	300-350°C	8.5 / 11.2	10 <sup>-5</sup> K <sup>-1</sup>	DIN 53 752	3)
Specific heat		1.22	J/(g*K)	ASTM E1461	
Thermal conductivity	40°C	0.4	W/(K*m)	ASTM E1461	
Electrical properties	parameter	value	unit	norm	comment
surface resistivity	23°C	10 <sup>16</sup>	Ω	ASTM D 257	
volume resistivity	23°C	10 <sup>16</sup>	Ω*cm	ASTM D 257	
Electric strength DC	23°C	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	parameter	value	unit	norm	comment
Water absorption	24 h in water, 23°C	0.16	%	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, 80°C	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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