

## TECASINT 4111 natural - Stock Shapes (rods, plates, tubes)

### Chemical Designation

PI (Polyimide)

### Colour

yellow

### Density

1.47 g/cm<sup>3</sup>

### Main features

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

### Target Industries

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

Mechanical properties	parameter	value	unit	norm	comment
Tensile strength	50 mm/min, 23°C	100	MPa	DIN EN ISO 527-1	(1) eU
Modulus of elasticity (tensile test)	1 mm/min, 23°C	6100	MPa	DIN EN ISO 527-1	(2) eA (3) Specimen in 4mm thickness (4) Ensinger Standard
Elongation at break (tensile test)	50 mm/min, 23°C	1.7	%	DIN EN ISO 527-1	
Elongation at break (tensile test)	10 mm/min, 23°C	2.5	%	DIN EN ISO 178	
Flexural strength	10 mm/min, 23°C	160	MPa	DIN EN ISO 178	
Modulus of elasticity (flexural test)	2 mm/min, 23°C	6100	MPa	DIN EN ISO 178	
Compression strength	10 mm/min, 23°C	250	MPa	EN ISO 604	
Compression strength	10mm/min, 10% strain, 23°C	210	MPa	EN ISO 604	
Compressive strain at break	10 mm/min, 23°C	25	%	EN ISO 604	
Compression modulus	1 mm/min, 23°C	2500	MPa	EN ISO 604	
Impact strength (Charpy)	max 7.5 J, 23°C	20	kJ/m <sup>2</sup>	DIN EN ISO 179-1	1)
Notched impact strength (Charpy)	max 7.5 J, 23°C	1.1	kJ/m <sup>2</sup>	DIN EN ISO 179-1	2)
Ball indentation hardness		345	MPa	-	3)
Shore hardness	Shore D, 23°C	90		-	4)
Thermal properties	parameter	value	unit	norm	comment
Glass transition temperature		n.a.	°C	DIN EN ISO 11357	(1) Thermal expansion XY/Z axis
Heat distortion temperature	1.82 MPa	470	°C	ASTM D 648	(2) Thermal expansion XY/Z axis
Thermal expansion (CLTE)	200-300°C	4.7 / 6.9	10 <sup>-5</sup> K <sup>-1</sup>	DIN 53 752	1) (3) Thermal expansion XY/Z axis
Thermal expansion (CLTE)	50-200°C	3.6 / 5.2	10 <sup>-5</sup> K <sup>-1</sup>	DIN 53 752	2)
Thermal expansion (CLTE)	300-400°C	6.5 / 9.9	10 <sup>-5</sup> K <sup>-1</sup>	DIN 53 752	3)
Specific heat		1.24	J/(g*K)	ASTM E1461	
Thermal conductivity	40°C	0.52	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	22.7	kV*mm <sup>-1</sup>	ASTM D 149	
Dielectric loss factor	1 MHz, 23°C	0.0013		ASTM D 150	
Dielectric constant	1 MHz, 23°C	3.7		ASTM D 150	
Other properties	parameter	value	unit	norm	comment
Water absorption	24 h in water, 23°C	0.08	%	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	0.3	%	DIN EN ISO 62	
Flammability (UL94)	corresponding to	V0		DIN IEC 60695-11-10;	1)
Oxygen Index		53	%	EN ISO 4589-2	

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