

## 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

- 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	130	MPa	DIN EN ISO 527-1	(1) eU
Modulus of elasticity (tensile test)	1 mm/min, 23°C	4300	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	4.5	%	DIN EN ISO 527-1	
Elongation at break (tensile test)	10 mm/min, 23°C	6.0	%	DIN EN ISO 178	
Flexural strength	10 mm/min, 23°C	180	MPa	DIN EN ISO 178	
Modulus of elasticity (flexural test)	2 mm/min, 23°C	4000	MPa	DIN EN ISO 178	
Compression strength	10 mm/min, 1% strain, 23°C	30	MPa	EN ISO 604	
Compression strength	10mm/min, 10% strain, 23°C	185	MPa	EN ISO 604	
Compression modulus	1 mm/min, 23°C	2100	MPa	EN ISO 604	
Impact strength (Charpy)	max 7.5 J, 23°C	87	kJ/m <sup>2</sup>	DIN EN ISO 179-1	1)
Notched impact strength (Charpy)	max 7.5 J, 23°C	9.6	kJ/m <sup>2</sup>	DIN EN ISO 179-1	2)
Ball indentation hardness		265	MPa	ISO 2039-1	3)
Shore hardness	Shore D, 23°C	88	-	-	4)
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)	ASTME1461	
Thermal conductivity	40°C	0.4	W/(K*m)	ASTME1461	
Electrical properties	parameter	value	unit	norm	comment
surface resistivity	23°C	10 <sup>16</sup>	Ω	ASTMD 257	
volume resistivity	23°C	10 <sup>16</sup>	Ω*cm	ASTMD 257	
Electric strength DC	23°C	18	kV*mm <sup>-1</sup>	ASTMD 149	
Dielectric loss factor	1 kHz, 23°C	1*10 <sup>-3</sup>		ASTMD 150	
Dielectric constant	1 kHz, 23°C	3.59		ASTMD 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).
Water absorption	24 h in water, 80°C	0.6	%	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)
Oxygen Index		49	%	EN ISO 4589-2	

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