

# SUPPLY SERVICES

performance engineering products

## TECASINT 1011 natural - Stock Shapes

### 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

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

Mechanical properties	parameter	value	unit	norm	comment
Modulus of elasticity (tensile test)	1 mm/min, 23°C	3600	MPa	DIN EN ISO 527-1	
Tensile strength	50 mm/min, 23°C	116	MPa	DIN EN ISO 527-1	
Elongation at break	50 mm/min, 23°C	3,8	%	DIN EN ISO 527-1	
Elongation at break	10 mm/min, 23°C	6	%	DIN EN ISO 178	
Flexural strength	10 mm/min, 23°C	170	MPa	DIN EN ISO 178	
Modulus of elasticity (flexural test)	2 mm/min, 23°C	3700	MPa	DIN EN ISO 178	
Compression strength	10 mm/min, 23°C	500	MPa	EN ISO 604	
Compression strength	10mm/min, 10% strain, 23°C	190	MPa	EN ISO 604	
Compression modulus	1 mm/min, 23°C	2000	MPa	EN ISO 604	
Compressive strain at break	10 mm/min, 23°C	45	%	EN ISO 604	
Impact strength (Charpy)	max 7.5 J, 23°C	75.8	kJ/m <sup>2</sup>	DIN EN ISO 179-1eU	
Notched impact strength (Charpy)	max 7.5 J, 23°C	5	kJ/m <sup>2</sup>	DIN EN ISO 179-1eA	
Shore hardness	Shore D, 23°C	90	D	DIN 53505	
Thermal properties	parameter	value	unit	norm	comment
Glass transition temperature		368	°C	-	1)
Heat distortion temperature	1.85 MPa	368	°C	DIN 53 461	(1) DMA, maximum loss factor tan d
Service temperature	long term	-	°C	-	2)
Thermal expansion (CLTE)	50-200°C	4.3 / 4.3	10 <sup>-5</sup> K <sup>-1</sup>	DIN 53 752	(2) Found in public sources. Individual testing regarding application conditions is mandatory.
Thermal expansion (CLTE)	200-300°C	5.3 / 5.3	10 <sup>-5</sup> K <sup>-1</sup>	DIN 53 752	(3) Thermal expansion XY/Z axis
Specific heat		1.04	J/(g*K)	-	(4) Thermal expansion XY/Z axis
Thermal conductivity	40°C	0.22	W/(K*m)	ISO 8302	
Electrical properties	parameter	value	unit	norm	comment
Specific surface resistance	23°C	10 <sup>16</sup>	Ω	DIN IEC 60093	
Specific volume resistance	23°C	10 <sup>17</sup>	Ω*cm	DIN IEC 60093	
Electric strength DC	23°C	20	kV*mm <sup>-1</sup>	ISO 60243-1	
Dielectric loss factor	50 Hz, 23°C	1*10 <sup>-3</sup>		DIN 53483-1	
Dielectric loss factor	27 MHz, 23°C	3*10 <sup>-3</sup>		DIN 53483-1	
Dielectric constant	50 Hz, 23°C	3.5		DIN IEC 60250	
Dielectric constant	27 MHz, 23°C	3.1		DIN IEC 60250	
Other properties	parameter	value	unit	norm	comment
Water absorption	24 h in water, 23°C	1.08	%	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	3.29	%	DIN EN ISO 62	
Flammability (UL94)	corresponding to	V0		DIN IEC 60695-11-10;	1)

# TECASINT 1021 black - Stock Shapes

## Chemical Designation

PI (Polyimide)

## Colour

black

## Density

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

## Fillers

15% graphite

## Main features

- very good slide and wear properties
- very good thermal stability
- good wear resistance
- good chemical resistance
- high thermal and mechanical capacity
- resistance against high energy radiation
- high creep resistance
- sensitive to hydrolysis in higher thermal range

## Target Industries

- automotive industry
- aircraft and aerospace technology
- cryogenic engineering
- conveyor technology
- hot glass technology
- mechanical engineering
- precision engineering

<b>Mechanical properties</b>	<b>parameter</b>	<b>value</b>	<b>unit</b>	<b>norm</b>	<b>comment</b>
Modulus of elasticity (tensile test)	1 mm/min, 23°C	4000	MPa	DIN EN ISO 527-1	
Tensile strength	50 mm/min, 23°C	97	MPa	DIN EN ISO 527-1	
Elongation at break	50 mm/min, 23°C	2.8	%	DIN EN ISO 527-1	
Elongation at break	10 mm/min, 23°C	4.5	%	DIN EN ISO 178	
Flexural strength	10 mm/min, 23°C	150	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, 23°C	210	MPa	EN ISO 604	
Compression strength	10mm/min, 10% strain, 23°C	175	MPa	EN ISO 604	
Compression modulus	1 mm/min, 23°C	1880	MPa	EN ISO 604	
Compressive strain at break	10 mm/min, 23°C	20.1	%	EN ISO 604	
Impact strength (Charpy)	max 7.5 J, 23°C	35.1	kJ/m <sup>2</sup>	DIN EN ISO 179-1eU	
Notched impact strength (Charpy)	max 7.5 J, 23°C	4.8	kJ/m <sup>2</sup>	DIN EN ISO 179-1eA	
Shore hardness	Shore D, 23°C	88	D	DIN 53505	
<b>Thermal properties</b>	<b>parameter</b>	<b>value</b>	<b>unit</b>	<b>norm</b>	<b>comment</b>
Glass transition temperature		330	°C	-	1) (1) DMA, maximum loss factor tan d
Heat distortion temperature	1.85 MPa	300	°C	DIN 53 461	(2) Found in public sources. Individual testing regarding application conditions is mandatory.
Service temperature	long-term	-	°C	-	2)
Thermal expansion (CLTE)	50-200°C	3.8 /	10 <sup>-5</sup> K <sup>-1</sup>	DIN 53 752	3) Thermal expansion XYZ axis
Specific heat		1.13	J/(g*K)	-	
Thermal conductivity	40°C	0.53	W/(K*m)	ISO 8302	
<b>Other properties</b>	<b>parameter</b>	<b>value</b>	<b>unit</b>	<b>norm</b>	<b>comment</b>
Water absorption	24 h in water, 23°C	0.51	%	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	1.57	%	DIN EN ISO 62	
Flammability (UL94)	corresponding to	V0		DIN IEC 60695-11-10;	1)

# TECASINT 1031 black - Stock Shapes

## Chemical Designation

PI (Polyimide)

## Colour

black

## Density

1.57 g/cm<sup>3</sup>

## Fillers

40% graphite

## Main features

- very good slide and wear properties
- very good thermal stability
- very high creep resistant
- good wear resistance
- high thermal and mechanical capacity
- resistance against high energy radiation
- low thermal expansion
- sensitive to hydrolysis in higher thermal range

## Target Industries

- automotive industry
- aircraft and aerospace technology
- cryogenic engineering
- conveyor technology
- hot glass technology
- mechanical engineering
- precision engineering
- textile industry

<b>Mechanical properties</b>	<b>parameter</b>	<b>value</b>	<b>unit</b>	<b>norm</b>	<b>comment</b>
Tensile strength	50 mm/min, 23°C	65	MPa	DIN EN ISO 527-1	
Elongation at break	50 mm/min, 23°C	2.2	%	DIN EN ISO 527-1	
Elongation at break	10 mm/min, 23°C	1.4	%	DIN EN ISO 178	
Flexural strength	10 mm/min, 23°C	88	MPa	DIN EN ISO 178	
Compression strength	10 mm/min, 23°C	180	MPa	EN ISO 604	
Impact strength (Charpy)	max 7.5 J, 23°C	16.5	kJ/m <sup>2</sup>	DIN EN ISO 179-1eU	
Notched impact strength (Charpy)	max 7.5 J, 23°C	3.6	kJ/m <sup>2</sup>	DIN EN ISO 179-1eA	
Shore hardness	Shore D, 23°C	85	D	DIN 53505	
<b>Thermal properties</b>	<b>parameter</b>	<b>value</b>	<b>unit</b>	<b>norm</b>	<b>comment</b>
Glass transition temperature		330	°C	-	1) (1) DMA, maximum loss factor tan δ
Service temperature	long-term	-	°C	-	2) (2) Found in public sources. Individual testing regarding application conditions is mandatory.
Thermal expansion (CLTE)	50-200°C	3.1 /	10 <sup>-5</sup> K <sup>-1</sup>	DIN 53 752	3) (3) Thermal expansion XYZ axis
<b>Other properties</b>	<b>parameter</b>	<b>value</b>	<b>unit</b>	<b>norm</b>	<b>comment</b>
Water absorption	24 h in water, 23°C	0.42	%	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.
Flammability (UL94)	corresponding to	V0		DIN IEC 60695-11-10;	1)

# TECASINT 1061 black - Stock Shapes

## Chemical Designation

PI (Polyimide)

## Colour

black

## Density

1.48 g/cm<sup>3</sup>

## Fillers

15% graphite, 10% PTFE

## Main features

- very good slide and wear properties
- high thermal and mechanical capacity
- good wear resistance
- resistance against high energy radiation
- good chemical resistance
- sensitive to hydrolysis in higher thermal range

## Target Industries

- automotive industry
- aircraft and aerospace technology
- conveyor technology
- mechanical engineering
- precision engineering
- textile industry
- vacuum technology

<b>Mechanical properties</b>					
	<i>parameter</i>	<i>value</i>	<i>unit</i>	<i>norm</i>	<i>comment</i>
Tensile strength	50 mm/min, 23°C	77	MPa	DIN EN ISO 527-1	
Elongation at break	50 mm/min, 23°C	2.9	%	DIN EN ISO 527-1	
Elongation at break	10 mm/min, 23°C	3.6	%	DIN EN ISO 178	
Flexural strength	10 mm/min, 23°C	120	MPa	DIN EN ISO 178	
Compression strength	10 mm/min, 23°C	227	MPa	EN ISO 604	
Impact strength (Charpy)	max 7.5 J, 23°C	25.8	kJ/m <sup>2</sup>	DIN EN ISO 179-1eU	
Notched impact strength (Charpy)	max 7.5 J, 23°C	3.9	kJ/m <sup>2</sup>	DIN EN ISO 179-1eA	
Shore hardness	Shore D, 23°C	85	D	DIN 53505	
<b>Thermal properties</b>					
	<i>parameter</i>	<i>value</i>	<i>unit</i>	<i>norm</i>	<i>comment</i>
Glass transition temperature		330	°C	-	1) (1) DMA, maximum loss factor tan δ
Service temperature	long-term	-	°C	-	2) (2) Found in public sources. Individual testing regarding application conditions is mandatory.
Thermal expansion (CLTE)	50-200°C	5.1 /	10 <sup>-5</sup> K <sup>-1</sup>	DIN 53 752	3) (3) Thermal expansion XYZ axis
<b>Other properties</b>					
	<i>parameter</i>	<i>value</i>	<i>unit</i>	<i>norm</i>	<i>comment</i>
Flammability (UL94)	corresponding to	V0		DIN IEC 60695-11-10;	1) (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.

# TECASINT 2011 natural - Stock Shapes

## Chemical Designation

PI (Polyimide)

## Colour

brown

## Density

1.38 g/cm<sup>3</sup>

## Main features

- very good thermal stability
- high thermal and mechanical capacity
- low outgassing
- very good electrical insulation
- resistance against high energy radiation
- good chemical resistance
- high creep resistance
- sensitive to hydrolysis in higher thermal range

## Target Industries

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

Mechanical properties	parameter	value	unit	norm	comment
Modulus of elasticity (tensile test)	1 mm/min, 23°C	3700	MPa	DIN EN ISO 527-1	(1) Specimen in 4mm thickness
Tensile strength	50 mm/min, 23°C	118	MPa	DIN EN ISO 527-1	
Elongation at break	50 mm/min, 23°C	4.5	%	DIN EN ISO 527-1	
Elongation at break	10 mm/min, 23°C	6.1	%	DIN EN ISO 178	
Flexural strength	10 mm/min, 23°C	177	MPa	DIN EN ISO 178	
Modulus of elasticity (flexural test)	2 mm/min, 23°C	3600	MPa	DIN EN ISO 178	
Modulus of elasticity (flexural test)	10 mm/min, 250°C	2300	MPa	DIN EN ISO 178	
Modulus of elasticity (flexural test)	10 mm/min, 300°C	2150	MPa	DIN EN ISO 178	
Compression strength	10 mm/min, 23°C	486	MPa	EN ISO 604	
Compression strength	10mm/min, 10% strain, 23°C	170	MPa	EN ISO 604	
Compression modulus	1 mm/min, 23°C	1713	MPa	EN ISO 604	
Compressive strain at break	10 mm/min, 23°C	58	%	EN ISO 604	
Impact strength (Charpy)	max 7.5 J, 23°C	87.9	kJ/m <sup>2</sup>	DIN EN ISO 179-1eU	
Notched impact strength (Charpy)	max 7.5 J, 23°C	9.3	kJ/m <sup>2</sup>	DIN EN ISO 179-1eA	
Shore hardness	Shore D, 23°C	90	D	DIN 53505	
Ball indentation hardness		260	MPa	ISO 2039-1	1)
Thermal properties	parameter	value	unit	norm	comment
Glass transition temperature		370	°C	-	1)
Heat distortion temperature	1.80 MPa	319	°C	DIN 53 461	(1) DMA, maximum loss factor tan δ
Service temperature	long-term	-	°C	-	2)
Thermal expansion (CLTE)	50-200°C	4.4 / 4.3	10 <sup>-5</sup> K <sup>-1</sup>	DIN 53 752	(2) Found in public sources. Individual testing regarding application conditions is mandatory.
Thermal expansion (CLTE)	200-300°C	5.1 / 5.1	10 <sup>-5</sup> K <sup>-1</sup>	DIN 53 752	(3) Thermal expansion XY/Z axis
Specific heat		0.925	J/(g*K)	-	(4) Thermal expansion XY/Z axis
Thermal conductivity	40°C	0.22	W/(K*m)	ISO 8302	
Electrical properties	parameter	value	unit	norm	comment
Specific surface resistance	23°C	10 <sup>15</sup>	Ω	DIN IEC 60093	
Specific volume resistance	23°C	10 <sup>15</sup>	Ω*cm	DIN IEC 60093	
Electric strength DC	23°C	21.8	kV*mm <sup>-1</sup>	ISO 60243-1	
Dielectric constant	100 Hz, 23°C	4.2		DIN IEC 60250	
Dielectric constant	1 kHz, 23°C	4.2		DIN IEC 60250	
Dielectric constant	10 kHz, 23°C	4.1		DIN IEC 60250	
Dielectric constant	100 kHz, 23°C	4.1		DIN IEC 60250	
Other properties	parameter	value	unit	norm	comment
Water absorption	24 h in water, 23°C	0.47	%	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	1.65	%	DIN EN ISO 62	
Flammability (UL94)	corresponding to	V0		DIN IEC 60695-11-10;	1)

# TECASINT 2021 black - Stock Shapes

## Chemical Designation

PI (Polyimide)

## Colour

black

## Density

1.45 g/cm<sup>3</sup>

## Fillers

15% graphite

## Main features

- very good slide and wear properties
- very good thermal stability
- high thermal and mechanical capacity
- good wear resistance
- resistance against high energy radiation
- high creep resistance
- good chemical resistance
- sensitive to hydrolysis in higher thermal range

## Target Industries

- automotive industry
- aircraft and aerospace technology
- cryogenic engineering
- conveyor technology
- hot glass technology
- mechanical engineering
- precision engineering

<b>Mechanical properties</b>	<b>parameter</b>	<b>value</b>	<b>unit</b>	<b>norm</b>	<b>comment</b>
Modulus of elasticity (tensile test)	1 mm/min, 23°C	4400	MPa	DIN EN ISO 527-1	
Tensile strength	50 mm/min, 23°C	101	MPa	DIN EN ISO 527-1	
Elongation at break	50 mm/min, 23°C	3.7	%	DIN EN ISO 527-1	
Elongation at break	10 mm/min, 23°C	4.6	%	DIN EN ISO 178	
Flexural strength	10 mm/min, 23°C	145	MPa	DIN EN ISO 178	
Modulus of elasticity (flexural test)	2 mm/min, 23°C	4300	MPa	DIN EN ISO 178	
Compression strength	10 mm/min, 23°C	300	MPa	EN ISO 604	
Compression strength	10mm/min, 10% strain, 23°C	160	MPa	EN ISO 604	
Compressive strain at break	10 mm/min, 23°C	43	%	EN ISO 604	
Compression modulus	1 mm/min, 23°C	1900	MPa	EN ISO 604	
Impact strength (Charpy)	max 7.5 J, 23°C	36.7	kJ/m <sup>2</sup>	DIN EN ISO 179-1eU	
Notched impact strength (Charpy)	max 7.5 J, 23°C	2.9	kJ/m <sup>2</sup>	DIN EN ISO 179-1eA	
Shore hardness	Shore D, 23°C	87	D	DIN 53505	
<b>Thermal properties</b>	<b>parameter</b>	<b>value</b>	<b>unit</b>	<b>norm</b>	<b>comment</b>
Glass transition temperature		370	°C	-	1) (1) DMA, maximum loss factor tan d
Heat distortion temperature	1.8 MPa	335	°C	DIN 53 461	(2) Found in public sources. Individual testing regarding application conditions is mandatory.
Service temperature	long-term	-	°C	-	2)
Thermal expansion (CLTE)	50-200°C	3.8 / 4.5	10 <sup>-5</sup> K <sup>-1</sup>	DIN 53 752	3) Thermal expansion XYZ axis
Thermal expansion (CLTE)	200-300°C	4.6 / 5.4	10 <sup>-5</sup> K <sup>-1</sup>	DIN 53 752	4) Thermal expansion XYZ axis
<b>Other properties</b>	<b>parameter</b>	<b>value</b>	<b>unit</b>	<b>norm</b>	<b>comment</b>
Water absorption	24 h in water, 23°C	0.44	%	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	1.55	%	DIN EN ISO 62	
Flammability (UL94)	corresponding to	V0		DIN IEC 60695-11-10;	1)

# TECASINT 2031 black - Stock Shapes

## Chemical Designation

PI (Polyimide)

## Colour

anthracite

## Density

1.59 g/cm<sup>3</sup>

## Fillers

40% graphite

## Main features

- high thermal and mechanical capacity
- very good slide and wear properties
- very good thermal stability
- very high creep resistant
- good wear resistance
- low thermal expansion
- resistance against high energy radiation
- sensitive to hydrolysis in higher thermal range

## Target Industries

- automotive industry
- aircraft and aerospace technology
- cryogenic engineering
- conveyor technology
- hot glass technology
- mechanical engineering
- precision engineering

<b>Mechanical properties</b>	<b>parameter</b>	<b>value</b>	<b>unit</b>	<b>norm</b>	<b>comment</b>
Modulus of elasticity (tensile test)	1 mm/min, 23°C	6300	MPa	DIN EN ISO 527-1	
Tensile strength	50 mm/min, 23°C	65	MPa	DIN EN ISO 527-1	
Elongation at break	50 mm/min, 23°C	2.1	%	DIN EN ISO 527-1	
Elongation at break	10 mm/min, 23°C	2.2	%	DIN EN ISO 178	
Flexural strength	10 mm/min, 23°C	87.5	MPa	DIN EN ISO 178	
Modulus of elasticity (flexural test)	2 mm/min, 23°C	5200	MPa	DIN EN ISO 178	
Compression strength	10 mm/min, 23°C	131	MPa	EN ISO 604	
Compression strength	10mm/min, 10% strain, 23°C	124	MPa	EN ISO 604	
Compression modulus	1 mm/min, 23°C	2027	MPa	EN ISO 604	
Compressive strain at break	10 mm/min, 23°C	12.5	%	EN ISO 604	
Impact strength (Charpy)	max 7.5 J, 23°C	14.2	kJ/m <sup>2</sup>	DIN EN ISO 179-1eU	
Notched impact strength (Charpy)	max 7.5 J, 23°C	3.3	kJ/m <sup>2</sup>	DIN EN ISO 179-1eA	
Shore hardness	Shore D, 23°C	84	D	DIN 53505	
<b>Thermal properties</b>	<b>parameter</b>	<b>value</b>	<b>unit</b>	<b>norm</b>	<b>comment</b>
Glass transition temperature		370	°C	-	1) (1) DMA maximum loss factor tan δ
Heat distortion temperature	1.8 MPa	325	°C	DIN 53 461	(2) Found in public sources. Individual testing regarding application conditions is mandatory.
Service temperature	long-term	-	°C	-	2)
Thermal expansion (CLTE)	50-200°C	3.0 /	10 <sup>-5</sup> K <sup>-1</sup>	DIN 53 752	3) (3) Thermal expansion XY/Z axis
Thermal expansion (CLTE)	200-300°C	3.8 /	10 <sup>-5</sup> K <sup>-1</sup>	DIN 53 752	4) (4) Thermal expansion XY/Z axis
<b>Other properties</b>	<b>parameter</b>	<b>value</b>	<b>unit</b>	<b>norm</b>	<b>comment</b>
Water absorption	24 h in water, 23°C	1.2	%	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	2.18	%	DIN EN ISO 62	
Flammability (UL94)	corresponding to	V0		DIN IEC 60695-11-10;	1)

# TECASINT 2061 black - Stock Shapes

## Chemical Designation

PI (Polyimide)

## Colour

anthracite

## Density

1.52 g/cm<sup>3</sup>

## Fillers

15% graphite, 10% PTFE

## Main features

- very good slide and wear properties
- good wear resistance
- high thermal and mechanical capacity
- resistance against high energy radiation
- good chemical resistance
- sensitive to hydrolysis in higher thermal range

## Target Industries

- automotive industry
- aircraft and aerospace technology
- conveyor technology
- mechanical engineering
- precision engineering
- textile industry
- vacuum technology

<b>Mechanical properties</b>	<b>parameter</b>	<b>value</b>	<b>unit</b>	<b>norm</b>	<b>comment</b>
Modulus of elasticity (tensile test)	1 mm/min, 23°C	3900	MPa	DIN EN ISO 527-1	
Tensile strength	50 mm/min, 23°C	63	MPa	DIN EN ISO 527-1	
Elongation at break	50 mm/min, 23°C	2.7	%	DIN EN ISO 527-1	
Elongation at break	10 mm/min, 23°C	3.3	%	DIN EN ISO 178	
Flexural strength	10 mm/min, 23°C	89	MPa	DIN EN ISO 178	
Modulus of elasticity (flexural test)	2 mm/min, 23°C	3490	MPa	DIN EN ISO 178	
Compression strength	10 mm/min, 23°C	164	MPa	EN ISO 604	
Compression strength	10mm/min, 10% strain, 23°C	142	MPa	EN ISO 604	
Compression modulus	1 mm/min, 23°C	1748	MPa	EN ISO 604	
Compressive strain at break	10 mm/min, 23°C	16.4	%	EN ISO 604	
Impact strength (Charpy)	max 7.5 J, 23°C	19.4	kJ/m <sup>2</sup>	DIN EN ISO 179-1eU	
Notched impact strength (Charpy)	max 7.5 J, 23°C	3.2	kJ/m <sup>2</sup>	DIN EN ISO 179-1eA	
Shore hardness	Shore D, 23°C	84	D	DIN 53505	
<b>Thermal properties</b>	<b>parameter</b>	<b>value</b>	<b>unit</b>	<b>norm</b>	<b>comment</b>
Glass transition temperature			°C	-	1) (1) DMA, maximum loss factor tan δ
Service temperature	long-term	-	°C	-	2) (2) Found in public sources. Individual testing regarding application conditions is mandatory.
Thermal expansion (CLTE)	50-200°C	4.0 /	10 <sup>-5</sup> K <sup>-1</sup>	DIN 53 752	3) (3) Thermal expansion XY/Z axis
Thermal expansion (CLTE)	200-300°C	5.0 /	10 <sup>-5</sup> K <sup>-1</sup>	DIN 53 752	4) (4) Thermal expansion XYZ axis
<b>Other properties</b>	<b>parameter</b>	<b>value</b>	<b>unit</b>	<b>norm</b>	<b>comment</b>
Water absorption	24 h in water, 23°C	0.35	%	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	1.5	%	DIN EN ISO 62	
Flammability (UL94)	corresponding to	V0		DIN IEC 60695-11-10;	1)



# TECASINT 2391 black - Stock Shapes

## Chemical Designation

PI (Polyimide)

## Colour

black

## Density

1.54 g/cm<sup>3</sup>

## Fillers

15% molybdenum disulfide (MoS<sub>2</sub>)

## Main features

- high thermal and mechanical capacity
- very good slide and wear properties
- low outgassing
- very good thermal stability
- good chemical resistance
- high creep resistance
- resistance against high energy radiation
- sensitive to hydrolysis in higher thermal range

## Target Industries

- aircraft and aerospace technology
- cryogenic engineering
- precision engineering
- vacuum technology

<b>Mechanical properties</b>	<b>parameter</b>	<b>value</b>	<b>unit</b>	<b>norm</b>	<b>comment</b>
Modulus of elasticity (tensile test)	1 mm/min, 23°C	4400	MPa	DIN EN ISO 527-1	(1) Specimen in 4mm thickness
Tensile strength	50 mm/min, 23°C	95	MPa	DIN EN ISO 527-1	
Elongation at break	50 mm/min, 23°C	2.9	%	DIN EN ISO 527-1	
Elongation at break	10 mm/min, 23°C	3.6	%	DIN EN ISO 178	
Flexural strength	10 mm/min, 23°C	137	MPa	DIN EN ISO 178	
Modulus of elasticity (flexural test)	2 mm/min, 23°C	4136	MPa	DIN EN ISO 178	
Compression strength	10 mm/min, 23°C	253	MPa	EN ISO 604	
Compression strength	10mm/min, 10% strain, 23°C	180	MPa	EN ISO 604	
Compression modulus	1 mm/min, 23°C	2200	MPa	EN ISO 604	
Compressive strain at break	10 mm/min, 23°C	35.6	%	EN ISO 604	
Ball indentation hardness		265	MPa	ISO 2039-1	1)
Shore hardness	Shore D, 23°C	90	D	DIN 53505	
<b>Thermal properties</b>	<b>parameter</b>	<b>value</b>	<b>unit</b>	<b>norm</b>	<b>comment</b>
Glass transition temperature		370	°C	-	1)
Thermal expansion (CLTE)	200-300°C	5.0 / 5.7	10 <sup>-5</sup> K <sup>-1</sup>	DIN 53 752	2)
Thermal expansion (CLTE)	50-200°C	4.0 / 4.7	10 <sup>-5</sup> K <sup>-1</sup>	DIN 53 752	3)
<b>Other properties</b>	<b>parameter</b>	<b>value</b>	<b>unit</b>	<b>norm</b>	<b>comment</b>
Water absorption	24 h in water, 23°C	0.53	%	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	1.58	%	DIN EN ISO 62	
Flammability (UL94)	corresponding to	V0		DIN IEC 60695-11-10;	1)

# TECASINT 4011 natural - Stock Shapes

## Chemical Designation

PI (Polyimide)

## Colour

yellow

## Density

1.41 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

<b>Mechanical properties</b>	<b>parameter</b>	<b>value</b>	<b>unit</b>	<b>norm</b>	<b>comment</b>
Modulus of elasticity (tensile test)	1 mm/min, 23°C	4000	MPa	DIN EN ISO 527-1	(1) Specimen in 4mm thickness
Tensile strength	50 mm/min, 23°C	130	MPa	DIN EN ISO 527-1	
Elongation at break	50 mm/min, 23°C	4.5	%	DIN EN ISO 527-1	
Elongation at break	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	4300	MPa	DIN EN ISO 178	
Compression strength	10 mm/min, 1% strain, 23°C	40	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 179-1eU	
Notched impact strength (Charpy)	max 7.5 J, 23°C	9.6	kJ/m <sup>2</sup>	DIN EN ISO 179-1eA	
Shore hardness	Shore D, 23°C	88	D	DIN 53505	
Ball indentation hardness		265	MPa	ISO 2039-1	1)
<b>Thermal properties</b>	<b>parameter</b>	<b>value</b>	<b>unit</b>	<b>norm</b>	<b>comment</b>
Glass transition temperature		260	°C	DIN EN ISO 11357	(1) Thermal expansion XYZ axis
Heat distortion temperature	1.82 MPa	360	°C	ASTM D 648	(2) Thermal expansion XYZ axis
Thermal expansion (CLTE)	50-200°C	4.6 / 5.6	10 <sup>-5</sup> K <sup>-1</sup>	DIN 53 752	1)
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		1.04	J/(g*K)	-	
Thermal conductivity	40°C	0.4	W/(K*m)	ISO 8302	
<b>Electrical properties</b>	<b>parameter</b>	<b>value</b>	<b>unit</b>	<b>norm</b>	<b>comment</b>
Specific surface resistance	23°C	10 <sup>16</sup>	Ω	ASTM D 257	
Specific volume resistance	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, 23°C	1*10 <sup>-3</sup>		ASTM D 150	
Dielectric constant	1 kHz, 23°C	3.59		ASTM D 150	
<b>Other properties</b>	<b>parameter</b>	<b>value</b>	<b>unit</b>	<b>norm</b>	<b>comment</b>
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	
Flammability (UL94)	corresponding to	V0		DIN IEC 60695-11-10;	1)
Oxygen Index		49	%	EN ISO 4589-2	

# TECASINT 4021 black - Stock Shapes

## Chemical Designation

PI (Polyimide)

## Colour

anthracite

## Density

1.49 g/cm<sup>3</sup>

## Fillers

15% graphite

## Main features

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

## Target Industries

- automotive industry
- conveyor technology
- hot glass technology
- mechanical engineering
- precision engineering

<b>Mechanical properties</b>	<b>parameter</b>	<b>value</b>	<b>unit</b>	<b>norm</b>	<b>comment</b>
Modulus of elasticity (tensile test)	1 mm/min, 23°C	4943	MPa	DIN EN ISO 527-1	
Tensile strength	50 mm/min, 23°C	93	MPa	DIN EN ISO 527-1	
Elongation at break	50 mm/min, 23°C	3	%	DIN EN ISO 527-1	
Elongation at break	10 mm/min, 23°C	3.4	%	DIN EN ISO 178	
Flexural strength	10 mm/min, 23°C	131	MPa	DIN EN ISO 178	
Modulus of elasticity (flexural test)	2 mm/min, 23°C	4200	MPa	DIN EN ISO 178	
Compression strength	10 mm/min, 23°C	208	MPa	EN ISO 604	
Compression strength	10mm/min, 10% strain, 23°C	163	MPa	EN ISO 604	
Compressive strain at break	10 mm/min, 23°C	36	%	EN ISO 604	
Compression modulus	1 mm/min, 23°C	2067	MPa	EN ISO 604	
Impact strength (Charpy)	max 7.5 J, 23°C	24.4	kJ/m <sup>2</sup>	DIN EN ISO 179-1eU	
Notched impact strength (Charpy)	max 7.5 J, 23°C	4.8	kJ/m <sup>2</sup>	DIN EN ISO 179-1eA	
Shore hardness	Shore D, 23°C	86	D	DIN 53505	
<b>Thermal properties</b>	<b>parameter</b>	<b>value</b>	<b>unit</b>	<b>norm</b>	<b>comment</b>
Glass transition temperature		260	°C	DIN EN ISO 11357	(1) Thermal expansion XYZ axis
Thermal expansion (CLTE)	50-200°C	3.9 / 5.4	10 <sup>-5</sup> K <sup>-1</sup>	DIN 53 752	1) (2) Thermal expansion XYZ axis
Thermal expansion (CLTE)	200-300°C	5.3 / 7.3	10 <sup>-5</sup> K <sup>-1</sup>	DIN 53 752	2) (3) Thermal expansion XYZ axis
Thermal expansion (CLTE)	300-350°C	7.5 / 10.5	10 <sup>-5</sup> K <sup>-1</sup>	DIN 53 752	3)
<b>Other properties</b>	<b>parameter</b>	<b>value</b>	<b>unit</b>	<b>norm</b>	<b>comment</b>
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	0.53	%	DIN EN ISO 62	
Flammability (UL94)	corresponding to	V0		DIN IEC 60695-11-10;	1)

# TECASINT 4111 natural - Stock Shapes

## Chemical Designation

PI (Polyimide)

## Colour

yellow

## Density

1.46 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

<b>Mechanical properties</b>	<b>parameter</b>	<b>value</b>	<b>unit</b>	<b>norm</b>	<b>comment</b>
Modulus of elasticity (tensile test)	1 mm/min, 23°C	6300	MPa	DIN EN ISO 527-1	(1) Specimen in 4mm thickness
Tensile strength	50 mm/min, 23°C	100	MPa	DIN EN ISO 527-1	
Elongation at break	50 mm/min, 23°C	1.7	%	DIN EN ISO 527-1	
Elongation at break	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	24	kJ/m <sup>2</sup>	DIN EN ISO 179-1eU	
Notched impact strength (Charpy)	max 7.5 J, 23°C	1.1	kJ/m <sup>2</sup>	DIN EN ISO 179-1eA	
Ball indentation hardness		345	MPa	-	1)
Shore hardness	Shore D, 23°C	90	D	DIN 53505	
<b>Thermal properties</b>	<b>parameter</b>	<b>value</b>	<b>unit</b>	<b>norm</b>	<b>comment</b>
Glass transition temperature		n.a.	°C	DIN EN ISO 11357	(1) Thermal expansion XYZ axis
Heat distortion temperature	1.82 MPa	470	°C	ASTM D 648	(2) Thermal expansion XYZ axis
Thermal expansion (CLTE)	200-300°C	4.7 / 6.9	10 <sup>-5</sup> K <sup>-1</sup>	DIN 53 752	(3) Thermal expansion XYZ 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)
Thermal conductivity	40°C	0.35	W/(K*m)	ISO 8302	
<b>Electrical properties</b>	<b>parameter</b>	<b>value</b>	<b>unit</b>	<b>norm</b>	<b>comment</b>
Specific surface resistance	23°C	10 <sup>16</sup>	Ω	ASTM D 257	
Specific volume resistance	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	
<b>Other properties</b>	<b>parameter</b>	<b>value</b>	<b>unit</b>	<b>norm</b>	<b>comment</b>
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	0.2	%	DIN EN ISO 62	
Flammability (UL94)	corresponding to	V0		DIN IEC 60695-11-10;	1)
Oxygen Index		53	%	EN ISO 4589-2	

# TECASINT 4121 black - Stock Shapes

## Chemical Designation

PI (Polyimide)

## Colour

anthracite

## Density

1.53 g/cm<sup>3</sup>

## Fillers

15% graphite

## Main features

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

## Target Industries

- automotive industry
- conveyor technology
- hot glass technology
- mechanical engineering
- precision engineering

<b>Mechanical properties</b>	<b>parameter</b>	<b>value</b>	<b>unit</b>	<b>norm</b>	<b>comment</b>
Modulus of elasticity (tensile test)	1 mm/min, 23°C	6600	MPa	DIN EN ISO 527-1	
Tensile strength	50 mm/min, 23°C	34	MPa	DIN EN ISO 527-1	
Elongation at break	50 mm/min, 23°C	0.5	%	DIN EN ISO 527-1	
Elongation at break	10 mm/min, 23°C	1.8	%	DIN EN ISO 178	
Flexural strength	10 mm/min, 23°C	113	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	200	MPa	EN ISO 604	
Compression strength	10mm/min, 10% strain, 23°C	183	MPa	EN ISO 604	
Compressive strain at break	10 mm/min, 23°C	15	%	EN ISO 604	
Compression modulus	1 mm/min, 23°C	2200	MPa	EN ISO 604	
Impact strength (Charpy)	max 7.5 J, 23°C	11	kJ/m <sup>2</sup>	DIN EN ISO 179-1eU	
Notched impact strength (Charpy)	max 7.5 J, 23°C	1.4	kJ/m <sup>2</sup>	DIN EN ISO 179-1eA	
Shore hardness	Shore D, 23°C	87	D	DIN 53505	
<b>Thermal properties</b>	<b>parameter</b>	<b>value</b>	<b>unit</b>	<b>norm</b>	<b>comment</b>
Glass transition temperature		n.a.	°C	DIN EN ISO 11357	(1) Thermal expansion XYZ axis
Thermal expansion (CLTE)	50-200°C	3.3 / 5.0	10 <sup>-5</sup> K <sup>-1</sup>	DIN 53 752	1)
Thermal expansion (CLTE)	200-300°C	4.2 / 6.6	10 <sup>-5</sup> K <sup>-1</sup>	DIN 53 752	2)
Thermal expansion (CLTE)	300-400°C	6.0 / 9.7	10 <sup>-5</sup> K <sup>-1</sup>	DIN 53 752	3)
<b>Other properties</b>	<b>parameter</b>	<b>value</b>	<b>unit</b>	<b>norm</b>	<b>comment</b>
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	0.38	%	DIN EN ISO 62	
Flammability (UL94)	corresponding to	V0		DIN IEC 60695-11-10;	1)