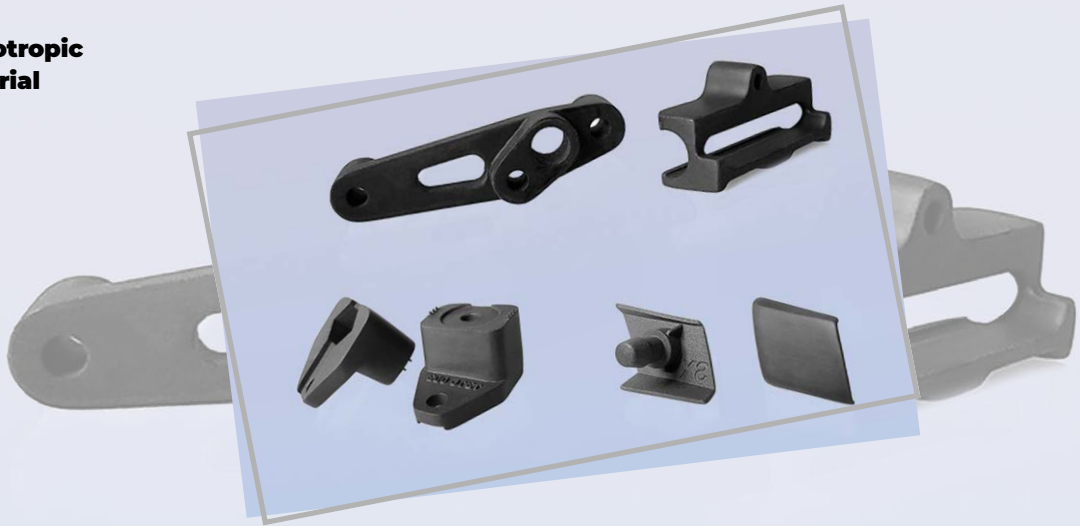
WINDFORM® P1

Full density, Isotropic insulated material

production

prototyping



Small functional parts for the Automotive

ABOUT

Class	Polyamide with superior mechanical properties
Color:	Dark grey
Technology:	HSS (High Speed Sintering)
Test:	CTI rating 600

Windform P1 is an innovative material for HSS technology providing for the fast production of small series with good mechanical properties. Adequate to replace injection molded parts. Windform P1 enables the production of complex high quality components at reasonable costs, by-passing the expense of tooling.

APPLICATIONS

- **Automotive:** interiors, ventilation flaps, steering wheel, paddle shifters
- **Electrical:** connectors, enclosures, housing for electronics
- **Consumer and household goods**: packaging and design
- **Medical**: soles and orthopedic insoles
- **Industrial products:** interior fittings, furniture parts, mock-ups

>>> KEY FEATURES

Isotropic (X,Y,Z axis)
Same properties regardless of the direction in which they are measured

Detailed surface resolution

High flexibility

Electrically insulated (CTI 600)

Full density material adequate to replace injection molded parts

High recyclability

GOT A PROJECT?

GET IN TOUCH WITH OUR EXPERT TO TALK ABOUT MOST SUITABLE MATERIAL AND TECHNOLOGY

LET'S TALK

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North America
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Rel.03_1024

Technical Specifications & conformity

	Test Method	SI Unit	US Unit
General Properties			
Density (20 °C/68 °F)		1,02 g/cc	1.02 g/cc
Colour		DARK GREY	DARK GREY
Thermal Properties			
Melting point	ISO 11357	182 °C	359.60 °F
HDT, 1.82 MPa	ISO 75 Method A	88,70 °C	191.66 °F
Vicat 10N	ISO 306 Method A50	177,20 °C	350.96 °F
Mechanical Properties			
Tensile Strength - X axis	UNI EN ISO 527-1	48,72 MPa	7066.24 psi
Tensile Strength - Y axis	UNI EN ISO 527-1	49,56 MPa	7188.07 psi
Tensile Strength - Z axis	UNI EN ISO 527-1	49,84 MPa	7228.68 psi
Tensile Modulus - X axis	UNI EN ISO 527-1	1960,60 MPa	284.36 ksi
Tensile Modulus - Y axis	UNI EN ISO 527-1	1943,20 MPa	281.84 ksi
Tensile Modulus - Z axis	UNI EN ISO 527-1	2054,60 MPa	297.99 ksi
Elongation at Break - X axis	UNI EN ISO 527-1	13,64 %	13.64 %
Elongation at Break - Y axis	UNI EN ISO 527-1	17,66 %	17.66 %
Elongation at Break - Z axis	UNI EN ISO 527-1	9,80 %	9.80 %
Flexural Strength	UNI EN ISO 14125	73,30 MPa	10631.27 psi
Flexural Modulus	UNI EN ISO 14125	1734,20 MPa	251.52 ksi
Impact Strength Unnotched (Charpy 23 °C/73.4 °F)	UNI EN ISO 179-1	36,90 kJ/m^2	17.56 ft-lb/in^2
Impact Strength Unnotched (Charpy -40 °C/-40 °F)	UNI EN ISO 179-1	37,80 kJ/m^2	17.99 ft-lb/in^2
Impact Strength Notched (Charpy 23 °C/73.4 °F)	UNI EN ISO 179-1	8,90 kJ/m^2	4.23 ft-lb/in^2
Impact Strength Notched (Charpy -40 °C/-40 °F)	UNI EN ISO 179-1	6,60 kJ/m^2	3.14 ft-lb/in^2
Hardness Shore D	UNI EN ISO 868	77	77
Electrical Properties			
Resistivity, Volume	ASTM D257-14	9,4 x 10^14 Ω*cm	9.4 x 10^14 Ω*cm
Resistivity, Surface	ASTM D257-14	2,4 x 10^16 Ω	2.4 x 10^16 Ω
CTI Comparative Tracking Index	IEC 60112 Solution A	600 V	600 V
Surface Finish			
After HSS Process		8,86 Ra µm	8.86 Ra µm
After manual finishing		1,89 Ra µm	1.89 Ra µm
After CNC machining		0,43 Ra µm	0.43 Ra µm
Properties per density unit			
UTS per density unit		47,76 MPa/(g/cc)	6927.69 psi/(g/cc)
Tensile Modulus per density unit		1922,16 MPa/(g/cc)	278.78 ksi/(g/cc)
Flexural Strength per density unit		71,86 MPa/(g/cc)	10422.81 psi/(g/cc)
Flexural Modulus per density unit		1700,20 MPa/(g/cc)	246.59 ksi/(g/cc)

Note: The material properties provided herein are for reference purposes only. Data was generated from the testing of parts produced with Windform® P1 material under optimal processing conditions.
Actual values may vary significantly as they are affected by part geometry and process parameters. Material specifications are subject to change without notice.
Standard Technical Details for Accuracy versus Tolerance:
For parts up to 1 mm (0.039"), the standard tolerance is ± 0,070 mm (0.003")
For parts up to 3 mm (0.118"), the standard tolerance is ± 0,125 mm (0.005")
For parts up to 6 mm (0.236"), the standard tolerance is ± 0,150 mm (0.006")
For parts over 6 mm (0.236"), refer to UNI EN ISO 286-2 JS14 class (linear tolerances).