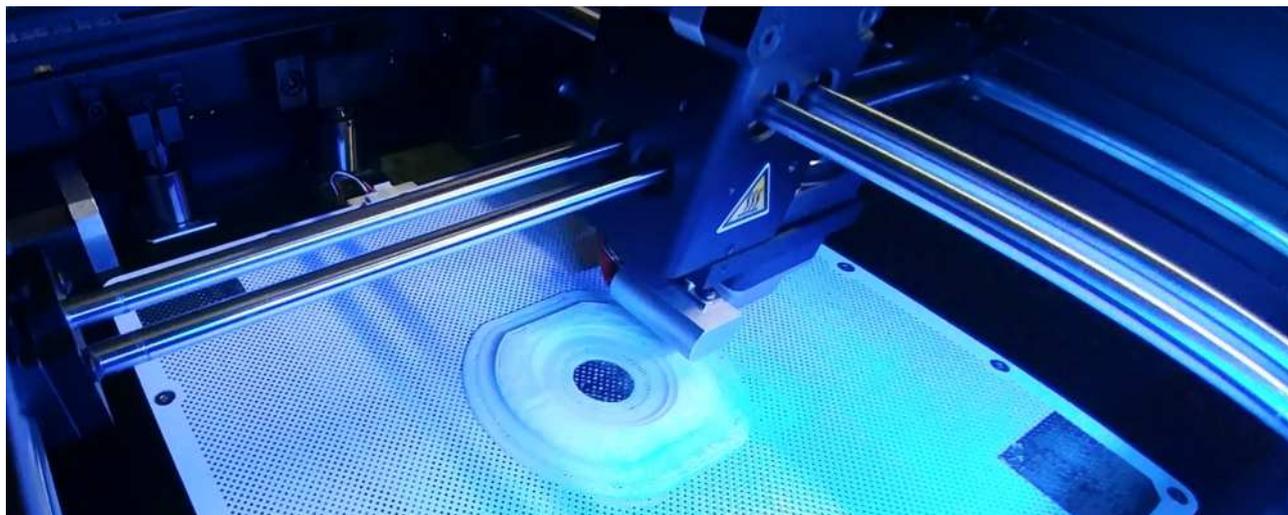


PRESENTAZIONE DEL SERVIZIO STAMPA 3D



DGsol SRL
Via dei Martini Angolani, 24
65014 Loreto Aprutino (PE)
P.Iva 01932260688
www.dgsol.it



DGsol s.r.l. *Service di prototipazione rapida con stampa 3D*

Sin dal 2015 la prototipazione rapida con tecnologia di stampa 3D è stato uno dei servizi maggiormente richiesti, in abbinamento alle numerose attività di ricerca e sviluppo per le quali la nostra realtà da sempre assiste i propri clienti.

Per quanto riguarda la realizzazione di prototipi o piccole produzioni la DGsol si è sempre appoggiata ad aziende esterne che hanno verticalizzato il loro Know How sulle varie tecnologie disponibili sul mercato, come **SLS** (*selective laser sintering*); **FDM** (*fused deposition modeling*); **LPD** (*Digital Light Processing*); e altre ancora.

A partire da Ottobre 2016 la DGsol mette a disposizione dei propri clienti il servizio di prototipazione in stampa 3D con una prima macchina monoestrusore con tecnologia **FDM** dalle alte performance:

- Volume di lavoro (x ; y ; z): 200 x 200 x 185 mm.
- Risoluzione di un singolo punto stampabile: 400 micron
- Layer minimo: 0,25 micron
- Accuratezza di movimento XY di 1.5 micron (1,25 micron su Z)
- Spessore pareti minimo 400 micron, ottimale: da 800 micron a salire
- Diametro ugello: 0,4 mm
- Singolo posizionamento: 1.5 micron
- Singolo step Z: 1.25 micron
- Compatibilità file: STL, OBJ, DXF

Grazie alla disponibilità di una macchina interna al nostro laboratorio riusciamo a garantire tempi di realizzazione e consegna particolarmente competitivi oltre a costi concorrenziali.

Abbiamo la possibilità di realizzare oggetti partendo direttamente dai file forniti dal cliente (**è richiesto un formato .stl in scala 1:1 dell'oggetto**).

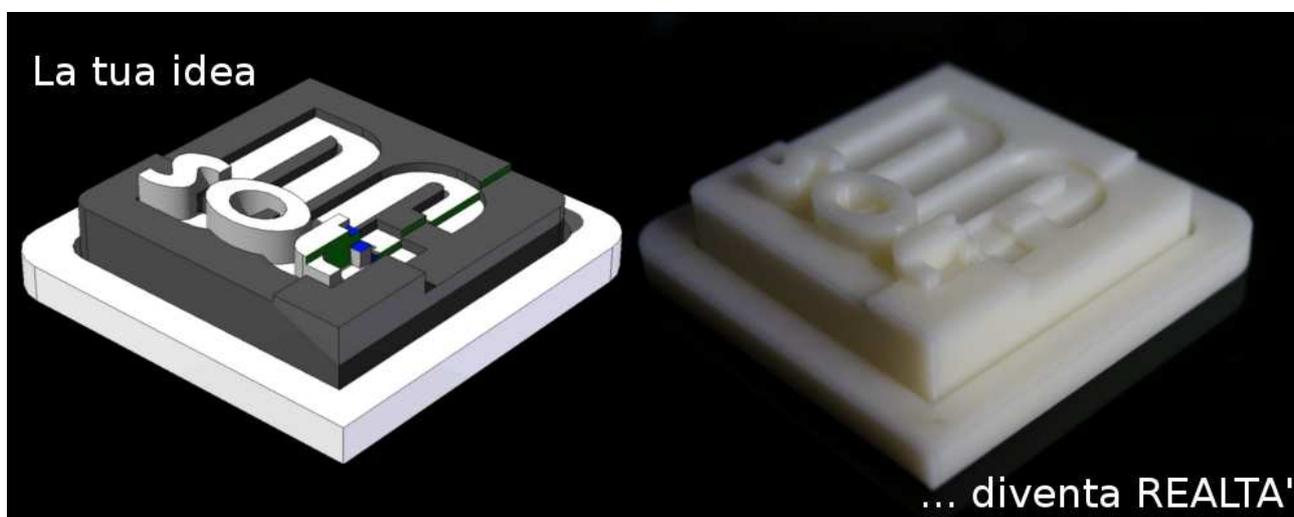
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Possiamo inoltre affiancare il cliente sin dalla fase della modellazione 3D creando insieme ai nostri tecnici l'oggetto da stampare in ambiente CAD 3D, per poi passare alla stampa ed alla fornitura dell'oggetto.

Inviaci il tuo file .stl per ricevere un'offerta commerciale oppure contattaci per iniziare a realizzare la tua idea



MATERIALI DEI FILAMENTI

La qualità del filamento incide pesantemente sulla qualità di stampa e sulle caratteristiche meccaniche delle parti stampate. Cattivi filamenti possono facilmente determinare l'intasamento dell'estrusore. Per questo motivo abbiamo scelto di utilizzare solamente materiali certificati tra cui:

- **Z-ABS** e **Z-ULTRAT**, studiati per ottenere il meglio dalla stampa 3D con tecnologia PLM. **Z-ABS** è uno “**smart**” **ABS** che produce una finitura uniforme, opaca, con un colore puro ed un ottimo livello di adesione tra i layer, mentre assicura una facile rimozione dei supporti. **Z-ULTRAT** è un materiale plastico di formulazione speciale, di elevata durezza, bassa elasticità e modesta deformazione, eccellente per produrre prototipi funzionali con parti in movimento.

Z-ABS disponibile nei colori : Blu scuro; Blu cielo; Verde Android; Verde acido; Arancio; Grigio scuro; Bianco; Nero; Rosso; Grigio chiaro; Giallo.

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Z-ULTRAT disponibile nei colori:

Gamma Base: Blu; Giallo; Verde; Grigio; Bianco; Nero; Rosso.

Gamma neutra: Rosa; Magenta; Verde oliva; Marrone.

Gamma Neon: Blu; Verde; Giallo; Arancio; Rosso; Pink.

Gamma pastello: Giallo chiaro; Rosa chiaro; Viola; Blu; Turchese.

- **Z-HIPS:** uno stirene ad alto impatto, leggero resistente, adatto alla realizzazione di modelli che debbono resistere ad urti (es. componenti di modellismo dinamico, droni etc.).

Disponibile nei colori: Grigio; Bianco neutro; Nero.

- **Z-GLASS:** uno speciale materiale semitrasparente ad alta resistenza, caricato in fibra di vetro.

Disponibile solo in trasparente.

- **Z- PETG:** un materiale derivato dal PET, altamente resistente a solventi, acidi, basi, ambienti salini, caratterizzato da un basso ritiro ed eccellente stabilità dimensionale.

Disponibile nei colori: Grigio; Nero.

- **Z-PCABS:** una miscela di ABS e Policarbonato ad altissima resistenza.

Disponibile solo in colore Avorio.

Per maggiori dettagli sulle caratteristiche tecniche dei vari materiali scarica la brochure con i datasheet allegati.

Material Data Sheet: Z-ABS

Mechanical Properties	Test Method	English	Metric
Young's Modulus	DIN EN ISO 527-2 (ASTM D638)	261 067 psi	1,80 GPa
Tensile Strength	DIN EN ISO 527-2 (ASTM D638)	5511 psi	38 MPa
Tensile Elongation	DIN EN ISO 527-2 (ASTM D638)	17 %	17 %
Charpy Impact, notched	PN-EN ISO 179-1: 2004/A1:2006 (ASTM 6110-1)	3,8 ft-lb/in ²	8 kJ/m ²
Rockwell R Hardness	PN-EN ISO 2039-1 (ASTM D785)		109
Maximum Load	PN-EN ISO 2039-1 (ASTM D785)		49 N
Efficient melting point for 3D printing*		482 - 500 F	250 - 260 °C
Glass Transition Temperature		257 F	125 °C
Vicat Softening Temperature		234 F	112 °C
Thermal Expansion		Minimal	
Odor		Nearly odorless	
Solubility		Insoluble in water	
Hazards		Product does not present any hazard while operating	

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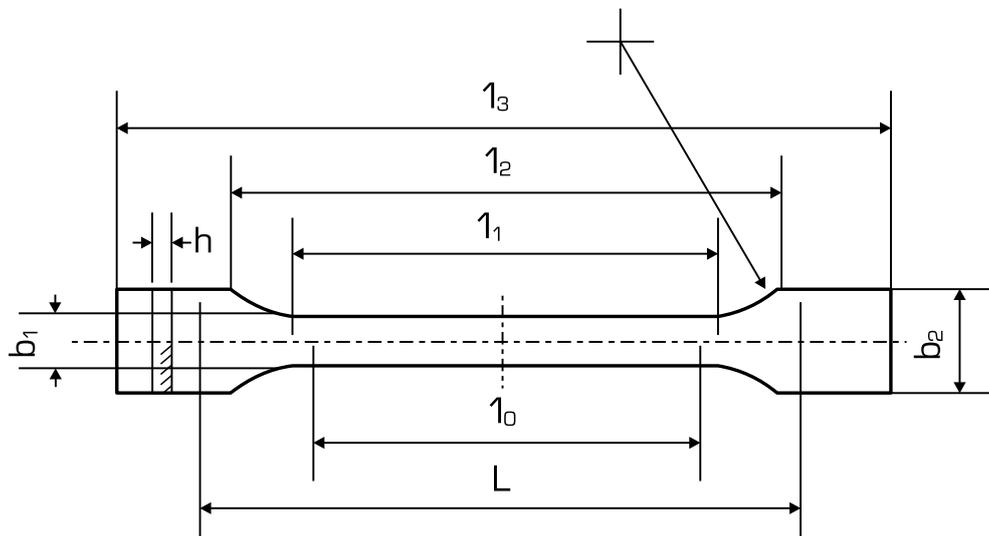
*Due amorphous nature, material does not display a true melting point.

Test Report

Plastic samples supplied by the principal were tested to determine their toughness in a static tensile test, the Charpy impact test and the Brinell hardness test.

1. Endurance Testing

Test was performed in accordance with DIN EN ISO 527-2 standard (ASTM D638). Dumbbell shaped specimens that were used to perform these tests are shown in picture 1. The INSTRON model 4481 toughness testing machine (made in UK) was used to perform the tests. Tests were carried out in room temperature. Samples were elongated with the speed of 50 mm/ min. Test results are summarized in the table 1., detailed overview of the results can be found in an annex.



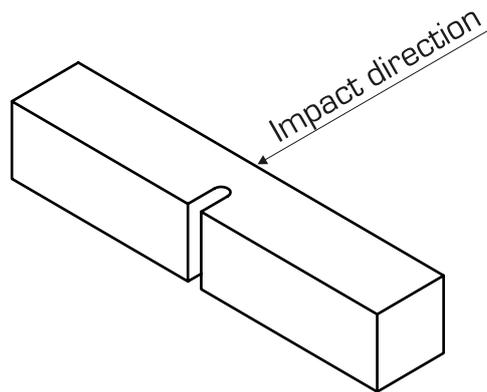
Picture 1. Dumbbell shaped specimen used for the Tensile Tes

No	Young's Modulus [MPa]	Tensile Strength [MPa]	Yield Strength [MPa]	Breaking Strength [MPa]	Elongation at Break [%]
SAMPLE	564,69 ± 12	15,28 ± 0,43	7,83 ± 0,69	14,11 ± 2,11	17,21 ± 3,45

Table 1. Test results marked in a Static Tensile Test

2. Charpy Impact Test

Test was performed in accordance with PN-EN ISO 179-1:2004/A1:2006 standard (ASTM 6110-1) ('Plastic materials: the Charpy Impact Test. The standard test for measuring impact energy – part 1 Non-Instrumental Impact Test'). In the picture 2. there is a sample of notched beam and marked impact direction of an impact hammer. Instron PW-5 impact hammer was used during this test.



Picture 2. Notched beam used for the Charpy Impact Test

The score was calculated as an average of 10 calculated impacts, where also fractured samples were counted in as approved (parts of which were still connected to each other with a thin layer of material after an impact). The impact score was estimated from the following formula:

$$a_k = \frac{A_k}{bt_k} 10^3, \text{ kJ/m}^2$$

Where: a_k – stands for the energy used to break the sample, kJ; b, t – thickness and width of a sample, mm; t_k – sample thickness under the notch

Charpy Impact Test results are presented in table 2.

Sample	Calculated impact score of notched samples in the Charpy Impact Test [kJ/m ²]
SAMPLE	7,98 ± 1,03

Table 2. Calculated impact score of notched samples

3. Ball Indentation Hardness Test

Test was performed in accordance with PN-EN ISO 2039-1 standard (ASTM D785) 'Plastic materials – determination of hardness – Part 1: Ball Indentation Hardness Test' on KB Pruftechnik durometer.

The final score is a result of calculating the average of 10 measurements. Test results are summarized in table 3.

Sample	HB Hardness was determined at a load of 49 N
SAMPLE	20,45 ± 1,15

Table 3. Samples hardness

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Material Data Sheet: Z-GLASS

Physical Properties	Metric	English	Comments
Specific Gravity	1.27 g/cm ³	10.598 lbs/gal	ASTM D792
Maximum Moisture Content	0.020	0.020	
Linear Mold Shrinkage, Flow	0.0040 - 0.010 cm/cm Thickness 3.20 mm	0.0040 - 0.010 in/in Thickness 0.126 in	ASTM D955
Light transmittance	75 - 90 % Wall thickness 0.4 mm	75 - 90 % Wall thickness 0.0157 in	ISO 13468-1
Mechanical Properties	Metric	English	Comments
Hardness, Rockwell R	111	111	ASTM D785
Tensile Strength at Break	76.5 MPa Thickness 3.20 mm	11100 psi Thickness 0.126 in	50mm/min; ASTM D638
Elongation at Break	4.0 % Thickness 3.20 mm	4.0 % Thickness 0.126 in	50mm/min; ASTM D638
Flexural Yield Strength	127 MPa Thickness 3.20 mm	18500 psi Thickness 0.126 in	1.3mm/min; ASTM D790
Flexural Modulus	4.12 GPa Thickness 3.20 mm	597 ksi Thickness 0.126 in	15mm/min; ASTM D790
Izod Impact, Notched	0.686 J/cm Thickness 3.20 mm, Temperature 23.0 °C	1.29 ft-lb/in Thickness 0.126 in, Temperature 73.4 °F	ASTM D256
Thermal Properties	Metric	English	Comments
Melting Point	225 °C	437 °F	ASTM D3418
Deflection Temperature at 0.46 MPa (66 psi)	200 °C Thickness 6.40 mm	392 °F Thickness 0.252 in	Unannealed; ASTM D648
Deflection Temperature at 1.8 MPa (264 psi)	180 °C Thickness 6.40 mm	356 °F Thickness 0.252 in	Unannealed; ASTM D648

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Material Data Sheet: Z-HIPS

Physical Properties	Metric	English	Comments
Specific Gravity	1.04 g/cm ³	8.679 lbs/gal	ASTM D792
Maximum Moisture Content	0.010	0.010	
Linear Mold Shrinkage, Flow	0.0040 - 0.0080 cm/cm Thickness 3.20 mm	0.0040 - 0.0080 in/in Thickness 0.126 in	ASTM D955
Melt Flow	6.0 g/10 min Load 5.00 kg, Temperature 200 °C	6.0 g/10 min Load 11.0 lb, Temperature 392 °F	ASTM D1238 (G)
	16 g/10 min Load 3.80 kg, Temperature 230 °C	16 g/10 min Load 8.38 lb, Temperature 446 °F	ASTM D1238 (I)
	69 g/10 min Load 10.0 kg, Temperature 220 °C	69 g/10 min Load 22.0 lb, Temperature 428 °F	ASTM D1238 (G)
Mechanical Properties	Metric	English	Comments
Hardness, Rockwell R	109	109	ASTM D785
Tensile Strength, Yield	34.3 MPa Thickness 3.20 mm	4980 psi Thickness 0.126 in	50mm/min; ASTM D638
Elongation at Break	79 % Thickness 3.20 mm	79 % Thickness 0.126 in	50mm/min; ASTM D638
Elongation at Yield	4.0 % Thickness 3.20 mm	4.0 % Thickness 0.126 in	50mm/min; ASTM D638
Tensile Modulus	2.26 GPa Thickness 3.20 mm	327 ksi Thickness 0.126 in	1mm/min; ASTM D638
Flexural Yield Strength	53.9 MPa Thickness 3.20 mm	7820 psi Thickness 0.126 in	15mm/min; ASTM D790
Flexural Modulus	2.67 GPa Thickness 3.20 mm	387 ksi Thickness 0.126 in	15mm/min; ASTM D790
Izod Impact, Notched	0.490 J/cm Thickness 3.20 mm, Temperature -30.0 °C	0.918 ft-lb/in Thickness 0.126 in, Temperature -22.0 °F	ASTM D256

Electrical Properties	Metric	English	Comments
Volume Resistivity	1.00e+14 ohm-cm	1.00e+14 ohm-cm	
Dielectric Strength	40.0 kV/mm	1020 kV/in	
Arc Resistance	120 - 180 sec	120 - 180 sec	ASTM D495
Thermal Properties	Metric	English	Comments
Deflection Temperature at 0.46 MPa (66 psi)	92.0 °C Thickness 6.40 mm	198 °F Thickness 0.252 in	Unannealed; ASTM D648
Deflection Temperature at 1.8 MPa (264 psi)	83.0 °C Thickness 6.40 mm	181 °F Thickness 0.252 in	Unannealed; ASTM D648
Vicat Softening Point	95.0 °C Load 5.00 kg	203 °F Load 11.0 lb	50°C/h; ASTM D1525
UL RTI, Electrical	50.0 °C Thickness ≥1.50 mm	122 °F Thickness ≥0.0591 in	
	50.0 °C Thickness ≥3.00 mm	122 °F Thickness ≥0.118 in	
UL RTI, Mechanical with Impact	50.0 °C Thickness ≥1.50 mm	122 °F Thickness ≥0.0591 in	
	50.0 °C Thickness ≥3.00 mm	122 °F Thickness ≥0.118 in	
UL RTI, Mechanical without Impact	50.0 °C Thickness ≥1.50 mm	122 °F Thickness ≥0.0591 in	
	50.0 °C Thickness ≥3.00 mm	122 °F Thickness ≥0.118 in	
Flammability, UL94	HB Thickness ≥1.60 mm	HB Thickness ≥0.0630 in	
	HB Thickness ≥3.20 mm	HB Thickness ≥0.126 in	

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Material Data Sheet: Z-PCABS

Physical Properties	Metric	English	Comments
Specific Gravity	1.14 g/cm ³	9.514 lbs/gal	ASTM D792
Density	1.14 g/cm ³	9.514 lbs/gal	ISO 1183
Moisture Absorption	0.1%	0.1%	23°C / sat ISO 62
Water Absorption	0.1%	0.1%	23°C / 50% RH ISO 62
Mold Shrinkage, flow	0.5 – 0.7 %	0.5 – 0.7 %	3,2mm (0.125 inch) [5] SABIC Method
Melt Flow Rate	8.5 g/10 min	0.0187 lbs/10 min	ASTM D1238
Mechanical Properties	Metric	English	Comments
Tensile Strength at Yield	58 MPa Thickness 3.20 mm	8200 psi Thickness 0.126 in	50mm/min (2 inch/min); ASTM D638
Tensile Strength at Break	57 MPa Thickness 3.20 mm	8100 psi Thickness 0.126 in	50mm/min (2 inch/min); ASTM D638
Tensile modulus	2.21 GPa	320 ksi psi	1mm/min ASTM D790
Elongation at Yield	4.9 %	4.9 %	50mm/min (2 inch/min); ASTM D638
Elongation at Break	125 % Thickness 3.20 mm	152 % Thickness 0.126 in	50mm/min (2 inch/min); ASTM D638
Flexural Strength	86 MPa Thickness 3.20 mm	12470 psi Thickness 0.126 in	1.27mm/min (0.05 inch/min); ASTM D790
Flexural Modulus	2.39 GPa Thickness 3.20 mm	347 ksi psi Thickness 0.126 in	1.27mm/min (0.05 inch/min); ASTM D790
Tensile Strength at Yield	50 MPa Thickness 3.20 mm	7250 psi Thickness 0.126 in	50mm/min (2 inch/min); ISO 527
Tensile Strength at Break	45 MPa Thickness 3.20 mm	6525 psi Thickness 0.126 in	50mm/min (2 inch/min); ISO 527
Tensile modulus	2.25 GPa	326 ksi	1mm/min ISO 527
Elongation at Yield	4 %	4 %	50mm/min (2 inch/min); ISO 527
Elongation at Break	>50 % Thickness 3.20 mm	>50 % Thickness 0.126 in	50mm/min (2 inch/min); ISO 527

Flexural Strength	85 MPa Thickness 3.20 mm	12325 psi Thickness 0.126 in	1.27mm/min (0.05 inch/min); ISO 178
Flexural Modulus	2.3 GPa Thickness 3.20 mm	334 ksi Thickness 0.126 in	1.27mm/min (0.05 inch/min); ISO 178
Rockwell Hardness	108	108	ASTM D785
Izod Impact, Notched	54 J/cm Thickness 3.20 mm, Temperature -30.0 °C	9.9 ft-lb/in Thickness 0.126 in, Temperature -22 °F	ASTM D256
	66 J/cm Thickness 3.20 mm, Temperature 23.0 °C	12.1 ft-lb/in Thickness 0.126 in, Temperature 73.4 °F	ASTM D256
	35 kJ/m ² 80x10x3 mm, Temperature -30.0 °C	6.4 ft-lb/in ² 80x10x3 mm, Temperature -30.0 °C	ISO 180/1A
	50 kJ/m ² 80x10x3 mm, Temperature 23.0 °C	9.3 ft-lb/in ² 80x10x3 mm, Temperature 23.0 °C	ISO 180/1A
Thermal Properties	Metric	English	Comments
Melting Point	225 °C	437 °F	ASTM D3418
	118 °C	244 °F	B/50 ASTM D1525
Vicat Softening Temperature	118 °C	244 °F	B/50 ISO 306
	122 °C	252 °F	B/120 ISO 306
Heat Distortion Temperature	107 °C	225 °F	1.82 MPa, 3.2 mm unannealed ASTM D648
	124 °C	255 °F	0.45 MPa, 3.2 mm unannealed ASTM D648
	120 °C	248 °F	1.8 MPa, 80x10x4 sp = 64 mm ISO 75/Af
Thermal Expansion Coefficient	7.2E-05 1/°C	4.E-05 1/°F	-40°C to 40°C, flow ISO 11359-2
			-40°C to 100°F, flow ASTM E831

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Material Data Sheet: Z-PETG

Physical Properties	Metric	English	Comments
Specific Gravity	1.27 g/cm ³	10.598 lbs/gal	ASTM D792

Maximum Moisture Content	0.013%	0.013%	ASTM D570
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Mechanical Properties	Metric	English	Comments
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Tensile Strength at Yield	50 MPa Thickness 3.20 mm	7252 psi Thickness 0.126 in	50mm/min (2 inch/min); ASTM D638
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Tensile Strength at Break	29.4 MPa Thickness 3.20 mm	4264 psi Thickness 0.126 in	50mm/min (2 inch/min); ASTM D638
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Elongation at Yield	4.5 %	4.5 %	50mm/min (2 inch/min); ASTM D638
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Elongation at Break	180 % Thickness 3.20 mm	180 % Thickness 0.126 in	50mm/min (2 inch/min); ASTM D638
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Flexural Strength	68.6 MPa Thickness 3.20 mm	9950 psi Thickness 0.126 in	1.27mm/min (0.05 inch/min); ASTM D790
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Flexural Modulus	2.10 GPa Thickness 3.20 mm	304 ksi Thickness 0.126 in	1.27mm/min (0.05 inch/min); ASTM D790
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Rockwell Hardness	108	108	ASTM D785
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Izod Impact, Notched	1.05 J/cm Thickness 3.20 mm, Temperature 23.0 °C	1.97 ft-lb/in Thickness 0.126 in, Temperature 73.4 °F	ASTM D256
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Thermal Properties	Metric	English	Comments
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Melting Point	225 °C	437 °F	ASTM D3418
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Heat Distortion Temperature	70 °C at 0.455 MPa	158 °F at 66 psi	ASTM D648
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Material Data Sheet: Z-ULTRAT

Physical Properties	Metric	English	Comments
Specific Gravity	1.08 g/cm ³	9.013 lbs/gal	ASTM D792
Density	1.08 g/cm ³	9.013 lbs/gal	ISO 1183
Maximum Moisture Content	0.001	0.001	
Linear Mold Shrinkage, Flow	0.0050 - 0.0080 cm/cm Thickness 3.20 mm	0.0050 - 0.0080 in/in Thickness 0.126 in	ASTM D955
Melt Flow	13.7 g/10 min Load 3.80 kg, Temperature 230 °C	0.03 lb/10 min Load 8.38 lb, Temperature 446 °F	ASTM D1238 (I)
	12 g/10 min Load 5 kg, Temperature 220 °C	0.03 lb/10 min Load 11 lb, Temperature 428 °F	
	42 g/10 min Load 10 kg, Temperature 220 °C	0.09 lb/10 min Load 22 lb, Temperature 428 °F	ISO 1183
Melt Viscosity	1870 1000 sec ⁻¹ , Temperature 240 °C	1870 1000 sec ⁻¹ , Temperature 464 °T	ASTM D3825 (I)
Mechanical Properties	Metric	English	Comments
Hardness, Rockwell R	110	110	ASTM D785
Tensile Strength, Yield	42 MPa Thickness 3.20 mm	6091 psi Thickness 0.126 in	5mm/min; ASTM D638
	42 MPa Thickness 3.20 mm	6091 psi Thickness 0.126 in	50mm/min; ISO 527
Tensile Strength, Break	30 MPa Thickness 3.20 mm	4351 psi Thickness 0.126 in	5mm/min; ASTM D638
	30 MPa Thickness 3.20 mm	4351 psi Thickness 0.126 in	50mm/min; ISO 527
Elongation at Break	21 % Thickness 3.20 mm	21 % Thickness 0.126 in	5mm/min; ASTM D638
	21 % Thickness 3.20 mm	21 % Thickness 0.126 in	50mm/min;
Elongation at Yield	2.3 % Thickness 3.20 mm	2.3 % Thickness 0.126 in	5mm/min; ASTM D638
	2.6 % Thickness 3.20 mm	2.6 % Thickness 0.126 in	50mm/min; ISO 527

Tensile Modulus	1.95 GPa Thickness 3.20 mm	283 ksi Thickness 0.126 in	1mm/min; ASTM D638
	1.95 GPa Thickness 3.20 mm	283 ksi Thickness 0.126 in	1mm/min; ISO 527
Flexural Yield Strength	50 MPa Thickness 3.20 mm	7252 psi Thickness 0.126 in	1.3mm/min; ASTM D790
	51 MPa Thickness 3.20 mm	7397 psi Thickness 0.126 in	2mm/min; ISO 178
Flexural Modulus	2.02 GPa Thickness 3.20 mm	293 ksi Thickness 0.126 in	1.3mm/min; ASTM D790
	2.03 GPa Thickness 3.20 mm	294 ksi Thickness 0.126 in	2mm/min; ISO 178
Izod Impact, Notched	0.60 J/cm Thickness 3.20 mm, Temperature -30.0 °C	1.05 ft-lb/in Thickness 0.126 in, Temperature -22.0 °F	ASTM D256
	1.8 J/cm Thickness 3.20 mm, Temperature 23.0 °C	3.3 ft-lb/in Thickness 0.126 in, Temperature 73.0 °F	
	5 kJ/m2 80x10x4 mm, Temperature -30.0 °C	3.2 ft-lb/in ² 3.15x0.394x0.157 in, Tempe- rature -22.0 °F	ISO 180/1A
	12 kJ/m2 80x10x4 mm, Temperature 23.0 °C	7.7 ft-lb/in ² 3.15x0.394x0.157 in, Temperature 73.0 °F	
Thermal Properties	Metric	English	Comments
Vicat Softening Point	128.0 °C Load 5.00 kg	262 °F Load 11.0 lb	B/50; ASTM D 1525
	128.0 °C Load 5.00 kg	262 °F Load 11.0 lb	B/50; ISO 306
	130.0 °C Load 5.00 kg	266 °F Load 11.0 lb	B/120; ISO 306
UL RTI, Electrical	60.0 °C Thickness ≥1.50 mm	140 °F Thickness ≥0.0591 in	
	60.0 °C Thickness ≥3.00 mm	140 °F Thickness ≥0.118 in	
UL RTI, Mechanical with Impact	60.0 °C Thickness ≥1.50 mm	140 °F Thickness ≥0.0591 in	
	60.0 °C Thickness ≥3.00 mm	140 °F Thickness ≥0.118 in	

UL RTI, Mechanical without Impact	60.0 °C Thickness ≥1.50 mm	140 °F Thickness ≥0.0591 in	
	60.0 °C Thickness ≥3.00 mm	140 °F Thickness ≥0.118 in	
Flammability, UL94	HB Thickness ≥1.60 mm	HB Thickness ≥0.0630 in	
	HB Thickness ≥3.20 mm	HB Thickness ≥0.126 in	
Deflection Temperature at 0.45 MPa (66 psi)	112 °C Thickness 3.20 mm	234 °F Thickness 0.126 in	Unannealed; ASTM D648
Deflection Temperature at 1.82 MPa (264 psi)	98 °C Thickness 3.20 mm	208 °F Thickness 0.126 in	Unannealed; ASTM D648
Deflection Temperature at 0.45 MPa (66 psi)	102 °C 120x10x4 mm sp=100 mm	216 °F 4.72x0.394x0.157 in sp=3,937 in	ISO 75/Be
Deflection Temperature at 1.8 MPa (264 psi)	90 °C 120x10x4 mm sp=100 mm	194 °F 4.72x0.394x0.157 in sp=3,937 in	ISO 75/Ae

The information presented are typical values intended for reference and comparison purposes only. They should not be used for design specifications or quality control purposes. Final properties of the material can be impacted (+/-) by part design, end-use conditions, test conditions, etc. Actual values will vary with build conditions. Product specifications are subject to change without notice.

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Entered in the Register of Entrepreneurs of the National Court Register kept by the District Court in Olsztyn, VIII Commercial Division of the National Court Register, under KRS number 0000564079, with a share capital of PLN 6 962 500 paid in full.