ESSENTIUM

Essentium PCTG-Z
TECHNICAL DATA SHEET

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Introducing Essentium's new line of industrial grade filaments that are ESD safe. Essentium's ESD materials are proven to succeed in an industrial setting. With non-marring surface properties, you don't have to worry about latent failures in electronics. These materials are the only industrially proven, safe material for ESD sensitive applications where you need a material that you must trust. PCTG is an easy to print material with significantly increased impact strength when compared to PETG.

MECHANICAL PROPERTIES

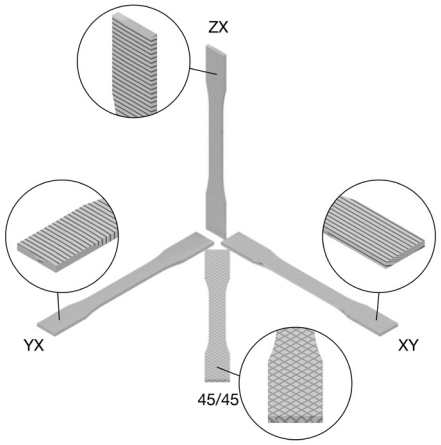
Metric	Test Method	Print Orientation			
		XY	45/45	YX	ZX
Ultimate Tensile Strength, MPa	ISO 527-2	45.0 (0.5)	41.0 (2.8)	33.0 (4.3)	33.3 (7.3)
Tensile Modulus, GPa	ISO 527-2	1.81 (0.07)	1.74 (0.01)	1.61 (0.05)	1.67 (0.10)
Strain at Break, %	ISO 527-2	150 (27)	8.8 (3.0)	2.8 (0.7)	2.2 (0.6)
Flexural Strength, MPa	ISO 178	74.5 (1.1)	64.6 (1.2)	37.2 (3.2)	46.8 (2.8)
Flexural Modulus, GPa	ISO 178	1.72 (0.03)	1.49 (0.04)	1.42 (0.06)	1.59 (0.06)
Notched Izod Impact Strength, kJ/m^2	ISO 180/A	7.0 (0.6)	2.7 (1.2)	3.3 (1.6)	2.1 (1.0)

Standard deviations listed in parentheses

MATERIAL PROPERTIES

Property	Method	Value
Specific Gravity[1], g/cm^3	ASTM D792	1.23
Glass Transition Temperature, ˚C	ASTM D3418	76
Melting Point, ˚C	ASTM D3418	202
HDT B @ 0.45 MPa[1], ˚C	ISO 75	76
HDT A @ 1.8 MPa[1], ˚C	ISO 75	64

1 Values taken from resin manufacturer TDS



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MATERIAL HANDLING AND DRYING

Essentium PCTG-Z is a hygroscopic thermoplastic and will absorb moisture from humid air. Keep the material in the vacuum sealed packaging until you are ready to print with it. PCTG-Z filament should always be fed to the printer in a dry container and stored in a dry cabinet. If the material does absorb more than 600ppm moisture, it should be dried in a low dew point (< -40˚C) oven or vacuum oven at 65 – 70˚C for 4 – 8 hours. Avoid touching filament with bare fingers or introducing oils to the filament prior to printing.

RECOMMENDED HSE PRINT SETTINGS

0.4mm Hozzle			
Extrusion Width, mm	0.35 – 0.5	Hozzle Temperature, ˚C	235 – 390
Layer Height, mm	0.15 – 0.25	Bed Temperature, ˚C	70 – 80
Print Speed, mm/s	50 – 500	IR Temperature, ˚C	20 – 40
Infill, %	15 – 75	Fan Speed, %	0 – 40
0.8mm Hozzle			
Extrusion Width, mm	0.7 – 0.9	Hozzle Temperature, ˚C	280 – 360
Layer Height, mm	0.3 – 0.35	Bed Temperature, ˚C	70 – 80
Print Speed, mm/s	20 – 220	IR Temperature, ˚C	20 – 40
Infill, %	15 – 75	Fan Speed, %	0 – 40

RECOMMENDED FDM PRINT SETTINGS

Nozzle Temperature, ºC	250 – 270	Fan Speed, %	25 – 50
Bed Temperature, ºC	70 – 80	Bed Material	G-10/FR4 or Glass
Print Speed, mm/s	40 – 80	Bed Adhesion Method	Dimafix® or Magigoo® HT
First Layer Speed, mm/s	20 – 40	Infill Density, %	<75

KEY FEATURES:

- All-purpose material for ESD safe jigs and fixtures
- Non-marring
- Low cost
- Easy to print
- Good all-around mechanical properties

APPLICATIONS INCLUDE:

- Handheld tools
- General assembly fixtures for electronics
- Robotics and automation components
- Parts for explosion-proof environments
- ESD part trays

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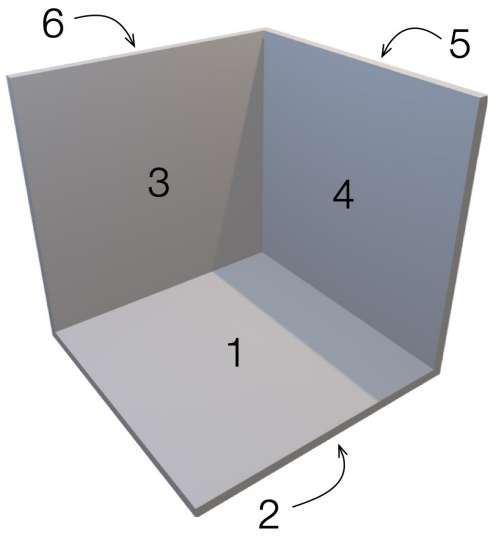
ELECTRICAL PROPERTIES

Measurement position	Resistance, Ω		
	80 mm/s @ 325˚C	140 mm/s @ 360˚C	200 mm/s @ 360˚C
1	2.61e8	4.12e6	4.67e6
2	2.56e6	2.67e4	9.30e7
3	5.83e3	3.59e3	5.89e3
4	1.02e4	5.51e3	7.80e3
5	3.96e4	4.87e3	4.21e4
6	3.42e4	7.60e4	5.56e4



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