

Prosilas

ULTEM 1010 Resin

FDM MATERIAL

Mechanical Properties ¹	Test Method	Value XZ Orientation	ZX Orientation
Tensile Strength, Yield (Type 1, 0.125", 0.2"/min)	ASTM D638	64 MPa (9,300 psi)	41 MPa (5,990 psi)
Tensile Strength, Ultimate (Type 1, 0.125", 0.2"/min)	ASTM D638	81 MPa (11,700 psi)	48 MPa (7,000 psi)
Tensile Modulus (Type 1, 0.125", 0.2"/min)	ASTM D638	2,770 MPa (402,000 psi)	2,200 MPa (322,000 psi)
Tensile Elongation at Break (Type 1, 0.125", 0.2"/min)	ASTM D638	3.3%	2.0%
Tensile Elongation at Yield (Type 1, 0.125", 0.2"/min)	ASTM D638	2.2%	1.5%
Flexural Strength (Method 1, 0.05"/min)	ASTM D790	144 MPa (21,000 psi)	77 MPa (11,100 psi)
Flexural Modulus (Method 1, 0.05"/min)	ASTM D790	2,820 MPa (409,000 psi)	2,230 MPa (324,000 psi)
Flexural Strain at Break (Method 1, 0.05"/min)	ASTM D790	No break	3.5%
IZOD Impact, notched (Method A, 23 °C)	ASTM D256	41 J/m (0.8 ft-lb/in)	24 J/m (0.4 ft-lb/in)
IZOD Impact, un-notched (Method A, 23 °C)	ASTM D256	326 J/m (6.1 ft-lb/in)	138 J/m (2.6 ft-lb/in)
Compressive Strength, Yield (Method 1, 0.05"/min)	ASTM D695	134 MPa (19,500 psi)	107 MPa (15,100 psi)
Compressive Strength, Ultimate (Method 1, 0.05"/min)	ASTM D695	No break	1,125 MPa (15,500 psi)
Compressive Modulus (Method 1, 0.05"/min)	ASTM D695	10,000 MPa (1,450,000 psi)	1,120 MPa (305,000 psi)

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Thermal Properties ¹	Test Method	Value
Heat Deflection (HDT) @ 66 psi, 0.125"	ASTM D648	216 °C (421 °F)
Heat Deflection (HDT) @ 264 psi, 0.125"	ASTM D648	213 °C (415 °F)
Vicat Softening Temperature (Rate B/50)	ASTM D1525	214 °C (416 °F)
Glass Transition Temperature (T _g)	DSC (SSYS)	215 °C (419 °F)
Coefficient of Thermal Expansion	ASTM E831	47 μm/(m·°C) 26 uin/(in·°F)
Coefficient of Thermal Expansion (xflow)	ASTM E831	41 μm/(m·°C) 23 uin/(in·°F)

Electrical Properties ¹	Test Method	Value
Volume Resistivity	ASTM D257	1.0 x10¹⁴ - 8.96x10¹⁵ ohm-cm
Dielectric Constant	ASTM D150-98	2.67
Dissipation Factor	ASTM D150-98	.001
Dielectric Strength	ASTM D149-09, Method A	240 V/mil

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Other ²	Test Method	Value
Specific Gravity	ASTM D792	1.27
Oxygen Index	ASTM D2863	0.44
Vertical Burn	FAR 25.853 (Test a (60s), passes at)	4 seconds
OSU Total Heat Release (2 min test, .060" thick)	FAR 25.853	35.7 kW min/m²
Food Safety Certification ³	NSF 51	Certified
Bio-Compatibility Certification ³	ISO 10993	Certified

Burn Testing		
Horizontal Burn (15 sec)	14 CFR/FAR 25.853	Passed (.060" thick)
Vertical Burn (60 sec)	14 CFR/FAR 25.853	Passed (.060" thick)
Vertical Burn (12 sec)	14 CFR/FAR 25.853	Passed (.060" thick)
45° Ignition	14 CFR/FAR 25.853	Passed (.060" thick)
Heat Release	14 CFR/FAR 25.853	Passed (.060" thick)
NBS Smoke Density (flaming)	14 CFR/FAR 25.853	Passed (.060" thick)
NBS Smoke Density (non-flaming)	14 CFR/FAR 25.853	Passed (.060" thick)

¹Build orientation is on side long edge.

²Literature value unless otherwise noted

Orientation: See Stratasys Testing white paper for more detailed description of build orientations.

- XZ = X or "on edge"
- XY = Y or "flat"
- ZX = or "upright"

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