

STEPTM Material //

STEP Technology uses ABS (Acrylonitrile Butadiene Styrene), a high-volume commercial thermoplastic that is one of the most cost-effective materials. It is best used in applications that demand high strength, heat resistance, and the ability to bend before breaking. Due to its strength, machinability and high-performance, ABS is the plastic preferred by engineers for the manufacturing of end-use-parts.

Technology Comparison

FEATURE	STEP (ABS)	DLS (CLIP)	MJF	IM*
Wall Thickness Range	0.25 - >> 10	1.0 - 2.5	0.5 - 3	1.0-3.5
Min Hole Diameter	0.4	0.5	0.5	1.0
Min Pin Diameter	< 0.5	0.4	0.5	1.0
Clearance Between Mating Parts	0.25	0.5	0.7	N/A
Engraving Depth / Embossing Height	0.2 (top/bottom) 0.5 (sides)	0.3	1	0.13
Text Size (engraved/ embossed) (pt.)	4 (top/bottom) 6 (sides)	8.5	6	1.5
Build Envelope Size (X/Y/Z)	600 x 300 x 50* *Z height 50+ possible with XY reduction	189 x 118 x 326	380 x 284 x 380	480 x 750 x 200
Dimensional Accuracy	0.20 mm or 0.003 mm/mm	0.125 mm + 0.002 mm/mm	0.3 mm or 0.003 mm/mm	0.003 mm/mm

Units measured in mm

Capabilities typically material-dependent; values cited are for ABS or most similar option

* Injection molding capabilities vary dramatically; typical small-mid size part capabilities shown

Mechanical Properties	Test Sample Type	Test Method	Typical Values	Units
Tensile Modulus	Type V, 5mm/min	ASTM D638	1770	MPa
Tensile Modulus	ISO-1BA	ISO 527-1BA	1770	MPa
Tensile Strength	Type V, 5 mm/min	ASTM D638	34	MPa
Tensile Strength	ISO-1BA	ISO 527-1BA	37	MPa
% Elongation to Break	Type V, 5 mm/min	ASTM D638	7-9	%
% Elongation to Break	ISO-1BA	ISO 527-1BA	10-15	%
Flexural Modulus	2mm/min	ISO 178	1600-2000	MPa
Charpy Notched, 23C	80x10x4mm, notch type A	ISO 179-1:2010	16-20	kJ/m2
Falling Dart, Fmax	1000mm drop/ height, 4.4 m/s	ISO 6603-2:2000	2200	N
Falling Dart, Energy	1000mm drop height, 4.4 m/s	ISO 6603-2:2000	8	J

Thermal Properties	Test Sample Type	Test Method	Typical Values	Units
Glass Transition Temperature (Tg)	N/A	DSC (internal method)	106-110	°C
Vicat Softening Temperature	Rate B/50	ASTM D1525	99	°C
Heat Deflection Temperature	0.45 MPa	ASTM D648	94	°C
Heat Deflection Temperature	1.82 MPa	ASTM D648	79	°C
Relative Temp Index, Elec		UL 746B	60	°C
Relative Temp Index, Mech w/ impact		UL 746B	60	°C
Relative Temp Index, Mech w/o impact		UL 746B	60	°C

Additional Properties	Test Method	Typical Values	Units
Specific Gravity	ASTM D792	1.04	Unitless
Density	ISO 1183	1.04	gm/cm3
Flame Classification	UL94	HB	N/A
Melt Mass-Flow Rate (220oC/10 kg)	ASTM D1238 / ISO 1133	8	g/10 min

Flame Characteristics	Test Method	Value	Units
UL Recognized, 94HB Flame Class Rating (3)	UL 94	1.5	mm

Electrical	Test Method	Value	Units
Hot Wire Ignition (PLC)	UL 746B	4	PLC Code
High Ampere Arc Ignition, Surface (PLC)	UL 746B	0	PLC Code
Comparative Tracking Index	UL 746B	1	PLC Code
Volume Resistivity	ASTM D257	15	10 ^x ohm-cm
Dielectric Strength	ASTM D149	36	kV/mm