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MATERIAL GUIDE
Stereolithography (SLA)
Digital Light Projection (DLP)
Micro 3D Printing

HI-TEMP 300 AMB
(Matrix HT300/HTA300)

HI-TEMP 300 AMB is an ultra-high temperature resin, available for SLA, DLP and Micro 3D Printing, with a heat deflection temperature of over 300°C at low stress (0.455 MPa) and no post thermal cure required.

It is the most heat-resistant stereolithography material available, and is well suited to functional testing of components in applications including HVAC, consumer appliances, motor enclosures, fixtures, mounts and tooling.

Applications

- High temperature components testing, and general use parts including: HVAC, consumer appliances, motor enclosures, stators, etc
- Low pressure molding/tooling: expanding foams, rubbers, etc.
- Functional prototype and production components for fixtures, mounts, housings, white goods and personal care products
- Elevated temperature fluid or gas flow visualisation
- Overmoulding

Benefits

- Production-grade material
- High heat resistant for testing and use in high heat environments
- Shortened production workflow; no requirement for a post thermal cure
- Excellent visualisation for parts requiring evaluation of internal features and fluid flow performance
- Chemical and auto fluid compatibility

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MATERIAL PROPERTIES

The full suite of mechanical properties is given per ASTM and ISO standards where applicable. All parts are conditioned per ASTM recommended standards for a minimum of 40 hrs at 23°C, 50% RH. Solid material properties reported were printed along the vertical axis (ZX-orientation).

As detailed in the Isotropic Properties section, stereolithography material properties are relatively uniform across print orientations. Parts do not need to be oriented in a particular direction to exhibit these properties.

LIQUID MATERIAL			
MEASUREMENT	METHOD	METRIC	US
Viscocity	Brookfield viscometer @ 25°C (77°F)	1100 cPs	2661 lb/ft-hr
Colour		Amber	
Liquid Density	Kruss K11 Force Tensiometer @ 25°C (77°F)	1.17 g/cm^3	0.04 lb/in^3

SOLID MATERIAL						
METRIC	ASTM METHOD	METRIC	U.S.	ISO METHOD	METRIC	U.S.
PHYSICAL				PHYSICAL		
Solid Density	ASTM D792	1.27 g/cm^3	0.046 lb/in^3	ISO 1183	1.27 g/cm^3	0.046 lb/in^3
24 Hour Water Absorption	ASTM D570	0.36%	0.36%	ISO 62	0.36%	0.36%
MECHANICAL				MECHANICAL		
Tensile Strength Ultimate	ASTM D638 Type IV	59 MPa	8600 psi	ISO 527 -1/2	53 MPa	7700 psi
Tensile Strength at Yield	ASTM D638 Type IV	Did not yield	Did not yield	ISO 527 -1/2	Did not yield	Did not yield
Tensile Modulus	ASTM D638 Type IV	3500 MPa	500 ksi	ISO 527 -1/2	3500 MPa	500 ksi
Elongation at Break	ASTM D638 Type IV	2.2%	2.2%	ISO 527 -1/2	2.6%	2.6%
Elongation at Yield	ASTM D638 Type IV	Did not yield	Did not yield	ISO 527 -1/2	Did not yield	Did not yield
Flex Strength	ASTM D790	117 MPa	16900 psi	ISO 178	108 MPa	15700 psi
Flex Modulus	ASTM D790	3400 MPa	500 ksi	ISO 178	3600 MPa	528 ksi
Izod Notched Impact	ASTM D256	10 J/m^2	0.2 ft-lb/in^2	ISO 180-A	1.6 J/m^2	0.75 ft-lb/in^2
Izod Unnotched Impact	ASTM D4812	70 J/m^2	1.3 ft-lb/in^2	ISO 180-U	6 J/m^2	2.96 ft-lb/in^2
Shore Hardness	ASTM D2240	88 D	88 D	ISO 7619	88 D	88 D
THERMAL				THERMAL		
Tg (DMA E")	ASTM E1640 (E"Peak)	23°C	74°F	ISO 2721-1/11 (E"Peak)	23°C	74°F
HDT 0.455 MPa / 66 PSI	ASTM D648	300°C	572°F	ISO 75-1/2B	300°C	572°F
HDT 1.82 MPa / 264 PSI	ASTM D648	124°C	255°F	ISO 75-1/2A	115°C	238°F
CTE -20 to 50°C	ASTM E831	74 ppm/°C	41 ppm/°F	ISO 11359-2	74 ppm/°C	41 ppm/°F
CTE 75 to 180°C	ASTM E831	55 ppm/°C	31 ppm/°F	ISO 11359-2	55 ppm/°C	31 ppm/°F

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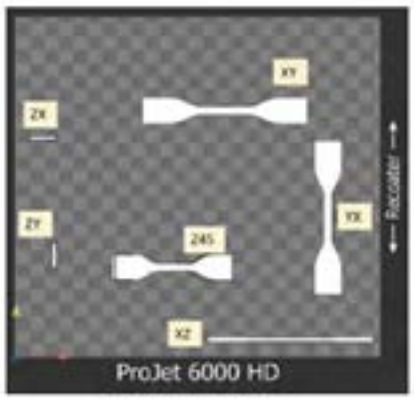
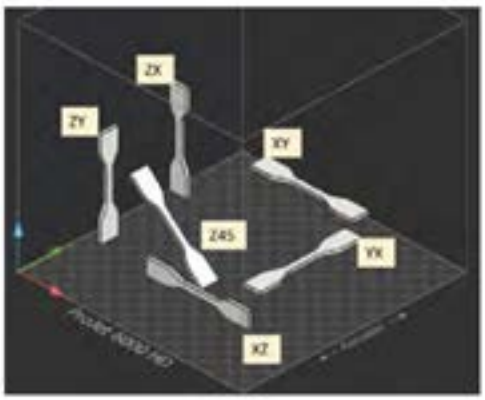
ISOTROPIC PROPERTIES

Stereolithography technology prints parts that are generally isotropic in mechanical properties meaning the parts printed along either the XYZ axis will give similar results.

Parts do not need to be oriented to get the highest mechanical properties, further improving the degree of freedom for part orientation for mechanical properties.

LIQUID MATERIAL						
METRIC	METHOD	METRIC				
MECHANICAL						
		ZX	XZ45	YX	Z45	XZ
Tensile Strength Ultimate	AMST D638 Type IV	59 MPa	41 MPa	53 MPa	57 MPa	40 MPa
Tensile Strength at Yield	AMST D638 Type IV	Did not yield	Did not yield	Did not yield	Did not yield	Did not yield
Tensile Modulus	AMST D638 Type IV	3500 MPa	3500 MPa	3700 MPa	3500 MPa	3600 MPa
Elongation at Break	AMST D638 Type IV	2.2%	1.3%	1.7%	1.9%	1.2%
Flex Strength	ASTM D790	117 MPa	116 MPa	100 MPa	92 MPa	117 MPa
Flex Modulus	ASTM D790	3400 MPa	3500 MPa	2860 MPa	3200 MPa	3400 MPa
Izod Notched Impact	ASTM D256	10 J/m	10 J/m	10 J/m	10 J/m	10 J/m
Izod Unnotched Impact	ASTM D4812	70 J/m	67 J/m	56 J/m	65 J/m	73 J/m
HDT 0.455 MPa / 66 PSI	ASTM D648	300°C	300°C	300°C	300°C	300°C
HDT 1.82 MPa / 264 PSI	ASTM D648	124°C	136°C	136°C	141°C	153°C





Please Note: All parts that are processed requiring USP Class VI must be cleaned and packaged following our guidelines, no post-processing operations can be carried out on these parts.