

# HTL Resin

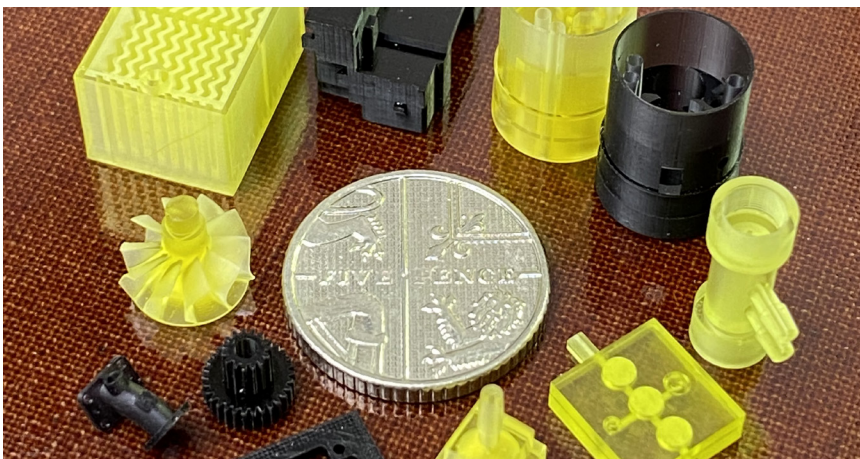
A high performance engineering material used for Projection Micro Stereo Lithography (PμSL) 3D printing

HTL is a high performance engineering material with high strength, rigidity, and heat resistance, able to withstand temperatures up to 140C. HTL enables high resolution features, making it suitable for a broad range of engineering and medical applications including those which require autoclave sterilisation.

		Cured parts	Standard
<b>Tensile Properties</b>	Tensile Strength	71.5 MPa	ASTM D638
	Elastic Modulus	2397 MPa	ASTM D638
	Elongation at Break	7.8%	ASTM D638
<b>Flexural Properties</b>	Flexural Strength	112.9 MPa	ASTM D790
	Flexural Modulus	2.8 GPa	ASTM D790
<b>Impact Properties</b>	Impact Strength	30 J/m	ASTM D256
<b>Thermal Properties</b>	CTE @ 60C	169.0 μm/m/°C	-
	HDT @ 0.45 MPa	114.2 °C	ASTM D648 - 07
<b>General properties</b>	Contact Angle	45-60°	ASTM D7334
	Water Absorption (24h)	1.05%	ASTM D570
	Dialectic Constant (10 GHz)	3.45	-
	DF	0.0245	-
	Hardness	81 Shore D	ASTM D785
	Viscosity	85 cP	-
	Standard Colour	Black / Carbon black	-

<sup>1</sup> Final properties are dependent on print conditions, post-processing operations, and part geometry.

<sup>2</sup> Test samples were UV cured and heat cured.



Selection of parts in BMF Materials - HTL (black), BIO (yellow), RG (yellow)

## Design features for PμSL

Design feature	Recommended
Maximum part size	100 x 100 x 75 mm
Minimum part size	1 mm <sup>3</sup>
Minimum feature size	0.05 mm
Minimum hole diameter (vertical)	0.05 mm
Minimum hole diameter (horizontal)	0.15 mm
Maximum unsupported hole diameter (horizontal)	2.0 mm
Minimum wall thickness (supported)	0.05 mm
Minimum wall thickness (unsupported)	0.1 mm
Minimum unsupported overhang angle	30°
Maximum bridged overhang length	1.5 mm
Maximum non-bridged overhang length	0.3 mm
Aspect ratio for channels	100:01:00
Aspect ratio for pins & pillars	40:01:00
Minimum feature clearance	0.1 mm
Recommended channel shape > Ø 100 μm	Rectangular or circular
Recommended channel shape < Ø 100 μm	Circular
Part-to-part spacing	0.1 mm
Layer height	0.01- 0.05 mm
Support structure shape	Cone
Support structure cone top diameter	0.08 - 0.2 mm
Support structure cone base diameter	0.1mm-1 mm

Warranty/Disclaimer: The performance characteristics of these products may vary according to product application, operating conditions, material combined with, or with end use. Prototype Projects makes no warranties of any type, express or implied, including, but not limited to, the warranties of merchantability or fitness for a particular use.

© 2022 by Prototype Projects Ltd. All rights reserved.