

# TWO MAKE LTD: 3D PRINTING SERVICE DATA SHEET

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## Comparison of the Two Main 3D Printing Processes We Offer (Summary Table)

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3D Print Process	Selective Laser Sintering <b>SLS</b>	Fused Deposition Modelling <b>FDM</b>
Material	Nylon/PA-12	ABS+
Raw Colour Colouring Options	White or Grey In-house dyeing and painting offered	White/Off-white In-house painting offered
Printed Layer Height	0.10 mm	0.15 mm
Print Quality / Definition	Excellent	Very Good
Print Strength in Raw State	Very High	Strong in XY axis. Weaker in Z axis.
Suitable Applications	Models, prototypes and structural components.	Models, prototypes and thicker parts.
Printing Cost	££	£

## LEAD TIMES (dependant on model size)

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FDM – 2-3 working days

SLS – 5-7 working days

*Rush & Weekend Service Available On Request at Additional Cost*

## Surface Finishing Options (smoothing/polishing/colouring)

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- Automated Polishing (Vibro Tumbling)
- Sand/Bead Blasting
- Hand Finishing
- Dyeing
- Various Paint Finishes
- Other bespoke and experimental options. *Contact us to discuss your requirements.*

## SELECTIVE LASER SINTERING (SLS)

### *Material*

Nylon 12 (PA 12)  
Colour – GREY

### *3D Print Powder Specification*

Granulation of 20-100 microns  
25% Virgin Powder Used Per Build

### *Print Layer Thickness*

Standard – 0.100 mm (100 microns)  
Custom – 0.075 mm (75 microns) available on request at additional cost

### *3D Digital Model Requirements for SLS*

Minimum wall thickness - 0.8 mm  
Recommended Minimum Wire Thickness – 1.0-1.2 mm (depending on geometry)  
Maximum Build Volume (bounding box) – 105 x 160 x 145 mm

### *Advice for Joining Prints Together*

Use a high quality Cyanoacrylate (Super Glue) and/or fixtures like screws.  
Larger parts are better printed using the FDM process and solvent welded together.

### *Tolerances*

± 0.20 mm *THEN* ± 0.20% of longest axis

**Note**

We can help you achieve these requirements with consultancy or our in house CAD service. *Contact us for more information.*

## FUSED DEPOSITION MODELLING (FDM)

### *Material*

Acrylonitrile Butadiene Styrene (ABS)

Colour – NATURAL (off-white)

### *Print Layer Thickness*

0.150mm (150 microns)

### *3D Digital Model Requirements for FDM*

Minimum Wall Thickness – 1.2 mm

Recommended Minimum Wire Thickness – 1.5-2.0 mm (depending on geometry)

Maximum Build Volume (bounding box)

- Standard - 130 x 130 x 130 mm
- Large, Flat Parts (prone to warping) – 100 x 100 x 120mm

### *Advice for Joining Prints Together*

An excellent joint between prints can be formed with a solvent like acetone. Contact us for advice.

### *Tolerances*

± 0.50 mm

Maximum Deviation 1-2% for parts with a large surface area on the X-Y Plane (prone to warping)

**Note**

We can help you achieve these requirements with consultancy or our in house CAD service. *Contact us for more information.*

### Comparison of 3D Printed Material Properties

*Approx. Values - For Guidance Only*

	SLS PA12	MJF PA12	FDM ABS+
<b>Tensile Strength</b>	XY: 48 MPa Z: 42 MPa	XY: 48 MPa Z: 48 MPa	40 MPa
<b>Tensile Modulus</b>	XY: 1650 MPa Z: 1650 MPa	XY: 1700 MPa Z: 1800 MPa	2443 MPa
<b>Elongation at break</b>	XY: 18% Z: 4%	XY: 20% Z: 15%	XY: 30% Z: Less - varies depending on part orientation / geometry
<b>Dimensional accuracy</b>	± 0.3% (lower limit of ± 0.3 mm)	± 0.3% (with lower limit on ± 0.2 mm)	± 0.5 mm
<b>Density</b>	0.95 g/cm <sup>3</sup>	0.95 g/cm <sup>3</sup>	1.05 g/cm <sup>3</sup>

#### Comparison with injection moulded part

	ABS
<b>Tensile Strength</b>	40 Mpa
<b>Tensile Modulus</b>	2300 Mpa
<b>Elongation at break</b>	30.0%
<b>Dimensional accuracy</b>	-
<b>Density</b>	1.05 g/cm <sup>3</sup>