Rapid Prototyping

This is a process used to produce a prototype model in a very short time, in days rather than weeks. Traditionally, drawings would be produced and sent to a toolmaker to make up. This would take a number of weeks and on its return it would be tested. Modifications may need to be made so the process would be repeated. With Rapid Prototyping this can be done in a couple of days directly from CAD software. Through an additional programme, the object would be sliced up into 2D layers or slices.

This data is then transferred to one of the rapid prototyping machines/processes; each 2D layer would be then be reproduced to create the complex model.

 Laser

 These layers can be:

Layer Epoxy resin

 Sand

 Paper

The three main processes are:

1. Stereolithography SLA

2. Laminated Object Manufacture LOM

3. Selected laser Sintering SLS

On the next few pages are diagrams explaining each machine.

Stereolithography - SLA

Re-coating Reservoir sweeps over after each layer

Laser & Optics

Platform – Z axis

Goes down after each layer

#### Fine Detail

#### Slightly Transparent

Brittle

Laminated Object Manufacture - LOM

#### Material: **Paper**, Acrylic, Polystyrene

Layer thickness: 0.1- 0.25 mm

Build Dimensions: Up to 800mm x 500mm x 450mm



Laminating Roller

X-Y positioning device

Laser & Optics

Platform – Z axis Goes down after each layer

Take-up Roll

Material Supply Roll

#### Fine Detail

#### Slightly Transparent

Brittle

Selective Laser Sintering - SLS

Scan Direction

Powder Feed Roller

Laser & Optics

#### Material: **Powder Process**, Sand, Nylon, Wax, Polycarbonate

Layer thickness: 0.1- 0.15 mm

Build Dimensions: Up to 750mm x 350mm x 350mm

Build Envelope Piston

Powder Feed Cartridge

Powder Feed Cartridge

#### Powder textured finish

Can be flexible

Can be used for moulds in casting

#### Material: **Powder Process**, Sand, Nylon, Polycarbonate

Layer thickness: 0.1- 0.25 mm

Build Dimensions: Up to 800mm x 500mm x 4500mm

Platform – Z-axis Goes down after each layer

Take-up Roll

Material Supply Roll