

To speak to one of our DLS experts, please call 01325 333 141 or email: sales@paragon-rt.com

Designing for DLS

Like other UV photopolymer printing processes, optical effects occur during printing. These can be seen on the part's A surface. These are not layers. They do not interfere with the material properties.

Carbon Digital Light Synthesis (DLS) is a resin-based process that utilises digital light projection, oxygen-permeable optics, and engineering-grade materials.

Materials are either rigid or elastomeric. All Carbon-created materials are biocompatible. It's important to know your desired material's temperature, chemical resistance and mechanical properties as material choices affect design, printing, and post processing.

Paragon runs four Carbon M2 printers. Critical sizes as follows:

Build Envelope
X: 189mm
Y: 118mm
Z: 326mm

At Paragon, we accept both .stl and .stp files for Carbon printing.

Designing for Additive Manufacturing is different from traditional manufacturing. The additive design process allows engineers to create more complex shapes and production parts, at the same time reducing weight and material usage.

These sizes are to be considered a starting point, helping you to avoid print failure, to reduce potential defects, and to reduce post-processing time. All feature sizes are material dependent:

- **Wall Thickness (mm)** - between 1.0 and 2.5
- **Maximum overhang (mm)** - 2.0 - 3.0
- **Maximum bridge (mm)** - 2.0 to 6.0
- **Unsupported angle** - av. 40°
- **Hole size (mm): XY** - between 0.5 - 2.0; **Z** - av. -.87
- **Positive feature (mm): XY** - av. 0.5 ; **Z** - av. 0.3
- **Engraving/Embossing(mm)**: av. 0.3



To incorporate threaded holes into your part, either:

- Design them within the part and print them; or
- Build in a 'nut' into which you can insert a screw; or
- Use inserts

Rethink Foam: All Paragon customers have access to the Carbon Design Engine, which enables you to go from an idea to a fully functional, latticed part in a matter of hours. Talk to us to discuss the opportunity to use 1000s of configurations designed for everything, from impact absorption to vibration isolation.

Simply remember

- Gradual geometry changes
- Consistent wall thickness
- No unvented volumes
- Self supporting
- Cleanability

There's a DLS material for that...From automotive parts to security device components; from electrical housing to single use surgical instruments; from wearables to connectors and sporting goods components.

Production parts - can prototype on the same platform

A "continuous liquid interface" projects the slice video into the resin from below. The light engine's UV light solidifies the resin and the part undergoes a gradient cure, creating dense, layerless parts with isotropic mechanical properties.

- Ask for:**
- DLS Materials Comparison Chart
 - Chemical Compatibility Results

Resolution
XY: 75 µm
Z: 100 µm

Slice thickness
 50 µm
 25 µm

Accuracy
General: ±70 µm + 1 µm per mm dimension size
Production: ±40 µm + 1 µm per mm dimension size

Ensure your mesh is as fine as possible to optimise the part quality.

The main design principles for designing for AM are:

- **Gradual geometry changes** - eliminate sharp edges, instead use fillets and chamfers
- **Consistent wall thickness** - think about both supported and unsupported walls
- **No unvented volumes** - vent parts at the build platform; leave resin flow paths in supports
- **Self supporting** - use recommended maximums for overhangs, bridges, unsupported angles and positive feature sizes
- **Cleanability** - consider hole sizes, engraving and embossing

- Ask for:**
- DLS Materials Recommended Feature Sizes Chart

The DLS process is high-resolution enough to print end-use threads to 0.7mm in pitch.

Cushioning, protection, vibration isolation, impact absorption and energy return



PARAGON
 AM Technologies

Paragon AM Technologies is the additive manufacturing division of Paragon Rapid Technologies Ltd. For a quote or to discuss your options, please call us or email us:

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Our technical experts are here to help you every step of the way.

