

LightForge™ Rapid Prototyping

Overview:

LightForge™ is a low-cost rapid fabrication service giving optical designers the ability to create innovative new freeform surfaces, test new ideas and verify designs for production without incurring expensive upfront engineering charges and lengthy prototyping lead times.

Uploading a design to the LightForge™ website could not be simpler. The optical surface must be specified on a 10µm grid for x, y and z. After submitting the design, the LightForge™ website runs a design rule check and if accepted, your optic will be ready in as little as 2 weeks.

LightForge™ can be used to create a wide range of refractive optical elements, from beam transformers and microlens arrays, to unique components such as diode laser smile correctors and wavefront compensator phaseplates, to completely custom surface shapes.

The LightForge™ fabrication service can be used for rapid prototyping as a precursor to volume production, or for one-off designs. The clear aperture can be used to test multiple variants of a single design or multiple separate designs.

The PowerPhotonic effect:

65µm

Maximum Sagitta

15mm

Square Clear Aperture

2 week

Turnaround Time

How it works:

Uploading your optic design to the LightForge™ website is a seamless process. Simply register on our website and upload your design. We will perform a quick rule check to verify that your design adheres to our design rules. Once your design has been approved, you can select the number of pieces you require and choose a payment option. Your custom optic will be delivered to your doorstep within as little as two weeks.



Key Features:

- Rapid prototyping
- Upload via web
- Fixed design rules
- Zemax to LightForge macro
- AR coatings available

Target Applications:

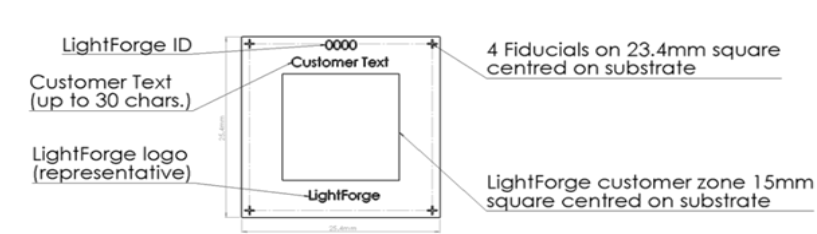
- Laser Additive Manufacturing
- Remote Welding
- Remote Cutting
- Scribing
- Drilling



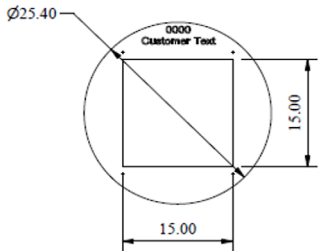
LightForge Rapid Prototype Datasheet V1 Mar 2023
All specifications are correct at the time of production. We reserve the right to change our specifications without notice. © PowerPhotonic Ltd.

LightForge™ Design Rules

| Material Properties | | Nominal Specification | |
|-------------------------------|--|-----------------------------|---------|
| Material | | UV fused silica | |
| Specific Type | | Corning 7980 | |
| Transmission | | ≈ 92% uncoated, >99% coated | |
| Refractive Index | | 1.453 @ 808nm | |
| Mechanical Characteristics | Dimensions and Tolerance | | Units |
| Length (L) or Diameter (D) | 25.4 +0/-0.1 | | mm |
| Width (W) | 25.4 +0/-0.1 | | mm |
| Thickness | 1.0 +/- 0.05 | | mm |
| Optical Characteristics | Dimension | | Units |
| Clear Aperture (X) | 15.0 | | mm |
| Clear Aperture (Y) | 15.0 | | mm |
| Process Parameters | Range | | Units |
| Sag | 0 - 65 | | µm |
| Slope (form error PV < 500nm) | 0 - 8 | | degrees |
| Slope | 0 - 45 | | degrees |
| Feature Size | 200 - 15000 | | µm |
| Steps & Discontinuities | smoothed over 150µm | | |
| Custom Options Available | Notes | | |
| AR Coating | Choice of none; AR-GREEN 532 ± 30nm AR-IR Broad 780-1020nm; AR-IR-V 1064 nm; AR-TELECOM 1260 - 1620nm; | | |
| Customer Marking | 0 - 30 characterers, centered above clear aperture | | |
| Mounting Options | 2" round interface plate for square substrate | | |



Square Substrate Dimensions



Round Substrate Dimensions

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