Blank Material, Silicon 1” optics, 40m Mariner

APPROVALS	DATE	REV	DCN NO.	BY	CHECK
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1 Description

1” diameter silicon optics, polished, uncoated, as illustrated in Figure 1.

1.1 Quantity

- 20x 1” diameter units

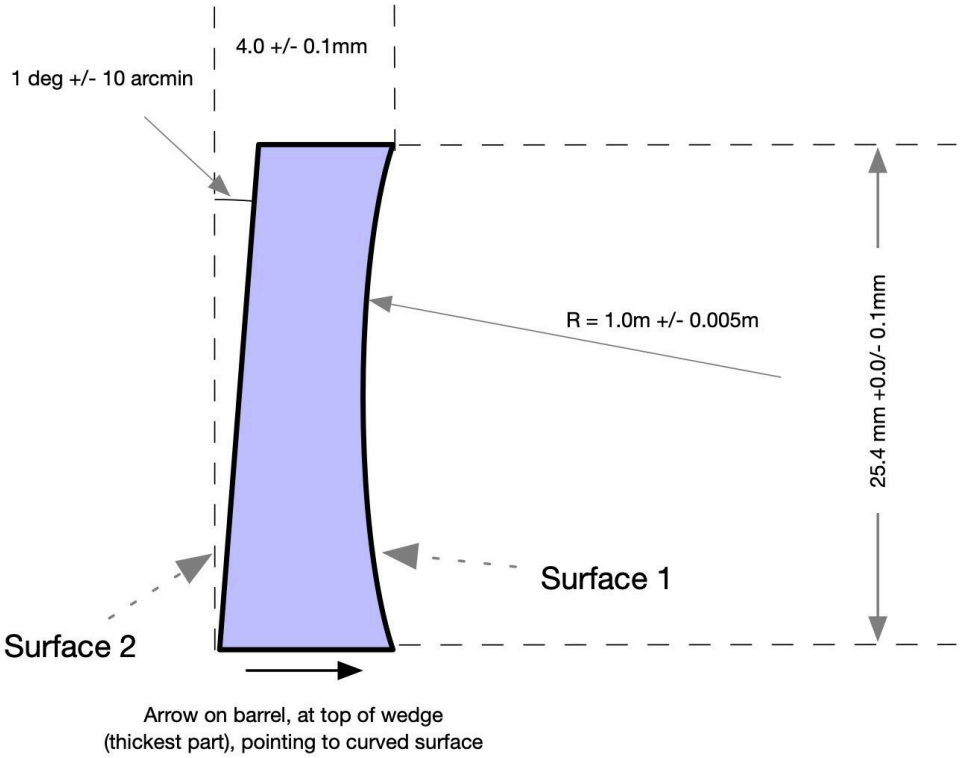

Figure 1: cartoon image of the 1” diameter silicon optic

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2 Material properties

- Material: Single-crystal, float zone silicon, <100>
- Dopants: Undoped; best effort for minimal residual dopant contamination
- Resistivity: > 3 kΩ cm; radial variation and striation ± 20% in clear aperture
- Roughness: < 1 Å RMS
- Crystal orientationFlat surfaces of cylinder aligned with {100} crystal plane, ±1°

3 Dimensions

Right circular cylinder, as illustrated in Figure 1:

- Diameter: 25.4 mm +0.00/− 0.1 mm
- Thickness (at edges): 4 mm ± 0.1 mm
- Wedge: 1 deg +/- 10 arcmin
- Chamfers**:** minimal to prevent chipping (goal of < 0.25 mm width)

4 Surface Roughness & Quality

Surfaces 1 & 2

- super-polished, less than 1 Angstrom RMS over central 20 mm diameter.
- Only commercial polish quality outside 20mm diameter (with best effort toward super-polish)

Edges and Bevels: Commercial-polish

5 Surface Figure

Side 1 & 2:

Over central 20 mm diameter, deviation from sphere: < λ/20 PV at 632.8 nm

6 Surface Polish & registration marks

6.1 Surface Figure (Curvature)

Measure over the central 20 mm diameter.

Surface 1

Spherical, concave. **Radius of curvature 1.0 m ± 0.005 m** (best effort for ± 0.002 m)

Surface 2

Flat. Radius of curvature > 500, m in absolute value (best effort for > 1 000 m)

6.2 Registration marks

- Each optic shall be laser engraved on the barrel of the optic for in-vacuum use — **no pencil marks shall be present**
- Each optic will have an arrow on the barrel:
    - At the thickest part of the barrel (top of the wedge)
    - Pointing to the curved surface