



40m BHD Optics: 50.8 mm Ø Relay Mirrors

AUTHOR(S)	DATE	Document Change Notice, Release or Approval
J. Richardson	16 Apr 2020	v1
J. Richardson	3 June 2020	v2 – updated telescope designs

1 Description

50.8 mm (2") Ø plano-concave mirrors @ 1064 nm

2 Material

Corning HPFS 7980 (high purity fused silica, UV grade)
Grade 4G or better

3 Dimensions

Diameter: 50.8 mm +0.0/-0.1 mm

Thickness (at edge): 9.53 mm ± 0.2 mm

Wedge: 2.0° ± 0.1°

4 Radius of Curvature:

Radius of Curvature (ROC) values are defined over the central 30 mm diameter of the optic.

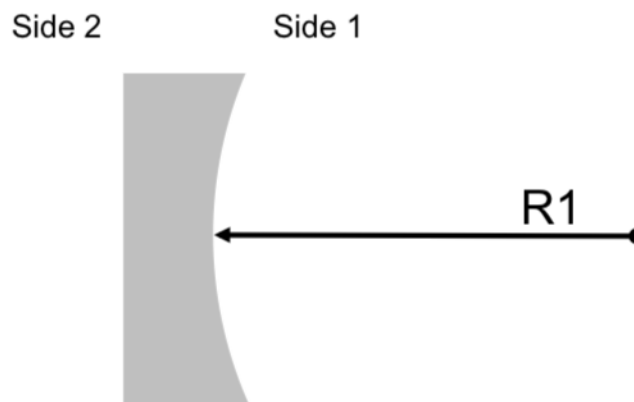


Figure 1: Schematic picture of the plano-concave optics E2000226-v2-X. This picture has the only purpose of identifying the ROC of the optic and the two sides.

- **E2000226-v2-A (AS1)**
Side 1: ROC R1 = +2.8 m ± 0.028 m
Side 2: Flat



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- **E2000226-v2-B (AS4)**
Side 1: ROC R1 = +0.6 m \pm 0.006 m
Side 2: Flat
- **E2000226-v2-C (LO1)**
Side 1: ROC R1 = +6.0 m \pm 0.06 m
Side 2: Flat

5 Surface Roughness & Quality

Side 1:

Super-polished

< 5 Å RMS over central 80% of diameter

10-5 scratch-dig

Side 2:

Commercial polish

< 10 Å RMS over central 80% of diameter

6 Surface Figure

Side 1:

Deviation from sphere < $\lambda/10$ PV at 632.8 nm over central 80% of diameter

7 Coating

Ion Beam Sputtered (IBS) coatings

Wavelength: **1064 nm**

Polarization: **p-polarization**

Angle of incidence: $0^\circ - 8^\circ$

Side 1:

HR coating

T < 100 ppm

Side 2:

AR coating

R < 0.2%

8 Serial numbers and marks

Each optic shall be laser engraved on the barrel for in-vacuum use—**no pencil marks shall be present**

Each barrel shall be inscribed as follows:



SPECIFICATION

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- Label centered on the thickest location:
E2000226-v2-Y SN0x
 - with “Y” the radius-of-curvature letter designator given above
 - with “x” starting at **1** for each type
- Arrow at the thinnest location pointing towards Side 1