40m BHD Optics: 25.4 mm Ø Relay Mirrors

AUTHOR(S)	DATE	Document Change Notice, Release or Approval
J. Richardson	3 June 2020	v2 – switch from lenses to mirrors

1 Description

25.4 mm (1") Ø plano-concave/convex mirrors @ 1064 nm

2 Material

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

3 Dimensions

Diameter: 25.4 mm +0.0/-0.1 mm
Thickness (edge): 6.35 mm ± 0.2 mm
Wedge: 2.0° ± 0.1°

4 Radius of Curvature (ROC):

Radius of Curvature (ROC) values are defined over the central 15 mm diameter of the optic.

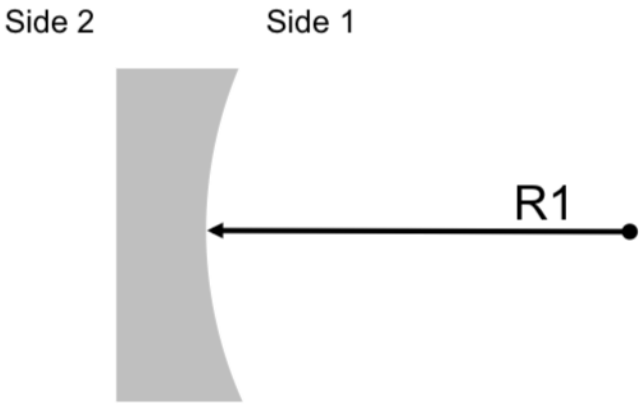

Figure 1: Schematic picture of the plano-concave/convex optics E2000228-v2-X. A concave surface is indicated by a positive radius of curvature and a convex surface by a negative radius of curvature. This picture has the only purpose of identifying the ROC of the optic and the two sides.

- **E2000228-v2-A** (AS3)
  Side 1: ROC R1 = –2.0 m ± 0.02 m
  Side 2: Flat

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- **E2000228-v2-B** (LO3)
  Side 1: ROC R1 = +0.75 m ± 0.008 m
  Side 2: Flat

- **E2000228-v2-C** (LO4)
  Side 1: ROC R1 = –0.45 m ± 0.005 m
  Side 2: Flat

5 Surface Roughness

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 < λ/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°– 10°

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:

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- Label centered on the thickest location:
  E2000228-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