Mirrors of the Second Harmonic Generator (SHG) of the H1 Squeezer

APPROVALS	DATE	REV	DCN NO.	BY	CHECK	DCC	DATE
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1 Description

Convex-concave mirror

2 Material

Corning HPFS 7980 (high purity fused silica, UV grade)
Grade 0A (Low inclusion class: <0.3 mm² cross section, 0.1 mm max. size;
Homogeneity < 1ppm)

3 Dimensions

Diameter: 12.7mm +0/-0.2mm
Thickness (center): 5.7mm ± 1mm
Radius of Curvature (ROC):

- Inner ROC **(Side1):** R1 = 25mm ± 0.5mm (2%)
- Outer ROC **(Side2):** R2 = 20mm ± 0.4mm (2%)

Figure 1 has the only purpose of identifying the two sides of the mirror.

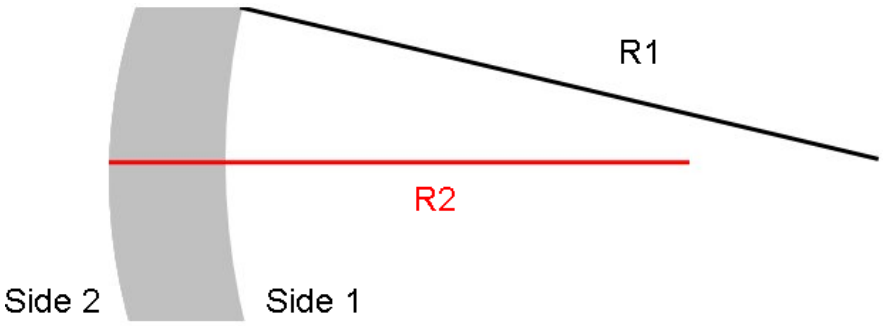

Fig1: Schematic picture of the SHG mirror: the inner ROC (Side1) is 25mm, the outer ROC (Side2) is 20mm.

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4 Surface Roughness

Side 1
Super-polished less than 1 Angstrom over central 80% of diameter with 10-5 scratch-dig; best effort for 0/0 20-10 scratch-dig outside central 80% of diameter.
Side 2
Less than 5 Angstrom over central 80% of diameter

5 Surface Figure

Side 1
Flat < λ/10 at 632.8 over central 80%
Side 2
Flat < λ/4 at 632.8 over central 80%

6 Coating

Wavelength: 1064nm and 532nm
Angle of incidence: 0°

Figure 2 has the only purpose of defining the different surfaces of the mirrors

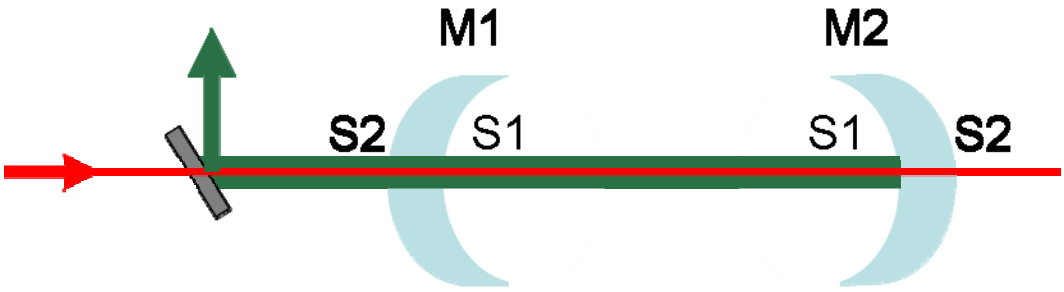

Fig2: Schematic picture of the SHG cavity. The SHG cavity is formed by two convex-concave mirrors, M1 and M2. For each mirror, side 1 (S1) is the concave side, and side 2 (S2) is the convex side.

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MIRROR M1

Side 1 (concave)
R=(90±1)% @ 1064nm
AR@532nm < 2%

Side 2 (convex)
AR@1064nm < 0.1%
AR@532nm < 0.2%

MIRROR M2

Side 1 (concave)
R=(99.85±0.05)% @ 1064nm
R>99.9%@532nm

Side 2 (convex)
AR@1064nm < 0.1%
AR@532nm < 0.2%