

**Coating, Contamination Cavity**

AUTHOR(S)	DATE	Document Change Notice, Release or Approval
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Background

Contamination Cavity mirrors are used as end mirrors in a resonant cavity, where the mirrors are exposed to potential vacuum contaminants and cavity loss is monitored over time to predict the impact of the contaminant on LIGO vacuum system cleanliness. Reference document E960222, LIGO Vacuum Compatibility, Cleaning Methods and Qualification Procedures, section 9.1.1. High Power Exposure Tests of Cavity Mirrors.

Ion Beam Sputtered Coating

S1: HR at 1064 nm, T=72 ppm +/- 3 ppm Angle of incidence, 0° Absorption at 1064nm <1 ppm	S2: AR at 1064 nm, R<0.1%, required R< 0.01% goal Angle of incidence, 0°
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These coatings are applied to commercially available superpolished substrates meeting the following requirements:

TYPE A Mirror substrate Specifications:

1.000" diameter, 0.250" thick

marked with arrow pointing to side 1

Side 1: Surface roughness less than 1 angstrom RMS

Flat, Surface figure is better than $\lambda/10$ measured at 633nm

Surface quality is 10/5 per MIL -0-13830A

Side 2: Fused silica conventional polished laser quality Plano surface.

Surface flatness is better than $\lambda/4$ measured at 633nm

Surface quality 40-20

Clear Aperture: Central 80%

TYPE B Mirror substrate Specifications:

Same as type A, except:

One meter Concave, Surface figure is better than $\lambda/10$ measured at 633nm