LASER INTERFEROMETER GRAVITATIONAL WAVE OBSERVATORY

SPECIFICATION

E1100267 V1

Document No Rev

Sheet 1 of 2

6 inch Vacuum Viewport Window

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This specification is for anti-reflection coated, laser-quality, plano-plano windows. They are to be used as viewports on UHV chambers.

Requirements

Physical Configuration

Diameter 6.00'' + -0.01''

Thickness 0.75'' + /- 0.01''

Wedge < 5 arc minutes

45 deg. bevel on both edges, width approx. 0.03" or as

Bevel appropriate to prevent chipping

Clear Aperture > 5.20"

Part and serial number, as defined below, shall be marked on

Markings the barrel

Substrate Material

Fused silica, Corning 7980 or equivalent, grade 1B or better

Part and Serial Number

The Part/Serial number shall be of the format:

E1100267-v1 TYPE YY, where

TYPE is I or II, depending on the coating type – see below YY is incremental for each optic type, starting at 01

Surface Quality: Surfaces 1 and 2, within the clear aperture

Laser grade polish: 10-5 scratch-dig surface quality

Transmitted wavefront error, within the clear aperture

 $\lambda/10$ or less, at 633 nm

LASER INTERFEROMETER GRAVITATIONAL WAVE OBSERVATORY LIGO

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Anti-Reflection Coatings

Applied to surfaces S1 and S2.

Durability per MIL-C-675C, Coating Adhesion and Durability, or current compatible standard, to be approved by LIGO.

Surface S1 will be used in an ultra-high vacuum environment — coating performance therefore applies to vacuum environment; if S1 and S2 designs are different, S1 must be indicated appropriately on the barrel.

Two types of AR coatings (each optic receives the same type on each side); specifications for each side are:

Type I. Dual wavelength 1064 nm: R < 0.2% for 0-15 deg. AOI, s- & p-polarization

532 nm: R < 0.3% for 0-15 deg AOI, s- & p-polarization

Type II. Broadband near IR R < 0.5% from 800-1080 nm, 0 deg AOI

Testing and Documentation

Specification	Test Method	Frequency of	Data Delivered
		Inspection	
Physical Dimensions	Visual Inspection	100%	Certification
Surface Quality	Visual Inspection	100%	Certification
Transmitted Wavefront Error	Interferometry	100%	Certification
AR Coatings	Spectrophotometer	Witness sample for	Spectral scans
		each coating run	