



# COMPONENT SPECIFICATION

TITLE

## MIRROR BLANK MATERIAL, BEAM SPLITTER, 40M

APPROVALS:	DATE	REV	DCN NO	BY	CHK	DCC	DATE
DRAWN: G. Billingsley	09-09-00	A	D000312-00-D	n/a	n/a	n/a	n/a
CHECKED:							
APPROVED:							
DCC RELEASE:							

### Applicable Documents

LIGO-D000265-A	Beam Splitter Blank
MIL-G-174-B	Glass, Optical

### Requirements

Physical Dimensions	per LIGO-D000265-A Beam Splitter Blank
Clear Aperture	Central 70 mm
Serial Number	Blanks shall be serialized as BSBXX, where XX increments starting at 01
Material	Fused Silica
Final shaping	Shaping shall be performed using a progression of grit size ending with a 320 or smaller grit wheel.
Defect depth	Maximum on any surface or corner is less than 0.5 mm
Homogeneity	$\leq 5 \times 10^{-7}$ peak to valley at $\lambda = 632.8$ nm, within the clear aperture
Birefringence	$\leq 1$ nm/cm within the clear aperture
Bubble and Inclusion Cross section	Total within the clear aperture $< 0.03 \text{ mm}^2/100\text{cm}^3$ of Glass Inclusions with a diameter of .06 mm or less are disregarded Maximum inclusion diameter - $< 0.1$ mm
Striae	Grade A according to MIL-G-174
Absorption Requirement	$< 2$ parts per million per centimeter at $\lambda=1.06\mu\text{m}$ within the clear aperture
Absorption Goal	$< 1$ part per million per centimeter at $\lambda=1.06\mu\text{m}$ within the clear aperture



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Specification	Method	Frequency of Inspection	Data Delivered
Physical Dimensions	Visual Inspection	100%	Inspection Report included with Certification
Registration Mark - Location	Visual Inspection	100%	Inspection Report included with Certification
Serial number	Visual Inspection	100%	Inspection Report included with Certification
Material	Process Control Material Certification	100%	Inspection Report included with Certification
Defect depth	Visual Inspection	100%	Hand sketch indicating location and dimensions
Homogeneity	Interferometric Measurement	100%	Color print of the phase map with Peak to Valley and rms displayed. Terms removed: Tilt and Piston
Birefringence	MIL-G-174 Section 4.4.5	100%	Inspection Report included with Certification
Inclusions	Visual Inspection	100%	Inspection Report included with Certification
Striae	MIL-G-174 Section 4.4.6, method 1 or 2 (in optical axis only)	100%	Inspection Report included with Certification
Absorption at 1.06 $\mu$ m	Measurement	100%	Certification

**Table 1: MEASUREMENT MATRIX: FREQUENCY AND METHOD**