Fused Silica Blank, Input Test Mass

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Scope

The glass blanks defined by this specification are to be used in research as first article Test Masses. These blanks should be manufactured using all processes intended for production quantity LIGO Test Masses.

Applicable Documents

LIGO – D050337-A Fused Silica Blank, Input Test Mass
MIL-G-174-B Glass, Optical

Requirements

Material

High purity fused silica

Physical Configuration

According to
LIGO - D050337-A Fused Silica Blank, Input Test Mass

Clear Aperture

Central 275 mm

Final Shaping

Shaping shall be performed using a progression of grit size ending with a 320 or smaller grit tool

Defect Depth

Maximum on any surface or corner is less than 0.5 mm

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Refractive Index Homogeneity

$\leq 5 \times 10^{-7}$ P-V at $\lambda = 632.8$ nm, within the central 80mm
$\leq 2.5 \times 10^{-6}$ P-V at $\lambda = 632.8$ nm, within the central 200mm

Birefringence

≤ 1 nm/cm within the central 80 mm
≤ 5 nm/cm outside the central 200 mm

Bubble and Inclusion Cross section

Total ≤ 0.03 mm^2 /100cm^3 of Glass within the clear aperture
Inclusions with a diameter of 0.06 mm or less are disregarded

Maximum inclusion diameter

≤ 0.1 mm

Striae

Class 1, Grade A according to MIL-G-174 within the clear aperture

OH Content

< 250 parts per million

Inspection

Certification of the above requirements must accompany any delivery.