Final Polish, LASTI End Test Mass (ETM)

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Applicable Documents

LIGO-D040431-C	Quad ETM Silica Test Mass
LIGO-D030265-A	Fused Silica Blank LASTI Test Mass
LIGO-E030309-A	Fused Silica Blank, LASTI Test Mass, R&D
LIGO-E050191-A	Shape and Polish LASTI ETM Blank
MIL-PRF-13830B	General Specification Governing the Manufacture, Assembly, and Inspection of Optical Components for Fire Control Instruments

Requirements

Physical Configuration

According to
LIGO-D040431 Quad ETM Silica Test Mass, X dimension 200.0 ± 0.5 millimeters

Fabricate from
LIGO-E050191 Shape and Polish LASTI ETM blank
LIGO-E030309 Fused Silica Blank, LASTI Test Mass, R&D

Optical Surface Figure, Sides 1 and 2 - FLAT. Measured over the central 120 mm diameter

Surface 1: Flat to < λ/10 Peak to Valley, measured at 633 nm

Surface 2: Flat to < λ/3 Peak to Valley, measured at 633 nm

Surface Error, High Spatial Frequency: "microroughness" measured over the central 120 mm diameter

Surface 1 HSF error $\sigma_{rms} \leq 0.2$ nanometers

Surface 2 : not specified

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Scratches, Sleeks and Point defects

Scratches, sleeks and point defects are evaluated according to MIL-PRF-13830B

Side 1

Within the central 20mm diameter: 10/5
Within the central 120 mm diameter: 20/10
Outside the central 120 mm diameter: 40/20

Side 2

Within the central 120 mm diameter: 40/20

Inspection

Table 1: Inspections

Specification	Test Method	Data Delivered
Scratches and Point defects, side one	Visual Inspection	Certification
Figure, side one	Interferometry	Surface phase map
Surface Errors - High Spatial frequency, side one	Interferometry	Surface maps for 3 central locations. Numerical values included with certification

Orientation: For the purpose of phase maps the substrate shall be oriented such that the point of minimum thickness shall be at the top center of the data.