

ETM QUAD_End Reaction Mass (ERM) component specification

1 Applicable Documents

This document supports the drawing:

D080116_ALIGO_SUS_ETM QUAD_End Reaction Mass (ERM)

2 Requirements

Material

Fused Silica:

- Corning 7980 3F
- Or vendor preferred equivalent fused silica, subject to approval of LIGO scientists

Material must meet the following requirements:

Index Homogeneity in central 200 mm diameter is $\leq 5.0 \times 10^{-6}$ P-V after subtracting tilt and power.

Total bubble and inclusion cross section within the clear aperture is $\leq 0.5 \text{ mm}^2/100\text{cm}^3$.

Inclusions with a diameter of 80 μm or less are not included in the total.

Material to be supplied with a certificate of conformity

Physical configuration

Shape and polish according to:

D080116_ALIGO_SUS_ETM QUAD_End Reaction Mass (ERM)

Additional shaping information not in drawing, requirement may be met by satisfying the following:

Surface figure (see LIGO-D080116, surfaces “S1” and “S2”) in the central 200 mm diameter clear aperture: nominally flat, with the residual peak to valley $< 100 \text{ nm}$ after subtracting tilt and power.

Reference Markings:

Registration marks shall be etched, ground or sandblasted, and located per LIGO-D080116.

Serial Number:

The serial number shall be etched, ground or sandblasted, and located per LIGO-D080116.

3 Inspection

Specification	Manufacturing note / drawing zone (LIGO-D080116)	Test Method	Data delivered
Outside diameter	(Zone C8)	Physical inspection	Measurement at six locations, plus mean measurement
Thickness	(Zone F5)	Physical inspection	Measurement at six locations, plus mean measurement
Wire groove separation	(Zone A6)	Physical inspection	Measured dimension

ETM QUAD_End Reaction Mass (ERM) component specification

Face to wire groove check	-	Physical inspection	
Surface S3 to wire groove 1	Note 5	“	Measured dimension
Surface S4 to wire groove 2	Note 5	“	Measured dimension
Edges and chamfers	Note 3	Visual inspection	Inspection report included with certification
Scratches and point defects	Note 3	Visual inspection	Inspection report included with certification
Serial Number	Note 6	Visual inspection	Inspection report included with certification
Surface figure (200mm clear aperture “S1” and “S2”)	(Zones E8 & Note 4)	Interferometry	Surface map

Table 1: Inspection requirements list

Data

To be taken as instructed in Table 1.
 Instrumentation used for any given measurement should be listed alongside that measurement.

Orientation

For the purpose of all data collection, data should be taken where possible from side 1 (surface S1). If this is not possible there shall be a special note beside the data indicating from what direction/how it was taken.

Format

All data shall be delivered according to Table 1.