



LIGO LABORATORY
California Institute of Technology
1200 E. California Blvd.
Pasadena, CA 91125

Statement of Work

Annular End Reaction Mass

C1501363-v2

1 Scope

Provide all materials to rework four End Reaction Masses (ERMs) into Annular End Reaction Masses (AERMs.) Caltech will provide four coated ERM substrates, shipping containers and shipping services. The vendor is responsible for dimensions of the inside wall (S4) and associated chamfers only.

1.1 Special Instructions regarding coatings:

The ERM substrates that will be used to manufacture AERMs are already provided with an ion beam sputtered AR coating and a gold coating. Preservation of these coatings justifies extreme measures since the value of re-applying these coatings exceeds \$10,000 USD per piece. The method for preserving the coatings will be reviewed and approved by Caltech prior to start of work.

1.2 Special Instructions regarding rework:

The vendor is not responsible for substrate loss. In the event of damage to the substrate, Caltech will make the determination whether to reject, accept delivery as is or require re-work of S1, S2 or edge chips. We do not foresee the need for rework of S3.

2 Document Access

Many supplemental documents and specifications are incorporated into and made a part this Statement of Work. Click on the document links to access these documents from the LIGO Document Control Center (DCC) or go on line to the LIGO Public DCC at <https://dcc.ligo.org/> to access the DCC#.

3 Commercial Terms and Applicable LIGO Specifications:

Note: The documents listed below are invoked for this Statement of Work and comprise additional requirements, which are integral to this Statement of Work.

- [LIGO-C080185-v1](#) LIGO Commercial Items or Services Contract General Provisions
- [LIGO-Q0900001-v5](#) Advanced LIGO Supplier Quality Requirements
- [LIGO-Q1100003-v1](#) Acceptable Quality Level (AQL) for Inspection of LIGO Components

4 Quality System:

Referring to the above referenced LIGO Specification Q0900001, Suppliers should include a copy of their current ISO 9001, AS9100, or TS16949 certification in their bid package. Suppliers lacking current certification should send a copy of their Quality Manual with their bid package.

5 Parts/Assemblies to be manufactured, Quantity Required, and Inspection requirements:

Note: refer to Section 8.0 for delivery schedule and location

Drawing #	Part Description	Total Qty:	AQL number (Inspection Frequency for S4 and associated chamfer)
LIGO-D080116	Caltech Supplied material	4 supplied	
LIGO-D1500163-v3	Annular End Reaction Mass	4 required	1

Note: refer to [LIGO-Q1100003-v1](#) for the AQL table.

6 Manufacturing:

7

7.1 Requirements:

Suppliers must refer to the LIGO Specifications referenced in Section 3 for additional, and in some cases, non-industry standard requirements.

7.2 Sub-Contracted Work:

- LIGO expects that at least 2/3 (by dollar value) of the contracted work be performed by the Supplier named on the Purchase Order. The Supplier shall be responsible for all sub-contracted work.

7.3 Precedence:

The drawings typically represent the finished part as needed for use in service. There may be requirements on the drawing (such as coatings), which are specifically defined as not the responsibility of the supplier in this SOW. Suppliers should always contact a LIGO representative to resolve any discrepancies uncertainties in the documentation or instructions.

7.4 Exclusions:

- Supplier is NOT responsible for the application of Gold Coating

8 End Item Data Package:

Before delivery of the parts, the Supplier shall provide the following data, as a minimum:

- Any as-built modifications (with approval of the LIGO Contracting Officer) as mark-ups to the drawings
- Heat Treat and/or Stress Relief certifications, if applicable
- Inspection reports of the inner diameter for the number of parts specified per the AQL number and referenced in the AQL table LIGO-Q1100003-v1 and any other inspection requirements detailed in Section 5 of this SOW
- Certificate of compliance for each part number stating conformance to contract and drawing requirements

9 Delivery Requirements:

9.1 Shipping Containers and Packaging:

Caltech will supply shipping containers and transportation, which protects these parts from damage from the transportation environment (weather, handling, accidents, etc.).

9.2 Shipping Destination(s):

The deliveries are FOB at the contractor facility. Caltech will be responsible for shipping the CFM from the Contractor's facility and delivering to Caltech DDP Los Angeles, USA, Incoterms 2000

9.3 Delivery Schedule:

- Staged delivery is acceptable, early delivery is advantageous.
- First part delivery by the end of December 2015
- Following parts delivered at a rate of one per month.