



LIGO LABORATORY
 Massachusetts Institute of Technology
 185 Albany St, NW22-193
 Cambridge, MA 02139

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

Statement of Work for, FAST SHUTTER COIL WINDING, aLIGO

The following documents are incorporated into and made a part of purchase order. Click on the following LIGO Document Control Center (DCC) links to access these documents or go on line to the LIGO Public DCC at <https://dcc.ligo.org/> to access the DCC#.

1.0 Terms:

<u>DCC #</u>	<u>Description</u>
C080185-v1	Laser Interferometer Gravitational Wave Observatory (LIGO) Commercial Items or Services Contract General Provisions California Institute of Technology “Institute”, LIGO Rev 11/12/08
F0810001-v5	Technical Direction Memorandum (used in case of changes to design or manufacture instructions)

2.0 End Item Data Package:

At the time of delivery of the parts, the Supplier shall also provide the following data, as a minimum:

- Any as-built modifications (with approval of the LIGO Contracting Officer)
- Dimensional & QC inspection reports—this shall include a report showing that parts have been inspected and fall within specified tolerances.

3.0 Included Documents:

In addition to the drawings, the contractor can be provided with CAD solid models of the parts (SolidWorks Professional 2013, STEP, IGES, DXF, Parasolid)

<u>DCC #</u>	<u>Description</u>
D1003319-v3	1x BOBBIN-COIL Assembly, ISC, aLIGO (PROTOTYPE)
D1003319-v3	9x BOBBIN-COIL Assembly, ISC, aLIGO (PRODUCTION)

4.0 Scope:

This SOW is for the fabrication of one (1) unique parts. There will be 10 of this part total. All parts are for permanent use inside the LIGO vacuum system, so all rules for in vacuum use must be followed (E0900364). This will be a two step process with the first part being a prototype. After verification of the expected functionality by LIGO, the remaining 9 parts will be fabricated either as is, or with minor modifications as requested LIGO. See section 6 fabrication details.

5.0 Quantity Required:

part number	description	total quantity	quantity for LHO	quantity for LLO
D1003319-v3	1x BOBBIN-COIL Assembly, ISC, aLIGO (PROTOTYPE)		1 for MIT	PROTOTYPE
D1003319-v3	9x BOBBIN-COIL Assembly, ISC, aLIGO (PRODUCTION)		9 FOR MIT	

The deliveries are FOB at these destinations, i.e. the contractor has responsibility for shipping title and control of goods until they are delivered and the transportation has been completed. The contractor selects the carrier and is responsible for the risk of transportation and for filing claims for loss or damage.

Shipping Location:

These items will be shipped to:

Sam Barnum
LIGO/MIT
185 Albany St.
NW22-291
Cambridge, MA. 02139

Shipping Containers:

The contractor is responsible for providing shipping containers and transportation which protects these parts from damage from the transportation environment (weather, handling, accidents, etc.). Mating edges of parts should be especially protected from damage during shipping.

6.0 Manufacturing:

6.1 Precedence

The Statement of Work (SOW) sections below regarding processing or fabrication of the parts are meant to convey the scope and nature of the requested work. If there is a conflict between the SOW and the drawing, the drawing has precedence.

6.2 Restrictions

- It is very important the wire wound onto the BOBBIN is clean and uncontaminated by oils, including oils finger prints. Clean room type gloves should be worn when touching the wire.
- Abrasive material removal techniques are NOT acceptable; including the use of “Scotch-brite”. Stainless steel wool may be used.
- All machining fluids must be fully synthetic, water soluble (not simply water miscible) and free of sulfur, chlorine, and silicone.
- Thoroughly clean part to remove all oil, grease, dirt, and chips. Follow with solvent (isopropyl alcohol) wipe.

6.3 Materials

- Material is specified on the drawing. All materials specified by drawings or SOW have been approved for use in the UHV environment in LIGO. No materials may be substituted or added without prior knowledge and testing by LIGO. Cast tooling plate is not permitted.
- PEEK BOBBINs (D1300320) will be supplied by LIGO, and will need to be wound with 32 AWG wire.
- Wire for winding (MWS-32 HMW) will also be supplied by LIGO.
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- The winding will need to be top coat potted (Epoxy Pax EP-1730-1), but full potting is allowed.
- The BOBBIN should be filled with wire windings, but without deforming the BOBBIN's external dimensions.
- Potting material must be contained within the BOBBIN and not exceed the external contours of the BOBBIN. It also must not interfere with the locational placement of the mirror on it's tab.
- The lead in/out wires should enter/exit the coil at the bottom center of the BOBBIN, forming a pig-tail about 12 inches long.
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