



**Statement of Work
 UHV Chemical Cleaning of Large Plates
 for the Advanced LIGO BSC ISI**

The following documents are incorporated into and made a part this 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-v4	Technical Direction Memorandum.

2.0 Quality Control:

<u>DCC #</u>	<u>Description</u>
Q0900001-v3	Advanced LIGO Supplier Quality Requirements, dated 4/15/09, describes following contractor/supplier QA/QC actions for this procurement:
<input type="checkbox"/> 3.1 Pre-Award Inspection	<input type="checkbox"/> 3.9 Discrepant Material Storage
<input type="checkbox"/> 3.2 Supplier In Process Quality Control	<input checked="" type="checkbox"/> 3.10 Quality Records
<input type="checkbox"/> 3.3 In Process Inspection	<input type="checkbox"/> 3.11 Drawing and Specification Change Control
<input type="checkbox"/> 3.4 Pre-Ship Inspection	<input type="checkbox"/> 3.12 Welding Certification
<input checked="" type="checkbox"/> 3.5 Receiving Inspection	<input checked="" type="checkbox"/> 3.13 End Item Data Package (including FTIR results)
<input type="checkbox"/> 3.6 Discrepant Material	<input type="checkbox"/> 4.1 Design Verification
<input type="checkbox"/> 3.7 Material Review Action	<input type="checkbox"/> 4.2 Raw Material Procurement
<input type="checkbox"/> 3.8 Material Review Actions at Contractor	<input checked="" type="checkbox"/> 4.3 Traceability of Materials
	<input type="checkbox"/> 4.4 Calibration Program
	<input type="checkbox"/> 4.5 Critical Interface
	<input checked="" type="checkbox"/> 4.6 Cleanliness- FTIR testing
	<input checked="" type="checkbox"/> 4.7 Packaging
	<input checked="" type="checkbox"/> 4.8 Storage
	<input checked="" type="checkbox"/> 4.9 Transport
	<input type="checkbox"/> 4.10 Customs

For the above list the Supplier shall: 1) Identify the corresponding sections/paragraphs in their existing QA/QC system 2) meet or exceed the design requirements contained in the attached engineering documents for each area called out.

3.0 End Item Data Package:

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

- Measurement data of the surface particulate cleanliness and Non-Volatile Residue (NVR) level for each part (in accordance with ASTM F303, Standard Practices for Sampling for Particles in Aerospace Fluids and Components; Practice C)
- Certification that each part meets the required cleanliness levels (defined in section 8.1).
- FTIR results for each part.

4.0 Included Documents:

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The drawings of parts to be chemically cleaned:

<u>DCC #</u>	<u>Description</u>
D0900894 -v1	Drawing, Stage 0 Monolithic Half Bottom
D0900895 -v1	Drawing, Stage 0 Monolithic Half Top
D0901516 -v1	Drawing, Optical Table, Down-facing
D0901517 -v1	Drawing, Optical Table, Up-facing
D0901518 -v1	Drawing, Keel Plate, Down-facing
D0901519 -v1	Drawing, Keel Plate, Up-facing
D0901520 -v1	Drawing, Mid-plate
D0902503 -v1	Drawing, Stage 1 Close out plate cover
D0902273 -v1	Drawing, Close Out Plate, Stage 1
D0902279 -v1	Drawing, Base Plate, Stage 1

5.0 Scope:

This RFQ is for the UHV chemical cleaning of a total of 150 plates - fifteen (15) sets comprised of the ten (10) unique plates listed in section 4.0.

6.0 Delivery Requirements:

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:

LIGO Livingston Observatory (LLO)
Attn: Joe Hanson and Tom Gentry
19100 LIGO Lane
Livingston, LA 70754

OR

LIGO Hanford Observatory (LHO)
Attn: Hugh Radkins and Jodi Fauver
127124 North Route 10
Richland, WA 99354

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.). In particular care must be taken to ensure that handling does not result in scratched or dented/nicked parts; point or line loads on the corners and edges can cause upsets in the part surfaces.

Wrapping and Placing in Shipping Containers

Parts will be packaged for shipping to LIGO per [LIGO- E970063-01-D](#) section 7

After cleaning, parts shall be triple wrapped for shipping:

- a. Wrap each part with UHV quality aluminum foil.
- b. Place each part in an anti-static bag fabricated from Ameristat poly sheet and cleaned to Class 100.
- c. Compress the bag tightly around the part to purge excess air. Tie wrap for closure or use a bag with a zipper.
- d. Two labels must be used on the outer layer of all bagged components: (i) a warning label stating: "UHV CLEAN PART – HANDLE ONLY WITH PROPERLY GLOVED HANDS" and (ii) an identification label with the LIGO part number (this part number is on the part).
- e. Place each part in a second anti-static polyethylene bag as specified above, remove excess air and heat seal or tape shut. Make sure both labels are visible.
- f. Place each double bagged part back into the LIGO shipping container in which the part originally arrived. Use care not to puncture or cut the bags. Seal the shipping container closed. Attach a label with the LIGO part number to the outside of the shipping container.

7.0 Delivery Schedule:

two (2) sets of ten (10) parts by 9/10/2010 (or two weeks after receipt of parts) to LLO

two (2) sets of ten (10) parts by 10/08/2010 (or two weeks after receipt of parts) to LHO

two (2) sets of ten (10) parts by 11/12/2010 (or two weeks after receipt of parts) to LLO

four (4) sets of ten (10) parts by 1/3/2011 (or two weeks after receipt of parts) to LHO

four (4) sets of ten (10) parts by 2/25/2011 (or two weeks after receipt of parts) to LHO

one (1) set of ten (10) parts by 3/12/2011 (or two weeks after receipt of parts) to LLO

If the bidding vendor cannot meet this delivery requirement, an alternate plan submitted by the bidding vendor will be considered as part of the bid evaluation.

8.0 Processing:

8.1. Specification:

Parts shall be precision cleaned to particulate level 100 (or lower) and Non-Volatile Residue (NVR) level A/20 (or lower) per IEST-STD-CC1246D.

8.2. Chemical Cleaning:

Large part chemical cleaning per standards in LIGO- [E970063-01-D](#) section 4.3, 5.4, 5.6, 6.5. LIGO will accept suggestions from the supplier on alternate detergents or parameters used to meet the LIGO specification.

8.3. FTIR Testing:

8.4. Parts shall be FTIR tested after chemical cleaning, in accordance with [E0900480-v2](#). If the contractor cannot perform quantitative FTIR testing then a qualitative FTIR should be performed and the contractor's bid response should note this. Test samples will be obtained by the supplier but tests may be performed by LIGO. Supplier shall state whether they have the appropriate capabilities to provide FTIR test results.