LASER INTERFEROMETER GRAVITATIONAL WAVE OBSERVATORY
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Porcelain Coating of Beam Tube Baffles

Title

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1 SCOPE

This specification is for the application of a porcelain enamel coating to the LIGO Beam Tube Baffles. The coating is required to provide the optical surface characteristics required for the baffles. There are two (2) types of baffle: the first type has a serrated edge on the conical section (reference Drawing Number D960045); the second type has no serrations (Reference Drawing Number D960046).

2 APPLICABLE DOCUMENTS

The surfaces which are to be porcelain coated are as indicated on the drawings.

Table 2-1: Applicable Documents

DOCUMENT TITLE	ID NUMBER
Full Serration Beam Tube Baffle, Porcelain Coverage Detail	LIGO-D960045-A (2 sheets)
Non-Serrated Beam Tube Baffle, Porcelain Coverage Detail	LIGO-D960046-A (2 sheets)

3 REQUIREMENTS

3.1 Materials

3.1.1 Baffle Material

The baffle material to be coated is 20 gauge 304L stainless steel that has been bead blasted by the baffle fabricator to remove all surface impurities and to provide a roughened surface for good coating adherence. Each of the baffles will be marked with a serial number on the band portion of the baffle.

3.1.2 Coating Material

The frit material to be used for the porcelain coating shall be **Ferro Corp. Part # LO 34 79 2.** No substitution of frit material shall be allowed. The coating vendor shall provide copies of material conformance specification certificates upon request by LIGO.

3.1.3 Edge Protection

Suitable material to protect the serrated edges of the finish coated baffles will be supplied to the vendor by LIGO.

3.1.4 Sealing Bags

Plastic bags for packaging the coated baffles will be supplied to the vendor by LIGO.

3.2 Cleaning

Prior to applying the coating, the baffle shall be cleaned by the porcelain coating vendor to insure that all oil, grease, fingerprints, and any other contamination are removed from the baffle.

3.3 Coating Workmanship

3.3.1 Application

The coating vendor shall comply with all Fero Corporation application and firing specifications. The coating shall be evenly applied to all prescribed surfaces, so that there are no high and low spots and no excessive buildup (beading) on the edges. The coating shall adhere to the base material to form a strong, integral unit. The parts of the baffle identified as “tab” shall be kept free of any overspray from the coating process. Adhesive materials shall not be used for masking of the tabs.

3.3.2 Thickness

The thickness of the coating shall be a minimum of 0.004 inches.

3.3.3 Finish

The glaze coat shall have a smooth, even finish, free of voids, pock marks, crazing, flaking and orange peel. The coated surface shall exhibit a finish which is comparable to, or better than the process qualification sample surfaces.

4 QUALITY ASSURANCE PROVISIONS

4.1 Quality Assurance

The vendor shall provide adequate quality control and process procedures throughout the coating process to ensure conformance to the coating process specifications and workmanship requirements.

4.2 Acceptance Criteria

Only those baffles which meet the minimum thickness and surface finish quality described in the above paragraphs shall be acceptable for packaging and shipment.

4.3 Inspection

The coating vendor shall be responsible to measure the coating thickness and confirm the finish

quality of each baffle prior to packaging and shipment. The coating vendor shall verify that the coated baffle complies with the specified requirement.

4.4 Oversight by LIGO

LIGO personnel shall be permitted to witness all coating processes and acceptance measurements and have the right to verify that all purchased products comply with the specified requirements.

5 PREPARATION FOR DELIVERY

5.1 General

The baffles shall at all times be handled in a manner to insure no denting, bending or other damage to the porcelain coating.

5.2 Shipping Containers

The baffles will be delivered for coating to the vendor in reusable shipping crates. These crates shall be used by the vendor to repackage the coated baffle assemblies.

5.3 Handling After Coating

After the baffle is coated, it shall be handled only with clean, lint free cloth gloves. The edge of the serrated baffles shall be protected with an edge protector supplied by LIGO. For shipping, the baffle shall be wound onto itself to an outside diameter of approximately forty two inches (42”) and secured with a nylon cable tie. The glass to glass overlap area shall be separated with an intervening material to prevent scratching of the coated surfaces. The baffle shall be placed in the first of the two LIGO supplied bags and sealed. The bagged baffle shall then be placed into the second bag to complete the sealing.

5.4 Shipping

The sealed baffles shall be placed into the reusable shipping crates for shipment to the LIGO designated address. The type and quantity of baffles packaged in each container shall be externally marked on the shipping crates. The crates shall also be marked with the coating date.