

 <b>LASER INTERFEROMETER GRAVITATIONAL WAVE OBSERVATORY</b> <b>SPECIFICATION</b>	E1000083 -v4
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<b>Specification for Enameled Steel Sheet to be used in the LIGO Ultra-High Vacuum System</b>	

APPROVALS	DATE
AUTHORS: Heidy Kelman	1 July 2010
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APPROVED: <a href="#">(refer to associated DCC file card to confirm approval)</a>	

## 1 Scope

This process specification is for manufacture of enameled (porcelain coated) sheet steel baffles for Advanced LIGO. It includes material requirements and the process and preparation for applying porcelain onto the baffle. These baffles are for use in an Ultra-High Vacuum (UHV) system.

## 2 Manufacturing Process

### 2.1 Material

The baffle material shall be 304, 304L or enameling steel ASTM A424 Types I and III (not Type II)

### 2.2 Shaping

All cutting, forming, spinning and welding of the part were performed by the sheet metal fabricator or an outsourced facility hired by the fabricator.

All machining fluids shall be water soluble (not simply water miscible) and free of sulfur, chlorine and silicone, such as Cincinnati Milacron's Cimtech 410 (SSTL).

Thoroughly clean part to remove all oil, dirt and chips.

### 2.3 Dimensional Check

Perform initial dimensional check on all dimensions, including, but not limited to the thickness at various positions along the length, the radius and the height. If the dimensions are not within the tolerances called out on the drawing, forward this information to LIGO for review.

### 2.4 Sandblasting

If not using ASTM A424 Type I or II steel, then sand blasting is necessary prior to enameling. Sandblasting of all surfaces must be performed to produce a surface to which the porcelain will adhere. Fused silica, trade name Golden Flint G-50, will be used. Vendor has stated that the sand blasting machine will be cleaned prior to sand blasting baffles and that only new silica will be used.



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**2.5 Porcelain Process**

Prior to the porcelain application, baffle will be thoroughly cleaned of residual silica. Also, all oils, grease, fingerprints and any other contaminants will be removed with an alkaline. The frit material to be used shall be Ferro Corp. Part #RM108, gloss black. No substitutions shall be allowed. The porcelain vendor shall provide copies of material conformance specification certificates upon request by LIGO. Once frit is applied, baffle will be placed on a 'table' surface, which will be suspended by hooks, and run through a continuous feed furnace. The porcelain vendor shall comply with all Fero Corp application and firing specifications. The thickness of the coating shall be a minimum of .004 inches.