

 LASER INTERFEROMETER GRAVITATIONAL WAVE OBSERVATORY SPECIFICATION	E1000083 -v3
	Document No Rev.
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Manufacturing Process for Manifold-Cryo Baffles for Advanced LIGO	

APPROVALS	DATE
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CHECKED:	
APPROVED: (refer to associated DCC file card to confirm approval)	

1 Scope

This process specification is for manufacture of manifold-cryo 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 stainless steel sheet metal. ASTM A424, cold rolled enameling steel is the preferred material by the porcelain vendor but is not approved by the vacuum review board so 304 stainless steel be used.

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

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 Ferro Corp application and firing specifications. The thickness of the coating shall be a minimum of .004 inches.