*LIGO Laboratory / LIGO Scientific Collaboration*

LIGO- E1700368-v3 *LIGO* 3/23/2017

Procedure for cleaning and baking black nickel coated stainless steel or aluminum stray light baffles

Alena Ananyeva and Calum Torrie

Distribution of this document:

LIGO Scientific Collaboration

This is an internal working note

of the LIGO Laboratory.

|  |  |
| --- | --- |
| **California Institute of Technology****LIGO Project** | **Massachusetts Institute of Technology****LIGO Project** |
| **LIGO Hanford Observatory** | **LIGO Livingston Observatory** |

http://www.ligo.caltech.edu/

**NEVER use any solvents on black nickel coated baffles! It may damage the coating**

# Scope

The following procedure is only for cleaning and baking of black nickel coated stray light baffles: stainless steel or aluminum plates, brackets, spacers etc. For handling of the large parts (ex D1700399 and bigger) at least two persons is required

# Handling

Always wear gloves when handling the coated parts even prior to cleaning. Never use IPA or other solvents on black nickel coated parts!

# Cleaning

1. Make sure to group the items in small enough groups to be able to rinse and dry each part within 10 min after cleaning. Large baffles (for example “Z-baffles”) should be cleaned individually
2. Prepare the drying area prior to cleaning. Wipe down your flow-bench or table in a clean room. Distribute clean teflon spacers on the table. Setup an approved balanced top-gun at the drying area. Adjust it to 100 PSI
3. Use 10 ml of liquinox per each liter of water to make the sonic bath. Never use IPA for black nickel coated parts
4. Optimize arrangement of parts in the sonicator by minimizing contact area between flat surfaces use approved teflon spacers to stack the baffles if applicable
5. Sonicate for 10 min at 50⁰ C. Tapped holes have to be sonicated with a wand during sonication or wire brushed prior to sonication
6. If a baffles does not fit in the sonicating tank, it can be cleaned in two steps: 5 min sonication per side. While sonicating one side, keep the other side wet by pouring water on the baffle
7. Thoroughly rinse the parts with DI water **immediately** after sonication is finished. If a black nickel coated part left over in water, permanent coating damage will occur! The whole process including cleaning, rinsing and hand drying must not take longer than 20 min (10+5+5)
8. Install the rinsed part on teflon spacers in the drying area. Thoroughly dry the part using the top-gun. Do not leave the part in the puddle that you just created, transfer it to a dry clean area or into a nitrogen ventilated vacuum bake oven

# Baking

1. Use approved at least class B cleaned stainless steel spacers to stuck baffles in a bake oven if applicable
2. Bake out at 120⁰ C: rump up 6h, hold 48 hours, rump down 6h

# Wrapping

1. Wrap polished coated parts using two layers of dry clean-room wipes (e.g. TX-1025) with sealed edge and kapton tape. The parts have to be top-gunned before the install if wipes with unsealed edge were used. CleanC3 covers are preferable to use instead (if available).
2. Parts with machine finish can be wrapped in one layer of the of dry clean-room wipes and then one layer of Al foil instead of using kapton the second wipe with tape
3. Place wrapped parts into double ameristat bags. If you don`t have an ameriatat bag of an appropriate size, use the roll of the same material and seal again with Kapton tape. Add desiccant between the inside and outside bag if the parts are being shipped or stored for long time
4. Bags should be labelled as normal with part number etc.

# Pre- and post-install handling

1. Inspect the baffles for dust, scratches, etc …
2. Parts have to be top-gunned before install if they were wrapped in wipes with unsealed edge or/and if any signs of dust accumulation occur. The black nickel baffles can be gently drag-wiped with a DRY WIPE instead but only when top-gunning is not allowed
3. **NEVER** use any solvents on black nickel coated baffles! It may damage the coating