LIGO-E930004-00-B

CBI

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DATE: 12/14/93

TO: LARRY JONES
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FROM: KEN FLESSAS

REF: LIGO PROJECT - CLEANING PROCEDURES - WELD COUPONS

ATTACHED IS CLCOUP, REV. 1, CHUCK ADVISES CHANGES ARE PER YOUR DISCUSSIONS WITH HIM ON 12/13/93.

Ken F.

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DOC. ID CLCOUP
REV. NO. 1
CONTRACT 930212

TITLE CLEANING OF WELDED AND PLAIN COUPONS FOR OUTGASSING TESTS CALTECH

PAGE NO. 1 OF 4

APPROVED	Engr	Corp Weld	Corp QA	Const	Mfg

	BY	DATE
PREPARED	CNS	12-7-93
REVISED	CNS	12-13-93
AUTHORIZED		
REFERENCED STANDARD		REV. NO.

1.0 SCOPE:

This procedure covers both the initial solvent cleaning of the plate material after it is ready for welding and the final Oakite 33 cleaning of the 0.115" x 1" x 18" coupons for the outgassing tests.

2.0 PERSONNEL:

Experienced personnel shall perform and supervise the cleaning performed in accordance with this procedure.

3.0 REFERENCES:

3.1 California Institute of Technology Technical Specification Number 1100004 for Beam Tube Modules and Number 1100007 for Type 304L Stainless Steel Vacuum Products.

3.2 ASTM Designation A 380 Standard Practice for Cleaning and Descaling Stainless Steel Parts, Equipment and Systems (as a guide).

3.3 Packaging per Caltech instructions.

4.0 EQUIPMENT AND MATERIALS:

4.1 Stainless steel power brushes used only for stainless steel.

4.2 Industrial grade 99% mol isopropyl alcohol.

4.3 Lint free cloths or paper towels.

4.4 100 Watt blacklight with 3650 Angstrom unit wavelength.

4.5 Blacklight meter capable of measuring at least 800 $\mu w/cm^2$.

4.6 Four (4) or more fifty five (55) gallon drums of de-ionized water.

4.7 Oakite 33 mixed with the de-ionized water in a proportion of 2% by volume.

4.8 Oakite Enprox 714 for neutralizing the used Oakite 33 cleaning solution.

4.9 Two (2) metal containers and two (2) heaters for heating the de-ionized water and the Oakite 33 cleaning solution.

4.10 Metal or glass tube thermometer with a range in excess of 160°F.

4.11 Recovery system for catching and retaining the used cleaning and rinse solutions.

4.12 Neoprene or other chemical resistant gloves and apron or coveralls, face shields or goggles with side shields and foot coverings as needed.

4.13 Two (2) chemical resistant plastic 1 1/2 to 3 gallon pump type garden sprayers and one five (5) or ten 910) gallon chemical resistant plastic bucket.

5.0 PROCEDURE:

Steps 5.1 through 5.5 is to be used only for test coupons. This is due to the possible hydrocarbon contamination that may be present as a result of the coupon shearing operation.

5.1 Turn on and warm up the blacklight for a minimum of five (5) minutes.

5.2 The examiner shall be in the darkened area for at least five (5) minutes to allow time for eye adaptation to the darkness prior to viewing the surface . If the examiner wears glasses or lenses, they shall not be photosensitive.

5.3 Confirm the maximum distance at which the blacklight produces 800 μw/cm² on the examination surface using the blacklight meter.

5.4 In a darkened area, blacklight inspect the plate material that has been power brushed for welding. During the inspection, hold the blacklight no further from the examination surface than the distance established in step 5.3.

5.5 Remove any hydrocarbon contamination from the power brushed plate material by flushing with isopropyl alcohol and wiping with lint free clothes or paper towels. Repeat this operation as necessary until no visible traces of hydrocarbon remain on the surface when viewed under the blacklight.

5.6 After all welding and shearing of coupons is complete, view all coupons, both welded and plain, in a darkened area with the blacklight. Repeat step 5.5 as necessary.

5.7 Arrange the coupons together in a rack in a cleaning area that can be drained to a catch basin where the used Oakite 33 cleaning solution can be retained. The cleaning area shall be covered and be protected from the wind so as to prevent contamination during and after cleaning.

5.8 Nearly fill both pump type sprayers with de-ionized water.

5.9 Mix a 2% by volume solution of Oakite 33 with the de-ionized water in one (1) of the pump type sprayers.

5.10 Place each pump type sprayer in a metal container partially filled with tap water.

5.11 Heat the de-ionized water and the Oakite 33 cleaning solution in each of the pump type sprayers to a temperature of approximately 160°F by heating the tap water in the metal containers. Check the temperature of the de-ionized water and Oakite 33 cleaning solution with the thermometer.

5.12 With the pump type garden sprayer containing the 140° to 160°F de-ionized water, thoroughly spray rinse the exposed surfaces of all coupons. While wearing clean neoprene rubber or chemical resistant gloves, turn over the coupons so that the opposite surface of the coupons is exposed. Then thoroughly spray those surfaces. Allow the used de-ionized water to run off into the sewer drain.

5.13 With the pump type garden sprayer containing the 140° to 160°F Oakite 33 solution, thoroughly spray the exposed surfaces of all coupons. While wearing clean neoprene rubber or chemical resistant gloves, turn over the coupons so that the opposite surface of the coupons is exposed. Then thoroughly spray those surfaces.

5.14 Wait for five (5) minutes and repeat step 5.13. Any time the catch basin becomes nearly full of used Oakite 33 solution, pump the used cleaning solution from the basin into the empty plastic bucket.

5.15 After five (5) minutes have elapsed, repeat step 5.12.

5.16 While wearing clean neoprene rubber or chemical resistant gloves the operator shall turn the coupons to ensure that all surfaces are dry.

5.17 When the coupons are thoroughly dry, package the coupons in accordance with Caltech packaging instructions.

5.18 Add Oakite Enprox 714 to the bucket of used Oakite 33 cleaning solution until the solution is neutralized to a ph of 7 as indicated by the litmus paper remaining at its neutral color when dipped in the solution.

5.19 When the used Oakite 33 cleaning solution is neutralized, drain it into the sanitary sewer. **DO NOT** drain it into the storm sewer.