LIGO-E940016-01-B

Facsimile Cover Sheet

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Date: February 21, 1994
Pages including this cover page: Seven (7)

Comments:

Larry, here is draft #1 of the coupon Oakite cleaning procedure CLCOUPA containing basically the same information as CLCOUP revision #3 but with the contamination and packaging instructions.

I left off the packaging instruction in 5.23 since they are identical. Please look over. Appreciate any comments by tomorrow if possible.

Regards,

Chuck

Chuck Sherlock
Houston Corporate Welding

cc: Marty Tellalian - Plainfield CBITS - NOE
Ken Flessas - CBILCH

CLEANING OF PLAIN COUPONS
FOR SURFACE ANALYSIS AND OUTGASSING TEST
CALTECH

CLCOUPA
Draft #1
930212

CNS 02-18-94

1.0 SCOPE:

This coupon cleaning procedure covers both the initial hydrocarbon contamination of the plate material and the Oakite 33 cleaning of forty nine (49) coupons cut from that plate material in areas that contain no old or new marker dye marks. One (1) 0.115" x 1" x 18" coupon will be used for post clean cutting by others into ten (10) or more 0.115" x 1 cm x 1 cm coupons for surface analysis by the XPS, SIMS and Auger methods. Eight (8) of these will be hydrocarbon contaminated and two (2) will be uncontaminated. Forty eight (48) 0.115" x 1" x 18" coupons will be used for the hydrogen outgassing test.

2.0 PERSONNEL:

Experienced personnel shall perform and supervise all 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 Package and ship per Caltech instructions (see step ~~5.25~~ 5.23 of this procedure).

4.0 EQUIPMENT AND MATERIALS:

4.1 Lint free cloths or paper towels.

4.2 100 Watt blacklight with 3650 Angstrom unit wavelength.

4.3 Blacklight meter capable of measuring at least 800 uw/cm^2.

4.4 Litmus paper or pH meter.

4.5 One (1) five (5) gallon container of de-ionized or distilled water.

4.6 Oakite 33.

4.7 Oakite Enprox 714.

4.8 One (1) metal drum and one (1) heater for heating the de-ionized (distilled) water/Oakite 33 cleaning solution and de-ionized (distilled) rinse water.

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

4.10 Two (2) vinyl polyester recovery containment pallet systems for catching and retaining the used cleaning and rinse solutions.

4.11 Clean Nitrilite chemical resistant gloves and neoprene or other chemical resistant apron or coveralls, face shields or goggles with side shields and foot coverings as needed.

4.12 Dust/mist respirators with exhalation valve that are NIOSH/MSHA approved such as Zee #2304.

4.13 Two (2) chemical resistant plastic two (2) gallon containers for the pump type sprayers. One (1) for mixing and holding the Oakite 33 cleaning mixture and one (1) for holding the de-ionized (distilled) rinse water.

4.14 Caltech supplied Ameristat packaging plastic.

4.15 Electrical tie wraps.

4.16 Supra Tech non-detergent SAE 30 motor oil.

4.17 Paint brush approximately one (1) inch wide.

4.18 Clean metal handling tongs.

4.19 Stainless steel 304L heat treated material supplied by Caltech for the test coupons. Use material from an area or areas that contain no old or new marker dye marks.

4.20 Clean blunt nose center punch.

4.21 One (1) 0.115" x 1" x 18" coupon with a J type thermocouple attached from previous alternate coupon cleaning procedures.

4.22 Digital thermocouple readout unit.

5.0 PROCEDURE:

5.1 Before shearing the coupons from the Caltech supplied sheets of heat treated 304L stainless steel, center punch mark the surface which is to be hydrocarbon contaminated at a minimum of forty nine (49) locations. For all forty nine (49) coupons, these locations shall be slightly off-center toward the end to be contaminated of the anticipated sheared position of each of these coupons. For the forty ninth (49th) , also center punch mark the anticipated location of the eight (8) 1 cm x 1 cm contaminated surface analysis coupons in the 1" x 18" coupon being shipped to MIT. See the cutting sketch below.

Same Sketch

5.2 Brush motor oil across the anticipated shear lines on the steel sheet surface in a pattern that will ultimately result in an oil residue coating of approximately one half of the surface on the center punched side of each of the forty eight (48) 1" x 18" hydrogen outgassing coupons. It should cover half of the surface of the forty ninth (49th) coupon on the end with the center punch marks from which eight (8) contaminated 0.115" x 1 cm x 1 cm surface analysis coupons will be cut. Two (2) 0.115" x 1 cm x 1 cm coupons will be cut from the other uncontaminated end.

5.3 Wipe the excess motor oil from the surface of the sheet steel with clean clothes or paper towels until it feels dry to the touch.

5.4 Shear the coupons from areas of the steel sheet having no old or new marker dye marks following the layout instructions.

5.5 In the cleaning area arrange two (2) vinyl polyester recovery containment systems. One to catch and retain the used Oakite 33 cleaning solution and the other to serve as a draining and drying rack for the coupons. The use of the second recovery system will prevent the draining and drying rack pallet grids from becoming contaminated with the Oakite 33 cleaning solution and, in turn, possibly contaminating the cleaned coupons. The cleaning area shall be in a protected area out of the weather.

5.6 Nearly fill both chemical resistant pump type plastic sprayers with de-ionized (distilled) water.

5.7 Mix a 2% by volume solution of Oakite 33 with the de-ionized (distilled) water in one (1) of the two (2) gallon chemical resistant pump type plastic sprayers..

5.8 Place each chemical resistant pump type plastic sprayer in a metal drum partially filled with tap water.

5.9 Heat the de-ionized (distilled) rinse 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 drum. Check the temperature of the de-ionized (distilled) rinse water and Oakite 33 cleaning solution with the metal or glass thermometer.

5.10 While heating the de-ionized (distilled) rinse water and Oakite 33 cleaning solution, remove the pallet grids from both vinyl polyester recovery containment systems. As soon as the Oakite cleaning solution and rinse water are at the required temperature, thoroughly spray the four pallets of the two recovery containment systems with the Oakite solution followed by the rinse water to remove any dirt or other contaminants from their surface. After the pallet grids have been cleaned, replace them on the interstices of the recovery systems.

5.11 Clean with Oakite 33 cleaning solution the tongs to be used in the next step.

5.12 To clean the coupons, hold each coupon by the uncontaminated end with the set of tongs cleaned in the previous step. For the coupon that is to be cut for surface analysis coupons, hold it by the end away from the multiple center punch marks. When spraying with the pump type sprayer, let the coupon hang down from the tongs over the one recovery containment system.

5.13 With the pump type sprayer containing the 140°F to 160°F de-ionized (distilled) water held only a few inches away, thoroughly spray rinse all the surfaces of the coupon. Allow the de-ionized (distilled) water to run off into the recovery containment system.

5.14 While still holding the rinsed coupon, with the pump type sprayer containing the 140°F to 160°F Oakite 33 cloaning solution held only a few inches away, thoroughly spray all surfaces of the coupon with Oakite 33 cleaning solution for a minimum of fifteen (15) seconds to a maximum of twenty (20) seconds. Also monitor the thermocouple reading during the Oakite 33 spray cleaning of that

temperature indicating coupon and record the maximum surface temperature noted.

5.15 While still holding the Oakite 33 cleaned coupon with the tongs, stand it on end 2" to 3" apart from other coupons by placing one end of the coupon in one of the grooves between a vinyl polyester pallet grid and the interstices of the vinyl polyester recovery containment system over which the coupon was being sprayed with the Oakite 33 cleaner.

5.16 Wait for five (5) minutes and repeat step 5.14 for each coupon.

5.17 After another five (5) minutes have elapsed, repeat step 5.13, THOROUGHLY RINSING TO RINSE OFF THE OAKITE 33 RESIDUE

5.18 Allow the coupons to air dry. Only use the electric hot air dryer if the humidity is so high as to prevent rapid drying of the coupons.

5.19 Add Oakite Enprox 714 to the used Oakite 33 cleaning solution in the vinyl polyester recovery containment system until the solution is neutralized to a pH of 7 as indicated by the pH meter or the litmus paper remaining gray when dipped in the solution

5.20 When the used Oakite 33 cleaning solution is neutralized, drain it into the sewer.

5.21 After the coupons are thoroughly dry, place a dust/mist respirator over one's mouth and nose. Just before handling the coupons, put on clean Nitrilite gloves. Be careful not to touch the outside of the gloves with the hands. While wearing the respirator and the gloves, wrap all of the coupons in a piece of Amerlstat plastic laid on a cart with the inside surface of the roll turned upward. Fold the plastic over the coupons for protection and carry them to a darkened lab room.

5.22 Excluding the coupon with the thermocouple attached, blacklight inspect all coupons for hydrocarbon contamination as follows:

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

5.22.2 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.

5.22.3 Confirm the maximum distance at which the blacklight produces 800 uw/cm^2 on the examination surface using the blacklight meter.

5.22.4 Put on new clean Nitrilite gloves before handling coupons in the darkened area.

5.22.5 In the darkened area, blacklight inspect all surfaces of all coupons. During the inspection, hold the blacklight no further or no closer from the examination surface than the distance established in step 5.22.3. Use extra care when inspecting the previously contaminated center punched surface of each coupon.

RECORD BLACKLIGHT OBSERVATIONS.

5.22.6 If the blacklight inspection reveals no hydrocarbon contamination (no fluorescent glow at 800 $\mu w/cm^2$) on the surfaces of the coupons, proceed to step 5.23. If the blacklight inspection reveals residual amounts of hydrocarbon, void this cleaning method procedure as inadequate.

5.23 Package and ship the forty eight (48) hydrogen outgassing coupons to Larry Jones at Caltech and the forty ninth (49th) coupon with extra center punch marks to Rainer Weiss at MIT in accordance with the Caltech instructions given as follows:

Same as other