

L190 - E940012 - 00 - B

 **Facsimile Cover Sheet**

To: Larry K. Jones
Company: Caltech
Phone: 818/395-2970
Fax: 818/304-9834

From: Charles N. Sherlock
Company: CBI
Phone: 713/896 - 3769
Fax: 713/466 - 4259

Date: February 15, 1994

**Pages including this
cover page: Eight (8)**

Comments:

Larry, this should do it, I hope. Here is revision 0 of coupon alternate cleaning procedure CLCOUPAO. I have incorporated your last few comments from earlier this morning. I found a few errors that I corrected. They are: Item 3.3 - 5.17 is now 5.18; item 5.13 - deleted second sentence since all center punching is done in 5.1; item 5.14 - for same reason deleted words "and center punch"; item 5.15 - added a sentence regarding care in not touching the outside of gloves with hands; item 5.17 - deleted words "and the center punch"; item 5.17.5 - deleted word "and the center punch to be used in step 5.18" and changed 5.16.3 to 5.17.3; and finally item 5.17.6 - changed 5.17 to 5.18.

Please look over this procedure and let me know if there are any problems. I will proceed to contaminate the procedure defined areas of the plate material with the motor oil and write up the work order for getting the material sheared.

Regards,



Chuck Sherlock
Houston Corporate Welding

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



DOC. ID CLCOUPA0
 REV. NO. 0
 CONTRACT 930212

TITLE CLEANING OF PLAIN COUPONS
 BY ALTERNATE METHOD #0
 FOR SURFACE ANALYSIS AND OUTGASSING TEST
 CALTECH

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APPROVED	Engr	Corp Weld	Corp OA	Const	Mfg	BY	DATE
						PREPARED	CNS
						REVISED	
						AUTHORIZED	
						REFERENCED	
						STANDARD	REV. NO.

1.0 SCOPE:

This alternate coupon cleaning procedure covers both the initial hydrocarbon contamination of the plate material and the cleaning of fifty (50) 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, cut from the clean end of the plate material will be used for post clean laser 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. The extra one (1) 0.115" x 1" x 18" coupon will have a thermocouple attached for determining the typical maximum coupon temperature during steam cleaning. This same coupon with the thermocouple attached will be used in each of the alternate coupon cleaning procedures investigated.

2.0 PERSONNEL:

Experienced personnel shall perform and supervise all cleaning performed in accordance with this alternate 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 5.18 of this procedure).



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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 $\mu\text{w}/\text{cm}^2$.
- 4.4 Electric hot air dryer.
- 4.5 Steam cleaner (Jenny) with a heater coil and a dead man type hand held sprayer.
- 4.6 Two (2) vinyl polyester recovery containment pallet systems for catching and retaining the used cleaning and rinse solutions.
- 4.7 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.
- 4.8 Dust/mist respirators with exhalation valve that are NIOSH/MSHA approved such as Zee #2304.
- 4.9 Caltech supplied Ameristat packaging plastic.
- 4.10 Electrical tie wraps.
- 4.11 Supra Tech non-detergent SAE 30 motor oil .
- 4.12 Paint brush approximately one inch (1") wide.
- 4.13 Clean metal handling tongs.
- 4.14 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.
- 4.15 Clean blunt nose center punch.
- 4.16 J Type thermocouple.
- 4.17 Digital thermocouple readout unit.



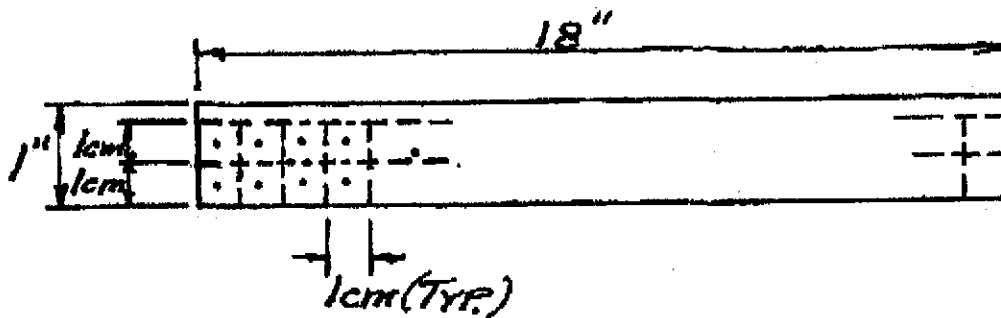
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5.0 PROCEDURE:

- 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 fifty (50) locations. For 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 fiftieth coupon, the location shall be in the center of one half of the anticipated sheared position of that coupon. Also center punch mark the anticipated location of the 1 cm x 1 cm surface analysis coupons in the 1" x 18" coupon being shipped to MIT.
- 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 of the center punched side of each of the forty nine (49) 1" x 18" hydrogen outgassing coupons. It should cover half of the surface of the fiftieth (50th) coupon on the end with the center punch mark from which eight (8) contaminated 0.115" x 1 cm x 1 cm surface analysis coupons will be laser cut. Two (2) 0.115" x 1 cm x 1 cm coupons will be laser cut from the other uncontaminated end. See the laser cutting sketch below.



- 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.



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- 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 Adjacent to the steam jenny, place two (2) vinyl polyester recovery containment pallet systems. One to catch and retain the used condensed steam liquid and the other to serve as a draining and drying rack for the coupons. This is in a protected area.
- 5.6 Turn on the steam cleaner heating coils.
- 5.7 Spray water from the steam cleaner spray nozzle into the sanitary sewer drain until it reaches the boiling point (turns to steam).
- 5.8 With the steam cleaner sprayer held only a few inches away, thoroughly spray the four pallet grids of the two vinyl polyester recovery containment system to remove any dirt or other contaminants from its surface. Remove the two pallet grids from one of the recovery containment systems. This will prevent the pallet grids from becoming contaminated with the condensed steam run-off and, in turn, possibly contaminating the cleaned coupons.
- 5.9 Attach a thermocouple to the surface of one of the 1" x 18" hydrogen outgassing coupons approximately in the middle of the 18" length on the side opposite from the center punch mark.
- 5.10 Steam clean the tongs to be used in the next step.
- 5.11 To steam 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 laser cut for surface analysis coupons, hold it by the end away from the center punch mark. When spraying with the steam cleaner, let the coupon hang down from the tongs over the recovery containment system from which the pallet grids were removed. With the steam cleaner sprayer held only a few inches away, thoroughly spray all the surfaces of the coupon for a minimum of fifteen (15) seconds to a maximum of twenty (20) seconds. Also monitor the thermocouple reading during the steam cleaning of that coupon and record the maximum coupon surface temperature noted.



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- 5.12 While still holding the steam cleaned coupon with the tongs, stand it on end 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 that has the grids in place.
- 5.13 Repeat steps 5.11 and 5.12 for each coupon. When standing them on end to dry, set them 2" to 3" inches apart.
- 5.14 Allow the coupons to air dry. Only use the electric hot air dryer if the humidity is so high as to prevent rapid drying.
- 5.15 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 chemical resistant 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 Ameristat 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.
- 5.16 Dispose of the cleaning/rinse condensed steam liquid by flushing it into the sanitary sewer.
- 5.17 Excluding the coupon with the thermocouple attached, blacklight inspect all the other cleaned coupons for hydrocarbon contamination as follows:
 - 5.17.1 Turn on and warm up the blacklight for a minimum of five (5) minutes.
 - 5.17.2 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 coupon surfaces. If the examiner wears glasses or lenses, they shall not be photosensitive.
 - 5.17.3 Confirm the maximum distance at which the blacklight produces 800 $\mu\text{w}/\text{cm}^2$ on the examination surface using the blacklight meter.



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- 5.17.4 Put on new clean Nitrilite gloves before handling any coupons in the darkened area.
 - 5.17.5 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 5.17.3. Use extra care when inspecting the previously contaminated center punched surface of each coupon.
 - 5.17.6 If the blacklight inspection reveals no hydrocarbon contamination (no fluorescent glow at $800 \mu\text{w}/\text{cm}^2$) on the surfaces of the coupons, proceed to step 5.18. If the blacklight inspection reveals residual amounts of hydrocarbon contamination, void this cleaning method procedure as inadequate.
- 5.18 Package and ship the forty eight (48) hydrogen outgassing coupons to Larry Jones at Caltech and the forty ninth coupon with extra center punch marks to Rainer Weiss at MIT in accordance with the Caltech instructions given as follows:
- 5.18.1 Place a piece of Ameristat film on a bench with the inside surface of the roll turned upward to provide a clean work surface.
 - 5.18.2 Handle all coupons and film only when wearing dust/mist respirators and clean Nitrilite chemical resistant gloves.
 - 5.18.3 Wrap twelve (12) hydrogen outgassing coupons to a bundle. In a separate bundle wrap the single coupon from which the surface analysis coupons will be laser cut by MIT.
 - 5.18.4 Keep the inside surface of the film roll toward the inside surface of the package being wrapped. Limit film handling to outside edges only.



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- 5.18.5 Wrap coupons with at least two (2) layers of film so outside edges do not come in direct contact with the coupons. Accomplish this for the outgassing coupons by rolling the film around the short dimension of the coupons. For the surface analysis coupons, lay them side by side in a line and roll the film around the short dimension. Then fold the outer edges of the film to the middle.
- 5.18.6 Secure the film around the bundle with two (2) or more electrical tie wraps.
- 5.18.7 Label each bundle with the date wrapped, the identification of the cleaning procedure used to clean the coupons and the maximum coupon surface temperature noted during cleaning.
- 5.18.8 Pack the wrapped 0.115" x 1" x 18" outgassing coupon bundles in a separate corrugated box. Add filler packing material as necessary for protection against possible shipping damage.
- 5.18.9 Label this box and ship these outgassing coupons via Airborne, Federal Express or UPS to:
- California Institute of Technology
Attention: Larry K. Jones 102 - 33
Pasadena, CA 91125
- 5.18.10 In a second corrugated box pack the single coupon for laser cutting into surface analysis coupons. Add filler packing material as necessary for protection against possible shipping damage.
- 5.18.11 Label this box and ship this coupon via Airborne, Federal Express or UPS to:
- Attention: Rainer Weiss
Room 20B145
Massachusetts Institute of Technology
18 Vassar Street
Cambridge, MA 02139