

CBI

CBI Company Ltd

TRANSMITTING ON OMNIFAX G661
VERIFY NUMBER IS: 713 896 3710

TELEFAX

8900 Fairhanks North Houston Road
P.O. Box 41146
Houston, Texas 77241-1146
713 466 7581
713 466 8218 FAX

PAGE: 1 OF 7

DATE: 12/10/93

TO: LARRY JONES
CALTECH

FAX NO. (818) 304-9834

PASADENA, CA

FROM: KEN FLEJJAS

REF: L190 PROJECT, CALTECH CONTRACT C146, CBITS CONTR. 930212

SUBJ: WELD COUPON TESTING

ATTACHED ARE PROCEDURES:

"
VIMS-ER 308L - CLEANING & BAKE OUT OF WELD WIRE FOR
(2 PAGES) USE DURING WELDING OR OUTGASSING TESTS"

CLCOUP : "CLEANING OF WELDED & PLAIN COUPONS FOR
(4 PAGES) OUTGASSING TESTS"

NEED YOUR APPROVAL - WE ARE READY TO START CLEANING &
BAKE OUT OF WIRE NOW!!

FAC CC: MARTY TELLOIAN
(815) 439-6012



DOC. ID WMS-ER308L
 REV. NO. 01
 CONTRACT 980212

TITLE CLEANING AND BAKE OUT OF WELD WIRE FOR
 USE DURING WELDING OF OUTGASSING TESTS
 CALTECH

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Engr	Corp Weld	Corp QA	Const	Mfg	BY	DATE
					PREPARED RWBP	12/9/93
					REVISED	
					AUTHORIZED BGS	12/9/93
					REFERENCED	
					STANDARD	REV. NO.

1.0 SCOPE:

This procedure covers the purchasing specifications, cleaning, bake out and handling of weld wire to be used during the welding of the 0.115" x 1" x 18" outgassing test coupons.

2.0 REFERENCES:

- 2.1 ASME Section II, Part C, latest edition.
- 2.2 California Institute of Technology Technical Specification Number 1100607 for Low Hydrogen, Type 304L Stainless Steel Vacuum Products.

3.0 MATERIAL:

- 3.1 ASME Specification SFA 5.9, latest edition in Part C, Section II Material Specification.
- 3.2 AWS Classification - ER308L.
- 3.3 Unit Package Type - 25 lb. spool of 0.035" diameter.

4.0 CERTIFICATION AND TESTING per SFA 5.01, latest edition in Part C, Section II Material Specification:

- 4.1 Lot Classification - S3.
- 4.2 Level of Testing - Schedule F.

5.0 CLEANING:

- 5.1 Weld wire in accordance with sections 3 and 4 above, shall be cleaned with Scotch Brite, Mirachem 500 cleaner/detergent to remove hydrocarbon contamination followed by Scotch Brite. The wire shall be wiped dry using lint free clothes or paper towels and re-spooled onto a stainless steel, 2 1/2 lb. spool.

6.0 BAKE OUT:

- 6.1 The wire spooled onto the 2 1/2 lb. stainless steel spool shall undergo a bake out at 440°C +/- 8°C (825°F +/- 15°F) for 36 hours.
- 6.2 The bake out shall be an air bake with the spool positioned on a raised grating with its surface vertical to promote convective flow over the surface.

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7.0 POST CLEANING:

7.1 The weld wire after bake out shall be re-spooled and cleaned with Scotch Brite to remove residual contamination due to the bake out procedure.

8.0 STORAGE:

8.1 If welding does not commence immediately, the re-cleaned wire shall be wrapped in a plastic bag, purged with 100% argon gas and sealed until further use.

8.2 To use sealed cleaned and baked out wire, remove spool from the plastic bag. To store remainder of wire, follow the steps outlined in section 8.1 above.

9.0 HANDLING OF CLEANED WIRE:

9.1 All handling of the wire after the initial cleaning procedure, section 5.1, shall be done wearing cloth gloves. No contact with skin shall occur.

9.2 All wire feed equipment shall use liners, rolls and contact tips that are either new or have only been in contact with stainless steel wire.



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APPROVED	Engr	Corp	Corp	Const	Mfg		BY	DATE
		Weld	OA					
							PREPARED CNS	12-7-93
							REVISED	
							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 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 Larry K. Jones facsimile of December 2, 1993 to Ken Flessas on Sequence of Preparing Outgassing Test Coupons.
- 3.4 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.



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- 4.5 Blacklight meter capable of measuring at least 800 $\mu\text{w}/\text{cm}^2$.
- 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 weight.
- 4.8 Oakite Enprox 714 for neutralizing the used Oakite 33 cleaning solution.
- 4.9 Steam cleaner (Jenny) with a heater coil and a dead man type hand held sprayer.
- 4.10 Recovery system for catching and retaining the used cleaning and rinse solutions.
- 4.11 Neoprene or other chemical resistant gloves and apron or coveralls and/or foot coverings as needed.
- 4.12 A minimum of four (4) chemical resistant plastic fifty five (55) gallon drums. Two (2) for mixing the Oakite 33 cleaning mixture and two (2) for holding the de-ionized rinse water.

5.0 PROCEDURE:

- 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 $\mu\text{w}/\text{cm}^2$ 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.

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- 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
- 5.7 Mix a 2% by weight solution of Oakite 33 and de-ionized water in two (2) of the drums.
- 5.8 Insert the screened suction line of the steam cleaner into the drum containing the de-ionized water. Turn on the cleaner heating coils.
- 5.9 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.
- 5.10 Spray the de-ionized water from the spray nozzle directly back into the drum from which it is being pumped until it reaches the boiling point. When the temperature of the de-ionized water in the steam cleaner reaches the boiling point, thoroughly spray the exposed surfaces of all coupons. While wearing 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.
- 5.11 Switch the screened suction line of the steam cleaner from the drum of de-ionized water to the drum containing the Oakite 33 cleaning solution.

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- 5.12 Spray the Oakite cleaning solution from the spray nozzle directly back into the drum from which it is being pumped until it reaches the boiling point. When the temperature of the Oakite 33 cleaning solution reaches the boiling point, thoroughly spray the exposed surfaces of all coupons. While wearing 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.
- 5.13 Wait for five (5) minutes and repeat step 5.12. Any time the catch basin becomes nearly full of used Oakite 33 solution, pump the used cleaning solution from the basin into an empty labeled drum.
- 5.14 Switch the screened suction line of the steam cleaner from the drum of Oakite 33 cleaning solution to the drum of de-ionized water.
- 5.15 Repeat step 5.10.
- 5.16 While wearing 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 drum(s) of used Oakite 33 cleaning solution until the solution is neutralized to a pH of 7 as indicated by the litmus paper remaining gray when dipped in the solution.
- 5.19 When the used Oakite 33 cleaning solution is neutralized, drain it into the sewer.