

**RADIOACTIVE (RA) BY-PRODUCT
 MATERIAL APPLICATION - TRITIUM**

DOCUMENT REVISION STATUS

REVISION LEVEL	DESCRIPTION OF CHANGE	DATE	ECN #
A	PROCEDURE REWRITTEN TO CONFORM TO CURRENT HNE METHODS AND FORMAT.	10/26/05	14195

APPROVALS

APPROVED: PROCESS ENGINEERING: _____ DATE: _____

APPROVED: ENGINEERING MANAGER: M. Jucci DATE: 1/23/06

APPROVED: MANUFACTURING MANAGER: [Signature] DATE: 1/24/06

APPROVED: QUALITY ASSURANCE MANAGER: [Signature] DATE: 1/24/06

1.0 Equipment:

- a) Vented Hood for the storage and assembly of tritiated inserts
- b) Storage Container for tritiated inserts
- c) Storage Container for reject material
- d) Stainless Steel Tweezers (kept in hood)
- e) Special Crimping Tool (kept in hood)
- f) Source Holders
- g) Center Punch
- h) Microscope
- i) Vise
- j) Welder
- k) Mass Spec Helium Leak Detector

2.0 Material:

- a) Tritiated Copper Inserts consisting of OFHC copper rod .050 diameter x .140 long with titanium tritide coating on one flat end. The total activity of the coating is to be 17 millicuries/rod.
- b) Tritiated Copper Inserts consisting of OFHC copper rod .024 diameter x .140 long with titanium tritide coating on one flat end. The total activity of the coating is to be 3 millicuries/rod.
- c) Support Structures into which the tritiated rods are to be mounted.

3.0 Procedure:

- 3.1 Place tritiated rods and source holders in vented hood.
- 3.2 Open storage container and remove one tritiated insert using stainless steel tweezers. Insert copper end of tritiated insert into open end of source holder.
- 3.3 Return tweezers to storage position inside hood. Pick up serial crimping tool and collapse support at end of source holder closest to tritiated insert.
- 3.4 Return crimping tool to storage position inside hood.
- 3.5 Place tritiated source assembly in storage container.
- 3.6 Repeat steps 3.1 to 3.5 until quantity of source assemblies required is met.
- 3.7 Place tube to be loaded into exhaust hood.
- 3.8 Using tweezers grasp source holder assembly at mid-point and insert tritiated end of source holder into tube.
- 3.9 Remove tube with inserted rod from exhaust hood and place on disposable cloth.
- 3.10 Repeat steps 3.7 to 3.9 until all tubes to be loaded are completed.

4.0 Quality:

- 4.1 Inspect each assembly after crimping. Examination should reveal the following:
 - 4.1.1 Assembly projecting from mounting structure by specified amount (approx. 1/16 inch).
 - 4.1.2 Crimp mark in proper location on support structure.
 - 4.1.3 Crimp mark indication as specified to assure mechanical bond of assembly.
- 4.2 Stake rod assembly using center punch.
- 4.3 Verify alignment of rod assembly visually using microscope.

5.0 Welding:

- 5.1 Secure tube into vise in fume welding hood.
- 5.2 Weld rod assembly into tube to make hermetic seal.
- 5.3 Visually inspect welded tube assembly for defects.
- 5.4 Remove tube assembly from fume hood and proceed to leak test.

6.0 Leak Test:

- 6.1 Helium leak test tube assembly with mass spec helium leak detector.
- 6.2 Complete all tube assemblies before proceeding to next step.

7.0 Safety:

- 7.1 Only qualified operators shall have access to RA facility.
- 7.2 Vinyl or latex gloves are to be used when working in hood.
- 7.3 Operators will remove glasses and dispose of gloves in compactor.
- 7.4 Tweezers and crimping tool must remain in hood.
- 7.5 All tubes with mounted RA assemblies must remain sealed after removal from hood. No salvage or rework operations involving penetrations of the tube envelope are to be attempted.
- 7.6 All operators working with tritiated rods must have bi-weekly urine analysis for tritium.
- 7.7 Area inside hood to receive periodic wipe test for tritium. Included with the surfaces to be tested are those of the tweezers and crimping tool used for assembly.