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1. Scope:

This procedure describes the method used to assemble, braze, and test Quench Resistor Assemblies for Helical Magnet Storage Units

2. Applicable Documents:

RHIC-MAG-Q-1000	Control of Measurement Test Equipment
RHIC-MAG-Q-1004	Discrepancy Reporting Procedure
RHIC-MAG-M-7229	Electrical Resistance Measurement for Warm-Up Heater Brazed Joints

3. Requirements:

3.1 Material & Equipment

3.1.1 Material

Flux Remover "Micro-Care"	BNL Stock No. H-28910
PRESOLVE	BNL Stock No. I-78289

3.1.2 Equipment

Torch	
Insulated Gloves	K-63025
400 Grit Emery Paper	
Alignment Block	SK069801
Swinging Stop	SK069802
Bead Blaster /Glass Bead Media	
Solder Pot	

3.2 Safety Precautions

3.2.1 Operators shall wear safety glasses with side shields, or goggles while performing brazing operations.

3.2.2 Operators shall wear insulated gloves while performing brazing operations.

3.2.3 Work area shall be free of debris and flammable objects.

- 3.2.4 The technicians shall be qualified by their cognizant technical supervisor in the operation of the required test equipment and these electrical testing procedures. They shall be familiar with the latest revision of the applicable documents referenced in section 2. In addition, some of these tests require the technician to have special training. A list of qualified personnel shall be maintained with the RHIC Training Coordinator.
- 3.2.5 Some of these electrical test procedures have specific safety requirements. The technicians performing these specific tests shall rigorously follow all the safety requirements listed as well as those prescribed by the BNL ES&H standard. Operators shall wear safety glasses with side shields or goggles.
- 3.2.6 Flux is hazardous. Dispose of waste and unused material as hazardous waste per SBMS Subject Area. Gloves shall be worn while applying flux. If Neoprene Gloves (or lighter grade) are used, remove gloves immediately if contaminated and dispose of as hazardous waste.
- 3.3 Procedure
- 3.3.1 Brazing
- 3.3.1.1 Degrease holes in both Heat Sinks using PRESOLVE and dry out completely. Clean ends of Nichrome Wireforms thoroughly using 400 grit emery paper.
- 3.3.1.2 Assemble wireforms and both heat sinks.
- 3.3.1.3 Set assembly into Alignment Block parallel to top of fixture and restrain using swinging stop.
- 3.3.1.4 Using torch, heat first heat sink until cherry red.
- 3.3.1.5 While heat sink is still cherry red, apply brazing paste (12050186) to all 5 wireforms where they enter one heat sink.
Note: Do not attempt to reconstitute dried paste.
- 3.3.1.6 As the heat sink cools and loses its cherry red color, spray with water jet from spray bottle to remove any residual flux.
- 3.3.1.7 Repeat 3.3.1.4-3.3.1.6 for second heat sink.
- 3.3.1.8 After cooling, bead blast entire assembly to remove any oxidation.
- 3.3.1.9 Inspect assembly under microscope for complete removal of flux residues and for presence of proper braze meniscus.

3.3.2 Tinning of Studs

CAUTION

Flux is hazardous. Dispose of waste and unused material as hazardous waste per SBMS Subject Area. Gloves shall be worn while applying flux. If Neoprene Gloves (or lighter grade) are used, remove gloves immediately if contaminated and dispose of as hazardous waste.

NOTE

Solder Tinning of Studs is to be completed within 8 Hours of brazing operation to reduce oxidation after bead blasting.

3.3.2.1 Dip stud into into flux. Blot dry with clean towel.

3.3.2.2 Dip stud into non-contaminated solder pot containing solder 12010730. Allow stud to reach temperature of molten solder.

3.3.2.3 Slowly withdraw stud from solder pot.

3.3.2.4 Remove residual flux from assembly using "Micro Care" flux remover as required.

3.3.3 Electrical Testing

Note: Pay particular attention to safety requirements included in individual electrical test procedures.

3.3.3.1 Perform electrical resistance measurement at 10A on the brazed joints per RHIC-MAG-M-7229. Resistance value to be between 50.5-51.2 milli-ohms.

3.3.4 Packaging

3.3.4.1 Bag /Tag assembly and mark with part no. and rev. per MIL-STD-130.

4 Quality Assurance Provisions:

4.1 The Quality Assurance provisions of this procedure require that the technician shall be responsible for performing all assembly operations in compliance with the procedural instructions contained herein and the recording of the results on the production traveler.

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4.2 The technician is responsible for notifying the technical supervisor and/or the cognizant engineer of any discrepancies occurring during the performance of this procedure. All discrepancies shall be identified and reported in accordance with RHIC- MAG-Q-1004.

4.3 Measuring and test equipment used for this procedure shall contain a valid calibration label in accordance with RHIC-MAG-Q-1000.

5 Preparation for Delivery:

5.1 N/A