

1. Scope:

This specification establishes the requirements for the installation of the insulation blankets for the drawings as given below.

2. Applicable Documents:

The following documents form a part of this procedure.

Drawings

12050123	Blanket, Insulation Multilayer - Cradle
12060043	Spacer Material
12065041-01 12065041-02	Blanket, Insulation Multilayer - Post, Cylinder
12065070	Baffle Assembly
12105050	Blanket, Insulation Multilayer - Magnet, Inner
12105051	Blanket, Insulation Multilayer - Magnet, Outer, No. 1
12105052	Blanket, Insulation Multilayer - Heat Shield, Inner
12100005	Blanket, Insulation Multilayer - Heat Shield, Outer
12105070	Blanket, Insulation Multilayer - Magnet, Outer, No. 2

3. Requirements:

NOTE: Perform the following steps (3.1, 3.2, and 3.3) in any sequence. Perform the step 3.1 before installing the cradles to the magnet. Protect insulation blanket while performing non ultrasonic welding.

3.1 Lay the cradle multilayer insulation blanket (Dwg. 12050123) on top of the cradle so the four (4) set screws go through four (4) holes on the blanket.

3.1.1 Wrap the blanket around the magnet.

- 3.1.2 Use Mylar tape to tape the blanket in place.

- 3.2 Wrap the outer wall of the upper post using blanket (Dwg. 12065041-01) so the edge of blanket is about 1/4 inch from the end (no external flange) of the post. Tape the edges of the blanket to the post using 1" wide Mylar tape. Tape the seam of the blanket.
 - 3.2.1 Repeat step 3.2 for the lower post using Dwg. No. 12065041-02.
 - 3.2.2 Wrap the inner wall of the lower post using blanket (Dwg. 12065041-01) so the edge of the blanket is about 1/4" below the inner flange. Tape the edges of the blanket to the post using 1" wide Mylar tape. Tape the seam of the blanket.
 - 3.2.3 Wrap the inner wall of the upper post using blanket (Dwg. 12065041-01) so the edge of the blanket is about 3/4" below the "no flange" side of the post [or 1/4" below the sliding post disk closure, (Dwg. 12105094) if the disk is already installed]. Tape this edge of the blanket to the post using 1" wide Mylar tape. Tape the seam of the blanket. Position the blanket so the other edge is about 3/4" from the flange inner surface. Tape the edge using 1" wide Mylar tape.

NOTE: This blanket must be in relaxed position.

- 3.3 Perform the baffle assembly per Dwg. 12065070.

- 3.4 SPECIAL NOTE: The following item 3.4.1 applies for the CQS magnet assembly, type B2, drawing 12105009 only.
 - 3.4.1 Position one heat shield multilayer insulation blanket, with the 1 mil. thick aluminized Mylar at the bottom, (Dwg. 12105052-1) on the assembly stand. Align the two 8 inch diameter holes on the blanket over the tow plate bosses. Flip the other heat shield multilayer insulation blanket (Dwg. 12105052-2) over the first one so the two 8 inch diameter holes on the blanket align over the tow plate bosses.

NOTE: The two blankets should be overlapped 12 inches. The three (3) holes with the 0.7 in diameter of the second blanket must be on top of the three (3) holes with the 0.7 in diameter of the first blanket. The 1 mil thick aluminized Mylar layers must be the outermost layers. Install the heat shield tray support plate and the heat shield tray.

NOTE: Perform the step 3.5 before setting cold mass plus cradle assemblies with upper post halves on top of the post plugs and before installing the helium pipe brackets.

SPECIAL NOTE: The following item 3.4.2 applies for the CQS magnet assembly, type A2, drawing 12105003 only.

3.4.2 Position one heat shield multilayer insulation blanket, with the 1 mil thick aluminized Mylar at the bottom, (Dwg. 12105052-2) on the assembly stand. Align the two 8 inch diameter holes on the blanket over the tow plate bosses. Flip the other heat shield multilayer insulation blanket (Dwg. 12105052-1) over the first one so the two 8 inch diameter holes on the blanket align over the tow plate bosses.

NOTE: The two blankets should be overlapped 12 inches. The three (3) holes with the 0.7 in diameter of the second blanket must be on top of the three (3) holes with the 0.7 in diameter of the first blanket.

The 1 mil thick aluminized Mylar layers must be the innermost and outermost layers. Install the heat shield tray support plate and the heat shield tray.

NOTE: Perform the step 3.5 before setting cold mass plus cradle assemblies with upper post halves on top of the post plugs and before installing the helium pipe brackets.

3.5 Place the magnet multilayer insulation outer (No. 1) blanket, (Dwg. 12105051), the 1 mil thick aluminized Mylar layer at the bottom, on the heat shield tray so the centers of the 8 inch diameter holes align with the centers of the heat shield tray holes.

3.5.1 Place the magnet multilayer insulation outer (No. 2) blanket (Dwg. 1210570), the 1 mil thick aluminized Mylar layer on the top, over the first one so the centers of the 8 inch diameter holes align together.

NOTE: The two blankets must be overlapped 8 inches.

NOTE: Perform the steps 3.5.2 to 3.5.8 after installing the cradles, magnet assembly on the assembly stand and before installing the helium pipe brackets.

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3.5.2 Wrap and tape ten (10) strips of the spunbonded polyester over the magnet strap bolts four (4) places to prevent puncturing the magnet blanket.

3.5.3 Place the magnet-insulation-inner blanket (Dwg. 12105050) over the magnet so the closed ends of the cutting slot snugged between magnet straps and strap bolts.

NOTE: The intact edge of the blanket should be on the heat shield cooling line (locating at bottom heat shield tray) side of the magnet (at or about 10 o'clock). The cradle blocks (ears) should be between the cutting slots on the blanket.

3.5.4 Tape the intact edge of the blanket to the magnet every 24 inches using 1 inch wide by 2 inches long Mylar tape.

3.5.5 Wrap the blanket around the magnet. Do not pull taut.

NOTE: Tug the blanket between the cradles and the magnet.

3.5.6 Use ultrasonic welding gun to weld the overlapped edge to the blanket at 1/2 inch from the edge and 2 inches from the blanket end.

NOTE: Use 1 inch wide Dacron Polyester Fiber (Dwg. 12100043) (Nexus Style 100-10) over the exposed 1 mil thick aluminized Mylar layer under each weld.

3.5.7 Weld every 24 inches horizontally (1/2 inch from edge).

3.5.8 Fold and tape the blanket flaps to the strips in 3.5.2.

3.5.9 Tape the blanket slot edges at the magnet supply (if any) to the re cooler and the power lead end adapter to the magnet.

NOTE: Perform step 3.6 after installing the helium brackets and pipes. Use a metal backing strip to insure a good ultrasonic weld.

3.6 Wrap the first magnet-multilayer-insulation-outer (No. 2) blanket (Dwg. 12105070).

NOTE: Cut through four (4) slots from 1 inch to 1.5 inches for the CQS power lead penetration. These slots are at corrector side and at left looking from corrector end. Cut through four (4) slots from 1 inch to 2.2 inches for the cryogenics valve penetration. All eight (8) slots are at the same side of the CQS magnet.

3.6.1 Interleave every 5 compound layers (spunbonded polyester layer must be the outermost layer) so the overlapped edge of the blanket touches the ultrasonic welding line of the underneath layers.

3.6.2 Use ultrasonic welding gun to weld the five (5) overlapped layers to the five (5) underneath layers. The weld is 1/2 inch from the overlapped seam and 2 inches from the blanket end. Do not melt through.

3.6.3 Weld every 24 inches horizontally (1/2 inch from the overlapped edge). Do not melt through.

3.6.4 Repeat steps 3.6.1, 3.6.2 and 3.6.3 for the rest of the blanket.

3.7 Wrap the second magnet-multilayer-insulation-outer (No. 1) blanket (Dwg. 12105051).

NOTE: Cut through four (4) slots from 1 inch to 1.5 inches for the CQS power lead penetration. These slots are at the CQS corrector side and at left looking from the corrector end.

3.7.1 Repeat step 3.6.1.

3.7.2 Repeat step 3.6.2.

3.7.3 Repeat step 3.6.3.

3.7.4 Use a removable metal backing strip to insure a good ultrasonic weld. Use 1 inch wide Dacron Polyester Fiber (Nexus Style 100-10) (Dwg. 12100043) strip over the exposed 1 mil thick aluminized Mylar under each weld. Do the same as step 3.6.4.

3.7.5 Lay the 1/2 inch outside diameter rod on top of the magnet. Use the string (nylon, teflon or lacing tape) to tie the blanket and the 1/2 inch rod securely. Remove the 1/2 inch rod.

NOTE: Do not damage any insulation layer. Protect insulation blanket while performing non ultrasonic welding. Pull the power lead flex end through the blanket. Keep the power lead flex from falling back inside the blanket.

Perform the following steps after welding the upper shield to the heat shield tray. Use a metal backing strip to insure a good ultrasonic weld.

3.8 Wrap the first multilayer-insulation-heat-shield blanket (Dwg. 12105052, inner).

NOTE: Cut through four (4) slots from 1 inch to 1.5 inches for the CQS power lead penetration. These slots are at the CQS corrector side and at left looking from the corrector end.

3.8.1 Interleave every 10 compound layers (spunbonded polyester must be the outermost layer) so the overlapped edge of the blanket touches the ultrasonic welding line of the underneath layers.

3.8.2 Use the ultrasonic welding gun to weld the ten (10) overlapped layers to the ten (10) underneath layers. The weld is 1/2 inch from the overlapped edge and 2 inches from the blanket end. Do not melt through.

3.8.3 Weld every 24 inches horizontally (1/2 inch from the overlapped edge). Do not melt through.

3.8.4 Repeat steps 3.8.1, 3.8.2 and 3.8.3 for the rest of the blanket.

3.9 Wrap the second multilayer-insulation-heat-shield blanket (Dwg. 12100005, outer).

NOTE: Cut through four (4) slots from 1 inch to 1.5 inches for the CQS power lead penetration. These slots are at the CQS corrector side and at left looking from the corrector end.

3.9.1 Repeat step 3.8.1

3.9.2 Repeat step 3.8.2.

3.9.3 Use 1 inch wide Dacron Polyester Fiber (Nexus Style 100-10) (Dwg. 12100043) strip over the exposed 1 mil thick aluminized Mylar layer under each weld. Do the same as step 3.8.3.

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3.9.4 Repeat step 3.8.4.

NOTE: Perform step 3.10 after:

- towing the magnet-shield assembly into the cryostat;
- removing the insertion tray and the tow plate;
- and securing the top and bottom posts.

3.10 Slide the baffle assembly (Dwg. 12065070) into the cryostat from the bottom opening so the top of the nylon rod touches the cradle or the cold mass.

NOTE: The baffle assembly must stay inside the cryostat. Otherwise, flatten the baffle (with the cylindrical multilayer insulation attached) and repeat step 3.10.

4. Quality Assurance Provisions:

4.1 The Quality Assurance Provisions of this specification require compliance with all procedural instruction contained herein.

4.2 Insure all inspection and test operations have been verified and signed on the production traveler by the cognizant operator and that all discrepancies have been reported as per RHIC-MAG-Q-1004.

5. Preparation for Delivery:

N/A