DCA322 Production Report

TS-SSC 92-081
September 15, 1992
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DCA322 is the first full length SSC collider dipole magnet built at Fermilab with Allied Signal Apical coil insulation. Other than this insulation change [DR476], the magnet is built essentially according to the specifications in "50 mm Collider Dipole Magnet Requirements and Specifications," Baseline Issue, August 16, 1991 ("The Yellow Book.")

The inner coil insulation consists of an inner 50% overlap layer of Apical NP film and an outer butt wrap layer of NP film. Cryorad adhesive is used on both sides of both layers. The outer coil insulation consists of inner and outer 50% overlap Apical NP layers, with Cryorad adhesive on both sides of both layers.

Brass shims were attached to the inner and outer coil wedges to compensate for the change in the insulation thickness from the baseline ASST design. The inner coil thin and thick wedges had 15 mil and 30 mil shims added respectively. The outer coil wedges had 10 mil shims added.

Coil Fabrication and Assembly: During lump checking on the conductor for coil 15M-50-1025 (the upper inner coil), small metal chips were detected due to wear in the lump checking equipment. The affected area was cleaned thoroughly [DR484]. Some damage was done to the lead end key of the lower outer coil; the damage was repaired by cutting the damaged part away and replacing with new material [DR494]. Before keying, it was noticed that voltage tap 19B was open [DR504]. The strain gauge packs on the magnet were not placed in the correct locations [DR505].

The quench protection heater strips in quadrants 1 and 3 have their resistive pad length reduced a factor of 6 relative to the strips in quadrants 2 and 4. All four heater strips are a single 5 mil layer closer to the outer coil surfaces than in the ASST magnets.

Keying: No kapton shim was added to the pole surfaces of the coils of this magnet. The average inner and outer coil strain gauge readings after removal from the keying press were: Lead End Inner = 89 MPa, Lead End Outer = 46 MPa, Return End Inner = 100 MPa, Return End Outer = 41 Mpa.

Final Assembly: Some changes were made in the electrical wiring to reduce risk of wire breakage and to simplify wiring of long dipole magnets [DR520]. A return end bullet gauge wire was broken and repaired [DR521]. There was some confusion over which drawing to use in the lead end Hypertronics harness; the confusion was resolved [DR524]. The 20 K bottom shield assembly tube has a large crease in it. The cause is unknown [DR527]. Tabs were welded on both 20 K and 80 K shields to hold a constant relative radius and thus prevent thermal shorts [DR540].

Final Inspection: Voltage tap 14 C was open at the test harness fixture. A repair was made [DR543]. There were several measurements out of tolerance in the various tube alignments [DR545]. Some miswiring was still being done on the Hypertronics connections. This was corrected [DR546].

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