



Insulation Specifications

A/C MOTORS & GENERATORS

Hydro Seal™ and Hybrid Seal™ Coils

SCOPE

1.00 These specifications cover the general material, and fabrication standards employed by Kencoil in the manufacture of AC stator coils operating at voltage ratings up to and including 7200 volts.

STANDARDS

2.00 All coils manufactured under these specifications are done so in accordance with the latest published IEEE and NEMA Standards unless otherwise specified.

MATERIALS

3.00 All materials are compatible and unless otherwise specified will be compatible with standard materials used in the industry. Materials meet or exceed class "F" temperature ratings.

4.00 Conductors copper wire use per NEMA.

5.00 Conductor strand insulation shall be heavy film or quad film enameled covered with Mica "B" stage tape. Other supplemental turn insulation (if required based on Volts per turn, slot length and VFD), will consist of taped mica or polyimide film turn insulation etc.

5.01 Strand insulation choice is determined from any of the following factors:

- A. RMS volts between turns
- B. Available slot space
- C. Machine application

6.00 The end turn insulation shall consist of "B" stage and film back mica tapes, typically ¾ lapped, with the minimum servings as indicated below:

| Voltage | No. of Servings |
|----------|-----------------|
| Thru 600 | 1 |
| 2300 | 1 |
| 4160 | 2 |
| 7200 | 4 |

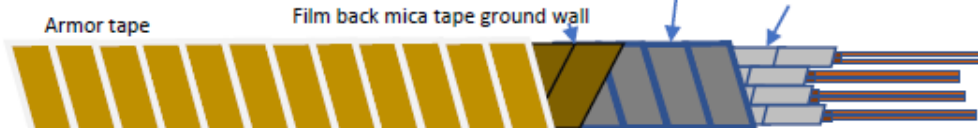
7.00 The ground wall insulation shall alternate between "B" stage and film back (and/or polyimide tape) mica tapes wrapper type insulation, a combination of both, typically ½ lapped if taped and typically applied to the thickness between conductor and core as indicated below:

8.00 The lead insulation for various voltages shall be as indicated below:

Voltage Type

Thru 4160
7200 Fiberglass braid over acrylic
 same construction as slot insulation

Mica B stage ground wall Mica "B" stage Turn Tape



9.00 The coil sealant material shall consist of a thermosetting, "B" staged, epoxy coated tape, .0075 thick, applied to the entire coil typically in a ½ lap fashion, with minimum serving of one layer.

10.00 The coil is typically protected with one serving of an outer armor tape, ½ lapped, B-staged epoxy-coated polyester-glass tape. Above 5KV or on a VFD application a corona protection on the straight sections will be applied.

CONSTRUCTION

11.00 Coils are machined turn taped and shuttle wound, slot consolidated by a heat and pressing proprietary process.

12.00 The coil loops have the lead insulation wiped clean to bare copper; are spread to proper shape and checked for uniformity.

13.00 Leads are taped and/or sleeved. The prescribed servings of mica ground-wall tape are applied by machine.

14.00 A final armor tape is applied. The coil will maintain a degree flexibility for ease of insertion. During the cure cycle after winding completed (12 hours at 300F), During the final bake the polyester threads in the epoxy tape shrink. This shrinkage action causes the tape resin to flow within the coil resulting moisture proof, chemical seal and void free coil. The straight sections of stator coils operating above 5000 volts are taped with anti-corona, resulting in a equalize voltage stress between the core slot side and the coil thus preventing corona discharges from occurring.

15.00 There is no construction differences between Hydro Seal™ and Hybrid Seal™, the only difference is that Hydro Seal™ will be semi/fully cured coil vs Hybrid seal™ coil which will have to be cured after winding by backing the stator.

TESTING

16.00 Prior to shipment a sample of coils must pass a dc ground test of twice normal operating voltage, plus 1000, times 1.7, for one minute. Coils must pass a ten second surge test (high frequency turn to turn insulation test) as follows:

Minimum Strand Insulation withstand Voltage

Heavy Film x 5000 = test voltage

[Polyimide film over add 4000 per layer]

[Mica over add 1,300 per layer]

GUARANTEE

17.00 Kencoil, Inc. guarantees its manufactured products to be free of defective materials and workmanship. It further guarantees the coils will pass the standard hi-pot and surge tests after complete insertion and proper connections are made. This guarantee remains in effect for five years from date of our invoice. Exceptions will be taken should the end user, through neglect or abuse, allow the machine to become victim of faulty electrical, mechanical, or environmental circumstances.

