KENCOIL™
MANUFACTURERS OF ELECTRIC COILS

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.

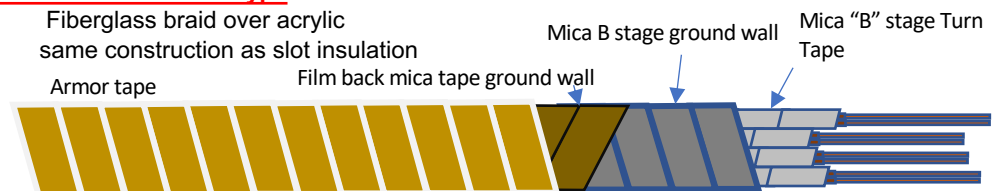
STANDARDS
2.00 All coils manufactured under these specifications are done so in accordance with the latest published IEEE and NEMA Standards unless otherwise specified.

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	Fiberglass braid over acrylic
7200	same construction as slot insulation



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 machine turn taped and shuttle wound, slot consolidated by a proprietary heat and pressing 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 of 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 in a moisture proof, chemically impervious and void free coil. The straight sections of stator coils operating above 5,000 volts are taped with anti-corona, resulting in an equalized 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 a semi-cured coil in the slot vs Hybrid Seal™ coils which will be minimally cured in the slot and both will have to be fully cured after winding and connecting by baking the stator as per section 14.00

TESTING
16.00 Prior to shipment a sample of green coils must pass a 70% DC ground test of twice normal operating voltage, plus 1000, times 1.7, for one minute. **NOTE:** Full voltage testing only after final cure. Coils must pass a ten second 70% reduced surge test voltage (high frequency turn to tum insulation test) as follows:

Minimum Strand Insulation withstand Voltage
Heavy Film x 5,000 = test voltage
Polyimide film over add 4,000 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, after proper connections are made and after final curing of the B-stage materials. 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.

Patent Pending