



Insulation Specifications

A/C MOTOR & GENERATOR VACUUM PRESSURE IMPREGNATION COIL SYSTEMS

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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. This insulation system requires a V.P.I. process utilizing a 100% solids resin.

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 used are high conductivity 100% virgin copper.

5.00 Conductor strand insulation shall be heavy or quad film covered wire with a polyester basecoat and a polyamideimide topcoat or fused single or double glass served over a heavy or quad film covered wire. Other supplemental turn insulation (if required), will consist of mica or polyimide film turn insulation.

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 .0065" thick mica tape, typically $\frac{3}{4}$ 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 be a mica tape typically applied to the thickness between conductor and core as indicated below:

| Voltage | Thickness |
|----------|-----------|
| Thru 600 | .013" |
| 2300 | .039" |
| 4160 | .052" |
| 7200 | .078" |

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

| Voltage | Type |
|-----------|---|
| Thru 4160 | Fiberglass braid over acrylic |
| 7200 | No less than 2 servings of $\frac{1}{2}$ laps, .0045" mica, or .001" polyimide film under fiberglass braid over acrylic |

9.00 The outer protective armor tape consists of one serving, .005 thick polyester Dacron. Conductive tape is used for corona protection on the straight sections of stator coils operating above 5000 volts.

CONSTRUCTION

10.00 Coils are shuttle wound, hydraulically press molded to assure conductor alignment and may be varnish submerged, and oven cured.

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

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

13.00 A final armor tape is machine applied. The coils may be oven baked to assure thorough drying of the insulation system. The straight sections of stator coils operating above 5000 volts are covered with anti-corona, conductive tape intended to equalize voltage stress between the core slot side and the coil thus preventing corona discharges from occurring.

TESTING

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

| Strand Ins. | Applied Voltage |
|----------------------|-------------------------------------|
| Heavy Film | Turns per coil x 500 = test voltage |
| Quad Film | Turns per coil x 850 = test voltage |
| [Single glass over | add 200 volts/turn] |
| [Double glass over | add 400 volts/turn] |
| [Polyimide film over | add 300 volts/turn] |
| [Mica over | add 1,300 volts/turn] |

TESTING (COMPLETED WINDING)

15.00 The following test values are recommended when applying D.C. voltage to a completed winding:

| | |
|--------------------------|----------------------|
| Before V.P.I. processing | 100% of line voltage |
| After V.P.I. processing | (2E + 1000) x 1.7 |

GUARANTEE

16.00 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 one year 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.