SCOPE

The specifications describe material, construction and testing standards for Manufacturing of Resin Rich stator coils voltage rating up to 13800 volts with class F insulation. Higher Voltages up to 15000V possible with this insulation.

MATERIALS

a) Conductors

Copper Conductors are 99.97% pure EC Grade.

b) Conductor Strand insulation

Bare Copper Conductor are covered with any one of the following insulation based on the design.

1. Single or double Daglass/Fiberglass
2. Enamel with daglass (Preferred)
3. Enamel with fiberglass
4. Mica tape without enamel
5. Enamel with Mica

C) Turn insulation (If applicable)

Glass backed resin rich epoxy mica paper tape for insulation of slot portion, one or two Layers half lap with 0.18mm (0.007”) thickness.

Glass backed silicone bonded mica paper or mica paper with glass cloth supported by Polyester film on sides for insulation of end winding, one or two layers half lap with 0.15mm (0.0059”) thickness.

d) Lead insulation

Glass backed silicon bonded or glass cloth polyester film mica tape 0.15mm (0.0059”) shall be applied as below:

VOLTAGE	NO. OF LAYERS
Up to 3.3 KV	2/3 layers
4.16 KV	4 layers
6.6 KV	5 Layers
11 KV	7 to 8 Layers
13.8 KV	9 to 10 Layers

e) Main wall insulation

Glass backed Resin Rich epoxy mica tape for insulation of slot portion.

0.18 mm (0.007”) thickness up to 6.6 KV and 0.20 mm (0.0078”) thickness shall be used above 6.6 KV, Generally all layers applied by half lap.

VOLTAGE	RADIAL GROUND WALL INSULATION AFTER COMPRESSION (field strength – 2.15 KV/mm)	NO.OF LAYERS
3.3 KV	0.88mm	3.5 layers
4.16 KV	1.12mm	4.5 Layers
6.6 KV	1.76mm	7 layers
11 KV	2.95mm	10.5 layers
13.8 KV	3.70mm	13 layers

f) End winding insulation

Glass backed silicone bonded mica paper or mica paper with glass cloth supported by Polyester film on sides for insulation of end winding, with 0.15mm (0.0059”) thickness.

VOLTAGE	NO. OF LAYERS
Up to 3.3 KV	2 layers
4.16 KV	3 layers
6.6 KV	5 Layers
11 KV	8 to9 Layers
13.8 KV	10 to 11 Layers

g) Slot corona protection

The slot corona in the form of conducting tape is applied after application of main wall Insulation above 3 KV. Slot corona protection consists of non-woven polyester mat (fleece) impregnated with a special varnish containing carbon black and graphite.

Generally tape thickness 0.09/0.10mm is used.

h) End corona protection

End corona in the form of semiconducting or stress grading tape is applied to the end

Portions above 3.3 KV with one half layers.

The tape consists of polyester – fabric, impregnated with silicon Carbide resin mixture in B-Stage.

The semiconducting overlap on conducting tape is 20 mm shall be maintained.

VOLTAGE	LENGTH
4.16 KV	80mm
6.6 KV	100mm
11 KV	150mm
13.8 KV	180mm

i) Sealing protection

Woven glass or impregnated mixed glass – polyester fabric combined with shrinkable

PET film tape is used for finishing of end winding portion with one half lap layer.

CONSTRUCTION

a) The looped coils are stack consolidated with B – staged epoxy resin impregnated glass cloth tape
b) The turn insulation and lead insulations are applied by hand taping
c) The End winding insulations are having very high flexible

d) The ground wall insulation(straight portion) is applied by machine and Consolidated or moulded with Hydraulic press
e) The insulated random coils are inspected with wooden cradle before shipment

TESTING

ELECTRICAL ROUTINE TEST

Electrical routine tests are carried out prior on all coils before shipment of insulated Coils.

a) Inter-turn test at 1.5 timesrated voltage with recurring surge voltage – should not short circuited
b) Tan delta test on coils for line voltage 6KV and above as per IEEE 286 and IEC 60034-27-3
c) IR measurement before and after AC high voltage as per IEEE 43-2000
d) AC high voltage test should pass at 2Un + 1 for 1 minute
Where Un is line voltage of the coil, High voltage to be conducted on straight portion (ground wall insulation)
e) DCR measurement.

TYPE TEST

If requested, the following type tests are shall be performed on our coils

I. Break down voltage test in air/Oil immersion
II. Partial discharge Measurement as per IEEE 1434-2014
III. Voltage endurance test as per IEEE 1043-1996
IV. Thermal cycling test as per IEEE 1310-2012

GUARANTEE

12 months from the date of supply. The coils after receipt of material at your end shall be tested as per IEEE standards before insertion into the slot. If any coil fails during this testing, we shall replace the quantity of failed coils with new coils at free of cost for which we shall not hold any liability for the consequential loses.