GLASS FILAMENT WOUND EPOXY BONDED TUBES

1. GENERAL:

This specification governs the requirements of glass filament wound epoxy bonded tubes manufactured by a special thread winding process. Specially formulated Epoxy resin system impregnated glass fibres are wound in exact spirals crosswise on to a cylindrical mandrel. First few inside layers (2 to 3 mm radial thickness) can be wound concentric to facilitate process requirements,. Both the ends of cylinders/Tubes to be cut to a sufficient length to remove the weaker cross over build up of winding. The tubes have excellent mechanical characteristics, attained by winding the filament at a suitable angle approx 54 deg. to the mandrel axis. The tubes shall have no deleterious effect on the properties of transformer oil and are capable of withstanding high degree of mechanical electrical & thermal Stresses. Tubes have temperature index of at least 150.

2. APPLICATION:

Used in tap changer as oil compartment cylinders, column tubes etc.

3. COMPLIANCE WITH NATIONAL STANDARDS;

There is no Indian Standard for this type of material.

4. DIMENSIONS & TOLERANCES:

ID x OD x Length of the tube and tolerances shall be stated on the order/drawing. It is mostly required in the form of finished components as per drawings.

5. FINISH:

5.1 The tubes shall have a uniform and smooth finish and be free from splits, inclusions or foreign bodies, visible defects and voids. Waviness between layers on out side is acceptable upto ± 0.8 mm max. Cylinders/Tubes to be Machined on outer surface if the waviness of spiral cross winding layers exceeds the specified limit.

5.2 The machined surface shall be uniformly finished with an arc resisting varnish,s which shall not effect the properties of transformer Oil.

6. TEST METHODS:

Unless otherwise specified, the tests shall be conducted in accordance with the relevant methods AA 085 17 01.

7. SAMPLE FOR TEST:

50 to 60 mm long built up circumferential wound portion of the cylinder which is cut to have cylinders of ordered length shall be submitted for testing& approval.

8. PHYSICAL PROPERTIES:

8.1 Apparent Density:

2.1 g/cm3, Min, when tested on a sample of size 25x25 mm by any conventional method.

8.2 Water absorption after 96 hours of water immersion at room temp.

0.2X, Max. when tested on a cured sample of 38 mm length ft 38 mm width.

8.3 Shrinkage after 96 hours at 120 t 4 deg.C.

0.5% max, when tested on a cured sample of 50 mm length& 50 mm width.

8.4 Bond Content:

22 ± 2X.

Shall be determined by burning the bond at 600 - 620 deg.C for sufficient time.

8.5 Texture of Glass:

Test shall be carried out on 50 mm long (curved) and 25 mm wide sample by burning the bond at 600-620 deg.C for sufficient time.

Glass fibres shall have cross weave orientation.

9. ELECTRICAL PROPERTIES:

9.1 Electric Strength in oil at 90 ± 2 deg C (Axial)

50 kV/25 mm for 5 minutes, when tested on a curved sample of 50 mm length.

9.2 Comparative Tracking Index

600, min,

10. TEST CERTIFICATE:

Three copies of the test certificates shall be supplied with each consignment, giving the following Information:

BP 22488 : Glass Filament Would Epoxy Bonded Tubes. Rev.03

Our Order No.

Supplier's reference no.

Batch No.

Test values obtained/certificate for compliance for clause 4,5, 8 & 9.

11. PACKING AND MARKING:

The tubes/components shall be suitably packed to prevent damage during transit. Each package shall bear the following information:-

BP 22488 : Glass Filament Wound Epoxy Bonded Tubes.

Our Order No.

Manufacturer's and/or supplier's Name and Grade.

Batch No.

ID x OD x Length/Drawing No.

No.of tubes/components.