


Annexure 'A'

	PLANT PURCHASING SPECIFICATION BHEL -JHANSI	JS 22299	
		PAGE 1 OF 3	Rev.01

GLASS FILAMENT WOUND EPOXY BONDED CYLINDERS/EDGE BLOCK FOR TRANSFORMER

1. GENERAL:-

This specification governs the requirement of glass filament wound epoxy bonded cylinders 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 3mm radial thickness) can be cut to a sufficient length to remove the weaker cross over build up of winding. The cylinders must have excellent mechanical characteristics attained by winding the filament at a suitable angle approx 45° to the mandrel axis. The cylinder's shall have no deteriorous effect on the properties of transformer oil and are capable of withstanding high degree of mechanical, electrical & thermal stresses. Cylinders should have temperature index of at least 120.

2. APPLICATION :


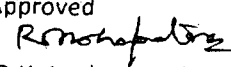
Used in manufacture of (a) Base cylinder for transformer winding
(b) Edge blocks for end supports.

3. COMPLIANCE WITH NATIONAL STANDARDS :


There is no Indian standard for this type of material.

4. DIMENSIONS & TOLERANCES :

Dimensions & tolerances (if any) of base cylinders and edge blocks shall be stated on the order/drawing. It is mostly required in the form of finished components as per drawings. The acceptable limit of tolerance on thickness of cylinder/ edge block is ± 0.25 mm.

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8

	PLANT PURCHASING SPECIFICATION BHEL -JHANSI	JS 22299	
		PAGE 2 OF 3	Rev.01

5. FINISH :


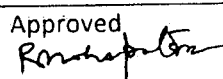
- 5.1. The cylinders shall have a uniform and smooth finish at I/D and be free from splits, inclusion of foreign bodies, visible defects and voids. Cylinders to be machined on outer surface.
- 5.2. The machined O/D surface shall be uniformly finished with an arc resisting varnish with suitable temperature index, which shall not affect the properties of transformer oil.
- 5.3. Edge trimming to be done to avoid any sharp corners.


6. TEST METHODS :-

Unless otherwise specified the tests shall be conducted in accordance with the relevant methods AA0851701.

7. PHYSICAL PROPERTIES :

- 7.1. Apparent Density 1.7 g/cc (Min.) when tested on a sample of 38mm length & 38mm width by any conventional method.
- 7.2. Water absorption after 4 days of water immersion at room temperature 0.2% max when tested on a cured sample of 38mm length & 38mm width.
- 7.3. Shrinkage after 4 days at 120+/-4° C.
0.5% max. When tested on a cured sample of 38mm length & 38mm width.
- 7.4. Bond content :
30 to 40% shall be determined by burning the bond at 600-620° C for sufficient time.
- 7.5. Texture of glass:
Test shall be carried out on 50mm long (curved) and 25mm wide sample by burning the bond at 600-620° C for sufficient time.
Glass fibres shall not have cross weave orientation.

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	PLANT PURCHASING SPECIFICATION BHEL -JHANSI	JS 22299	
		PAGE 3 OF 3	Rev.01

- 7.6. Mechanical strength :
 - Compression strength axial: 85 N/mm² (min.)
 - Compression strength circumferential: 250 N/mm (min.)
- 8. ELECTRICAL PROPERTIES : (Test to be conducted on a sample test piece and separate test certificate to be submitted)
 - 8.1. Electrical Strength in oil at 90+/-2⁰ C : 10kv /mm for 5 minutes.
 - 8.2. Comparative Tracking Index: (400 Min.)
 - 8.3. Dielectric loss factor tan delta at 90⁰ C and 50 Hz: 0.005 (Max.)

9. TEST CERTIFICATE :
 Material shall be tested for each batch of consignment for physical properties at clause 7. Three copies of test certificates shall be supplied with each consignment giving the following information.

- Our Order No.
- Supplier's reference No.
- Batch No.

10. PACKING AND MARKING :
 The cylinder/edge block shall be suitable packed to prevent damage during transit. Each packing shall bear the following information.
 JS 22299 REV01 Glass Filament Epoxy bonded edge-block /Cylinder

- Our Order No.
- Manufacturer's and / or supplier's Name and Grade
- Batch No.
- ID x OD x Length/ Drawing No.
- No. of Edge block / Cylinder.

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	30.10.2002	<i>[Signature]</i> (All Power Design Engineers)	<i>[Signature]</i> (R.K. Mohapatra)