

Tender ref number NP12303933



Tender ID 2024_BHEL_37331_1

Corrigendum1 for revised specification

PURCHASE SPECIFICATION FOR FIBER REINFORCED PLASTIC TUBES

SECTION	1602
Specification No	BHLSBD:CI:FRP: HI:001
Rev No	02
Rev Date	20-09-2023
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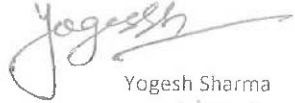
SL NO	Specification	Requirement	
1	Purpose	The Specification provide guidelines for different properties of Fiber re-inforced plastic/polymer (FRP) tubes with relevant standards used for measurement of these values. The FRP tubes are to serve as core component in manufacturing Polymer composite Hollow Insulators up to 800KV rating by Injection Moulding technique. Composite Hollow Insulators are used in circuit breakers , CT, VT, Capacitor Housings, Power transformers etc for Standard & polluted Zones	
2	Drawings	Fully finished FRP (Fiber Reinforced Plastic) Tubes made by wet filament winding technique using incut fibers, meeting the technical requirements as per Sl.No 3 of this specification & mentioned in the concerned drawings. The tubes should be post-cured. Internal diameter side Polyester coating should be done if mentioned in the drawing.	
3	Technical Parameters		
SL.No	Parameter	Reference Standard	Specified value
3.1	Visual Examination	----	Tube should be free from any defects like voids inconsistency of the material, deformation, crack etc.
3.2	Dimensions	As per drawing	As per drawing
3.3	Dye Penetration Test	IEC 61462 & IEC 62217	No Dye Penetration for 15 Minutes(minimum)
3.4	Flammability Test	IEC 60695-11-10	VO
3.5	Water absorption	DIN 53475 / ASTM D570	0.1% Maximum
3.6	Water absorption, 100°C	DIN 53479	0.1% Maximum
3.7	Water diffusion test	IEC 62217	Leakage Current should not exceed 1mA & no puncture & surface flash over after applying 12KV for one minute
3.8	Specific Gravity	ASTM D792-20	2.0±0.1
3.9	T _g Temperature	ASTM D 3418/ D 7028-07	125°c
3.10	Chemical Resistance	BHEL-SBD-CI-FRP-001	FRP material should not react with Transformer Oil
3.11	Glass Content	IS: 13411 Annexure A	75% (min)
3.12	Tensile E- Modulus	ASTM D3039 / D 2105-01(2019)	12500 Mpa
3.13	Shear Strength	ASTM D 3846	10 Mpa

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3.14	Volume resistivity	IEC 62631-3-1	$> 3 \times 10^{12} \Omega$
3.15	Di-electrical Strength	IEC 60243	8 to 10 KV/mm
3.16	Di-electrical Loss factor (tan δ)	IEC 62631-1 & 2	0.30 to 0.50
3.17	Relative Permittivity	IEC 62631-1 & 2	3 to 6
3.18	Mechanical test requirement of the FRP Tubes	As per Drawing	As per Drawing

4	Winding Angle	25 DEG & 54 DEG
5	Packing	Each FRP Tube should be wrapped using 10 mm thick expanded polythene Sheet to avoid foreign material (like dust etc) deposition. To be packed in a well seasoned wood crate or strong corrugated box, such that no damage (like scratch, dent, Bend, crack etc) should take place during transportation / transit. Relevant marking to be labelled or printed on the crate / box.
6	Marking	Each Tube should be marked 1. Manufacture's name, 2. Serial Number 3. Date of Manufacture

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