

 TP SOUTHERN ODISHA DISTRIBUTION LIMITED A Joint Venture of Tata Power and Government of Odisha	TP SOUTHERN ODISHA DISTRIBUTION LIMITED		F01-(09.07.04)
			Revision: 03
			Release Date: 20/08/2026
Name of the Document	SPECIFICATION FOR ENAMELLED COPPER WINDING WIRE (0.630 mm dia.), (0.560 mm dia.) & (0.710 mm dia.)		
Document No.	ENG-GEN-08	Document Revision No.	03
Prepared By	Reviewed By	Approved By	Issued By
SIBANI PANDA	Shailendra Kumar Jaiswal	Ashok Saraf	Dnyaneshwar Ramchandra Dharmadhikari

SR NO	PARTICULARS
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1. SCOPE:

This specification covers the technical requirements of design, manufacture, testing at manufacturer's works, packing, forwarding, supply and unloading at site/store of TP Southern Odisha Distribution Limited of **Enamelled Copper Winding Wire of diameter 0.63mm.**

2. APPLICABLE STANDARDS

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. The latest addition of the referenced documents applies (including any amendments)

IEC:60317-0-1-2013 - Specification for particular types of winding wire, Part 0-1: General requirement -Enamelled round copper wire.

IEC:60172 - Test procedure for the determination of temperature index of enamelled winding wires

IEC:60851 - Test methods

IS:13730: Part 0: Section 1:1993 – Specification for particular types of winding wires

IS:13730: Part 3: 2012 - Specification for particular types of winding wires

3. CLIMATIC CONDITIONS OF THE INSTALLATION

The material shall be suitable for following climatic conditions,

[a] Maximum altitude above sea level	: 1000 m
[b] Maximum ambient temperature	: 50 ° C
[c] Maximum daily average ambient air temperature	: 40 ° C
[d] Minimum ambient air temperature	: -5° C
[e] Maximum temperature attainable by an object exposed to the sun	: 60 ° C
[f] Maximum yearly weighted average ambient temperature	: 32° C
[g] Maximum relative humidity	: 100%
[h] Average no. of rainy days in a year	: 120 days
[i] Average annual rainfall	: 150 cm
[j] Maximum wind pressure	: 260 Kg/Sq.Mtr
[k] Average number of thunderstorm days per annum	: 70

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Environmentally, the region where the equipment will be installed includes coastal areas, subject to high relative humidity, which can give rise to condensation.

Onshore winds will frequently be salt laden. On occasions, the combination of salt and condensation may create pollution conditions.

Therefore, outdoor material and equipment shall be designed and protected for use in exposed, heavily polluted, salty, corrosive, tropical and humid coastal atmosphere.

4. GENERAL TECHNICAL REQUIREMENTS

Sl.no	Guaranteed Technical Requirement	Requirement	Requirement	Requirement	Remarks
1	Grade	2	2	2	---
2	Nominal Conductor Diameter (mm)	0.630	0.560	0.710	---
2.1	Minimum avg. force to failure (N)	7.90	7.40	8.50	---
2.2	Minimum force to failure of each measurement (N)	6.70	6.25	7.20	---
3	Appearance	The film coating shall be essentially smooth and continuous, free from streaks, blisters and foreign material when examined with normal vision, as wound on the original spool or reel of length 228mm.			clause 3 of IEC 60317-0-1
4	Dimension	0.630	0.560	0.710	Tol. Not accepted other than ± 0.006 as per IEC 60317-0-1
4.1	Conductor tolerance (mm)	± 0.006	± 0.006	± 0.007	---
4.2	Minimum increase due	0.05	0.047	0.053	resistance at 20° C

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	to insulation (mm)				
4.3	Maximum overall diameter	0.704	0.630	0.789	resistance at 20° C
5	Electrical Resistance at 20° C				---
5.1	Minimum (Ω/m)	0.05335	0.06736	0.04198	---
5.2	Nominal (Ω/m)	0.5484	0.06940	0.04318	---
5.3	Maximum (Ω/m)	0.05638	0.07153	0.04442	---
6	Elongation	Shall not be less than 27%	Shall not be less than 26%	Shall not be less than 28%	Elongation at fracture
7	Springiness				---
7.1	Mandrel Diameter (mm)	37.5	25	37.5	---
7.2	Tension (N)	12	8	12	---
7.3	Maximum Spring back (degrees)	50	44	47	---
8	Flexibility, Adherence & Heat Shock	The coating shall show no crack after the wire has been elongated and wound on the appropriate mandrel as per IEC:60317-0-1			---
9	Min Breakdown Voltage (RMS Value at 20° C)				---
9.1	Room temperature (V)	4800	4600	4800	---
9.2	Elevated Temperature (V)	3600	3500	3600	---
14	Continuity of Insulation	5 faults/30mtr			---

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15	Temperature Index	The test shall be carried out in accordance with IEC 60172. The time to failure at the lowest test temperature shall not be less than 5000 h		---
16	Test	To be done as per IEC-60851, IEC 60317		---
16.1	Resistance to refrigerants	To be done as per IEC-60851, IEC 60317		---
16.2	Solderability	To be done as per IEC-60851, IEC 60317		---
16.3	Heat or Solvent Bonding	To be done as per IEC-60851, IEC 60317		---
16.4	Dielectric dissipation factor	To be done as per IEC-60851, IEC 60317		---
16.5	resistance to transformer oil	To be done as per IEC-60851, IEC 60317		---
16.6	Pin Hole Test (Max)	Test method as per IEC 60317		---
17.	Marking on spool (visible printing/non-tearable stickering)	Wire (SWG), Wire (Dia.), Gross weight of bobbin (Kg), Wire Weight (Kg), Spool weight (Kg)		

5. Type Tests

Type test certificates on selected material, strictly as per IEC, with latest amendment thereof, from **NABL recommended by TPSODL** or any Govt. labs. The type test certificates must accompany drawing of type tested equipment, duly signed by type testing authority. The above tests must not have been conducted on the equipment earlier than 5 years from the date of opening of bids. In case of any change in design/type of machine already type tested and the one offered against this specification, the owner reserves the right to demand repetition of type tests, without any extra cost.

6. Acceptance and Routine Tests

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All acceptance and routine tests, as stipulated in relevant standards, shall be carried out by the manufacturer, in presence of owner's representative. Immediately after finalization of the program of type testing, the manufacturers shall give, fifteen days advance intimation to the owner, to enable him depute his representative for witnessing the tests.

7. Sample

Bidder shall provide the sample, to the user during tender evaluation. Deviation for sample verification is not allowed in this tender. Also, the sample may not be returned as the sample shall be tested for testing/site installation suitability etc.

8. Make:

Reputed make along with performance certificates from Transformer Manufacturer. Finalization will be done at the time of detailed engineering.

9. Performance Guarantee

The equipment offered shall be guaranteed for satisfactory performance for a period of 18 months from the date of receipt of complete material at destination store/site in good condition or 12 months from the date of satisfactory installation of material whichever is earlier. The material found defective/failed within the above guarantee period shall be replaced/repared by the supplier free of cost within one month of receipt of intimation. If the defective/failed equipment are not replaced/repared as per the above guarantee clause, the company shall recover the supply cost of that material amount plus 15 % supervision charges from any of the supplier's bills.

10. Pre-dispatch Inspection:

The firm shall demonstrate the Plant performance as per parameters mentioned in the specifications.

11. Packing and Forwarding:

The equipment shall be packed in suitable crates so as to withstand handling during transport and outdoor storage during transit. The supplier shall be responsible for any damage to the equipment during transit, due to improper and inadequate packing. The easily damageable materials shall be carefully packed and marked with the appropriate caution symbols. Wherever necessary, proper lifting arrangement such as lifting hooks etc. shall be provided. Any material found short inside the packing cases shall be supplied by supplier without any extra cost.

Each consignment shall be accompanied by a detailed packing list containing the following information:

- Name of the consignee.
- Details of consignment.
- Destination.

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- d. Net mass of wire.
 - e. Nominal dimension of wire & Grade of insulation
 - f. Date of manufacturing
 - g. Handling and unpacking instructions.
 - h. Bill of materials indicating contents of each package and spare materials
- The supplier shall ensure that the packing list and bill of materials are approved by the purchaser before dispatch.

12. Schedule of Deviations:

(TO BE ENCLOSED WITH TECHNICAL BID)

All deviations from this specification shall be set out by the Bidders, clause by Clause in this schedule. Unless specifically mentioned in this Schedule, the tender shall be deemed to confirm the purchaser's specifications:

S. No	Clause No.	Details of deviation with justifications

We confirm that there are no deviations apart from those detailed above.

Seal of the Company:

Signature of Bidder:

Name of the Company:

Date:

Office Seal: