

STANDARD TECHNICAL SPECIFICATION COVER SHEET

Specification No. : ENG-GEN-4023

Specification Name : Technical Specification For Fuse Wire

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1. SCOPE:

This specification is intended to cover the design, manufacture and testing before dispatch, supply and delivery of Tinned Copper Fuse Wire at TPCODL/ TPNODL/ TPWODL/ TPSODL stores. Tinned copper fuse wire shall be used for re-wire able type electric fuses for protection of lines and transformers.

2. APPLICABLE STANDARDS:

The Tinned Copper Fuse wire shall be generally comply in all respect to the requirement of relevant IS: 9926/1981 amended till date except wherever modified in this specification. Consideration may be given to alternative which the supplier consider advisable by reasons of his own manufacturing requirements and experiences, provided descriptive matter is submitted and recommended device of arrangement is equal to or superior to that required by the accompanying specification and if the purchaser is convinced of the quality and/ or superiority of the material.

IS: 8130: 1984: Specification for conductor for insulated electric cables and flexible cord.

3. CLIMATIC CONDITION OF THE INSTALLATION

1	Maximum ambient temperature	50 deg C
2	Max. Daily average ambient temp	35 deg C
3	Min Ambient Temperature	0 deg C
4	Maximum Humidity	95%
5	Average Annual Rainfall	1500mm
6	Average No. of rainy days per annum	120
7	Altitude above MSL not exceeding	1000mm
8	Wind speed	300 Km/hr
9	Earthquakes of an intensity in horizontal direction	equivalent to seismic acceleration of 0.3g
10	Earthquakes of an intensity in vertical direction	equivalent to seismic acceleration of 0.15g (g being acceleration due to gravity)

TPCODL/ TPNODL/ TPWODL/ TPSODL service area has heavy saline conditions

along the coast and High cyclonic Intensity winds with speed upto 300 Kmph. The atmosphere is generally laden with mild acid and dust in suspension during the dry months and is subjected to fog in cold months.

4. TECHNICAL SPECIFICATION:

The Tinned Copper Fuse wire shall be conforming to the IS 9926/1981 with latest amendments, if any.

Diameter & maximum allowable Resistance should be as below :

Sr. No.	Item Description	SWG	Nom Dia (in mm)	Tolerance (+/-)t	Permissible resistance in Ohm per meter at 20 ° C (Max/Min)	
1	6A TC Fuse Wire	36	0.20	0.003	0.5644	0.5250
2	10A TC Fuse Wire	33	0.35	0.004	0.1834	0.1730
3	16A TC Fuse Wire	25	0.50	0.005	0.0898	0.0848
4	20A TC Fuse Wire	23	0.63	0.006	0.0566	0.0535
5	25A TC Fuse Wire	22	0.75	0.008	0.0400	0.0376
6	32A TC Fuse Wire	20	0.85	0.009	0.0311	0.0293
7	40A TC Fuse Wire	18	1.25	0.011	0.0143	0.0136
8	63A TC Fuse Wire	16	1.50	0.015	0.0099	0.0094
9	80A TC Fuse Wire	15	1.80	0.018	0.0069	0.0065
10	100A TC Fuse Wire	14	2.00	0.020	0.0056	0.0053

For the specified sizes, those are not defined in Indian Standards, but are procured sometimes for O&M activities, bidder to provide the below details :

Sr. No.	Item Description	SWG	Nom Dia (in mm)	Tolerance (+/-)t	Permissible resistance in Ohm per meter at 20 ° C (Max/Min)
1	2.5A TC Fuse Wire	Bidder to provide			
2	8.5A TC Fuse Wire				
3	200A TC Fuse Wire				
4	300A TC Fuse Wire				

5. GENERAL CONSTRUCTION

The Tinned Copper fuse wire shall comply with the following requirements: -

a) The fuse wire shall be made from electrolytic tough pitched (ETP) copper (tinned) conforming to IS:8130/1984 amended up to date.

- b) The fuse wire is designed to melt and open the circuit to avoid any fault to circuit
- c) The fuse wire shall be circular and shall have a uniform cross section and free from pits, draw marks or any other harmful surface defects.
- d) The tin coating layer shall be uniform, smooth, continuous and firmly adherent to the base copper material.
- e) The electrical properties of the material used ETP copper, for making the fuse wires shall be as given here under
 - i. Resistivity at 20 ° C --- 0.017241 ohm mm Sq./m
 - ii. Density at 20 ° C ----- 8.89 gm/cub cm.
 - iii. Constant mass temp. Deficient of resistance at 20 ° C --- 0.00393/ ° C .
 - iv. Coefficient of linear expansion --- 17 x 10-6 / ° C.

6. NAME PLATE & MARKING

Not Applicable

7. TESTS:

All the routine and acceptance tests shall be carried out in accordance with the relevant IS/ IEC standards. All routine and acceptance tests shall be witnessed by the purchaser/ his authorized representative. All components shall be type tested as per relevant standards.

7.1 TYPE TESTS

The following tests shall be carried out: -

- i) Visual examination.
- ii) Dimensional Check.
- iii) Resistance test
- iv) Per sulphate test

7.2 ROUTINE TESTS

- i) Visual examination.
- ii) Dimensional Check.

iii) Resistance test

7.3 ACCEPTANCE TESTS

- i) Visual examination.
- ii) Dimensional Check.
- iii) Resistance test

8. TYPE TEST CERTIFICATES

The bidder shall furnish the type test certificates of the fuse wire for the tests as mentioned as above as per the corresponding standards. All the tests shall be conducted by CPRI/ ERDA or TPCODL/ TPNODL/ TPWODL/ TPSODL recommended other government Laboratories as per the relevant standards. Type test should have been conducted in certified Test Laboratories during the period not exceeding 5 years from the date of opening the bid. In the event of any discrepancy in the test reports i.e. any test report not acceptable or any/all type tests (including additional type tests, if any) not carried out, same shall be carried out without any cost implication to TPCODL/ TPNODL/ TPWODL/ TPSODL.

9. PRE-DISPATCH INSPECTION

The material shall be subject to inspection by a duly authorized representative of the TPCODL/ TPNODL/ TPWODL/ TPSODL. Inspection may be made at any stage of manufacture at the discretion of the purchaser and the equipment, if found unsatisfactory as to workmanship or material, the same is liable to rejection. Bidder shall grant free access to the places of manufacture to TPCODL/ TPNODL/ TPWODL/ TPSODL's representatives at all times when the work is in progress. Inspection by the TPCODL/ TPNODL/ TPWODL/ TPSODL or its authorized representatives shall not relieve the bidder of his obligation of furnishing equipment in accordance with the specifications. Material shall be dispatched after specific MDCC (Material Dispatch Clearance Certificate) is issued by TPCODL/ TPNODL/ TPWODL/ TPSODL.

Following documents shall be sent along with material.

- a. Test reports
- b. MDCC issued by TPCODL/ TPNODL/ TPWODL/ TPSODL
- c. Invoice in duplicate
- d. Packing list
- e. Drawings & catalogue

- f. Guarantee / Warrantee card
- g. Delivery Challan

Other Documents (as applicable).

10. INSPECTION AFTER RECEIPT AT STORE

The material received at TPCODL/ TPNODL/ TPWODL/ TPSODL store will be inspected for acceptance and shall be liable for rejection, if found different from the reports of the pre-dispatch inspection and one copy of the report shall be sent to Engineering & contracts department.

11. GUARANTEE

Bidder shall stand guarantee towards design, materials, workmanship & quality of process/ manufacturing of items under this contract for due and intended performance of the same, as an integrated product delivered under this contract. In the event any defect is found by the Purchaser up to a period of at least 12 months from the date of commissioning or 24 months from the date of last supplies made under the contract whichever is later, (the time scale of 12/24 months could be enhanced subject to mutual agreements). Bidder shall be liable to undertake to replace/rectify such defects at its own costs, within mutually agreed time frame, and to the entire satisfaction of the Purchaser, failing which the Purchaser will be at liberty to get it replaced/rectified at Bidder's risks and costs and recover all such expenses plus the Purchaser's own charges (@ 20% of expenses incurred), from the Bidder or from the "Security cum Performance Deposit" as the case may be.

Bidder shall further be responsible for 'free replacement' for another period of THREE years from the end of the guarantee period for any 'Latent Defects' if noticed and reported by the Purchaser.

12. PACKING:

The fuse wires shall be supplied in spools weighing 1 kg. The bidder shall ensure that all the fuse wire spools shall be adequately protected and specification shall be prepared for rail/road transport in a manner so as to protect the equipment from damage in transit.

13. TENDER SAMPLE:

Bidder to share the Tender sample of material with the offer.

14. QUALITY CONTROL:

The bidder shall submit with the offer Quality Assurance Plan indicating the various stages of inspection, the tests and checks which will be carried out on the material of construction, components during manufacture and bought out items and fully assembled component and equipment after finishing. As part of the plan, a schedule for stage and final inspection within the parameters of the delivery schedule shall be furnished. The Purchaser's engineer or its nominated representative shall have free access to the manufacturer's/sub-suppliers works to carry out inspections. The bidder shall ensure that the material supplied is as per the Guaranteed Technical Particulars as specified in the specifications.

15. MINIMUM TEST FACILITIES

Bidder shall have adequate in house testing facilities for carrying out all routine tests & acceptance tests as per relevant Indian standards. In case of supply by the channel partner, the manufacturer shall have the in house testing facilities to carry out the routine and acceptance tests.

16. MANUFACTURING ACTIVITIES

The successful bidder will have to submit the bar chart for various manufacturing activities clearly elaborating each stage, with quantity. This bar chart should be in line with the Quality assurance plan submitted with the offer. This bar chart will have to be submitted within 15 days from the release of the order.

17. SPARES, ACCESSORIES & TOOLS

Not Applicable.

18. DRAWING & DOCUMENTS

Following documents shall be prepared based on TPCODL/ TPNODL/ TPWODL/ TPSODL specifications and statutory requirements with complete BOM and shall be submitted with the bid:

- a) Completely filled in Schedule "A" Guaranteed Technical Particulars.
- b) Work Experience details
- c) Type test certificates.
- d) Drawing (3 sets) of Guy Insulator containing complete information about manufacturing

& fabrication etc.

After the contract soft copies of drawing and GTP shall be forwarded for approval. Soft copies of all the drawing, GTP, test certificates shall be submitted after the final approval of the same to the purchaser.

Following Drawings/Documents shall be submitted after the award of the contract				
Sl No.	Description	For Approval	For Review Information	Final Submission
1	Technical Parameters	Required		Required
2	Manual/Catalogues/drawings for all components.		Required	
3	Technical details of fuse wire.		Required	Required
4	Installation Instructions		Required	Required
5	Instructions for use		Required	Required
7	Transport/shipping dimensions		Required	Required
8	OA & QC Plan	Required	Required	Required
9	Routine, Acceptance and Type test Certificates	Required	Required	Required

All the Documents and Drawings shall be in English Language.

Instruction Manuals: Bidder shall furnish soft copies of manual (in English Language) covering erection and maintenance instructions and all relevant information pertaining to the main equipment as well as auxiliary devices

19. SCHEDULE "A" GUARANTEED TECHNICAL PARTICULARS

S.No	Description	Units	To be furnished by bidder
1	Nominal Diameter	mm	To be furnished by bidder
2	Rated Current of Fuse Wire	±t	
3	Tolerance	A	
4	Rated SWG of the fuse wire with reference the rated current	SWG	
5	Maximum Permissible Resistance at 20°C	ohm/m	
6	Minimum Permissible Resistance at 20°C	ohm/m	
7	Weight of each Packing Spool	kg	

21. SCHEDULE "B" DEVIATION:

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:

SI No.	Clause No.	Details of Deviation with Justification

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

Seal of Company

Signature

Designation