

Addendum-1

Technical Specification for Cables

1. Scope

This specification covers the technical requirements of design, manufacture, test at manufacturer's works, packing & forwarding supply at stores/ sites, unloading at utility stores for efficient and trouble free operation. The specific requirements are covered in the enclosed technical data sheet.

2. Applicable Standards

The equipment shall conform to latest relevant applicable Indian standards. Equipment's complying with any authoritative standards such British, USA, VDE, IEC etc. will also be considered if it assures performance equivalent to or superior to standards below. In such cases bidder shall clearly indicate the latest standard. Standards adopted and furnish a copy of the English version / translation of the same. List of applicable standards is as below:

Sr. No	IS/ IEC standards	Particulars
1	IS-8130	Conductor for insulated electric cables & flexible cords
2	IS-5831	PVC insulation and sheath of electric works
3	IS-1554	PVC insulated cables
4	IS-5216	Guide for safety procedures and practices in electric works
5	IEC-228	Conductor for insulated cables
6	IEC-332	Flame Retardant, characteristics of electric cables
7	IS-3975	Mild steel wires strips and tapes for armoring cables
8	Indian Electricity Act	
9	Indian Electricity Rules	
10	The Electricity Act 2003	

3. Climatic conditions of the installation

Temperature

- i. Max. Ambient Temperature : 50 Deg C
- ii. Max. Daily avg ambient Temperature : 40 Deg C
- iii. Max Soil temperature at cable length : 30 Deg C

Relative Humidity

- i. Maximum : 100%
- ii. Minimum : 10%
- iii. Avg number of thunderstorms per annum: 40
- iv. Avg annual rainfall : 750 mm
- v. Rainy Months : June to Oct
- vi. Altitude not exceeding : 300 Mtrs above M.S.L.
- vii. Wind Pressure : 195 kg/sq m up to 30 meters.
Deviations as per IS 875-1975

The variation between daily maximum and minimum temperature is of the order of 15-20 Deg C. the design of equipment and accessories shall be suitable to withstand seismic forces corresponding to an acceleration of 0.1g.

The design, manufacture and performance of the equipment and services provided under this specification shall comply with the standards, rules, regulations and acts given in this specification.

4. General technical requirements

This specification covers design, engineering manufacturing, testing packing at manufactures' works and delivery of 1.1 KV(E), PVC insulated, Al/Copper conductor, galvanized steel round wire armoured/ un-armoured cable.

5. General constructions

The PVC insulated cable shall be manufactured and tested strictly in accordance with Indian standard IS 1554 (Part-I)/ 1998 and its latest amendments.

All the material used in the manufacturing of cables shall be new and shall be selected as the best available for the intended use.

1.1kV, stranded copper conductor, PVC insulated, extruded inner sheath, galvanized round wire armoured, extruded outer sheathed cable conforming to IS 1554 (part 1) with latest amendments.

1.1kV, stranded aluminium conductor, PVC insulated, extruded inner sheath, galvanized round wire armoured, extruded outer sheathed cable conforming to IS 1554 (part 1) with latest amendments.

The cable should be sequentially marked and the color shall be uniform for all the cable.

- a. Armouring: The armouring shall be of galvanized steel wires for multi core cables. The galvanized steel wires shall comply with the requirements of IS: 3975 with latest amendments. No tolerance on the negative side shall be acceptable.
- b. Outer sheath: The outer sheath shall be of polyvinyl chloride (PVC) compound conforming to the requirements of Indian standards IS: 5832 with latest amendments. The outer sheath shall be applied by extrusion process.
The thickness of the outer sheath shall be as per IS: 155 (Part1). No tolerance on the negative side shall be acceptable.
- c. Core Identification: Individual core of the multi core cables shall be color coded and / or numbered for proper identification in accordance with relevancy IS/ manufacture's standard, subject to specific approval of purchaser.
- d. Reels/ Drums: cables shall be supplied in wooden drums in the specified length. Wooden drums shall be strong, weather proof and non-returnable. The ends of the cable shall be sealed by means of non-hygroscopic sealing material.

6. Tests

Cables shall be subjected to routine & acceptance tests in accordance with the relevant standards in addition to physical ageing and electrical tests at manufacturer's plant in accordance with applicable standards. All the cost of such tests, including replacement of damaged material shall be borne by the manufacturer. Cables, if required shall be subject to inspection and shall not be shipped without release from purchaser.

7. Type Test certificates

The bidder shall furnish type test certificates and results as per relevant IS/ Standards at the time of dispatch.

8. Pre-dispatch Inspection

Cables shall be subject to inspection by a duly authorized representative of the purchaser. Inspection may be made at any stage of manufacture at the option of the purchaser and the equipment found unsatisfactory as to workmanship or material is liable to rejection. Supplier shall grant free access to the places of manufacture to purchaser's representative at all times when the work is in progress. Inspection by purchaser or its authorized representative shall not relieve the supplier of his obligation of furnishing equipment in accordance with the specification. Material shall be dispatched after specific MDCC is issued by purchaser.

Following documents shall be sent along with material:

- a) Test reports
- b) MDCC issues by the purchaser
- c) Invoice in duplicate
- d) Packing list
- e) Guarantee/ warranty card
- f) Delivery challan
- g) Other documents(as applicable)

9. Inspection after receipt at Stores

Purchaser will inspect the material received at stores for acceptance

10. Guarantee

Supplier shall stand guarantee towards design, material, workmanship & quality of process/ manufacturing of items under the 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 12 months from date of commissioning or 18 months from the date of last supplies made under the contract, whichever is earlier, supplier shall be liable to undertake to replace/ rectify such defects at his own costs within mutually agreed time frame and to the entire satisfaction of the purchaser, failing which the company will be at liberty to get it replaced/ rectified at suppliers risks and costs and recover all such expenses plus the Purchasers own cost(@20% of expenses incurred) from the supplier or from the " Security cum performance Deposit" as the case may be.

Supplier shall further be responsible for "free replacement" for another period of FOUR years from the end of guarantee period for any "Latent Defects" if noticed and reported by the company.

11. Packing

The material shall be packed as per the following:

Drum Length : 500/1000 Meters

Tolerance on Drum Length : $\pm 5\%$

Tolerance in total length : $\pm 2\%$

12. Tender Sample

Not Required

13. Quality Control

The bidder shall submit within two weeks from LOI, assurance plan indicating the various stages of inspection the tests and checks that will be carried out on the material of construction, components during manufacture and after finishing bought out items and fully assembled component and equipment including drives. 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 representative shall have free access to the manufacturer/ sub-suppliers works to carry out inspections.

14. Minimum Testing facilities

Test facility shall be fully equipped for conducting the routine tests and acceptance test as per IS.

15. Manufacturing Activities

The manufacturer shall have adequate machinery for manufacturing cables according to the Quality Assurance Manual, as applicable.

16. Guaranteed Technical Particulars

Bidder shall submit guaranteed technical particulars.