

TECHNICAL SPECIFICATION OF UNARMoured 1.1 kV ALUMINIUM LT PVC INSULATED PVC SHEATHED CABLES 3½ CORE 25mm², 50mm², 70mm² & 150mm².

1. SCOPE:

This specification covers Manufacture; testing at works, supply and delivery of unarmored 1.1 KV LT PVC insulated and sheathed round cable 3½ CORE 25mm², 50mm², 70mm² & 150mm² with sector shape aluminum conductor of H4 grade class-2 to any stores in Gujarat.

2. CLIMATIC CONDITIONS:

The unarmored L.T. PVC insulated & sheathed with yellow colour outer sheath cables are required to be laid outdoor either for giving power supply to LT motive power consumers or for LT distribution system on transformer center. The climatic conditions will be as under.

- | | |
|--|--|
| a) Temperature Variation | : 5°C to 55°C |
| b) Relative humidity | : Up to 95% |
| c) Altitude | : 0 to 1000 Meters |
| d) No. of tropical monsoon months | : 3 (Three) |
| e) Max. wind pressure | : 150 Kg/cm ² |
| f) Average annual rainfall | : 750/800 mm |
| g) Average thunder storm base per annum. | : 15 (Fifteen) |
| h) Terrain | : Coastal saline, desert chemically polluted, heavily/moderate, polluted and normal atmosphere |

3. INSTALLATIONS:

These cables are required to be laid outdoors on the transformer structures for LT power distribution i.e. from transformer L.T. bushings to LT distribution box and from LT distribution box to LT overhead lines supported on poles.

Date:	Seal & Signature of Tenderer
-------	------------------------------

These cables are required to be laid overhead, hung, exposed to Atmosphere in climatic condition as mentioned above. These are also to be used for giving power supply to LT motive power consumers.

4. APPLICABLE STANDARDS:

- a.IS : 1554 (Part-I)1988 (For cable)
- b.IS : 5831/1984 (For PVC Insulation/Sheath)
- c.IS : 8130 of 1984 (For Aluminum Conductor)
- d.IS : 10418 of 1982 (For wooden Drums)
- e.IS : 10810 of 1984 (Methods of test's for Cables)
- f. IS : 10462(Part-I)1983 (Fictitious calculation method for determination of dimensions of protective covering of cables)

5. TECHNICAL PARTICULARS:

a) The LT PVC cables shall be unarmored PVC insulated and sheathed with shaped stranded aluminum conductor for earthen neutral system **confirming to IS: 1554 (Pt-I) 1988** with latest amendment or revision if any. The cable shall be ISI marked and shall have characteristics suitable for voltage rating of 1100 V in standard length as mentioned clause VIIA.

b) The word name of DISCOM i.e. M.G.V.C.L/D.G.V.C.L/U.G.V.C.L/P.G.V.C.L, Voltage, Grade Electric, Year of Manufacture, IS Number and Manufacturer's Trademark shall be embossed clearly on every meter of cable.

c) Insulation and sheath:

The type of insulation shall be type A as per IS: 5831 of 1984with latest amendment/revision if any. The PVC of sheath shall be type ST-1 as per IS-5831 of 1984 (with latest amendment/revision) if any.

- (d) Colour of Insulation of each core as specified in IS.
- (e) Colour of outer sheath shall be yellow only.
- (f) Colour of inner sheath is black.

6. PACKING AND MARKING/EMBOSSING:

(i) The LT PVC cable of size 3½ Core x 25mm², 50mm², and 70mm² shall be wound on non-returnable wooden drums with standard length of 500 Meters and 3½ cores x 150mm² shall be in standard length of 250 Meters

(ii)The wooden drums shall be as per IS: 10418/1982. The outer surface of the drums shall be painted with white Aluminum paint. Similarly,

Date:

Seal & Signature of Tenderer

the inside surface of the drums shall have the protective layer of varnish/paint to protect it from white ants.

The ends of the cable shall be sealed by means of non-hydroscopic sealing materials.

(iii) The following information must be either stenciled on the drums

- a) IS: 1554(Pt-I)/88 or as applicable.
- b) Manufacturer's Name, Brand Name or Trade Mark
- c) Type of cable & Voltage Grade
- d) Number of cores
- e) Nominal cross sectional area of conductor
- f) Cable code
- g) Colour of cores
- h) Length of cable on the reel, drums or coil
- i) Number of lengths on reel, drum or coil
- j) Direction of rotation of drum (by means of arrow)
- k) Approximate gross weight & Drum No.
- l) Country of Manufacture
- m) Year of Manufacture
- n) P.O.(A/T) No. and Date
- o) Date of dispatch
- P) Property of DISCOM (i.e. MGVCL/DGVCL/UGVCL/PGVCL)
- q) Details of consignee (on wooden drums only)
- r) ISI Mark

7. The following words shall be duly embossed on sheath of very meter length of cables. The embossing should be clear and visible.

- a) Name of Purchaser (i.e. MGVCL/DGVCL/UGVCL/PGVCL)
- b) Voltage Grade
- c) Electric
- d) Year of Manufacture
- e) Trade Mark of Supplier
- f) IS Number

8. MARKING:

Progressive running length of the cable shall be marked on outer sheath at an interval of not more than 10 Meters.

9. TOLERANCES:

$\pm 1\frac{1}{2}\%$ of standard length

Date:

Seal & Signature of Tenderer

A) STANDARD LENGTH:

Cable Up to and including the size 3½ core x 70 mm² shall be packed in 500 Meters± ½ % whereas cable of the size 3½ core x 150mm² shall be packed in 250 Meters.± ½ % length.

B) NON-STANDARD LENGTH:

The non-standard length of not less than 100 Meters up to **3%** of Order quantity (for all sizes)

10. SUBMISSION OF ISI LICENSE AND G.T.P:

Cables bearing **ISI Mark only** will be acceptable. The tenderer/s should submit attested copy of ISI License of IS: 1554 (Part-I) 1988 valid at least up to the date of tender. If applied for renewal, the copy of receipt of fees and or acknowledgement of ISI/BSI shall be furnished along with copy of ISI License (Expired) with the offer. The firm shall also furnish G.T.P. as per Appendix-“A” attached.

11. SUBMISSION OF TYPE TEST CERTIFICATE NOT MORE THAN SEVEN YEARS OLD

The copy of the type test certificate for all type tests carried out as per IS: 1554 (Part-I) 1988 with latest amendment/revision in force, on date of opening of tender on any of the sizes mentioned and specified in the tender and offered by the firm, at **any Govt. approved Laboratory** has to be submitted along with the offer. The party has to submit type test certificate for the all sizes ordered on him before commencement of bulk supply and get it approved without affecting delivery scheduled.

12. INSPECTION AND TESTING:

a) Testing will be carried out at the works of Manufacturers in presence of Company's Engineers at firm's cost according to IS:1554(Part-I)1988with latest amendment/revision if any and in force on date of inviting tender. Materials shall not be dispatched by the supplier without having been inspected and test certificate approved by Company's Inspector and obtaining of specific dispatch instruction in writing.

b)The Company reserves the right to select sample from any offered/inspected lot against the A/T to be issued which will be get type tested at any Government approved laboratory as decided by the Company. The results of this type-tested sample shall be applicable for

Date:	Seal & Signature of Tenderer
-------	------------------------------

the entire quantity of the particular lot offered or supplied by the supplier. The Company shall bear the testing charges if sample passes all the tests and if sample fails in any one of the tests, supplier shall have to bear testing charges, same are recoverable from the supplier's any pending bill, security deposit, Bank Guarantee or by any suitable means, whichever deem fit by the Company. In case of sample failing in aforesaid type tests, supplier shall have to replace the whole lot materials, which should pass through the type tests, the re-testing charges will have to be paid by supplier. If any quantity against the particular lot is consumed by the Company, the supplier will agree for any penalty/deduction in price as decided by the competent authority of Company. Decision of competent authority in case of any dispute will be final and binding to supplier.

13. IMPORTANT:

In absence of valid ISI License, Guaranteed Technical Particulars and copy of type test certificate attested by authorized person, the offer is liable to be ignored without any further correspondence.

14. SEALING:

Both the ends of cable are to be provided with lead seals with seal wire.

15. MACHINE/METER CALIBRATION:

All machines and meters to be used in testing shall be calibrated within valid time limit either at the Laboratory of manufacturer or machine/meter or at Govt. recognized laboratory. The machine/meter to be used in testing shall be in tolerance limit as per their accuracy class.

**Manufacturer's Name:
and Address:**

Date:

Seal & Signature of Tenderer

GUARANTEED TECHNICAL PARTICULARS (G.T.P)

TECHNICAL INFORMATION AND GUARANTEED TECHNICAL PARTICULARS (GTP)

For supply of 3.5 Core x 25mm², 50mm², 70mm² and 150mm² unarmoured LT PVC insulated and with yellow colour outer sheathed round cable.

PART - A

Sr.No.	Particulars	Confirmation
1	Cable shall be manufactured and supplied Confirming to IS: 1554 (P-I) 1988 with latest Amendment if any and Company's specification	Yes
2.	Cable drum shall bear ISI Mark.	Yes
3.	ISI License shall remain valid till Order is completed.	Yes
4.	Colour of outer sheath - yellow	
	Size: a.3.5 C x 25mm ²	Yes
	b. 3.5 C x 50mm ²	Yes
	c. 3.5 C x 70mm ²	Yes
	d. 3.5 C x 150mm ² .	Yes
5.	Shape- Round	Yes
6	Standard Length is case of 3.5 Core x 25mm ² , 50 mm ² and 70 mm ² : 500 ± 0.5%	Yes
7.	Standard length in case of 3.5 core x 150 mm ² : 250mtr ± 0.5%	Yes
	a. Length measuring 100 Meters to 497 Meters shall be considered non-standard length and is acceptable up to 3% of ordered quantity (For 3.5 core x 25mm ² , 50mm ² , 70mm ²)	Yes
	b. Length measuring 100 Meters to 248 Meters shall be considered non-standard length and is acceptable up to 3% of ordered quantity (For 3.5core x 150sq.mm)	Yes

Date:	Seal & Signature of Tenderer
-------	------------------------------

8. Packing shall contain only one length Yes
9. Packing material: wooden drums as per IS: 10418/1982 duly painted as per Clause No. 6 of tender's specification Yes
10. Following shall be embossed on every Metre Length of cable.
 - a. Name of DISCOM i.e. **MGVCL/DGVCL/UGVCL/PGVCL** Yes
 - b. 1100 Volts Yes
 - c. Trade Mark Yes
 - d. Electric Yes
 - e. Year of manufacture Yes
 - f. IS Number Yes
11. Progressive running length of the cable shall be marked on outer sheath at an interval of not more than 10 Meters Yes
12. Marking on drum shall be as per tender specification cl. No.6 Yes
13. The ends of the cable shall be sealed by means of non-hygroscopic sealing material Yes
14.
 - a. Conductor - Aluminum Sector Shape Yes
 - b. Class - 2, H4 Grade Yes
15. Maximum Conductor Resistance at 20°C.
 - a. For 25 sq. mm - Main Core - 1.20 Ohm/Km. Yes.
Neutral Core - 1.91 Ohm/Km Yes
 - b. For 50 sq. mm - Main Core - 0.641 Ohm/Km. Yes
Neutral Core - 1.20 Ohm/Km Yes
 - c. For 70 sq. mm - Main Core - 0.443 Ohm/Km. Yes
Neutral Core - 0.868 Ohm/Km Yes
 - d. For 150 sq. mm - Main Core - 0.206 Ohm/Km. Yes
Neutral Core - 0.443 Ohm/Km Yes
16.
 - a. PVC insulation type 'A' as per IS: 5831/1984 Yes
 - b. Inner sheath should be thermoplastic material or LDPE as per Cl. No. 5 & 12 of IS-1554/1988 and confirming to IS-5831/1984. Yes
 - c. Outer sheath shall be type ST-1 PVC Compound confirming to requirement of IS-5831/1984. Yes

Date:	Seal & Signature of Tenderer
-------	------------------------------

	<u>Average</u>	<u>smallest</u>	
a. 3.5 Core x 25 sq. mm			
Main Core	1.20 mm	0.98 mm	Yes
Neutral Core	1.00 mm	0.80 mm	Yes
b. 3.5 Core x 50 sq.mm			
Main Core	1.40 mm	1.16 mm	Yes
Neutral Core	1.20 mm	0.98 mm	Yes
c. 3.5 Core x 70 sq.mm			
Main Core	1.40 mm	1.16 mm	Yes
Neutral Core	1.20 mm	0.98 mm	Yes
d. 3.5 Core x 150 sq. mm			
Main Core	1.80 mm	1.52 mm	Yes
Neutral Core	1.40 mm	1.16 mm	Yes

- | | | |
|----|---|-----|
| a. | For 3.5 Core x 25 sq. mm - 0.30 mm (Min) | Yes |
| b. | For 3.5 Core x 50 sq. mm - 0.30 mm (Min) | Yes |
| c. | For 3.5 Core x 70 sq. mm - 0.40 mm (Min) | Yes |
| d. | For 3.5 Core x 150 sq. mm - 0.50 mm (Min) | Yes |

19. PVC outer sheath type 'ST-1' as per IS: 5831/84 Yes

	<u>Average</u>	<u>smallest</u>	
a. 3.5 Core x 25 sq.mm	2.00mm	1.40 mm	Yes
b. 3.5 Core x 50 sq.mm	2.20mm	1.56 mm	Yes
c. 3.5 Core x 70 sq.mm	2.20mm	1.56 mm	Yes
d. 3.5 Core x 150 sq. mm	2.40mm	1.72 mm	Yes

- | | | |
|----|--|-----|
| a. | At 27°C - 1×10^{13} ohm. Cm.(Min) | Yes |
| b. | At 70°C - 1×10^{10} ohm. Cm.(Min) | Yes |

12.5 N/mm² (Min) Yes

23. Elongation at break of Insulation & Sheath: 150 %(Min) Yes

PART - B

Bidder has to furnish below details about materials for information

Sr. No.	Particulars
1.	ISI License for IS:1554 (P-I)1988 a. Number b. Date of expiry
2.	Approximate weight of <u>1 (one) meter length</u> in KGs: <u>a) Aluminum</u> <u>b) PVC</u> <u>c) Total</u> a) 25mm²: b) 50mm²: c) 70mm²: d) 150mm²: <u>Cable manufacturing process i.e. with</u> i) Inner sheath by extrusion or by wrapping? ii) Is Binder taps are provided? iii) Outer sheath & inner sheath by separate extrusion? iv) Inner and outer sheath in a single extrusion? If so than polyester tape is required on laid up cores.

PART - C (Enclosures)

Bidder has to enclose following documents and has to confirm the same:

Sr.No.	Particulars	Confirmation
1.	ISI License (attested copy)	Yes.
2.	Proof if applied for renewal of ISI License	Yes
3.	Type Test Certificate from Govt. of India's approved laboratory (for all cores/rating) with yellow colour outer sheath....	Yes

Description	Rating/Size of Cable: 3.5 Core			
	25mm ²	50mm ²	70mm ²	150mm ²
a) Name of Laboratory/City (State)				
b) Test Report No.				
c) Test Report Date				

- | | | |
|----|---|------|
| 4. | List of plant and machinery | Yes. |
| 5. | List of testing facility available | Yes. |
| 6. | List of orders pending/executed: | |
| | a. with GUVNL (formerly GEB)/ MGVCL/DGVCL/UGVCL/PGVCL | Yes. |
| | b. with agencies other than 6(a) above | Yes. |

PART - D

Bidders have to mention below deviation if any, Quoting relevant clause of specification.

Date:	Seal & Signature of Tenderer
-------	------------------------------