

STANDARD TECHNICAL SPECIFICATION COVER SHEET

Specification No. : ENG-GEN-4013

Specification Name : Technical Specification for Aluminium Lugs

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CONTENTS

- 1. SCOPE**
- 2. APPLICABLE STANDARDS**
- 3. CLIMATIC CONDITIONS OF THE INSTALLATION**
- 4. GENERAL TECHNICAL REQUIREMENTS**
- 5. GENERAL CONSTRUCTIONS**
- 6. MARKING**
- 7. TESTS**
- 8. TYPE TEST CERTIFICATES**
- 9. PRE-DISPATCH INSPECTION**
- 10. INSPECTION AFTER RECEIPT AT STORES**
- 11. GUARANTEE**
- 12. PACKING**
- 13. TENDER SAMPLE**
- 14. QUALITY CONTROL**
- 15. TESTING FACILITIES**
- 16. MANUFACTURING ACTIVITIES**
- 17. SPARES, ACCESSORIES AND TOOLS**
- 18. DRAWINGS AND DOCUMENTS**
- 19. SCHEDULE “A” GUARANTEED TECHNICAL PARTICULARS**
- 20. SCHEDULE “B” DEVIATIONS**

1. SCOPE

This specification covers the technical requirements of design, manufacture, inspection & testing at manufacturer's works, packing, forwarding, supply and unloading at store/site of Aluminium Lugs for efficient and trouble free performance. Aluminium Lugs to be used for cable termination purpose.

2. APPLICABLE STANDARDS

The equipment covered by this specification shall unless otherwise stated, be designed, manufactured and tested in accordance with the latest editions of the following Indian, International Standards and shall conform to the regulations of the local authorities:

Ref. IS	Description
IS 8309:1993	Compression type tubular terminal ends for aluminium conductors of insulated cables
IS 5082: 1998	Wrought aluminium and aluminium alloy bars, rods, tubes and sections for electrical purposes

3. CLIMATIC CONDITIONS OF THE INSTALLATION:

SL. NO.	CONDITONS	VALUES
1	Max. altitude above sea level	1200m
2	Max. Ambient Temperature	50 °C
3	Max. Daily average ambient temp	35 °C
4	Min Ambient Temp	0 °C
5	Maximum temperature attainable by an object exposed to sun	60 °C
6	Maximum Humidity	95%
7	Minimum Humidity	10%
8	Average No. of thunderstorm days per annum	70
9	Average Annual Rainfall	150 cm
10	Average No. of rainy days per annum	120
11	Thermal Resistivity of soil	150 Deg. Ccm/W
12	Wind Pressure	126 kg/sq. m up to an elevation of 10 meter.
14	Earthquakes of intensity in horizontal direction	equivalent to seismic acceleration of 0.3g
15	Earthquakes of intensity in vertical direction	equivalent to seismic acceleration of 0.15g
16	Wind velocity	300 km/hr.

TPCODL/TPNODL/TPSODL/TPCODL/TPWODL/TPWODL/TPSODL service area has heavy saline conditions along the coast and High cyclonic Intensity winds with speed up to 300 Km ph. 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. GENERAL TECHNICAL REQUIREMENTS:

Sl. No.	Item Description	E	A	C	D	F	B	H	G	L	J
1	Lugs Al 4 sq. mm XLPE Single hole	5.1	2.9	5.5	12	1.2	7	7	6	-	24
2	Lugs Al 10 sq. mm XLPE Single hole	5.2	4.4	7.4	10	2.8	9	9	8	-	30
3	Lugs Al 25 sq. mm XLPE Single hole	8.4	6.8	12	16	5.2	32	10	8	-	57
4	Lugs Al 35 sq. mm XLPE Single hole	6.4	8	10.8	15	2.8	18	11	11	-	47
5	Lugs Al 50 sq. mm XLPE Single hole	10.5	9.8	16	21.5	6.2	42	12	10	-	72
6	Lugs Al 95 sq. mm XLPE Single hole	10.5	13.2	17.5	24.9	4.3	56	15	13	-	95
7	Lugs Al 150 sq. mm XLPE Single hole	13	16.3	21.6	31.2	4.9	60	20	15	-	108
8	Lugs Al 185 sq. mm XLPE Single hole	16.3	18.4	24	34.5	5.5	60	20	15	-	108
9	Lugs Al 300 sq. mm XLPE Single hole	16.2	21.8	31.2	44.2	7.5	70	25	19	-	130
10	Lugs Al 400 sq. mm XLPE Single hole	20.3	26.8	35.5	51	8.5	70	25	19	-	130

11	Lugs Al 630 sq. mm XLPE Single hole	16.3	31.7	44.4	61	12.7	130	26	28	-	200
12	Lug Al 70 sq. mm for 7/10 SWG wire	10.2	11.6	16	22	4.4	52	15	13	-	88
13	Lugs Al 4Cx300 sq.mm XLPE Single hole sector shaped	16.2	23.5	31.2	42	7.5	70	25	19	-	130
14	Lugs Al 300 sq. mm XLPE Double hole	12.7	21.8	30.2	42	8.4	89	25	19	44.4	191.4
15	Lugs Al 630 sq. mm XLPE Double hole	12.7	31.7	44.4	61	12.7	140	25	19	44.4	244.4
16	Lugs Al 120 sq. mm XLPE Single hole	13	14.7	23	31.5	7.9	56	20	15	-	108
17	Lugs Al 240 sq. mm XLPE Single hole	16.2	21	31.2	44.2	7.5	70	25	19	-	130

5. GENERAL CONSTRUCTIONS:

The material of lugs should be Aluminium of minimum 99.5% pure. Material of aluminium shall be as per IS: 5082:1991. Lugs is made of aluminium compression type tubular ends for termination of aluminium conductor of insulated cables. Edges and corners of aluminium lugs shall be free from burrs and sharp edges. Lugs is a connecting device with barrel accommodating respective conductor size of electrical cable and which has a fixing arrangement of termination by means of a bolt fixing or pin insertion in tunnel type terminal blocks and screwing.

Tolerance on B, H, G and J : $\pm 5\%$

Tolerance on A, C and E : ± 0.1 mm

Tolerance on D & F : 0.3 mm

Diagram of Single Hole

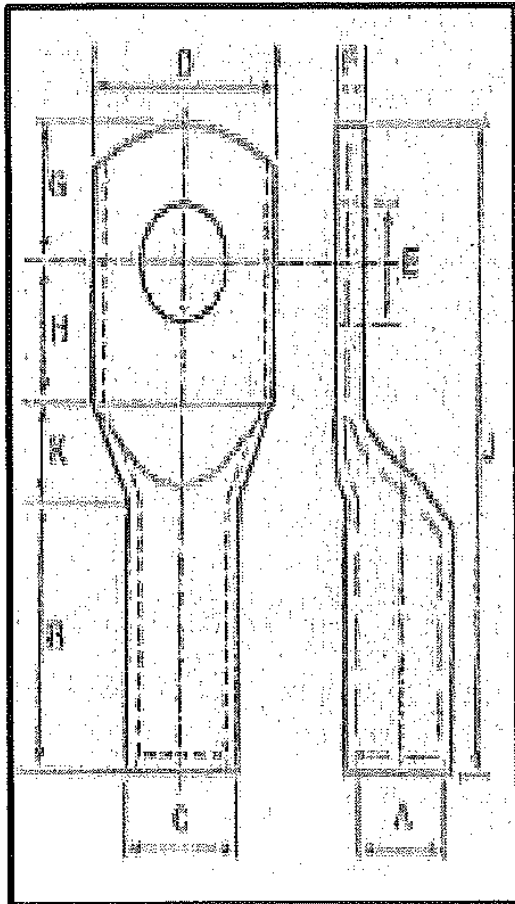
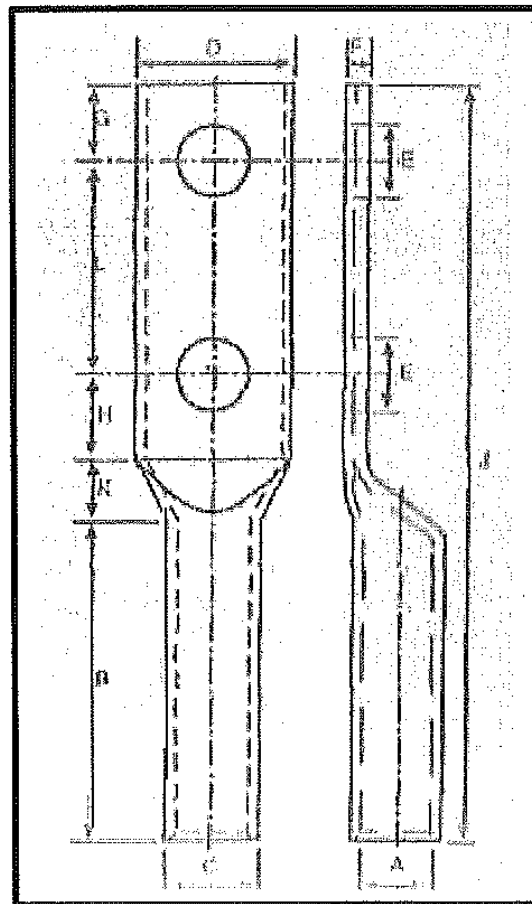


Diagram of Double Hole



6. MARKING:

Name of Manufacturer, size to be engraved on all the aluminium lugs:

The Packing of Aluminium lugs shall have following details:

- Name of Manufacturer
- PO No. with Date
- Month & Year of Manufacturer
- PROPERTY OF TPCODL/TPNODL/TPSODL/TPWODL
- Item Description
- Material Code

7. TESTS:

All the Routine and acceptance tests shall be carried out in accordance with the relevant IS/IEC standards. All routine/acceptance tests shall be witnessed by the purchaser/his authorized representative. All the components shall be type tested as per the relevant standards. All dimension of lugs shall meet with the relevant IS 8309:1993, wherever not mentioned specifically.

7.1 ACCEPTANCE TESTS

- a) Dimension of all type of Lugs as per TPCODL/TPNODL/TPSODL/TPWODL Specification
- b) Surface Finish

7.2 ROUTINE TESTS

- a) Dimension of all type of Lugs as per TPCODL/TPNODL/TPSODL/TPWODL Specification
- b) Electrical Conductivity test.
- c) Surface Finish

7.3 TYPE TESTS

- a) Chemical Composition Test.
- b) Electrical Conductivity test.
- c) Flattening Test

8. TYPE TEST CERTIFICATES:

The bidder shall furnish the type test certificates of the individual component for the tests as mentioned as above as per the corresponding standards. All the tests shall be conducted by CPRI / ERDA or TPCODL/TPNODL/TPSODL/TPWODL recommended NABL lab 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/TPSODL/TPWODL

9. PRE DISPATCH INSPECTION:

The material shall be subject to inspection by a duly authorized representative of the TPCODL/TPNODL/TPSODL/TPWODL. 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/TPSODL/TPWODL's representatives at all times when the work is in progress. Inspection by the TPCODL/TPNODL/TPSODL/TPWODL 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/TPSODL/TPWODL.

Following documents shall be sent along with material.

- a) Test reports

- b) MDCC issued by TPCODL/TPNODL/TPSODL/TPWODL
- c) Invoice in duplicate
- d) Packing list
- e) Drawings & catalogue
- f) Guarantee / Warrantee card
- g) Delivery Challan
- h) Other Documents (as applicable).

10. INSPECTION AFTER RECEIPT AT STORES:

The material received at TPCODL/TPNODL/TPSODL/TPWODL, Odisha 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 department.

11. GUARANTEE:

Bidder shall stand guarantee towards design, materials, 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 Company up to a period of 12 months from the date of commissioning or 24 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 timeframe, and to the entire satisfaction of the Company, failing which the Company will be at liberty to get it replaced/rectified at supplier's risks and costs and recover all such expenses plus the Company's own charges (@ 20% of expenses incurred), from the supplier or from the "Security cum Performance Deposit" as the case may be.

12. PACKING:

Supplier shall ensure that all the aluminium lugs covered under this specification shall be prepared for rail/road transport and be packed in such a manner so as to protect the equipment from damage in transit. The material used for packing shall be environmentally friendly. The bidder shall provide instructions regarding handling and storage precautions to be taken at site.

Note: Single use plastic not to be used for packing of the material.

13. TENDER SAMPLE:

Bidders are required to submit two samples of lugs of each size for TPCODL/TPNODL/TPSODL/TPWODL approval and submit the sample along with the Technical bid.

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-supplier's 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. TESTING FACILITIES:

Bidder shall have adequate in-house testing facilities for carrying out all routine tests & acceptance tests as per relevant International / Indian standards.

16. MANUFACTURING ACTIVITIES:

CAT-B/CAT-A approval is mandatory to start manufacturing works.

17. SPARES, ACCESSORIES AND TOOLS

NA.

18. DRAWINGS AND DOCUMENTS

Following documents to be submitted along with the bid for evaluation:

- a) Completely filled-in clause wise compliance of this specification along with bid.
- b) Signed and stamped copy of Generalized drawing for Aluminium Lugs with Bill of Material
- c) Work Experience details
- d) Type test certificates.

Following drawings and documents shall be submitted in line with the requirement of Tender specifications:

- a) Completely filled-in clause wise compliance of this specification along with bid.
- b) Signed and stamped copy of Generalized drawing for Aluminium Lugs with Bill of Material
- c) Compliance of all undertaking submitted during technical evaluation

All the Documents and Drawings shall be in English Language.

CAT-A Approved GTP and Drawing 1 set of Hard Copy containing complete information about manufacturing shall be submitted.

19. SCHEDULE- “A” GUARANTEED TECHNICAL PARTICULARS

Completely filled–in clause wise compliance of this specification along with bid.

20. SCHEDULE “B” 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:

SL. 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

Designation