

**Technical specifications of composite type spacers**  
**for L.T. Distribution Lines**

**1.0. Scope:**

This specifications covers design, manufacture, testing at works and supply of composite type L.T. Line spacers required for 3 Ph-4wire L.T. Power distribution systems.

**2.0 Climatic Conditions:**

The materials used in the construction of composite type L.T. Line spacers shall be suitable for use under the following climatic conditions.

- a. Ambient Air Temperature : - 5 °C to 50 °C
- b. Relative Humidity : 0 to 100%
- c. Altitude : 1000 Meters
- d. Wind Pressure : Upto 150kg/M<sup>2</sup>

**3.0. Service Condition:**

Composite type L.T. Line spacers shall be suitable for outdoor installation for 3 phase, 50Hz, 433V L.T. distribution system in which the neutral is effectively earthed and the same shall be suitable for service conditions under fluctuations in supply voltage up to 12% permissible under Indian Electricity Rules.

**4.0 Technical Requirement for Material**

- a. The material used for manufacture of composite type L.T. Line spacers shall be made of Poly - Propylene and shall be of single mould only except the clamping pieces.
- b. Sufficient strength shall be made for the spacers at the points where grooves are made for holding the conductors.
- c. The fly nuts and studs shall be made of Engineering grade Nylon.
- d. The studs shall be properly fixed in position at the moulding stage.
- e. No special tool shall be required for providing the spacers.
- f. The L.T. Line spaces shall be of Grey / white color

**5.0. Dimensions:**

The dimensions of composite type L.T. Line spacers are to be as follows and the drawing is enclosed as annexure-A:

- a. Total length of the L.T. Line spacer : 1000mm ± 5mm
- b. Width of the L.T. Line spacer : 25mm
- c. Thickness of the L.T. Line spacer : 12mm
- d. Each Conductor spacing : 300mm ± 3mm
- e. Size of the studs with fly-nuts : 8mm
- f. Conductor holding diameter : **6mm to 11mm**

**Note:** The conductor holding diameter should be decided depending upon the type of conductor and to be specified accordingly.

**6.0. Application:**

The composite type L.T. Line spacer is fixed by sliding the line conductors in the grooves and tightening the fly nuts manually. The spacers shall be suitable for both horizontal and vertical configuration of the lines.

**7.0. Tests:**

The manufacturer shall have adequate testing facility to conduct all the type tests, routine and acceptance (routine) test. If the manufacturer doesn't have the facility to conduct type tests, the type tests are to be conducted in any approved NABL laboratory/Approved Govt. Laboratory.

**7.1. Type Tests**

**a) Dry Power frequency with stand voltage test:**

The spacers shall with stand dry Power frequency test voltage of 23 kV when tested in accordance with IS-1445 – 1977 with suitable modification to simulate the actual method of application in the field.

**b) Wet Power frequency with stand voltage test:**

The spacers shall with stand wet Power frequency test voltage of 10 kV when tested in accordance with IS-1445 – 1977 with suitable modification to simulate the actual method of application in the field

**c) Ageing / Tensile Test:**

Three out of 1000 nos. of Line spacers selected at random shall be maintained at temperature of + 70° C and - 2° C for a period of 24 hrs each. After this treatment, the specimen shall not show any deformity after cooling and shall have a minimum tensile strength of 500 kg.

**7.2. Routine Tests:**

The firm shall conduct the following routine tests:

- a. Visual examination: 100 percent
- b. Dimensional verification: 100 percent
- c. Ageing /Tensile strength: one percent of material offered for inspection.

**7.3. Acceptance Tests:**

Sampling procedure for acceptance tests:

Sl. No.	Lot size-Nos.	First sample size	Second sample size	Acceptance Number	No. of rejection allowed
Visual and Dimensional verification:					
1	Up to 10000	100	100	2	3
2	10001-50000	150	150	3	4

3	Above 50000	200	200	5	6
Ageing and Tensile strength					
1	Each inspection Lot	10	10	1	2

**Note:**

- a) The manufacturer shall make necessary arrangements for carrying out the above Tests in his works and purchaser will have the option to carry out these tests at the time of inspection by selecting at random. Three specimen composite spacers out of a lot of 1000 spacers or part thereof depending upon the quantity ordered.
- b) All tests and inspections shall be made at the place of manufacturer unless otherwise specially agreed upon by the manufacturer and purchaser.

**8.0. Guaranteed Technical Particulars:**

The guaranteed technical particulars as per annexure-B shall be filled by the supplier and submitted along with the tender.

**9.0. Guarantee:**

The successful bidder has to guarantee the Composite type L.T. Line spacers for a period of at least 5 years (5 years 6 months from the date of supply or 5 years from the date of commission.)

**10.0. Sample:**

The bidder shall submit two samples and get them approved by BESCO before taking up production or before offering the first lot of material for inspection.

**11.0. Markings:**

Each spacer shall be embossed with the following information:

- a. Purchaser name.
- b. Manufacturer name.
- c. Manufacturer trade mark.
- d. Year of manufacture.
- e. P.O No.
- f. ISI certification marks if any.

**12.0. Inspection:**

The supplier shall give 15 days advance intimation to the purchaser to arrange for inspection of the material offered for inspection duly mentioning the quantity of material offered for inspection along with routine test reports.

**13.0. Documentation:**

The supplier should manufacture and supply the Composite type L.T. Line spacers as per the specifications and as detailed in the drawing only and no deviations are permitted.

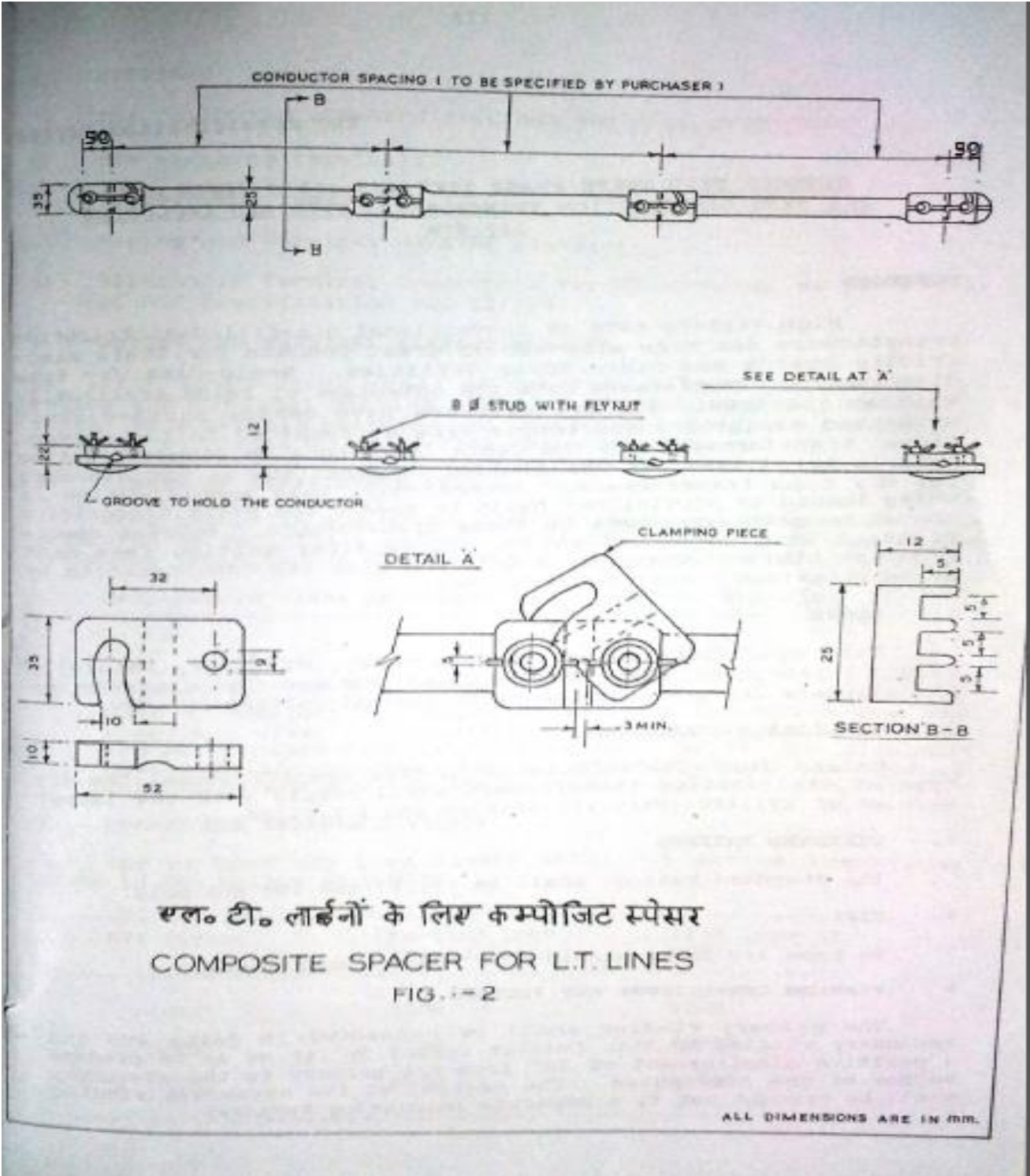
**14.0. Conditions of Acceptance:**

BESCOM reserves the right to select random samples from the materials supplied and subject to type tests. If the samples fail to pass the test, BESCOM reserves the right to reject the entire supplies made beside conforming all other penal measures.

**15.0. Packing and Forward:**

- a. The spacers shall be packed in wooden/plastic boxes suitable to withstand rough handling during transportation by rail/road, loading and unloading etc.
- b. Each box shall contain not more than 250 spacers.
- c. Each consignment shall be containing the following information.
  1. Name of the Consignee.
  2. Details of Consignment.
  3. Destination.

Drawing for Composite Type L.T. Line Spacers



**Annexure-B****Guaranteed Technical Particulars for Composite type L.T. Line Spacers**

(To be furnished by the supplier)

<b>Sl.No.</b>	<b>Particulars</b>	<b>Description</b>
1	Name of the Manufacturer	
2	Place of Manufacture	
3	Type of Spacer	
4	Working Voltage	
5	Standard	
6	Dry power frequency withstand voltage in kV	
7	Wet power frequency withstand voltage in kV	
8	Tensile strength	
9	Net Weight(approx) in Kg.	
10	Dimensions with tolerances	
	a. Total length of the L.T. Line spacer in mm	
	b. Width of the L.T. Line spacer in mm	
	c. Thickness of the L.T. Line spacer in mm	
	d. Each Conductor spacing in mm	
	e. Size of the studs with fly-nuts in mm	
	f. Conductor holding diameter	
11	Content of each packing	
12	Markings as per clause 11.0	

Signature and Seal of the Bidder