

**MATERIAL SPECIFICATIONS CELL**

**TECHNICAL SPECIFICATION**

**OF**

**G. I. WIRE (SIZE 3.15/4/5mm dia.) & G. I. STAY WIRE**

**TECHNICAL SPECIFICATION FOR G. I. WIRE (SIZE 3.15/4/5mm dia.) & G. I. STAY WIRE**

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## TECHNICAL SPECIFICATION FOR G. I. WIRE (SIZE 3.15/4/5mm dia.) & G. I. STAY WIRE

### (Part-I)

#### TECHNICAL SPECIFICATION FOR G. I. WIRE ( 3.15/ 4/ 5mm dia. )

1.0 Scope:

This specification covers details of solid G.I. wires for use in Rural Distribution System.

2.0 Applicable Standards:

Except when conflict with the specific requirements of this specification, the G.I. wires shall comply with the provision of IS: 280-2006 and IS: 7887-1975 or the latest version thereof.

3.0 Application and sizes:

G.I. Wires covered in this specification are intended for the following applications.

Application	Sizes ( Nominal dia )
i) Bearer wire for service	3.15mm ( for single-phase cables service )
ii) Continuous earth wire for 11KV lines.	4mm
iii) Earthing of transformers poles & fittings.	4mm
iv) Protection guarding at the crossing of overhead power lines with roads, railway tracks and telecommunication lines.	3.15, 4 & 5mm

4.0 Material:

4.1 The wires shall be drawn from the wire rods conforming to IS: 7887- 1975 or the latest version thereof.

4.2 The requirements for chemical composition for the wires shall conform to IS:7887- 1975 or the latest version thereof.

4.3 The wires shall be sound, free from split surface flaws, rough jagged and imperfect edges and other detrimental defects on the surface of the wires.

4.4 Material to be supplied shall bear ISI certification mark. The relevant ISI certificates indicating the MSEDCL's required details shall be submitted along with tender document.

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### 5.0 Galvanizing:

The wires shall be galvanized with ' heavy coating ' as per IS:4826-1979 or the latest version thereof.

### 6.0 Grades:

G.I wires shall be conforming to the following tensile properties & condition as per IS-280 :2006

Condition	Tensile strength ( MPa )
Hard	550-900

### 7.0 Tolerance in diameter:

The tolerance on nominal diameter at any section of the wire shall not exceed plus minus 2.5%. further the maximum difference between the diameters at any two cross sections of wires shall not exceed 2.5%.

### 8.0 The following tests shall be carried out in accordance with IS: 280/2006 or the latest version at NABL accreditation laboratories in India and submitted online alongwith offer. At the manufacturer following tests shall be carried out on samples as per sampling criteria stipulated IS 280/2006.

- i) Dimensional Check ( dia ) – refer Clause 7 above.
- ii) Visual Inspection regarding freedom from defects- refer Clause 4.3 above.
- iii) Tensile Test.
- iv) Wrapping Test ( for wire diameters smaller than 5mm ).
- v) Bend Test ( for wire diameter of 5mm. only )
- vi) Coating Test – refer Clause 5 above.
- vii) Chemical Composition.

### 9.0 Packing:

The wires shall be supplied in 30-40 kg. Coils, each coil having single continuous length. Each coil of wire shall be suitably bound and fastened compactly and shall be protected by suitable wrapping.

### 10.0 Marking:

Each coil shall be provided with a label fixed firmly on the inner part of the coil bearing the following information:

- (a) Manufacturer's name or trade mark.
- (b) Lot number and coil number.
- (c) Size.
- (d) Condition-Hard
- (e) Finish-Galvanized
- (f) Mass
- (g) Length.
- (h) ISI Certification Mark.

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11.0 Specific Technical Particulars: This shall be as per Annexure -I.

**ANNEXURE – I'**  
**Guaranteed Technical Particular of GI wire**

1.	Size ( dia )	:	3.15mm	4.00mm	5.00mm
2.	Tolerance of size	:	As per Clause 7 of the specification.		
3.	Tensile Strength	:	550-900 MPa		
4.	I.S. Specification	:	IS-280/2006 IS-7887/ 1975, IS-4826/1979 or the latest version thereof.		
5.	Coating ( gms ) / m <sup>2</sup>	:	270 ( for 3.15mm ), 290 ( for 4 mm and 5.00mm )		
6.	Type of galvanizing	:	Hot dip heavy coating		
7.	IS for Zinc Coating	:	IS-4826/ 1979 or the latest version thereof		
8.	No. of dips	:	3 dips of 1 min. and 1 dip of 1/2 min.		
9.	Packing	:	30 to 40 kgs. In coils as per Clause 9 of this specification ( Part- I )		
10.	Chemical composition	:	As per IS-7887/1975 Carbon 0.23% max Sulphur 0.55% max, Phosphorus 0.055% max.		

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**Part-II**

**TECHNICAL SPECIFICATION FOR G.I. STAY WIRE**

**1.0 G.I. STAY WIRE:**

Wire conforming to IS 2141/2000 (Reaffirmed 2010 ) or the latest version and having tensile strength 45- 55 kg per sq. mm. The wires should be heavily coated with zinc as per IS 4826/ 1979 or the latest version thereof by Hot Dip Galvanization and of sizes shown below.

- i) 7/4.0 mm
- ii) 7/3.15 mm

**2.0 PACKING:**

The wires shall be supplied in 30-40 Kg. per coil. The packing should be done in accordance with the provision of IS 6594/1977 or the latest version thereof. However, the wire shall be supplied in coils ( and not on reels ). Each coil shall be suitably bound and fastened compactly and shall be protected by suitable wrapping.

**3.0 SPECIFIC TECHNICAL PARTICULARS:**

This shall be as per the attached Annexure -II.

**4.0 TESTING:**

All the tests specified in the above IS specification are required to be conducted as detailed therein. Tenderer must clearly indicate what testing facilities are available at the works of the manufacturer and whether the facilities are adequate to carry out all the tests mentioned above. These facilities should be available to Company's Engineer if deputed to carry out / witness these tests in the manufacturer's works.

Following test as per IS 2141/2000 ((Reaffirmed 2010 ) or the latest version shall be carried out at NABL accreditation laboratories in India and submitted online alongwith offer. At the manufacturer following tests shall be carried out on sample as per sampling criteria stipulated IS 2141/2000.

- 1. Test on Wires before manufacturing
  - a. Ductility Test
- 2. Test on completed Strand
  - a. Tensile and Elongation test
  - b. Galvanizing test as per IS 4826

**5.0 DOCUMENTS TO BE SUBMIT ONLINE**

- 1) If any test as per clause no.4 Annexure –II cannot be carried out at the manufacture's work, reasons should be clearly stated.
- 2) Full copy of BIS certification Mark ing.
- 3) Material to be supplied shall bear ISI certification mark. The relevant ISI certificates indicating the MSEDCL's required details shall be submitted along with tender document.

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**ANNEXURE 'II'**

**Guaranteed Technical Particular of GI Stay wire**

Sr. No.	Parameters	:	7/3.15mm	7/4.00mm
1.	Size of individual wire	:	3.15mm	4.00mm
2.	No. of strands	:	7	7
3.	Lay length	:	12 to 18 times strand Diameter (both)	
4.	Tolerance of dia of individual wire.	:	$\pm 2.5\%$	$\pm 2.5\%$
5.	Minimum tensile strength of individual wire.	:	450N/sq.mm (Grade 5) (Both).	
6.	Minimum breaking load of individual strand	:	350 kg.	565 kg.
7.	Minimum breaking load of completed stay wire.	:	2331 kg.	3758 kg.
8.	Specification to which the stay wire will conform	:	IS 2141/ 1979 or the latest version thereof.(for both size)	
9.	Type of zinc coating	:	Heavy coating.(for both size)	
10.	Method of coating	:	Hot Dip Galvanizing.(for both size)	
11.	Specification for galvanizing	:	IS 4826/ 1979 or the latest version thereof.(for both size)	
12.	Packing	:	As per Clause 2 of Schedule 'A' (Part – II) in coils weighing between 30 kg to 40 kg.(for both size)	
13.	Chemical composition	:	Sulphur & Phosphorous less than 0.06%.	