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# SUPPLY CHAIN MANAGEMENT

## THIRUVANANTHAPURAM

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### SPECIFICATION

6MM<sup>2</sup> TWIN CORE WEATHER PROOF WIRE

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APPLICABLE TO KSEBL	Rev#0	DOC. NO.: SCM-SPEC/XH/6SQ.MM TC WP WIRE
		EFF. DATE: 14/12/2021

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Technical Specification and Evaluation Committee for Distribution Material



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## TECHNICAL SPECIFICATION

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Rev.#: 0

Effective Date 14/12/2021

#### (i) Document Approval & Control Status

	Compiled by	Verified by	Approved by
Name	Smt.Anu.V.R	Smt.Bindu.T.Wilson	Smt.Presannakumari.S
Position	Assistant Engineer (Supply Chain Management)	Executive Engineer (Supply Chain Management)	Chief Engineer (Supply Chain Management)
Date	14/12/2021	14/12/2021	14/12/2021
Signature	Sd/-	Sd/-	Sd/-

#### (ii) Amendments and History

Sec. #	Rev. #	Date	History of Change



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#### 1. PURPOSE:

Purpose of this document is to document updates & history, upkeep and publish the specifications related to **6mm<sup>2</sup> Twin Core Weather Proof Wire** in a professional manner

#### 2. SCOPE:

The Scope of this document is to inform and alert all relevant stakeholders including KSEBL, Public, KSERC etc regarding the current specifications and historical changes adopted in specifications of **6mm<sup>2</sup> Twin Core Weather Proof Wire** used in field by KSEBL

#### 3. RESPONSIBILITY:

**The Executive Engineer (H), Office of Chief Engineer, Supply Chain Management** shall compile and take necessary steps to publish the specification in KSEBL website and shall inform relevant stakeholders regarding updates and revisions.

#### 4. PROCEDURE FOR REVISION:

Modifications if any, in the technical specification will be incorporated as **Revisions**. Any changes in values, minor corrections in pages, incorporation of small details etc. will be considered as Minor Modification. **The Revisions due to minor modifications will be assigned as Rev. No.0.1, 0.2 etc.**

A complete updation of the technical specification will be considered as Major modification. **The Revisions due to major modifications will be assigned as Rev. No.1.0, 2.0 etc.**

All the details of regarding the revisions (both minor and major) will be incorporated in **“(ii)-Amendments and history”** above.

The concerned officers, in consultation with the Technical Committee will review and suggest changes required and the revision suggestion will be approved by **Chief Engineer (SCM)**. Those who notice any discrepancy or have any suggestion regarding revision, may bring the matter to the attention of Chief Engineer (SCM) in writing or through e-mail id:**cescm@kseb.in**



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### TECHNICAL SPECIFICATION

#### 2 6MM TWIN CORE WEATHER PROOF WIRE

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### Technical Specification

The cable shall be ISI Marked 1100V PVC insulated PVC sheathed unarmored. The cable shall conform to the IS:694 with latest amendments. The following tests shall be carried out on the WP Wire as per 694:2010.

l) **Type Tests:-**

- a) Test on conductors:
  - i) Tensile test (for aluminium)
  - ii) Wrapping test (for aluminium)
  - iii) Conductor Resistance test
- b) Test for over all dimensions and thickness of insulation and sheath.
- c) Physical test for insulation and sheath.
  - i) Tensile strength and elongation at break.
  - ii) Loss of mass test.
  - iii) Ageing in air oven.
  - iv) Shrinkage test
  - v) Heat shock test.
  - vi) Hot deformation.
  - vii) Thermal Stability.
  - viii) Cold bend test (insulation only).
  - ix) Cold impact test (insulation only).
  - x) Flammability test (insulation only).
- d) Test on completed cable
  - i) High voltage test ( Water immersion test)
  - ii) High voltage test or spark test.
  - iii) Insulation resistance.



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- iv) High voltage test.
- v) Flammability test.
- vi) Additional ageing test ( OU cables only)

#### II) **Acceptance test:-**

- i) Tensile test (for aluminium)
- ii) Wrapping test (for aluminium)
- iii) Conductor resistance test
- iv) Test for thickness of insulation and sheath
- v) Tensile strength and elongation at break for insulation and sheath
- vi) Insulation resistance test
- vii) High voltage test or spark test
- viii) Flammability test

#### III) **Routine Tests:-**

- i) Conductor resistance test
- ii) High voltage test or spark test

#### iV) **Applicable Standards:-**

- i) IS: 694/2010
- ii) IS: 8130/1984.
- iii) IS: 3961 (part II)/1967.
- iv) IS: 5831/1984.
- v) IS: 5484/1997.
- vi) IS: 10810.
- vii) IS: 10418/1982.



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Any technical feature, not specifically mentioned here, but is necessary, for the good performance of the product, shall be incorporated in the design.

#### V) **Packing & Marking:-**

The material shall be packed properly in Hessian on canvas as per standard to eliminate the chances of damages during transit and while handling at site. The packages should clearly be marked CE (SCM)/ . The wires shall be wound on reels or coils (100metres in length) and packed in gunny or cellophane bags and labeled.

The labels should be attached to the reel or coil and should have following information.

- i) Trade Name.
- ii) Name of Manufacturer.
- iii) Nominal cross sectional area of the conductor in the coil.
- iv) No. of cores.
- v) Colour of wire cable.
- vi) Length of cable contained in the coil or reel
- vii) Year of Manufacture.
- viii) Type of cable and voltage for which it is suitable.
- ix) ISI Mark.
- x) Ref.IS:694/2010

Necessary identification mark of the manufacturers shall be embossed on the wires at intervals so as to distinguish them from those supplied by others. Similarly the letters "KSEB Ltd" shall also be embossed on the wires at one metre intervals. The wires shall be marked with ISI Certification marks on all coils.

#### VI) **Variation in Length:-**

The coil shall be 100 metres in length with a tolerance of,  $\pm 1\%$ .

#### VII) **Colour of Cable:-** Blue.



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#### VIII) **Inspection and despatch:-**

All the test and inspection shall be made at the place of manufacture unless otherwise specifically agreed upon by the manufacturer and purchaser at the time of purchase. All Tests shall be performed in presence of Purchaser's representative if so desired by the Purchaser. The manufacturer shall give at least Twenty (20) days advance notice for witnessing such tests.

The manufacturer shall afford the inspector representing the purchaser all reasonable facilities without charge, to satisfy him that materials is being furnished in accordance with the inspection.

Certified copies of all routine tests carried out at works for each batch shall be furnished in two (2) copies along with the inspection call (pre-factory report) for approval of the purchaser. The acceptance test report signed by the manufacturer and inspector shall be furnished for MDCC. The wires shall be despatched from Works only after receipt of Purchaser's written approval of the test reports and MDCC.

Upon delivery of the wire KSEBL will inspect them and / or may perform relevant tests in order to verify compliance with this specification. The Manufacturer / Supplier shall replace/rectify without any extra or additional charge to KSEBL, cables which upon examination, test or use, fail to meet any of the requirements in the specification.

The purchaser has the right to have the tests carried out at the supplier's cost by an independent agency wherever there is a dispute regarding the quality of supply.

#### VI) **Quality Assurance Plan:-**

Details of Quality Assurance Plan including production, raw material procurement, Inspection and Testing Plan must be submitted and get approved from this office with in one month from the date of Purchase Order.

Sd/-

**CHIEF ENGINEER (SCM)**





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#### GUARANTEED TECHNICAL PARTICULARS

Sl.No.	Particulars	6 mm <sup>2</sup> TC WP wire
1.0	Code Word	AYYOU
2.0	Makers name, address and country	
3.0	Conductors Nominal Cross Sectional area mm <sup>2</sup>	6
3.1	No. of Strands / Core	½
3.2	Actual aluminium area mm <sup>2</sup>	6
3.3	Tensile strength of Aluminium N/mm <sup>2</sup> (Min).	
3.3.a	Grade H2	Above 100 and upto and including 150N/mm <sup>2</sup>
3.3.b	Grade H4	Above 150N/mm <sup>2</sup>
3.4	Conductor resistance/ km (ohm/km at 20) <sup>o</sup> C	4.61 (Max.)
3.5	Volume Resistivity ohm cm.	0.028035(Type 1) 0.028264(Type 2)
3.6	Purity of Aluminium used	99.6%
4.0	Insulation (Material)	PVC (Type A)
4.1	Thickness (Nominal)mm	0.8mm nominal
4.2	Tensile strength(min) N/mm <sup>2</sup>	12.5 (min)
4.3	Variation max	+/- 20%
4.4	Elongation at break (min)	150%(min)
4.5	Variation max	+/- 20%
4.6	Volume resistivity Ohm cm	1*10 <sup>13</sup> @27 deg celsius 1*10 <sup>10</sup> @70 deg celsius
5.0	Outer sheath (Material)	PVC (Type ST 1)



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5.1	Thickness of sheath (Nominal)mm	1.4
5.2	Tensile strength N/Sq.mm (Min).	12.5
5.3	Elongation at break (min)	150%
5.4	Volume resistivity Ohm mm	NA
6.0	Continuous maximum current rating of cable in air	35 A
6.1	Overall dimension of cable in mm (Maximum)	13.0 * 8.0 (Max.)
6.2	Ovality	As per IS:694/2010
7.0	Standard length of each piece	100 Mtrs
8.0	Tolerance if any on standard length	+/- 1%
9.0	a) Weight of the cable in one coil	11 kg
	b) Weight of Aluminium in one coil	
	c) Weight of insulation in one coil	
	d) Weight of Outer sheathe in One coil	
10.0	Standard according to which the cable will be manufactured or tested	IS:694/2010 with latest amendments
11.0	Other specification/ particulars if any	Nil

Sd/-

**Chief Engineer (SCM)**