

KARNATAKA POWER TRANSMISSION CORPORATION LIMITED

**SECTION – AAC, ACSR, COPPER CONDUCTOR AND
STEEL WIRE**

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1.0 SCOPE

- 1.1 This Specification covers the design, material, constructional features, manufacture and testing at the VENDOR'S Works and delivery to Site of All Aluminium Conductors (AAC), Aluminium Conductor Steel Reinforced (ACSR), Aluminium Conductor Alloy Reinforced (ACAR), All Aluminium Alloy Conductor (AAAC), copper conductors and steel wires.

2.0 CODES & STANDARDS

- 2.1 The design, material, construction, manufacture, inspection and testing of conductors shall comply with all currently applicable statutes, regulations and safety codes in the locality where the conductors will be installed. The equipment shall also conform to the latest applicable standards. Nothing in this Specification shall be construed to relieve the VENDOR of this responsibility.
- 2.2 The conductors shall conform to latest standards specified in Data Sheet-A. In case of conflict between the standards and this Specification, this Specification shall govern.

3.0 MATERIAL

- 3.1 Aluminium strands of AAC or ACSR conductor shall be hard drawn from 99.5% pure electrolyte aluminium rods with 60% IACS conductivity. The VENDOR shall specify the guaranteed minimum and average values of conductivity. The copper conductor shall consist of hard drawn round copper wires and shall have 97% conductivity. The copper shall have resistivity of 0.017241 Ohm – mm²/m at 20° C.
- 3.3 Chemical composition of the material shall comply with the requirements of relevant Standards.
- 3.3 The surface of conductor shall be clean and dry and free from any excess grease that may be used in its fabrication. The surface strands shall be smooth and free from burrs and other projections which may cause for increasing corona losses when the conductor is used on extra high voltage lines.

4.0 GALVANISING

- 4.1 The steel wire strands of ACSR conductor and steel conductor shall be hot dip galvanised. Zinc coating shall be evenly and uniformly coated complying with relevant standards as specified in Data Sheet-A for heavily coated wires.

5.0 GREASING

- 5.1 When specified in Data Sheet-A, the steel core and the inner layer of aluminium wires, (where more than one aluminium layer exists), shall be protected with a special grease in order to provide additional protection against corrosion due to saline pollution. The grease shall fill the whole space between wires within circumscribed cylinder at inner aluminium layer or at steel core, if the conductor has only one aluminium layer.
- 5.2 The grease shall be chemically neutral with respect to aluminium, zinc and steel. It shall withstand weather conditions given under Section-B (Project Data) and permanent temperature of 85°C or as per maximum allowable conductor temperature whichever is higher without alteration of its properties.

6.0 TESTS

- 6.1 All tests on the required number of samples of raw materials and finished conductor as stipulated in the relevant standards shall be carried out. No manufacture shall be commenced prior to PURCHASER'S/ENGINEER'S written approval of the test certificates regarding raw materials.

7.0 PACKING

- 7.1 Conductor shall be wound on non-returnable wooden drums made of seasoned and sufficiently strong wood, and conforming to relevant standards specified in Data Sheet-A. At least 12 mm clearance from the conductor to outer edges of the drum shall be provided prior to lagging.

- 7.2 All drums shall be painted inside and outside with aluminium paint. All drums shall have a layer of water-proof paper around the drum under the conductor and another layer over the conductor and under the lagging.
- 7.3 In addition to manufacturer's standard markings on the drums, batch of manufacture shall be clearly marked on each drum.
- 7.4 Drums shall have barrel of at least 1000 mm diameter with centre hole of 100 mm dia.

Note : For any other type of conductor specific requirement may be described in specific requirements section.

1.0 APPLICABLE STANDARDS

1.1 AAC, ACSR, ACAR Conductors () IS: 398 () BS () IEC 1089

1.2 Copper conductors () IS: 7391 () IEC

1.3 Galvanisation of steel wires () IS: 4826 () BS

1.4 Reels and drums for bare wire () IS: 1778 () ()

2.0 NOTES :

2.1 Equipment, raw material, tests etc. shall in general conform to () IS () BS () IEC

DATA TO BE FURNISHED BY VENDOR AFTER AWARD OF CONTRACT

- 1.0 The following test certificates in triplicate :
- 1.1 Raw material manufacturers' test certificates.
- 1.2 AAC/ACSR/Steel wire manufacturers' certificates of tests carried out at his works, on samples out of raw materials received.
- 1.3 Test certificates of all tests as per relevant IS.
- 2.0 Sag and Tension Charts.
- 3.0 Conductor Particulars :
- 3.1 DC resistance if applicable

(i)	at 20°C			Ohm/km
(ii)	at 27°C			Ohm/km
(iii)	at 50°C			Ohm/km
(iv)	at 65°C			Ohm/km
(v)	at 85°C			Ohm/km
(vi)	at 100°C			Ohm/km
(vii)	at 125°C			Ohm/km
(viii)	at 150°C			Ohm/km
(ix)	at 185°C			Ohm/km
(x)	at 210°C			Ohm/km

3.2 AC resistance if applicable

(i)	at 20°C			Ohm/km
(ii)	at 27°C			Ohm/km
(iii)	at 50°C			Ohm/km
(iv)	at 65°C			Ohm/km
(v)	at 85°C			Ohm/km
(vi)	at 100°C			Ohm/km
(vii)	at 125°C			Ohm/km
(viii)	at 150°C			Ohm/km
(ix)	at 185°C			Ohm/km
(x)	at 210°C			Ohm/km

3.3 Curves showing continuous current carrying capacity of conductor at various temperature rises in still air and in wind of velocity 0.6 m/sec.

3.3.1 Reduction in ultimate tensile strength for continuous conductor temperature 10°C higher than that recommended by the manufacturer.

3.4 Curves showing 1 sec. current rating for various conductor temperature.