

**TECHNICAL SPECIFICATIONS FOR OVERHEAD LINE  
100, 70 & 32 SQ. MM COPPER CONDUCTORS**

**5.1. Site Conditions.**

Climatic conditions in Kuwait are rigorous and during summer the ambient shade temperature rises to 55 degrees centigrade and the sun temperature to 90 degrees centigrade as measured with a black bulb thermometer. Periods of high humidity are common and a relative humidity of 100% at 30 degrees centigrade has been recorded. Violent sand and dust storms occur, and even on comparatively still days, fine dust is carried in suspension in the atmosphere.

The copper conductors called for in this specification, shall therefore give trouble free service under the worst conditions encountered in Kuwait and shall carry their rated currents continuously under the worst temperature conditions which prevail in summer and shall also withstand maximum fault currents without damage or deterioration. This is to be confirmed in the form of test certificate from relevant authority.

The copper conductor drums will be stored for periods up to three years in the open and will be exposed to direct sunlight. Therefore, the conductor will be so designed to withstand without deterioration in their mechanical and electrical properties.

**5.2. CONDUCTOR SPECIFICATION:**

The hard drawn copper conductors are to be used on the Purchaser's 11 KV, O/H Line network and shall be of 100 sq. mm, 70 sq. mm. and 32 sq. mm. cross-sectional area. Overhead line, hard drawn, high conductivity copper conductors shall comply with BS/7884 specifications.

**5.3. PACKING:**

The copper conductors shall be wound in strong wooden drums provided with wooden battens to protect the copper conductors from damage. All drums shall become the property of the Purchaser. The copper conductors shall be supplied in drums lengths of 1000 meters. The drum length should not vary from this standard length by more than 10 meters.

**5.4. TESTING & INSPECTION:**

The following Mechanical and Electrical Routine Tests shall be carried out in the presence of our appointed Inspector to determine whether the materials comply with the recommendations of the British Standard Specifications BS:7884. Samples of wire shall be taken from lengths of standard conductors, selected from approximately 10% of the drums included in the consignment. One sample, sufficient to provide one specimen for each test, shall be taken from each of the selected drums. Three copies of the results/records of all tests shall be furnished to the Purchaser.

**5.4.1 MECHANICAL TESTS:**

**(a) Tensile Test:**

The test shall apply to the component wires of the stranded conductor and shall be made in accordance with the methods described in BS: EN 10002 – 1.

The breaking load of any of the wires shall be not less than 92.5% of the appropriate values given in Table 3 of BS: 7884. the average breaking load of all the wires in the stranded conductor shall not be less than 94% of the appropriate values specified in the same Table, Table No. 3.

**(b) Wrapping Test:**

The test shall be carried out on component wires of the stranded conductor following the methods described in Annex C of BS: 7884. The component wire shall be wrapped round a wire of its own diameter to form a close helix of 8 turns. Six turns shall be unwrapped and again closely re-wrapped in the same direction as the first wrapping. The conductor shall not break when subjected to this test.

Also, the checking of dimensions and masses of the stranded conductor shall be carried out and the results of these measurements shall comply with the appropriate requirements of Table-4 of BS:7884. The lay ratio shall be within the limit given in Table -1.

**5.4.2. ELECTRICAL TESTS:**

**Resistance Measurement Test:**

This test shall be carried out in accordance with Annex D of BS: 7884, following one of the methods given in BS:5714.

The value obtained, after correcting to the reference temperature of 20 degr. cent. by means of the appropriate factor given in Table-D.1 of BS:7884, shall not exceed the appropriate maximum value given in Table-4 of the same standard.

**5.4.3 ACCEPTANCE:**

Should 10% of the samples taken from the selected drums in the consignment fail to pass any of the above mentioned tests, the whole of the consignment shall be made tests as specified and shall be deemed not to comply with the standards and shall be rejected.

**5.4.4 SAMPLE TEST TO CONFIRM ACTUAL COPPER WEIGHT:**

The sample shall be taken from one of drum of each production batch or from one drum of every 10 Kms. of cable produced in a batch i.e., a sampling whichever is higher in percentage is to be considered.

**5.5 VOCABULARY NO:**

The vocabulary number is to be indicated on each drum are as hereunder:-

1408000	-	32 sq. mm. Conductor.
1408001	-	70 sq. mm. Conductor.
1408002	-	100 sq. mm. Conductor.

The marking shall be in bold and clear letters and the exact size and type of lettering shall be submitted to the M.E.W for approval.

**5.6. TECHNICAL SCHEDULES:**

The attached technical schedules shall be completed in all respects by the Tenderer and returned duly signed.