



Technical Specification

Material: COPPER ROD

Code: CR01

1. Application:

Copper rod specified by this specification is mainly used for all types of electric cables conductors, (Power-telephone-automotive-enameled-special) as soft or hard drawn.

Conforming to standard BS EN 13602:2002.

This rod is drawn to a minimum size of 0.1 mm diameter.

2. Raw material and process

Copper rods produced by United Metals Company UMC. Are manufactured from sheets of Copper Cathodes and its designation type is Electrolytic Tough Pitch ETP.

Classified Grade 1A conforming to standard ASTM B115-00. & it's UNS No. C11000.

And/or BS EN 1978:1998 & its material designation is Cu-CATH-1 (CR001A).

The copper rods coils are fabricated by process of Continuous Casting & Rolling -CCR.

3. Material designation:

- UNS No. C11040 & Copper type ETP. According ASTM B49-10.

- Symbol. Cu-ETP 1 & Number. CW003A According EN 1977:2013.

4. Standards:

The following standards are applicable:

1. ASTM B49-10

2. EN 1977:2013. It supersedes BS 6926:1988 which is withdrawn.

5. Characteristics:

5.1. Size:

Copper rod shall be of round cross sectional area of 8 mm diameter with ± 0.38 mm as tolerance.

5.2. Electrical Properties:

1. Minimum conductivity of **101 % IACS**

2. Maximum electrical volume resistivity shall not exceed **0.017070 $\Omega \cdot \text{mm}^2/\text{m}$** . at 20 °C.

3. Maximum electrical Weight resistivity shall not exceed **0.15176 $\Omega \cdot \text{g}/\text{m}^2$** . at 20 °C.

4. Specific weight shall be equal **8.89 g/cm^3** at 20 °C.

5.3. Mechanical Properties:

1. Maximum tensile strength = 240 N/mm^2 .

2. Minimum elongation 38 % (gauge L. 200 mm.)

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5.4. Finishing and Appearance:

Copper rod shall be supplied in form of rose coiler coils in one continues length without any Kind of joints.

Rod shall be clean, smooth and free from pipes, laps, slake, flakes, cracks, twists seams, Damaged ends, excessive oil and grease and other injury or defects.

5.5 Chemical Properties:

The copper shall meet the compositional requirement of following elements:

Element	PPM
Oxygen content from	200 to 350
Selenium, max.	2
Tellurium, max.	2
Bismuth, max.	1
Group total, max.	3
Antimony, max.	4
Lead, max.	5
Arsenic, max.	5
Tin, max.	5
Iron, max.	10
Nickel, max.	10
Sulfur, max.	15
Silver, max.	25
Maximum allowable total, max.	65

Copper Content not less than 99.95 %

The surface oxide on copper rod to be less than 400 Å (Angstrom)

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6. Annealability (Rapid Elongation AR-Test):

Copper rod coils which are produced by UMC shall have a minimum Rapid Elongation (A_{200}) 20% When tested according to test method given in BS EN 1977:3013 Annex B.

7. Packing and Marking:

The copper rod coil shall be of maximum diameter of 1.5 meter wide and of maximum height 0.9 meter. Each coil weight shall be up to 5 Metric Tons.

Each coil shall be packaged, protected and delivered on a wooden pallets or steel pallets strong enough such that no damage handling or storage.

Each coil shall be strapped individually with 6 straps.

Each coil shall be covered with shrinkable plastic bags.

Each coil shall submit a tag including:

The manufacturer name, purchasing order number, coil production number, lot number, net weight and gross weight.

Any additional or Special Marking on tags on each coil and of packing other than described before shall be agreed upon between the purchaser and UMC. and we have obligation to follow all in totality.

8. Acceptance Test Certificate:

The following tests and checks are conducted as acceptance test certificate:

1. Appearance Checks.
2. Diameter Measurements.
3. Chemical composition.
4. Electrical Properties.
5. Mechanical Properties.
6. Weight.

All tests procedure are as stated in the above mentioned standards. UMC. Shall submit with each coil a certificate of conformity and test certificate.

Approved by:
Samy Abd El Samad
Plant Manager

Issued by:
Samy Mohamed Kamal
Technical & Quality Manager

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