



# COPPER ROD

OFC & FRHC / Upcast & Continuous Cast



## About Universal Metals

Universal Metals (Pvt.) Ltd operates a state-of-the-art European CCR line, making us the only manufacturer in Pakistan capable of producing FRHC copper rod in full compliance with ASTM B49. Using reclaimed copper with a minimum purity of 99.90%, we deliver rods that meet the highest quality standards while promoting true sustainability, enabling copper to be reused repeatedly without loss of performance.

Alongside our FRHC production, we run one dedicated upcast furnace for manufacturing oxygen-free copper rod with a minimum copper content of 99.99%, using Grade A / Cu-Cath-1 copper cathodes. This combination of advanced technology and dual production lines gives Universal Metals the largest installed copper rod manufacturing capacity in Pakistan.

## Applications

Our copper rods serve as the primary feedstock for a wide range of downstream products:

- Control Cables
- Instrumentation Cables
- Solar Cables
- Power Cables
- Enamelled Copper Wire
- House Wiring
- Paper Covered Copper Strip
- Copper Grounding Conductors

Reference Standard: ASTM B49

## Physical Properties

| Property                     | Value    | Unit                                |
|------------------------------|----------|-------------------------------------|
| Elongation in 250 mm, min    | 30       | %                                   |
| Resistivity, max             | 0.017241 | $\Omega \cdot \text{mm}^2/\text{m}$ |
| Conductivity, min            | 100      | % IACS                              |
| Surface Oxide Thickness, max | 750      | Å (Angstrom)                        |

## Available Diameters

| Diameter | Rod Type          | Tolerance             |
|----------|-------------------|-----------------------|
| 8 mm     | FRHC, Oxygen Free | $\pm 0.38 \text{ mm}$ |
| 10.5 mm  | FRHC, Oxygen Free | $\pm 0.38 \text{ mm}$ |
| 12.5 mm  | Oxygen Free       | $\pm 0.38 \text{ mm}$ |
| 14 mm    | FRHC, Oxygen Free | $\pm 0.38 \text{ mm}$ |
| 16 mm    | Oxygen Free       | $\pm 0.38 \text{ mm}$ |
| 20 mm    | Oxygen Free       | $\pm 0.51 \text{ mm}$ |

Reference Standard: ASTM B49, Maximum allowable impurity limits

| Element                    | FRHC Rod      | Oxygen Free Rod |
|----------------------------|---------------|-----------------|
| Tellurium, max             | 10 ppm        | 2 ppm           |
| Selenium, max              | 10 ppm        | 3 ppm           |
| Bismuth, max               | 5 ppm         | 1 ppm           |
| Antimony, max              | 50 ppm        | 4 ppm           |
| Arsenic, max               | 10 ppm        | 5 ppm           |
| Tin, max                   | 150 ppm       | 2 ppm           |
| Lead                       | 150 – 450 ppm | 5 ppm           |
| Iron, max                  | 20 ppm        | 10 ppm          |
| Nickel, max                | 150 ppm       | 10 ppm          |
| Sulfur, max                | 20 ppm        | 15 ppm          |
| Silver, max                | 150 ppm       | 25 ppm          |
| Oxygen                     | 100 – 400 ppm | 5 ppm           |
| Cadmium, max               | 100 ppm       | 1 ppm           |
| Phosphorous, max           | N/A           | 3 ppm           |
| Zinc, max                  | 80 ppm        | 1 ppm           |
| Manganese, max             | N/A           | 0.5 ppm         |
| <b>Copper Content, min</b> | <b>99.90%</b> | <b>99.99%</b>   |

All values per ASTM B49 specification. Oxygen-free copper rod is manufactured from Grade A / Cu-Cath-1 cathodes via upcast technology. FRHC rod is produced from reclaimed copper via continuous casting and rolling (CCR).

The material is supplied on coils with the following dimensions. Each coil is secured onto a wooden pallet with appropriate measures taken to prevent corrosion and damage from the surrounding environment.

| Metric         | FRHC           | Oxygen Free Copper Rod |
|----------------|----------------|------------------------|
| Inner Diameter | 600 mm         | 600 mm                 |
| Outer Diameter | 1600 mm        | 1630 mm                |
| Height         | 800 – 1000 mm  | 400 mm                 |
| Nominal Weight | 3000 – 3500 kg | 2500 ± 200 kg          |