TINNED COPPER WIRE

../../public/images/products/drawn-wire/Tinned_Coppe

About Universal Metals

Universal Metals (Pvt.) Ltd produces tinned copper wire by applying electrolytic or hot-dip tin coating to high-purity ETP copper wire across 0.1--3.25 mm diameter. Electrolytic tinning is used for fine wire gauges ($\leq$1.5 mm), delivering tight coating thickness control of 1--5 μm. Hot-dip tinning is available for heavier gauges ($\geq$1.5 mm), providing 5--20 μm coating for marine and corrosion-intensive applications.

The tin coating preserves the full electrical performance of the copper core: soft-annealed tinned wire is rated at $\geq$100% IACS per ASTM B33 and BS EN 13602 — identical to bare copper. Coating continuity is verified by the hydrochloric acid and sodium polysulfide test per ASTM B33 and BS 6360 Cl.9.1, ensuring a continuous, adherent, pin-hole-free tin layer across every spool.

Applications

- Marine and offshore cable conductors
- Automotive wiring harness (fine gauge)
- Flexible cable and cord conductor stranding
- Solar PV cable conductors
- Coaxial cable braid and inner conductor
- PCB hookup wire and electronic assembly
- High-temperature cable with solder connections
- Shielding braid for signal and data cables

Applicable Standards

- ASTM B33: Specification for Tin-Coated Soft or Annealed Copper Wire (0.05--11.68 mm)
- ASTM B246: Specification for Tin-Coated Medium-Hard and Hard-Drawn Copper Wire ($\geq$1.63 mm)
- BS EN 13602: Drawn Copper Wire for General Electrical Purposes, including Tinned (0.04--5.0 mm)
- IEC 60228: Conductors of Insulated Cables
- BS 6360: Conductors in Insulated Cables — Coating Continuity Cl.9.1

Mechanical and electrical properties by temper — ETP Copper (Cu-ETP / C11000) with tin coating

Temper	Dia. Range	Tensile Str.	Elongation	Conductivity	Coating (μm)	Tin Method
Soft / Annealed	0.1--3.25 mm	196--250 MPa	≥20%	≥100% IACS	1--20	Electrolytic (≤1.5 mm) / Hot-dip (≥1.5 mm)
Medium-Hard	0.1--3.25 mm	~290 MPa	10--20%	≥97.16% IACS	1--5	Electrolytic
Hard Drawn	1.63--3.25 mm	310--380 MPa	6--15%	≥96.16% IACS	1--5	Electrolytic or Hot-dip

Tin Coating Grade Guide

Coating Grade	Thickness Range	Typical Application
Standard	1--3 μm	General cable conductor stranding, automotive, electronics
Marine Grade	5--10 μm	Marine cables, offshore, humid/salty environments
Heavy Duty	10--20 μm	Offshore, industrial corrosive environments, marine bus conductors

Coating continuity test: Hydrochloric acid + sodium polysulfide immersion test per ASTM B33 / BS 6360 Cl.9.1. All production coils are sampled and tested. Coating thickness measured by X-ray fluorescence or strip-and-weigh method. 1 μm coating is applicable to pre-drawing feedstock only; minimum 2 μm for finished conductor grade.

Diameter & Resistance Data

Maximum DC resistance at 20°C for soft-annealed tinned copper wire (≥100% IACS, $\rho \leq 0.017241\ \Omega \cdot mm^2/m$)

Nom. Diameter (mm)	Cross Section (mm^2)	DC Resistance (Ω/km)	Elongation min.	Diameter Tolerance
0.10	0.00785	2197.0	≥20%	±0.001 mm
0.20	0.03142	549.2	≥20%	±0.002 mm
0.30	0.07069	243.9	≥20%	±0.003 mm
0.50	0.19635	87.8	≥22%	±0.005 mm
0.80	0.50265	34.3	≥24%	±0.008 mm
1.00	0.78540	21.97	≥25%	±0.010 mm
1.25	1.22718	14.06	≥27%	±0.013 mm
1.50	1.76715	9.76	≥27%	±0.015 mm
2.00	3.14159	5.49	≥30%	±0.020 mm
2.50	4.90874	3.51	≥30%	±0.025 mm
3.00	7.06858	2.44	≥30%	±0.030 mm
3.25	8.29588	2.08	≥30%	±0.033 mm

Resistance values are for the annealed copper core and are unaffected by the tin coating (tin layer cross-section is negligible relative to copper). For medium-hard and hard-drawn grades, multiply resistance values by 1.029 (medium-hard) or 1.039 (hard-drawn) to account for reduced conductivity per ASTM B246 requirements.

Packing & Delivery

Standard packaging for tinned copper wire by diameter range

Diameter (mm)	Package Type	Standard Net Weight	Core Material
0.10 -- 0.50	Plastic bobbin (PT-15)	0.5 -- 5 kg	Plastic
0.50 -- 1.50	Plastic bobbin (PT-25)	5 -- 25 kg	Plastic
1.50 -- 3.25	Wooden drum or steel basket	50 -- 500 kg	Wood / Steel

Wire is supplied in moisture-resistant packaging with sealed outer wrap. Each spool is labelled with: product grade, diameter, temper, tin coating thickness (nominal), net weight, heat number, tinning method (electrolytic or hot-dip), and applicable standard. Custom spool sizes and drum configurations are available. Contact our sales team to discuss specific packaging requirements for marine OEM, automotive Tier-1, or automated cable stranding applications.