

1. EXECUTIVE OVERVIEW & VALUE PROPOSITION

Continuously Transposed Conductor (CTC) is the essential winding material for EHV/UHV power transformers, reactors, and high-capacity electrical equipment. Manufactured using high-purity Oxygen-Free Copper (ETP/OFC), multiple enameled rectangular wires are arranged in two parallel stacks and continuously transposed along the axial direction. Available in **Paper-Covered CTC** (wrapped with multi-layer insulation paper) and **CTC Without Paper** (self-bonding or mesh-taped).

⚡ Ultra-Low Eddy Current Loss

Splitting large conductors into individual insulated strands with continuous transposition homogenizes magnetic fields, **reducing winding eddy current losses by 65% – 75%**.

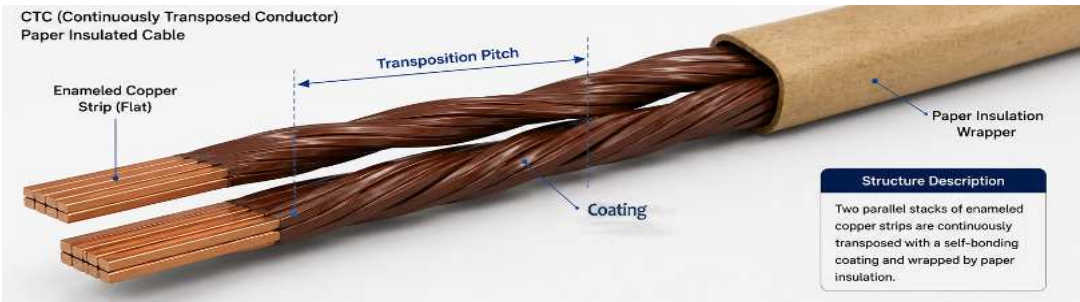
🛡️ Exceptional Short-Circuit Strength

Utilizing **PVA-EPOXY self-bonding enamel (B-Stage thermo-curing)**, the winding solidifies into a rigid block after heat treatment to resist severe short-circuit electrodynamic forces.

🔺 Space Efficiency & Oil Cooling

High space factor minimizes overall winding volume, while engineered oil duct pathways optimize thermal dissipation and extend transformer operational lifespan.

2. STRUCTURE & PRODUCT CLASSIFICATION



Type	CTC Without Paper	Paper Covered CTC Cable
Insulation Form	Enameled single strands + Polyester mesh tape / Self-bonding tape binding	Enameled single strands + Multi-layer outer kraft paper (Thermally Upgraded / Crepe Paper)
Key Advantages	Direct oil immersion, superior cooling, smaller winding OD, eliminates paper wrapping process	High main insulation strength, minimal dielectric loss, outstanding lightning impulse resistance
Typical Applications	Low-voltage high-current windings, autotransformers, traction & renewable transformers	Power transformers (110kV, 220kV, 500kV, 750kV+ EHV/UHV systems)

3. TECHNICAL SPECIFICATIONS

LP Industry CTC Cables fully comply with and exceed international standards including IEC 60851, IEC 60317-0-4, GB/T 12970, and JIS C3215.

Specification Item	Technical Parameter / Standard	Options / Remarks
Number of Strands	5 – 81 Strands (Typically odd-numbered arrangement)	Odd / Even Available
Single Strip Thickness ('a')	0.90 mm – 3.15 mm (Tolerance ±0.01 mm)	0.5mm ultra-thin strip available
Single Strip Width ('b')	2.50 mm – 13.00 mm (Tolerance ±0.01 mm)	Recommended ratio $2.0 < b/a < 9.0$
Max Outer Dimension	Height Max. 120 mm, Width Max. 26 mm (Tolerance ±0.05 mm)	Customizable for large cross-sections
Conductor & Yield Strength	High-purity Oxygen-Free Copper (ETP / OFC); CPR Copper (Rp0.1: 140–250 MPa)	High short-circuit resistance copper
Single Strip Enamel	Polyvinylacetal (PVA - Class 120) / Polyesterimide (PEI - Class 180)	Oil-resistant, high dielectric strength
Enamel Thickness	0.08 mm – 0.12 mm	Uniform concentric coating
Self-Bonding Layer Thickness	0.03 mm – 0.05 mm (B-Stage Cresol-Free Epoxy Resin)	Thermo-cured solid structural bond
Outer Paper Cover Material	Thermally Upgraded Kraft Paper, Calendered Paper, Mesh Paper, Crepe Paper	Complies with IEC 60664 standards
Transposition Pitch	35 mm – 225 mm (Calculated based on minimum core diameter)	Precision transposed, zero strand defect



4. MANUFACTURING EXCELLENCE & QUALITY ASSURANCE

PVA-EPOXY Thermo-Curing Anti-Short-Circuit Technology

Single strands coated with B-Stage tack-free epoxy resin solidify into a consolidated compound beam during transformer oven drying (120°C - 140°C). Inter-strand shear strength reaches several MPa, effectively absorbing electrodynamic short-circuit forces and preventing winding collapse.



Comprehensive Quality Assurance Checkpoints

- **Copper Purity & Conductivity:** Electrical conductivity $\geq 100\%$ IACS, strictly verified yield strength (CPR).
- **Enamel & Bonding Layer:** Rigorous testing for flexibility, adhesion, thermal shock, and transformer oil compatibility.
- **Transposition Geometry:** Automated optical inspection for transposition nodes; dimensional tolerance $\leq \pm 0.01\text{mm}$.
- **Dielectric Strength:** 100% high-voltage breakdown testing between single strands and cable layers.

5. TYPICAL APPLICATIONS

LP Industry Continuously Transposed Conductors are widely deployed in major power projects worldwide:

Power Transformers

110kV – 1000kV EHV & UHV
Main Power Transformers

Renewable Energy

Offshore Wind Step-Up &
Solar Inverter Transformers

Railway Traction

High-Speed Locomotive
Traction Transformers

Special Reactors

Shunt Reactors, Smoothing
Reactors & VFD Windings

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Products: CTC Cables, Paper Covered Wires, Enameled
Wires, Fiberglass Wires

Contact Us for Custom Drawings & Quotes

Supporting Custom Transposition Pitch, CPR Copper &

Custom
Insulation Papers