

Luoyang Hongsheng Trading Co., Ltd. Enterprise StandardHSTB/TC-Q-010-2026

Standard Foil Product Specification**Prepared by:** Xiao Yi**Reviewed by:** Li Jianshu**Approved by::** Wang Wujun**Issue Date: June 11, 2026 Implementation Date: June 12, 2026****Published by Luoyang Hongsheng Trading Co., Ltd.**

Foreword

This specification is established to meet the quality requirements of customers during production. It provides operational guidance on the basic requirements and methods for the physical properties, packaging, storage, and transportation of standard copper foil.

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It is revised, administered, and interpreted by the Technical Center.

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1. Scope

This product specification applies to the **standard electrolytic copper foil** produced by **Luoyang Hongsheng Trading Co., Ltd.**

2. Terms and Definitions

2.1 Electrodeposited Foil: Metal foil produced by electrolytic deposition on a cathode.

2.2 Stain Proofing: The treatment process to prevent surface oxidation of copper foil.

2.3 Smooth Side: The side that contacts the cathode drum.

2.4 Matte Side: The side that does not contact the cathode drum.

3. Reference Standards

3.1 IPC-4562 — Copper Foil for Printed Circuit Applications

3.2 IPC-TM-650 — Test Methods Manual

3.3 IPC-T-50 — Terms and Definitions for Interconnecting and Packaging Electronic Circuits

3.4 IPC-TR-485 — Copper Foil Fracture Strength Research Results (Joint Test)

3.5 GB/T 5230-2020 — Electrolytic Copper Foil for Printed Boards

4. Product Specifications

4.1 Model and Specifications

35 μ m standard copper foil, width as required by the customer.

4.2 Patent Application Performance Indicators (or Composition)

4.2.1 Composition Indicator: Cu $\geq$ 99.8%

4.2.2 Physical and Chemical Indicators

No.	Item	Specification	Unit	Test Method
1	Packaging	Packaging intact, markings clear, coil wound neatly and tightly, core intact and free from contamination, etc.	/	Visual inspection: Check whether the outer box and inner coil packaging of the copper foil meet specification requirements.
2	Appearance	1) Surface flat and straight, uniform color; no indentations, bruises, or surface scratches allowed. 2) Edges neat, no notches, tears, coil deviation, folding, or burrs; cut surface flat. 3) Pits and dimples: No pits with diameter exceeding 0.5 mm allowed. Pits with diameter less than 0.5 mm shall not exceed 2 within any 300 mm × 300 mm area. Pits with diameter less than 0.13 mm are not counted. Edge area within 1 inch is exempt. 4) Wrinkles: No permanent wrinkles affecting performance allowed. 5) Scratches: No scratches exceeding 20% of the nominal foil thickness. Scratches with depth between 5% and 20% shall not exceed 3 per 300 mm × 300 mm area. Scratches with depth less than 5% of nominal foil thickness may be disregarded. 6) Inclusions: No inclusions with maximum dimension >0.002 mm. 7) Cleanliness: Copper foil surface shall be free from dirt, oil, rust, and other stains affecting etching. 8) Pinholes: For foil thickness ≤18 μm, no pinholes with	/	Visual inspection: Unroll 3–4 turns and observe the product surface condition. Pinhole inspection: Take a 600 mm × width copper foil sample, place it smooth side up in a light box with illuminance ≥2500 LUX (in a dark room), and visually observe for light-transmitting holes. Penetration point inspection: Take a 600 mm × width copper foil sample, evenly apply copper sulfate solution (containing Cu = 5 g/L; H₂SO₄ = 50 g/L) on the smooth side, wait 10 seconds, turn the matte side up, visually observe whether copper sulfate solution penetrates and wets the surface, and record the number of wetting points.

No.	Item	Specification	Unit	Test Method
		major axis greater than 0.05 mm allowed. Pinholes with major axis less than 0.05 mm shall not exceed 3 per square meter. For foil thickness >18 μm, no pinholes with major axis greater than 0.05 mm allowed. Pinholes with major axis less than 0.05 mm shall not exceed 2 per square meter. 9) Penetration points: For foil ≤18 μm, penetration points shall not exceed 3 within a 300 mm × 300 mm area. For 35 μm and 70 μm foil, penetration points shall not exceed 2 within a 300 mm × 300 mm area. 10) Oxidation spots and color spots: Oxidation spots and color spots with diameter >1 mm are not allowed. For those with diameter ≤1 mm, no more than 2 per 1 m length × width area; no more than 10 per coil. 11) Pockmarks and indentations: Indentations and pockmarks with diameter >1 mm are not allowed. For those with diameter ≤1.0 mm, no more than 2 per meter length × width area; total length of indentations per coil ≤5 m. Indentations and pockmarks with diameter less than 5% of nominal thickness may be disregarded. 12) Joints: No more than 2 joints per single coil. 13) Copper powder: Visual inspection of filter paper shows extremely slight copper powder transfer. At 100× magnification, copper particles are clearly visible but can be etched away after pressing. 14) Burrs and protrusions: Burrs and protrusions with diameter >1 mm are not allowed. For protrusions ≤1 mm, no more than 2 per 1 m length × width area; total length of burrs and protrusions per coil ≤5 m.		

No.	Item		Specification	Unit	Test Method
4	Width		Nominal width (-0/+2) mm	mm	Film ruler / tape measure: Measure width with a suitable range ruler or tape measure.
5	Mass per unit area		280±5	g/m ²	Electronic balance: Use a 100 × 100 mm standard sampling plate and cutter to uniformly take 3 or more sample pieces across the copper foil width, weigh, and multiply the average by 100 to obtain the product unit mass.
6	Thickness		32-35	μm	IPC-TM-650
7	Oxidation resistance		After baking at 200°C for 30 min, no oxidation discoloration	/	Take a 200 × width copper foil sample, bake at 200°C for 30 min, remove, and compare with an unbaked sample. No obvious color change is acceptable.
8	Tensile strength		Room temperature: ≥28 kgf/mm ² 180°C: ≥14 kgf/mm ²	kg F/mm ²	IPC-TM-650 2.2.18
	Elongation		Room temperature: ≥4.5% 180°C: ≥2%	%	IPC-TM-650 2.4.18
9	Surface roughness	Ra	≤0.4	μm	IPC-TM-650 2.4.17

No.	Item	Specification	Unit	Test Method
	Rz	≤10.0		
10	Peel strength	≥1.60	N/mm	IPC-TM-650 2.4.8
11	Hazardous substance content	Complies with EU RoHS, REACH, halogen-free, and other regulatory requirements	/	Outsourced testing
Remarks: 1.When customers have specific requirements, copper foil performance shall be determined according to customer requirements and reviewed by relevant departments. Copper foil coil weight and joint requirements shall be executed according to customer requirements on the production plan. 2.The above technical specifications are formulated with reference to IPC-4562 "Metal Foil for Printed Board Applications" and GB/T 5230-2020 "Electrolytic Copper Foil for Printed Boards" , combined with company and industry requirements.				

5. Inspection Rules

5.1 Inspection Frequency

No.	Item	Inspection Frequency	Remarks
1	Packaging, appearance, and slitting width among physical and che	Inspect each small coil after slitting	/
2	Thickness, mass per unit area, oxidation resistance, tensile strength, elongation, surface roughness among physical and chemical indicators	Inspect each parent coil	/
3	Product composition	Annual sampling	Qualified third-party testing institution
4	Hazardous- substance content	Annual external testing	

5.2 Shipment Quality Control

5.2.1 Each batch of products shall be inspected according to the frequency specified in Section 5.1 to ensure shipped products meet customer requirements.

5.2.2 The range of mass per unit area for each small coil after slitting shall be $\leq 1 \text{ g/m}^2$.

6. Composition of Shipment Batch

Copper foil coils produced on the same production line using the same batch of materials and the same manufacturing process, with a total weight not exceeding **5,000 kg**, shall be considered one batch. The batch number shall be executed according to customer requirements.

7. Product Packaging and Marking

7.1 Product Packaging

7.1.1 Packaging Method (I)

Step	Packaging Process	Operational Requirements	Packaging Specification	Diagram
1	Edge sealing	Apply sealing tape to the centre of the foil roll end; apply tension and run tape along winding direction.	Operate with clean white cotton gloves to avoid contamination. Use only one layer of sealing tape to prevent foil creases.	
2	PE- film wrapping	Start wrapping PE- film from left end; PE- film width shall match foil width (no overhang past end- faces). Rotate roll along winding direction. Each wrap cycle shall overlap ≤ 5 cm toward the right; leave ≥ 10 cm film extending past the right end- face.	Maintain uniform wrapping tension; avoid uneven thickness which would cause creases.	
3	EPE foam protection	Wrap ≥ 2 layers of EPE pearl- foam over PE- film. Fit ≥ 10 mm- thick EPE washers onto both ends of paper core before crate- loading. Washer	Wrap foam along roll rotation direction; tight but without inducing creases.	

Step	Packaging Process	Operational Requirements	Packaging Specification	
		inner-diameter > paper-tube outer-diameter by 5 mm; washer outer-diameter $\geq$ foil-roll outer-diameter so end-faces are fully covered.		
4	PE film wrapping	Start wrapping PE film from the left end. The first wrap should retain at least 10 cm outside the copper foil end face. Then rotate the copper foil in the winding direction to wind the film. Each wrap should extend no more than 5 cm to the right. Keep at least 10 cm of film at the right end.	The film should be wrapped evenly to prevent creasing.	
5	Tape edge sealing	(1) Apply tape tightly along the bottom edge of the copper foil, stretch to about 2 mm line width, and wrap at least 5 turns to ensure no gaps between the PE film and the copper foil side. (2) Attach the unwinding direction arrow label, consistent from inside to outside. Packaging complete.	The PE film should be tightly wound to prevent air entry.	

Step	Packaging Process	Operational Requirements	Packaging Specification	Diagram																									
6	Loading into wooden box	The paper tube head should fully match the wooden box groove.	(1) Handle gently when loading into the wooden box to prevent bumping the copper foil. (2) The paper tube length should fully match the wooden box groove. (3) Place one pack of desiccant in each of the four corners of the wooden box and secure with nails, then load the copper foil finished product into the box.																										
7	Sealing and marking	After the copper foil is boxed, attach markings to the outer box. Box labels include: box number, name, product specification and size, gross weight and net weight, production date, number of coils, warranty period, etc.	(1) Wear clean gloves to prevent contamination. (2) Verify each label and match the packaging box.	<table border="1"> <tr> <td>名称</td><td colspan="3">规格: $\mu\text{m} \times \text{mm}$</td><td>生产日期</td></tr> <tr> <td>物料号</td><td colspan="4"></td></tr> <tr> <td>箱号</td><td>米数/m</td><td>净重/kg</td><td>毛重/kg</td><td>质保期</td></tr> <tr> <td>卷号</td><td></td><td></td><td></td><td>质 检</td></tr> <tr> <td>合计</td><td>(含箱重/Kg)</td><td></td><td></td><td></td></tr> </table>      	名称	规格: $\mu\text{m} \times \text{mm}$			生产日期	物料号					箱号	米数/m	净重/kg	毛重/kg	质保期	卷号				质 检	合计	(含箱重/Kg)			
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Step	Packaging Process	Operational Requirements	Packaging Specification	Diagram
8	Crate sealing & final labelling	Fit crate lid and fasten crate; print final outer-crate label and affix to crate exterior.	(1) Label orientation must align with printed handling- symbol arrows. (2) Wear PPE; avoid pinch-injuries during closing. (3) Total gross weight = n × (foil net weight + coreweight) + crate weight.	

7.2 Product Marking

7.2.1 Inner marking: After unwinding, attach a winding direction indicator label to the copper foil, indicating number, product name, specification, mass per unit area, net weight, length, joints, inspection, and date.

7.2.2 Outer marking: After boxing, attach markings to the outer box. Box labels include: box number, name, product specification and size, gross weight and net weight, production date, number of coils, warranty period, etc.

8. Quality Abnormality Handling Plan

8.1 If the inspected product meets the specifications listed in this document, the product may be packaged, warehoused, and shipped.

8.2 Non-conforming products:

8.2.1 Products with non-conforming packaging shall be unpacked and repackaged.

8.2.2 Products with non-conforming slitting width may be slit into smaller sizes required by other customers.

8.2.3 Except for the above indicators that can be reworked, if one or more of the other physical and chemical indicators are non-conforming, the product shall be scrapped

9. Material Transfer, Storage, and Shelf Life

9.1 Product transfer and storage during production must avoid mechanical, chemical, oil, heat contamination, and other forms that may cause product performance degradation.

9.2 Shelf life: 180 days from arrival. Non-normal pickup is not covered.

9.3 Storage conditions: The warehouse for copper foil storage shall be kept clean and dry, with **relative humidity $\leq 75\%$, temperature 18–26°C**, and no corrosive atmosphere, corrosive chemicals, or humid items.

10. Others (Precautions and General Matters)

10.1 Before product arrival, confirm whether the packaging box is damaged or has impact marks. If abnormal, take photos and provide feedback promptly.

10.2 Before use, confirm label information to avoid misuse.

10.3 For matters beyond this supply specification, handling of non-conforming products, or conflicts of interest, both parties shall resolve through negotiation.

10.4 Luoyang Hongsheng Trading Co., Ltd. shall be exempt from liability for the following:

- a) Failure to store according to storage conditions after delivery;
- b) Problems caused by other materials used together with the copper foil;
- c) Improper methods during use (fingerprints, indentations, drops, etc.);
- d) Exceeding the warranty period.

10.5 If changes to the content of this product specification are required, they shall be made after negotiation between both parties.