

COPPERBOND® P2

SPECIFICATION SOM-5 REV.A – ROLLED C110 (RA COPPER) FOIL WITH COPPERBOND® TREATMENT

OLIN BRASS, Feb. 2012

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I Scope: A specification for Copperbond® P2 Treated rolled copper alloy C110 foil. Note: CUB is the general term for treated foil in the following document.

II Applicable Documents:

IPC-4562A Industry Specification
ASTM B-152 (foil chemistry)

III Chemical Description:

ALLOY C110, Cu + Ag = 99.9% min, O₂ ≤ 0.03%
Treatment, electroplated copper in nodular form
P2 stain proofing, electroplated Zn + Cr in compound form

Treatment Options:

- No treatment, no stain proofing
- No treatment, both sides stain proofed
- Single side treatment, both sides stain proofed
- Double side treatment, both sides stain proofed
- Pink (100% Cu) or Black (~90% Cu ~10% Ni) treatment

IV Thickness: Nominal thickness, Nominal area weight, (IPC Foil Designation)
Nominal Tolerance ± 5%.

10 μm, 0.29 oz/sq.ft. (88.5 gm/sq.m)
12 μm, 0.35 oz/sq.ft. (106.8 gm/sq.m) (T)
17 μm, 0.5 oz/sq.ft. (152.5 gm/sq.m) (H)
35 μm, 1 oz/sq.ft. (305 gm/sq.m) (1)
70 μm, 2 oz/sq.ft. (610 gm/sq.m) (2)

V Width: As requested ± 0.015 in. (0.38mm)

VI Foil Tempers: Cu-W5, As-Rolled (AR)
Cu-W7, Annealed (ANN)

VII Mechanical Properties: Per IPC-4562A

	<u>As Rolled (Cu-W5)</u>	<u>Annealed (Cu-W7)</u>
Tensile Strength (min):	50 ksi (345 N/mm ²)	Depends on thickness
Elongation (min):	0.5% min (50m m)	- see IPC-4562A

VIII Electrical Properties: 100% IACS nominal (annealed)

IX Surface Roughness (typical, by contact profilometer):
4 – 12 μin . Ra (0.1 - 0.3 μm)
20 – 60 μin . Rz (0.5 – 1.5 μm)

X Appearance & Shape:

Foil to be defect free under visual inspection with no oxidation, pits, dents, pinholes permitted. Foil must be free of wrinkles, creases, scratches and contamination.
Treatment must be tightly adhering and have a consistent tint.

XI Peel Strength (with Pyralux adhesive):

(T) 4 lb/in (7.0 N/cm) minimum
(H) 5.6 lb/in (9.8 N/cm) minimum
(1) 8.9 lb/in (15.6 N/cm) minimum
(2) 13.1 lb/in (23.0 N/cm) minimum

XII CUB Definition and Lot Size:

CUB Definition: A coil of metal rolled from a specific master coil which has been treated (electroplated) in a unique batch and assigned a specific CUB number. Each coil has a proprietary CUB number like M14210-01. M represents the treatment line. The fourth and fifth figures 10 denote the last digit of the year, in this case, 2010. The first three numbers 142 show the order of the production and the number after the hyphen represents the sequential cut or coil number. 142 would mean the 142nd production in 2010, and 01 after the hyphen shows the first cut or sub-coil from lot 14210.

A lot will consist of one CUB Number regardless of total weight.
A CUB number is traceable throughout all Olin Brass processing

XIII Test Certification will be by lot:

The certification shall contain the following:
Tensile strength in SI units and elongation as shipped,
Peel strength in SI units,
Area weight per IPC-4562A in g/254 in²
Melt ladle chemistry,
Solderability per IPC-4562A.

The following tests will not be certified but must pass internal standards

190 C air bake test

Tape transfer test

P2 removal with 4% H₂ SO₄; (Ammonium sulfide [(NH₄)₂S] exposure confirms the absence of the P2 after acid removal).

XIV Test frequency:

All testing is performed on the beginning and end of each lot

Mechanical properties, 3 total

Peel, 5 total

Area weight, 6 total

Electrical, 1 total

Chemical, X-ray spectroscopy at casting

XV Warranty:

Somers will guarantee chemical, mechanical and dimensional properties for an unlimited time. When stored under clean, dry conditions all surface characteristics will be guaranteed for a six month period.

XVI Roll Specification:

Core ID 76 mm typical

Wound on cardboard core, typical length 600 mm

Coil length, 500 – 1000 meters typical

XVII Packaging:

Each roll will be loosely wrapped in saran wrap, bagged with plastic and have molecular sieve desiccant inside the bag

Each roll core, and plastic bag will be labeled with:

Somers Thin Strip Mill Order Number
Gauge, width, alloy and temper,
CUB and cut number, Net weight in pounds, Length in meters.

Each roll will be suspended in individual cardboard or wood cases roughly 300mm x 300mm x 750mm. Each case will have two 75mm x 100mm bottom runners located ~375mm apart. Each case will be covered with a wood Copperbond® case lid, and each lid will be labeled as above on each end and top.

For 1 or 2 ounce product, two layers of three cases will typically be stacked on a 750mm x 750mm pallet. For thinner products, a single layer of three cases will typically be used.
The layers will be separated by a chipboard spacer.

The cases will be stretch wrapped to the pallet, and a chipboard lid will be banded to the pallet.

Each pallet load will be labeled with:

Somers Thin Strip
Somers order number, item number and alloy
Gage, width, temper
CUB number
IPC foil designator,
Ship to address
Gross weight, Net weight

XVIII Defective Material procedure

A sample or photograph (if transit damage) with the lot (CUB) number and coil will be forwarded to Somers Thin Strip, along with a detailed description of the defect (Defective Material Report)

Somers will investigate to determine the root cause of defective material and report their results to the customer within 14 working days following sample receipt

Material disposition, to either scrap at the customer location or return to Somers, will be conveyed at the same time

A corrective action report will be issued if appropriate and applicable changes implemented