TW-B-YE / TW-B

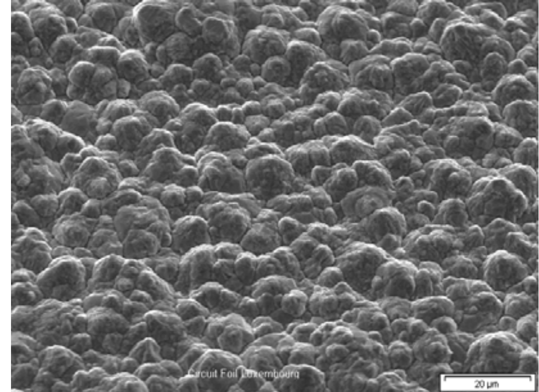
Technical Characteristics

TW-B style of foil is an advanced single-sided treated electro–deposited copper foil, where bonding treatment is applied to the "shiny" side (so-called "Reverse Treated Foil"). The final product exhibits Very Low Profile characteristics for the treatment side. Base foil is characterized by enhanced high temperature elongation properties [Grade 3].

This foil is now also available with the inorganic YE protection on the untreated matte surface, assures superior resistance to oxidation, especially in warm and humid environments.

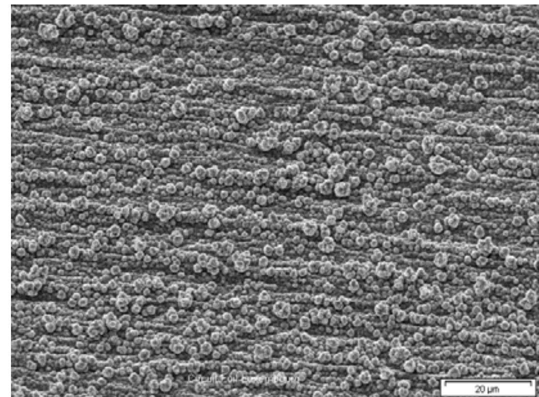
The product is designed for the manufacture of FR-4 based laminates for multilayer PCB's, where inner layers will be submitted to "oxide-bonding" chemistries.

Such cores will be used to produce high density, fine line or controlled impedance PCB circuitry.



Untreated matte side

Treated shiny side



Typical average properties

TW-B-YE							
Table 1							
MEASURED PARAMETERS	UNITS	PRODUCT GAUGE				IPC	
Nominal Thickness	µm oz.	12 1/3	18 1/2	35 1	70 2	Specification IPC-4562A	Test Method IPC-TM-650
Area Weight (± 5 %)	oz/ft² g/m² g/254 in²	0.35 108 17.7	0.50 154 25.2	0.95 290 47.5	1.90 580 95.0	(a)1.2.5, table 1-1 (b)3.4.4 (c)4.6.3	2.2.12
Untreated Matte Side Roughness (Rz)	µm µ.inch	< 5.1 < 201	3.0 - 5.5 118 - 217	5.0 - 7.5 197 - 295	6.5 - 9.0 256 - 354	3.5.6	2.2.17
Treated Shiny Side Roughness (Rz)	µm µ.inch	< 5.1 < 201				3.4.5	2.2.17
Tensile Strength Transverse at RT	MPa k.Lb/in²	> 276 > 40				3.5.1	2.4.18
Tensile Strength Transverse at 180 °C	MPa k.Lb/in²	> 138 > 20				3.5.1	2.4.18
Elongation Transverse at RT	%	> 3	> 6	> 10	> 15	3.5.3	2.4.18
Elongation Transverse at 180 °C	%	> 3				3.5.3	2.4.18
Peel Strength Treated Shiny Side (RT) FR4[1]	N/mm Lb/in	> 0.87 > 5.0	> 1.0 > 5.7	> 1.35 > 7.7	> 1.6 > 9.1	3.5.4	2.4.8
High Temp. Tarnish Resistance	-	120 min @ 180 °C in air: pass					
Solderability	-	Complies with IPC specification				3.6.3	2.4.12

[1] Laminate construction with thickness >= 0.5 mm

TW-B							
Table 2							
MEASURED PARAMETERS	UNITS	PRODUCT GAUGE				IPC	
Nominal Thickness	µm oz.	105 3	140 4	175 5	210 6	Specification IPC-4562A	Test Method IPC-TM-650
Area Weight (± 5 %)	oz/ft² g/m² g/254 in²	2.88 880 144	3.93 1200 197	4.92 1500 246	5.90 1800 295	(a)1.2.5, table 1-1 (b)3.4.4 (c)4.6.3	2.2.12
Untreated Side Roughness (Rz)	µm µ.inch	7 - 11 276 - 433	8 - 12 315 - 472	8 - 13 315 - 512	8 - 14 315 - 551	3.5.6	2.2.17
Treated Side Roughness (Rz)	µm µ.inch	< 5.1 < 201				3.4.5	2.2.17
Tensile Strength Transverse at RT	MPa k.Lb/in²	> 276 > 40				3.5.1	2.4.18
Tensile Strength Transverse at 180 °C	MPa k.Lb/in²	> 138 > 20				3.5.1	2.4.18
Elongation Transverse at RT	%	> 15	> 20			3.5.3	2.4.18
Elongation Transverse at 180 °C	%	> 3				3.5.3	2.4.18
Peel Strength Treated Shiny Side (RT) FR4[1]	N/mm Lb/in	> 1.7 > 10	> 1.8 > 10.3			3.5.4	2.4.8
High Temp. Tarnish Resistance	-	120 min @ 180 °C in air: pass					
Solderability	-	Complies with IPC specification				3.6.3	2.4.12

[1] Laminate construction with thickness >= 0.5 mm

The higher foil thicknesses (table 2) are typically used for high current applications or power / ground planes.

Advanced Product Features

General Features

- High temperature elongation - [HTE-Type E / Grade 3] properties prevent "barrel cracking" failures in multilayer PCB's.
- Thermally stable microstructure - stable mechanical properties unaffected by thermal excursion from lamination or post laminate baking cycles - which could degrade laminate dimensional stability, warp & twist, and drilling characteristics (nail heading).
- The product meets or exceeds all of the requirements of IPC-4562A when tested on typical epoxy and multifunctional prepregs, in accordance with IPC test methods, including high temperature peel strength, solder shock and accelerated ageing.

Bonding Surface Related (Treated shiny side)

- Very Low Profile bonding surface roughness (Rz ≤ 5.1 µm / 200 µ.inch) ensures fast clean etching, with minimal loss of bond strength compared to conventional products.
- Increased etch capacity throughput from reduced etch times.
- Improved fine line capability and overall yield.

Copper Surface of Laminate (Untreated matte side)

- An "as plated" copper surface with a uniform controlled micro roughness provides an ideal surface for PCB processing:
- Eliminates all aggressive and variable mechanical processing, such as pumice scrubbing, to roughen the copper surface. This enhances laminate dimensional stability and is especially important for thin laminates prone to mechanical damage.
- Easy removal of the non-tarnish passivation layer by simple chemical processing (typically 30 s immersion in 10 % sulphuric acid at room temperature) prior to photo resist application.
- Improved photo resist adhesion, reducing undercut and improved line definition.
- Simplified "oxide" processing. The already roughened untreated matte surface eliminates the need for chemical micro etching prior to oxide processing and the associated etch waste disposal costs.

Notes

- Products can be supplied in both roll and sheeted formats.
- Roll product is available in widths of 150 mm (~ 5.9") to 1360 mm (~ 53.5").
- Product is supplied on sturdy cardboard cores with an ID of ~ 80 mm (3 1/8"). Alternative core sizes and materials are available on request.
- Please visit our website (www.circuitfoil.com) for regular updates.

All of this Technical Information has been determined with due care and thoroughness. However, because the conditions of use and process and application technologies employed can substantially vary, the provided data and figures can only serve as non binding guidelines. They do not constitute a guarantee that the purchased item will possess certain attributes. For this reason, no liability whatsoever can be assumed for them. The buyer is obliged to check the suitability of all supplied products.

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