



TW-LP4-YE & LPT

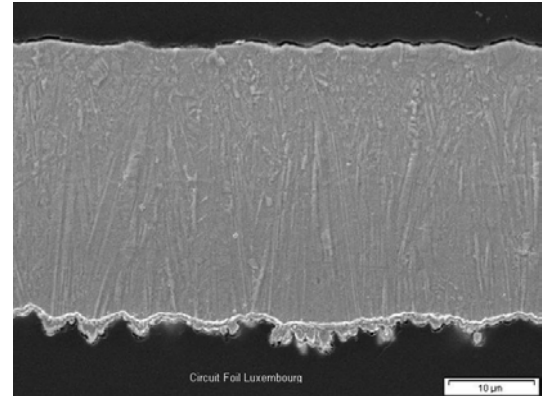
Technical Characteristics

TW-LP4-YE represents a family of advanced single-sided treated products based on a unique low profile matte side base foil. The final product, after application of bonding treatment to this matte surface, exhibits Very Low Profile characteristics.

The inorganic **YE** protection on the shiny foil surface ensures its superior resistance to oxidation in warm and humid environments.

The product is designed for the manufacture of ultra thin innerlayer FR-4 based laminates for multilayer PCB manufacture. These laminates will be used to produce high density, fine line or controlled impedance PCB circuitry.

Derived versions like **LPT** are used for chip or smart card modules.



Cross section of a 35 µm foil with LP4 roughness profile

(Rz between 4.0 and 5.1 µm)

Typical average properties

TW-LP4-YE & LPT									
Table 1									
MEASURED PARAMETERS	UNITS	PRODUCT GAUGE					IPC		
		TW-LP4-YE				LPT	Specification IPC-4562	Test Method IPC-TM-650	
Nominal Thickness	µm oz.	18 1/2	25 3/4	35 1	70 2	35 1			
Area Weight (± 5 %)	oz/ft ²	0.50	0.72	0.95	1.90	1.05	(a)1.2.5, table 1-1	2.2.12	
	g/m ²	154	220	290	580	319	(b)3.4.4		
	g/254 in ²	25.2	36.1	47.5	95.0	52.3	(c)4.6.3		
Untreated Side Roughness (Ra)	µm µ.inch	0.20 - 0.40 8 - 16						3.5.6	2.2.17
Treated Side Roughness (Rz)	µm µ.inch	< 5.1 < 201				< 6 < 236		3.4.5	2.2.17
Tensile Strength Transverse at RT	MPa k.Lb/in ²	> 276 > 40				> 400 > 58		3.5.1	2.4.18
Tensile Strength Transverse at 180 °C	MPa k.Lb/in ²	> 138 > 20				> 175 > 25		3.5.1	2.4.18
Elongation Transverse at RT	%	> 6		> 10	> 15	> 10		3.5.3	2.4.18
Elongation Transverse at 180 °C	%	> 3						3.5.3	2.4.18
Peel Strength (RT) FR4 ^{1/1}	N/mm Lb/in	> 1.2 > 6.9	> 1.3 > 7.5	> 1.4 > 8.0	> 1.6 > 9.1	> 1.4 > 8.0		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

^{1/1} Laminate construction with thickness ≥ 0.5 mm



Advanced Product Features

- Very Low Profile bonding surface roughness ($R_z \leq 5.1 \mu\text{m} / 200 \mu\text{inch}$) 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.
- Higher internal tensile strength compared to "standard" HTE product provides improved foil handling properties and improved lamination yield.
- High temperature elongation - [HTE-Type E / Grade 3] {IPC-4562 / 1.2.4.1} prevents "barrel cracking" failures in multi-layer 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).
- **LPT** version is characterized by superior elastic limit which is also preserved after the typical process for chip card modules. High mechanical properties ensure a perfect flatness of the foil inside the chip window.
- The product meets or exceeds all of the requirements of IPC-4562 when tested on typical epoxy and multifunctional prepregs, in accordance with IPC test methods, including high temperature peel strength, solder shock and accelerated ageing.

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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