

CAC[®] CSC 5 μ m

Premium Solution for High End Multilayers

- 5 μ m copper foil with aluminium or steel separator sheet
- Treatment roughness Rz less than 2 μ m
- Thickness uniformity is guaranteed with a tolerance of max. +/-5%
- Eliminates differential etching
- Easy handling on a steel or aluminium separator sheet

Overview

The most suitable solution for high density multilayer PCBs is GOULD's 5 μ m foil, combined with its proprietary CAC or CSC technology.

CAC/CSC 5 μ m eliminates the need for differential etching and thus, all negative implications of reduced thickness uniformity. It also reduces the inconvenience of handling thin 5 μ m copper foil and assures a particle and resin-dust free interface between separator plate and copper foil.

Differential etching is commonly practiced to reduce base copper thicknesses of 35 μ m or 18 μ m copper foil to meet the

requirements of impedance controlled multilayers or Fine Line Technology (< 4 mils/100 μ m). In most cases, this is done at the expense of a uniform thickness distribution and high etching costs.

GOULD's 5 μ m copper foil offers a technical and commercial alternative for high tech multilayers. Aluminum (CAC) or steel (CSC) separators provide additional benefits for leading edge fine line circuitries.

Advantages

■ VLP Treatment

The foil has a Very Low Profile treatment with a roughness Rz of less than 2 μ m. This allows realization of finest geometries and tight impedance controls.

■ Eliminates Differential Etching

Benefits of 5 μ m foil compared to 18/35 μ m foil with differential etching include:

- no etching to thin the copper
- no chemical step
- less material handling
- clean and uniform surface for consecutive steps (e.g. photoimaging)
- surface passivation of foil allows for longer buffer times between process steps

■ Less Material Handling

In conventional pin lamination of a ten-high book, 31 individual copper foil and aluminum or steel separator components must

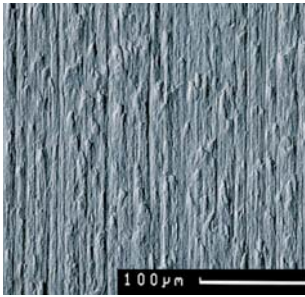
be carefully placed over pins in the lay-up of a multilayer book. CAC/CSC reduces the number of components that must be handled to 11.

■ Eases Use of Thin Foils and Reverse Treated Foils

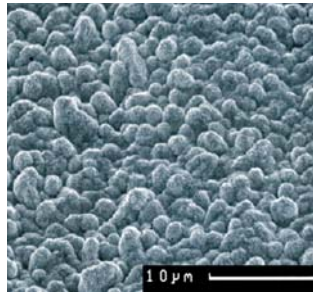
Because the foil is attached to a rigid separator, CAC/CSC with thin foils, such as 5 μ m, significantly eases creation of fine lines and spaces as small as 50 μ m (2 mils).

■ Eliminates Foil Wrinkles

Handling and registration of thin copper foil onto lamination fixture pins can cause handling wrinkles, a major source of foil pinholes. They are eliminated by the use of separators.



JTCHTE-5 μm, shiny side



JTCHTE-5 μm, treated matte side

Specifications

Typical Mechanical Properties of JTCHTE- 5 μm (IPC-4562) and Separator Sheets:

Property	Unit	JTCHTE	Property	Unit	CAC	CSC	CSC
		5 μm			0.30 mm	0.22 mm	0.49 mm
Area weight	g/m ²	50	Density	g/cm ²	2.63	7.87	7.87
Tensile strength RT	N/mm ²	460	Thermal conductivity	W/m*grd	120	73	73
Elongation RT	%	2.9	Specific heat capacity	kJ/kg*grd	0.99	0.45	0.45
Tensile strength 180 °C	N/mm ²	210	CTE (0 ... 200 °C)	10 ⁻⁶ 1/grd	26.1	12.1	12.1
Elongation 180 °C	%	2.0	Young's modulus	kN/mm ²	72	210	210
Peel strength FR4-Tg140	N/mm	0.60 ¹⁾	Poisson ratio	--	0.34	0.28	0.28
Shiny side, Ra	μm	0.27	Tensile strength	N/mm ²	410	435	435
Matte side, Rz	μm	1.9	Elongation	%	> 10	> 16	>18
			Hardness HV _{0.1}	kg/mm ²	115	120	120

¹⁾ After planting up

Supply

CAC®/CSC can be supplied in varying sizes with and without registration holes to the widespread varieties of customer specifications. This product is produced under the same excellent conditions like other CAC and CSC products. JTCHTE 5 μm is 0.148 oz/ft². The foil is produced at our sister plant Nikko Materials Philippines.

GOULD Electronics is part of the Nikko Materials group. The company is a leading supplier of materials to the electronics industry.



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