Nippon Steel Chemical Co.,Ltd.

For Your Dream & Happiness

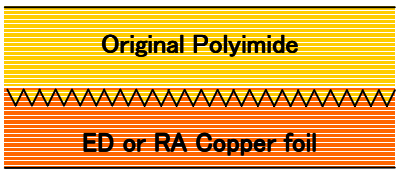
Adhesiveless, Flexible Copper Clad Polyimide Laminate
Single side

ESPANEX® SC series

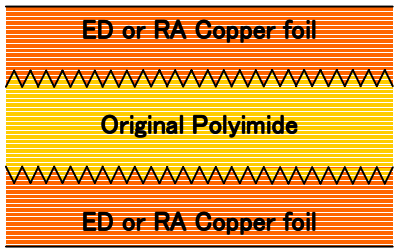
Adhesiveless, Flexible Copper Clad Polyimide Laminate
Double side

ESPANEX® SB series

ESPANEX SC & SB series: are single and double sided copper clad, flexible adhesiveless polyimide dielectric laminates used for Flex circuitry, Flex-rigid multilayers, and TBGA chip carrier packaging. These high performance flexible laminates are based upon engineered polyimide chemistries that result in CTE's matched to copper foils combined with high Tg thermal resistance. Excellent dimensional stability and high service temperature provide designers with flexible interconnects for fine pitch high density applications.



SC series
Single side



SB series
Double side

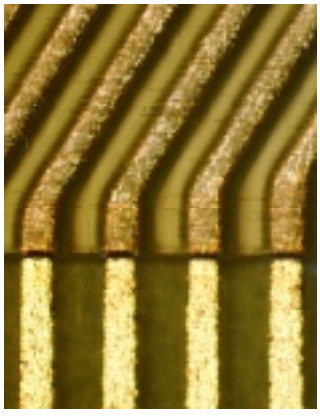
■Features

- Excellent **dimensional stability** related to our unique casting technology.
- Excellent **heat/thermal resistance** for wire bonding, soldering and high temperature applications.
- Excellent **chemical resistance** to processing and plating chemistries.
- **Multiple Copper foil selections**, ED/RA, thickness and treatment profiles.
- Excellent **electrical performance** related to additive free polyimide dielectric.
- Excellent performance using **laser processing** for micro via designs.

■Application

- Flex circuits
- Multilayer Rigid-Flex wiring boards
- Chip On Film substrate
  (Chip on Flex)
- CSP & BGA
- PDP driver
- etc.

Example 1, CSP



Example 2, COF

■Copper Foil Types & Polyimide Thickness Selection

● Copper foil selections

ESPANEX SC & SB series adhesiveless copper clad laminates are produced by our precision polyimide CASTING process, using NSCC developed polyimide precursor chemistry cast onto specified copper foils. Copper foil types and thickness may be selected according to the design requirements of each application.

Process	Supplier	Supplier's grade	NSCC grade	
			Single side	Double side
ED: Electro deposit	Mitsui Mining & Smelting	3EC-Ⅲ	SCXX-YY-00ME	SBXX-YY-XXME
		SQ-VLP	SCXX-YY-00AE	SBXX-YY-XXAE
	Nippon Denkai	SLP	SCXX-YY-00WE	SBXX-YY-XXWE
		USLP	SCXX-YY-00KE	SBXX-YY-XXKE
	Circuit foil Japan (Furukawa)	WS	SCXX-YY-00CE	SBXX-YY-XXCE
RA: Roll annealed	Japan Energy	BHY	SCXX-YY-00FR	SBXX-YY-XXFR

XX=Copper foil thickness, YY=Polyimide thickness

● Polyimide thickness

Our CASTING process can provide polyimide thickness of 12μm, 25μm, 40μm and 50μm for single sided and 25μm and 50μm for double sided.

Polyimide thickness	NSCC grade	
	Single side	Double side
12μm	SCXX-12-00ZZ	
25μm	SCXX-25-00ZZ	SBXX-25-XXZZ
40μm	SCXX-40-00ZZ	
50μm	SCXX-50-00ZZ	SBXX-50-XXZZ

XX=Copper foil thickness, ZZ=Copper foil type

■General Properties

Property		Units	SC18-25-00		SB18-25-18		Test method
			FR	WE	FR	WE	
Tensile Strength		MPa	249.7		242.2		IPC-TM-650, 2.4.19
Tensile Elongation		%	49.3		55.5		
Tensile Modulus		MPa	4500		4500		
Peel Strength	Initial	kN/m	1.2	1.6	0.9	1.4	JIS C-5012
	Aging	kN/m	1.0	1.3	0.9	1.1	150℃, 7days
Etch Shrinkage	MD	%	0.00	0.04	0.00	(-0.02)	
	TD	%	0.01	0.01	(-0.02)	(-0.04)	
Thermal Shrinkage	MD	%	(-0.05)	(-0.04)	(-0.03)	(-0.02)	250℃, 30min
	TD	%	(-0.05)	(-0.04)	(-0.02)	(-0.02)	
Insulation Resistance		MΩ	9.7×10^7	1.3×10^7	5.1×10^7	1.8×10^7	IPC-TM-650, 2.5.9
Volume Resistivity		MΩ・cm	-	-	1.6×10^6	5.7×10^6	IPC-TM-650, 2.5.17
Dielectric strength		kV/mil	7.5	7.5	7.0	6.5	ASTM-D-149 Short time test
Solder float resistance		℃	400	400	360	360	1 min dipping

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