



**Glass cloth and glass mat base epoxy resin
 flame retardant copper clad laminate**

CEM-3-92 /UV BLOCK CEM-3-92

■ FEATURES

- Natural color CEM-3-92 is more transparent; especially the color is similar to FR-4 material.
- Same quality, same P. C. B. Process capability as CEM-3-86.
- Wearing of drill bit is much less than that of FR-4; especially suitable for punch process.
- Electrical properties as well as chemical resistance are the same as those of FR-4.
- Through-hole reliability and warpage have been improved to replace some part of the market share of FR-4.
- IPC-4101C Specification is applicable.

■ PERFORMANCE LIST

Characteristics	Unit	Conditioning	Typical Values	SPEC	Test Method	
Volume resistivity	MΩ-cm	C-96/35/90	5.0×10^8	$10^6 \uparrow$	2.5.17	
Surface resistivity	MΩ	C-96/35/90	5.0×10^7	$10^4 \uparrow$	2.5.17	
Permittivity 1MHZ	-	C-24/23/50	4.50	5.4 ↓	2.5.5.2	
Loss tangent 1 MHZ	-	C-24/23/50	0.03	0.035 ↓	2.5.5.2	
Dielectric breakdown	KV	D-48/50	60 ↑	40 ↑	2.5.6	
Moisture absorption	%	E-1/105+D-24/23	0.09	0.50 ↓	2.6.2.1	
Flammability	-	C-48/23/50	94V0	94V0	UL94	
Peel strength 1oz	lb/in	288°C x 10" solder floating	11	6 ↑	2.4.8	
Thermal stress	SEC	260°C dipping	150 ↑	20 ↑	2.4.13.1	
Flexural strength	LW	N/mm ²	A	300-400	276 ↑	2.4.4
	CW	N/mm ²	A	200-300	186 ↑	2.4.4
Glass transition temp	°C	DSC	130 ± 5	N/A	2.4.25	
Punchability	Kg/cm ²	ASTM D-732 Shear strength	900	N/A	ASTM D-732	
Decomposition Temperature (Td 5% W/L)	°C	TGA	310	N/A	2.4.24.6	

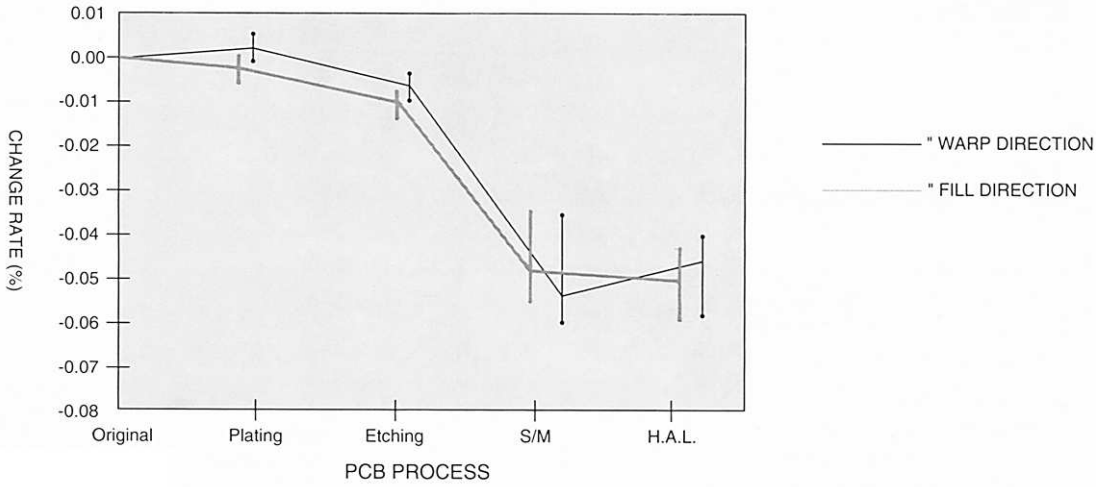
NOTE:

The average value in the table refers to samples of .062"
 Test method per IPC-TM-650

Data shown are nominal values for reference only.

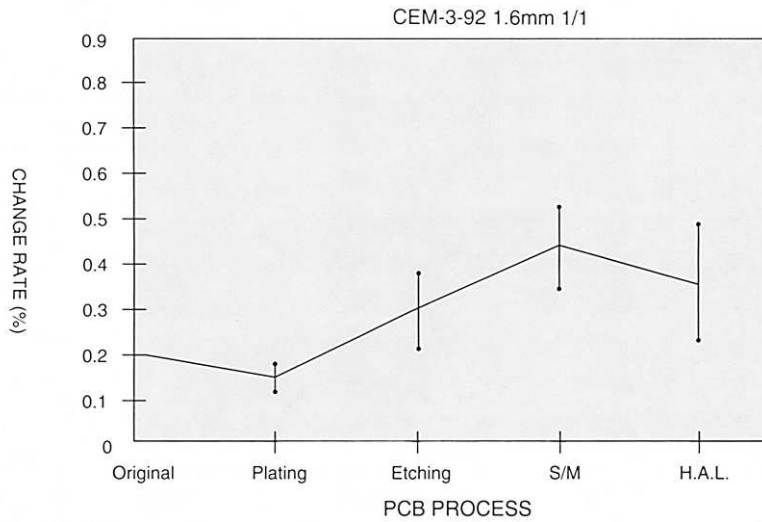


■ **Excellent dimensional stability**

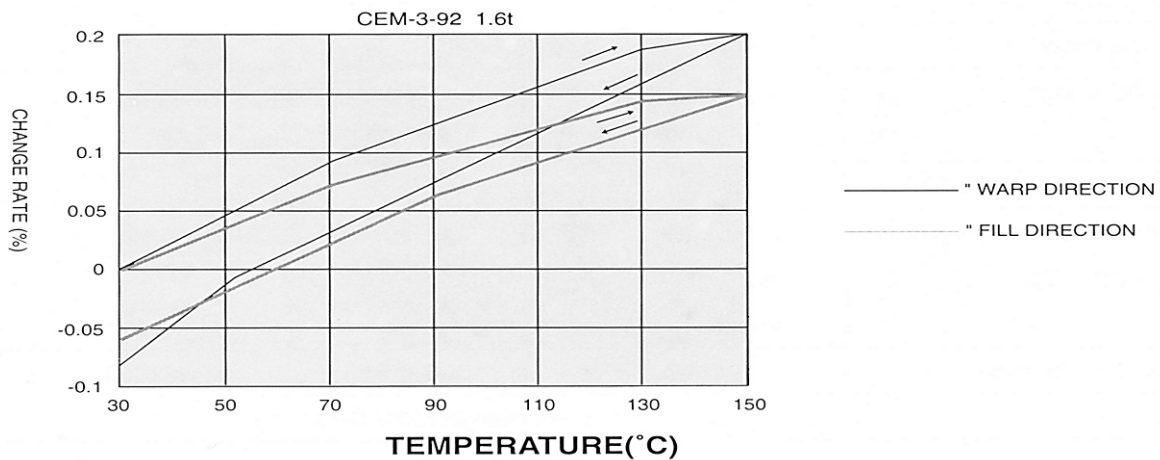


■ **Less Bow and Twist**

The percentage of Bow & Twist after PCB process.



■ **Coefficient of thermal expansion**



	FILL	WARP
Expansion %	0.143	0.190
Shrinkage %	0.067	0.083



■ **Recommended drilling parameters of CEM-3 single & double side**

drill bit Ø (mm)		CEM-3 1.6mm 1/x			CEM-3 1.6mm1/1		
		RPM	IPM	CHIP LOAD (mil)	RPM	IPM	CHIP LOAD (mil)
a stack of 4 heights	0.6~0.65	70000	90	1.3	70000	90	1.3
	0.7~0.85	70000	110	1.6	70000	110	1.6
	0.9~1.05	66000	120	1.8	66000	120	1.8
	1.05~1.35	60000	115	1.9	60000	115	1.9
a stack of 3 heights	0.6~0.65	70000	115	1.6	65000	105	1.6
	0.7~0.85	65000	125	1.9	65000	125	1.9
	0.9~1.05	66000	120	1.8	66000	120	1.8
	1.05~1.35	58000	145	2.5	55000	132	2.4

■ **CERTIFICATION UL**

• UL File No. : E98983 • ANSI TYPE:CEM-3