NAN YA PLASTICS CORPORATION
ELECTRONIC MATERIALS DIVISION.
COPPER CLAD LAMINATE DEPARTMENT
NO. 201. TUNG HWA N. ROAD, TAIPEI, TAIWAN.

Issued: 2008/03/01
New: 2020/09/01

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
- 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-4101E Specification is applicable.

■ PERFORMANCE LIST

Characteristics		Unit	Condition	Typical Values	SPEC	Test Method
Volume resistivity		MΩ-cm	C-96/35/90	5.0×10^8	10^6 ↑	2.5.17
Surface resistivity		MΩ	C-96/35/90	5.0×10^7	10^4 ↑	2.5.17
Permittivity 1MHz		-	C-24/23/50	4.50	5.4 ↓	2.5.5.2
Loss tangent 1 MHz		-	C-24/23l/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	V-0	V-0	UL94
Peel strength 1oz (≥0.5mm)		lb/in	288℃ x 10" solder floating	11	6 ↑	2.4.8
Thermal stress		SEC	260℃ 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 temperature		℃	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)		℃	TGA	310	N/A	2.4.24.6

Data shown are nominal values for reference only.

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

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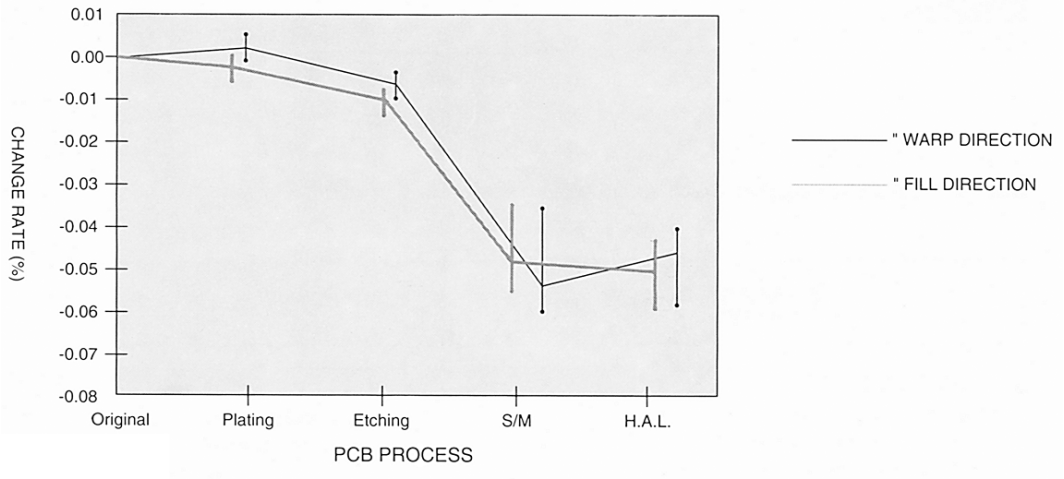
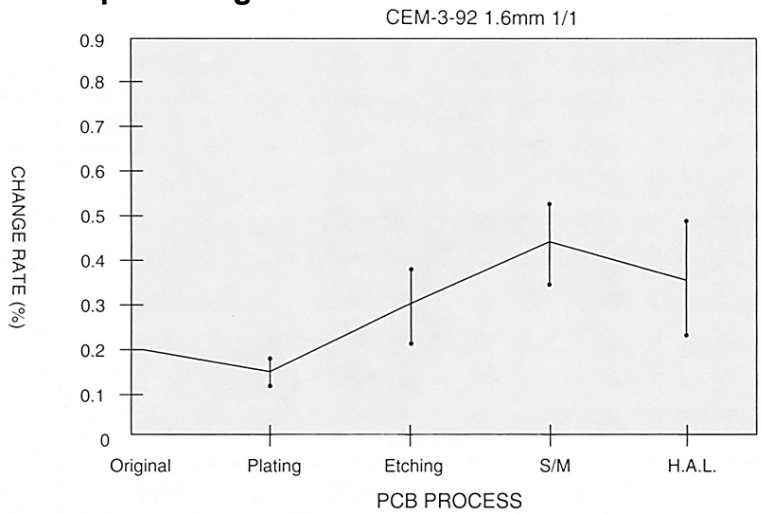
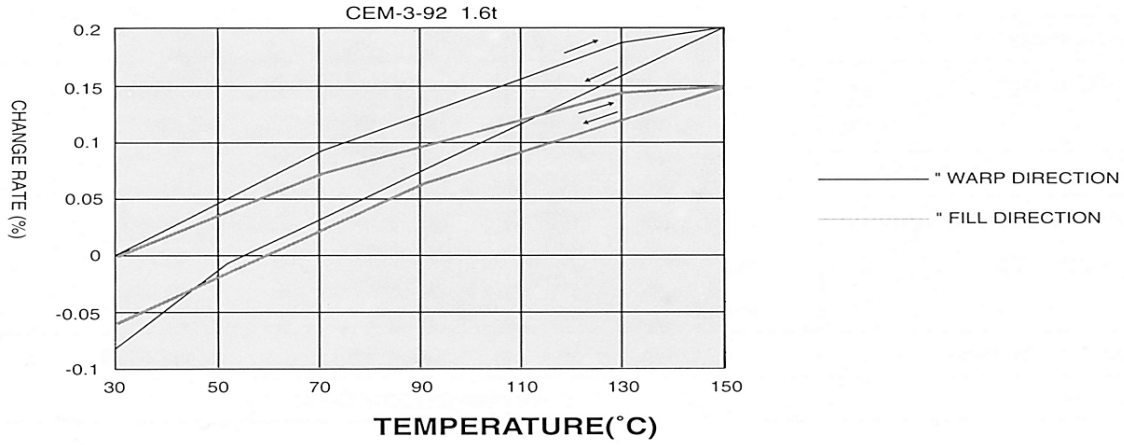
■ Excellent Dimensional Stability



■ 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