

N4000-11

**CAF Resistant, Low CTE
High Tg FR-4 Epoxy
Laminate & Prepreg**

Jan 2003

Processing Guideline

1.0 Artwork compensation factor

The actual compensation factor of a multi-layer PCB has to be determined prior to volume production, as there are many factors involved. There are some typical factors for dimensional movement :

- a) Inner layer board thickness
- b) Copper density of circuitry
- c) Circuitry trace thickness
- d) Type of prepreg used as bonding sheet

It is recommended to determine the actual factor by running a prototype sample before embarking on volume production.

2.0 Inner layer surface treatment

It is recommended to **BY PASS** micro etch bath for laminate clad with Reverse Treated Foil (RTFoil) or Double Treated Foil (DTFoil).

Mild Acid Treat → Rinsing → Micro-etch → Rinsing → Drying →
Pre-heat → Dry Film Lamination

No pre-baking of laminate is needed as the laminate is fully cured. However, a pre-bake is recommended for laminate that has been kept for a substantial period of time. The recommended drying condition varies upon the humidity level and length of exposure. Generally a 2 hrs @ 120 C in an hot air oven is sufficient to dry the laminate.

3.0 Inner layer oxide process

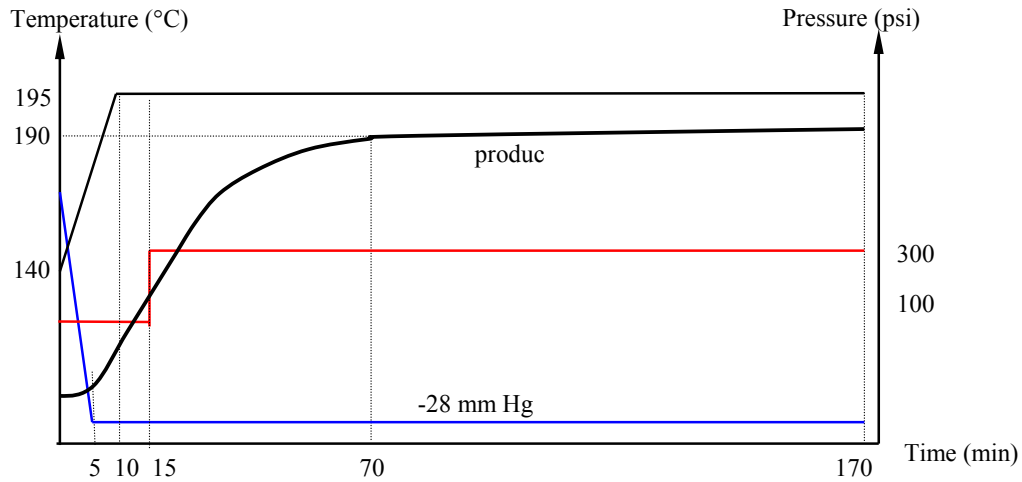
N4000-11 laminates are compatible with any type of oxides used in PCB industry. Oxides such as controlled dissolution; standard brown/black oxide with DMAD, and alternative coatings can be used successfully. Typical weight gain control at 0.2 to 0.4 mg/cm².

Bake the oxide panel for 30 ~ 45 min@110 °C in a hot air oven before lay-up to eliminate the effect of moisture.

4.0 Lamination process

Type of machine = Vacuum Hydraulic Press
Platen temperature = 195 ± 5 C
Heat rise = 4 - 7 °C/min (material temp. measure between 70°C to 140 °C)
Curing time = 90 min @ 190°C and above (material temp.)
Pressure = 300 ~ 350 psi
Vacuum level = -28" Hg or higher

Hot Press Cycle



Note:

- 1) The above product's temperature curves assume at the centre of the stack-up, that is the coldest location of the product's stack-up
- 2) The platen temperature is very close to product temperature (5°C or less)

5.0 Drilling condition

Drill ϕ (mm)	Feed (IPM)	Speed (RPM) K	Retract (IPM)	Max Hits	Chip load (mils)
0.25	60	100	500	500	0.60
0.30	75	100	750	750	0.75
0.35	95	100	1000	1000	0.95
0.40	100	100	1000	1000	1.00
0.50	97	80.8	1000	2000	1.20
0.60	103	68.8	1000	1200	1.50
0.80	116	51.6	1000	1500	2.25

6.0 Desmearing condition

N4000-11 can be successfully desmeared with a Permanganate chemistry. The following condition is recommended.

Option	Type	Temp (°C)	Time (min)
1	Butyl /OH	78 \pm 2	6 - 8
2	Cyclic Amine 50% v/v	77 \pm 2	6 - 5
3	Cyclic Amine 100%	54 \pm 2	3 - 5
Oxidizer			
	Alkaline Permanganate	77 \pm 2	12 - 16