



NAN YA PLASTICS CORPORATION

ELECTRONIC MATERIALS DIVISION.

COPPER CLAD LAMINATE DEPARTMENT

**Glass cloth base epoxy resin
Flame retardant copper clad laminate**

NO. 201. TUNG HWA N. ROAD,
TAIPEI, TAIWAN.

NP-175FR

■ FEATURES

- Dicy-Free & Low C.T.E
- Lead-Free Compatible
- Excellent dimensional stability and through-hole reliability
- Superior CAF-Resistance (Anti-migration)
- High luminance of multi-functional epoxy contrast with copper for A.O.I
- IPC-4101B/99

■ PERFORMANCE LIST

Characteristics	Unit	Conditioning	Typical Values	SPEC	Test Method	
Volume resistivity	MΩ-cm	C-96/35/90	$5 \times 10^9 \sim 5 \times 10^{10}$	$10^6 \uparrow$	2.5.17	
Surface resistivity	MΩ	C-96/35/90	$5 \times 10^8 \sim 5 \times 10^9$	$10^4 \uparrow$	2.5.17	
Permittivity 1MHZ	-	C-24/23/50	4.6-4.8	5.4 ↓	2.5.5.9	
Permittivity 1GHZ	-	C-24/23/50	4.2-4.4	-	2.5.5.9	
Loss Tangent 1MHZ	-	C-24/23/50	0.016-0.020	0.035 ↓	2.5.5.9	
Loss Tangent 1GHZ	-	C-24/23/50	0.014-0.016	-	2.5.5.9	
Arc resistance	SEC	D-48/50+D-0.5/23	120 ↑	60 ↑	2.5.1	
Dielectric breakdown	KV	D-48/50	60 ↑	40 ↑	2.5.6	
Moisture absorption	%	D-24/23	0.05-0.10	0.35 ↓	2.6.2.1	
Flammability	-	C-48/23/50	94V0	94V0	UL94	
Peel strength 1 oz	lb/in	288°Cx10" solder floating	8-10	6 ↑	2.4.8	
Thermal stress	SEC	288°Cx10" solder dipping	600 ↑	10 ↑	2.4.13.1	
Pressure cooker (2 atm 120°C)	1/2 hr	288°C dipping	600 ↑	N/A	-	
	1 hr	288°C dipping	600 ↑	N/A	-	
	2 hr	288°C dipping	600 ↑	N/A	-	
Flexural strength	LW	N/mm ²	A	480-550	415 ↑	2.4.4
	CW	N/mm ²	A	415-480	345 ↑	2.4.4
Dimensional stability X-Y axis	%	E-0.5/170	0.005-0.030	0.050 ↓	2.4.39	
Coefficient of thermal expansion						
Z-axis before Tg	ppm/°C	TMA	40-60	60 ↓	2.4.24	
Z-axis after Tg	ppm/°C	TMA	250-270	300 ↓		
50-260°C	%	TMA	3.0%	3.5% ↓		
Glass transition temp	°C	DSC	175 ± 5	150 ↑	2.4.25	
T260	min	TMA	>60	30 ↑	2.4.24.1	
T288	min	TMA	>20	5 ↑	2.4.24.1	
Td (5% Weight Loss)	°C	TGA, 10°C/min	351	325 ↑	-	

NOTE:

The average value in the table refers to samples of .062" 1/1.

Test method per IPC-TM-650

Data shown are nominal values for reference only.