

Technical Values

DURAVER®-E-Cu quality 104

Specification Sheet #:	IPC-4101/21
Reinforcement:	woven E-glass fabric
Resin System:	Epoxy, flame resistant
ID Reference:	NEMA FR-4, MIL-S-13949/04 - GF/GFN/GFK
Glass Transition Range T _g 1:	110°C minimum

Explanations:

C = preconditioning in moist
E = preconditioning at temperature

The figures following the letter symbols indicate with the first digit the duration of the preconditioning in hours, with the second digit the preconditioning temperature in °C and with the third digit the relative humidity.

LAMINATE REQUIREMENTS	Units	SPECIFICATION	VALUES-ISOLA	SPECIFICATION	VALUES-ISOLA
		< 0.78 mm		≥ 0.78 mm	
1. Peel Strength , minimum					
A. Low profile copper foil and very low profile copper foil - all copper weights > 17 microns	N/mm	0.70	1.10	-	-
B. Standard profile copper foil					
1. After thermal stress	N/mm	0.80	1.70	1.05	2.00
2. At 125 °C	N/mm	0.70	1.60	0.70	1.90
3. After process solutions	N/mm	0.55	1.60	0.80	2.00
C. All other foils-composites	N/mm				
2. Volume Resistivity , minimum					
A. C-96/35/90	MΩ · cm	1.00E+06	3.10E+07	-	-
B. After moisture resistance	MΩ · cm	-	-	1.00E+06	8.00E+08
C. At elevated temperature E-24/125	MΩ · cm	1.00E+03	7.20E+05	1.00E+03	8.00E+06
3. Surface Resistivity , minimum					
A. C-96/35/90	MΩ	1.00E+04	2.20E+07	-	-
B. After moisture resistance	MΩ	-	-	1.00E+04	4.00E+06
C. At elevated temperature E-24/125	MΩ	1.00E+03	1.60E+06	1.00E+03	7.00E+04
4. Moisture Absorption , maximum	%	0.80	0.35	0.35	0.24
5. Dielectric Breakdown , minimum	kV	-	-	40	45
6. Permittivity @ 1 MHz , maximum (Laminate or prepreg as laminated)	-	5.4	4.5-4.9	5.4	4.7
7. Loss Tangent @ 1 MHz , maximum (Laminate or prepreg as laminated)	-	0.035	0.020	0.035	0.019
8. Flexural Strength , minimum					
A. Length direction	N/mm ²	-	-	423	600
B. Cross direction	N/mm ²	-	-	352	480
9. Flexural Strength @ Elevated Temperature , length direction, minimum	N/mm ²	-	-	-	-
10. Arc Resistance , minimum	s	60	63	60	75
11. Thermal Stress 10 Sec. @ 288°C , minimum	s				
A. Unetched		Passed	Passed	Passed	Passed
B. Etched		Passed	Passed	Passed	Passed
12. Electric Strength , minimum (Laminate or prepreg as laminated)	V/mm	2.90E+04	3.20E+04	-	-
13. Flammability					
A. Average burn time, maximum	s	5	3	5	3
B. Individual burn time, maximum	s	10	4	10	4
14. Glass Transition Range (T_g) DSC	°C	> 110	> 128	> 110	>130
15. Coefficient of Expansion					
α (RT-200 °C) TMA	ppm/K				x = 16
	ppm/K				y = 9
	ppm/K				z = 160

All data of the technical information were carefully determined. However, in view of the versatility of applications as well as process and application engineering, the given data and information are unbinding reference values only. Therefore, no warranty claim can be derived from these data. Otherwise, besides our general sales conditions, agreements shall be deemed binding only if made in writing.

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