



isola

B-DE 117/6

DURAVER®-E-Cu
quality 117

High-T_g base material

Processing

DURAVER®-E-Cu quality 117 can be fully cured with a similar press cycle as

DURAVER®-E-Cu quality 104 (standard FR-4). Post-baking is not required.

Current product information can also be obtained from our website www.isola-group.com

DURAVER®-E quality 117 ML Standard Prepregs

Prepreg type	Nominal thickness		Resin content %	Res. gel-time s	Viscosity Pa · s	Scaled flow	
	mm	inch				mil/Prepreg	mm/Prepreg
106 HT01	0.061	0.0024	74 ± 4	115 ± 20	64 ± 15	1.6 ± 0.2	0.041 ± 0.005
1080 HT01	0.079	0.0031	64 ± 4	115 ± 20	64 ± 15	2.3 ± 0.2	0.058 ± 0.005
2116 HT01	0.132	0.0052	54 ± 4	115 ± 20	64 ± 15	4.5 ± 0.3	0.114 ± 0.008
7628 HT01	0.190	0.0075	43 ± 3	115 ± 20	64 ± 15	6.5 ± 0.3	0.165 ± 0.008

Other prepreg types on request.

DURAVER®-E-Cu quality 117 ML Standard Laminate Constructions

Nominal thickness		Thickness tolerances		Construction	Mean resin content* %
mm	inch	IPC-4101B cl. B mm	IPC-4101B cl. C mm		
0.075	0.003	± 0.018	± 0.013	1 x 1080	63
0.100	0.004	± 0.018	± 0.013	1 x 2116	45
0.125	0.005	± 0.025	± 0.018	1 x 2165	47
0.150	0.006	± 0.025	± 0.018	1 x 2157	47
0.200	0.008	± 0.038	± 0.025	1 x 7628M	44
0.250	0.010	± 0.038	± 0.025	2 x 2165	47
0.300	0.012	± 0.050	± 0.038	2 x 2157	47
0.360	0.014	± 0.050	± 0.038	2 x 7628M	39
0.410	0.016	± 0.050	± 0.038	2 x 7628M	44
0.510	0.020	± 0.064	± 0.050	3 x 7628	39
0.540	0.022	± 0.064	± 0.050	3 x 7628M	39
0.610	0.024	± 0.064	± 0.050	3 x 7628M	44
0.710	0.028	± 0.064	± 0.050	4 x 7628M	39
0.760	0.030	± 0.064	± 0.050	4 x 7628M	42
0.900	0.035	± 0.100	± 0.075	5 x 7628M	39
1.000	0.039	± 0.100	± 0.075	5 x 7628M	44
1.080	0.042	± 0.130	± 0.075	6 x 7628M	39
1.200	0.047	± 0.130	± 0.075	6 x 7628M	44

Other thicknesses on request.

DURAVER®-E-Cu quality 117 Standard Laminate Constructions

Nominal thickness		Thickness tolerances		Construction	Mean resin content* %
mm	inch	IPC-4101B cl. L mm	IPC-4101B cl. M mm		
1.55	0.060	± 0.130	± 0.075	8 x 7628M	42
2.0	0.080	± 0.180	± 0.100	11 x 7628M	39
2.4	0.096	± 0.180	± 0.100	12 x 7628M	43
3.2	0.128	± 0.230	± 0.130	17 x 7628M	41

Other thicknesses on request.

*double sided 35 µm

Technical Values

DURAVER®-E-Cu quality 117

Specification Sheet #:	IPC-4101B/24
Reinforcement:	woven E-glass
Resin system:	primary: difunctional epoxy • secondary: multifunctional epoxy
Flame Retardant Mechanism:	brominated epoxy resin • minimum UL requirement: V-0
Fillers:	none
ID Reference:	UL/ANSI: FR-4 • ANSI: FR-4/24 • RoHS-compliant
Glass Transition Temperature (T _g):	150 °C - 200 °C

Explanations:

C = preconditioning in humidity chamber
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.

Properties	Units	Laminate thickness < 0.50 mm		Laminate thickness ≥ 0.50 mm	
		Specification	Isola-Value	Specification	Isola-Value
1. Peel Strength , minimum					
A. Low profile copper foil and very low profile copper foil – all copper weights > 17 µm	N/mm	0.70	1.40	0.70	n/a*
B. Standard profile copper foil (35 µm)					
1. After thermal stress	N/mm	0.80	1.50	1.05	1.80
2. At 125 °C	N/mm	0.70	1.20	0.70	1.40
3. After process solutions	N/mm	0.55	1.50	0.80	1.70
C. All other foil composite	N/mm	n/a*	n/a*	n/a*	n/a*
2. Volume Resistivity , minimum					
A. C-96/35/90	MΩ · cm	1.0 · 10 ⁶	4.6 · 10 ⁷	n/a*	n/a*
B. After moisture resistance	MΩ · cm	n/a*	n/a*	1.0 · 10 ⁴	4.0 · 10 ⁸
C. At elevated temperature E-24/125	MΩ · cm	1.0 · 10 ³	1.4 · 10 ⁷	1.0 · 10 ³	5.0 · 10 ⁶
3. Surface Resistivity , minimum					
A. C-96/35/90	MΩ	1.0 · 10 ⁴	3.8 · 10 ⁷	n/a*	n/a*
B. After moisture resistance	MΩ	n/a*	n/a*	1.0 · 10 ⁴	3.3 · 10 ⁷
C. At elevated temperature E-24/125	MΩ	1.0 · 10 ³	2.9 · 10 ⁷	1.0 · 10 ³	1.7 · 10 ⁷
4. Moisture Absorption , maximum	%	n/a*	n/a*	0.80	0.15**
5. Dielectric Breakdown , minimum	kV	n/a*	n/a*	40	48
6. Permittivity @ 1 MHz , maximum (Laminate or prepreg as laminated)		5.4	4.5 - 4.9	5.4	4.6 - 4.9
7. Loss Tangent @ 1MHz , maximum (Laminate or prepreg as laminated)		0.035	0.013	0.035	0.016
8. Flexural Strength , minimum					
A. Length direction	N/mm ²	n/a*	n/a*	415	600
B. Cross direction	N/mm ²	n/a*	n/a*	345	490
9. Flexural Strength @ Elevated Temperature , length direction, minimum	N/mm ²	n/a*	n/a*	n/a*	n/a*
10. Thermal Stress at 288 °C , minimum					
A. Unetched	s	≥ 10	≥ 10	≥ 10	≥ 10
B. Etched	s	≥ 10	≥ 10	≥ 10	≥ 10
11. Electric Strength , minimum (Laminate or prepreg as laminated)	kV/mm	30	45	n/a*	n/a*
12. Flammability	class	V-0	V-0	V-0	V-0
13. Glass Transition Temperature (T_g) DSC	°C	150 - 200		150 - 200	170
14. Coefficient of Thermal Expansion (CTE) TMA					
Fill direction (below T _g / above T _g)	ppm/K	–	–	–	17/12
Warp direction (below T _g / above T _g)	ppm/K	–	–	–	12/7
Vertical (below T _g / above T _g)	ppm/K	–	–	–	60/260

Tests are carried out in accordance with IPC-650 test methods.

*not applicable **measured at 1.55 mm laminate

Our information and our eventual advice for the application of our products in any form (for instance oral, written or by tests) is given carefully and by the best of our knowledge but is not binding and is provided without making any representation or warranty, expressed or implied, and without any liability. The user is not released also in the case of our prior testing or if the use is based on our practical application advice from its sole responsibility to use our product and to insure the correct application, the condition and fitness of our product for this application as well as the condition and fitness of the product itself.

USA

Isola USA S.a.r.l.
(Headquarters)
3100 W. Ray Road, Suite 301
Chandler, AZ 85226, USA
Phone: +1/4 80 / 8 93 65 27
Fax: +1/4 80 / 8 93 14 09
E-mail: info@isola-usa.com

EUROPE

Isola GmbH
52353 Düren
Germany
Phone: +49 (0) 24 21/ 80 80
Fax: +49 (0) 24 21/ 8 08 80
E-mail: info-dur@isola-group.com

MAS Italia s.r.l.
Via S. Sebastiano 21
I-51032 Bottegone (PT)
Phone: +39 / 05 73 / 92 22 31
Fax: +39 / 05 73 / 92 22 65
E-mail: info-bot@isola-group.com

Isola Fabrics s.r.l.
Via Matteotti, 120
I-20047 Brugherio (MI)
Phone: +39 / 039 / 2 89 16 47
Fax: +39 / 0 39 / 2 89 16 90
E-mail: info@isola-fabrics.com

ASIA

Isola Asia Pacific (Hong Kong) Ltd.
Unit 3512 - 3522, 35/F
No. 1 Hung To Road, Kwun Tong,
Kowloon, Hong Kong
Phone: +8 52 / 24 18 - 13 18
Fax: +8 52 / 24 18 - 15 33
E-mail: asia@isola-group.com