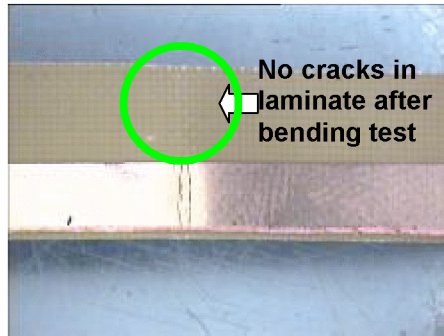


Flexible base material for printed circuit board applications DURAFLEX-E-Cu

DURAFLEX-E-Cu is an epoxy based, adhesiveless, semiflexible laminate which can replace well-known flexible base materials like Polyester or Polyimide. Typical applications for DURAFLEX-E-Cu



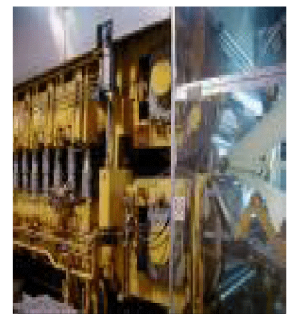
are rigid-flex PCBs or bend to assembly designs where dynamic bending characteristics are not required.

Besides the high flexibility DURAFLEX-E-Cu has a Tg at 150 °C (DSC). Its endurance bending strength has been verified in several test series: After 2x

lead free reflow the base material showed excellent bending results around mandrel diameters of 2 mm and 5 mm at 180 °.

DURAFLEX-E-Cu is available as laminate and prepreg. Epoxy based it can be processed with standard process parameters (relamination as well as PCB manufacturing process).

DURAFLEX-E-Cu does not need an adhesive layer to the copper foil which helps to avoid many problems in the PCB manufacturing process.



Additional characteristics:

- excellent solder bath resistance at 288 °C
- chemical resistance which reduces the danger of resin recession
- high mechanical strength
- no smearing due to absence of adhesive layer
- compatibly to other Isola base materials as well as to PI and PE
- dimensionally stability similar to FR4 ML cores

Polyester or Polyimide based materials can be used as cover layer. For rigid-flex constructions FR406N prepreg is recommended.

Standard availability:

Laminates: 60 µm or 100 µm thickness (w/o Cu-foil)
Sheets, panels, on roll

Cu-foil cladding:

Std. thickness 18 or 35 µm
high ductility
single or double sided
other thicknesses on request

Preliminary Datasheet

Typical Values

Characteristics	Dimension	Pre-treatment	IPC 4101B/21 specification	Typical value
Surface resistance	M Ω M Ω	C 96/35 /90 E-24/125	1,0 · 10 ⁴ 1,0 · 10 ³	4,5 · 10 ⁶ 1,5 · 10 ⁶
Volume resistivity	M Ω · cm M Ω · cm	C-96/35/90 E-24/125	1,0 · 10 ⁶ 1,0 · 10 ³	3,4 · 10 ⁷ 5,5 · 10 ⁶
Permittivity Dk1 MHz	-	A	5,4	4,7
Loss tangent Df 1 MHz	-	A	0,035	0,020
Dielectric breakdown ¹⁾	KV/mm	A	40	49
Cu-peel strength 35 μ m	N/mm	E	0,7	1,3
Thermal stress @ 288 °C	s	A	≥ 10	> 10
Moisture absorption ¹⁾	%	A	0,8	0,18
Flammability class ²⁾	-	A	V1	V-0
Glass transition temperature Tg ³⁾	°C		110 - 150	150
Endurance bending strength after 2x lead free reflow				
100 μ m laminate thickness, Cu 35/35; \varnothing 2 mm, 180°	Number of bendings	A	-----	15x
100 μ m laminate thickness, Cu 35/35; \varnothing 5 mm, 180°	Number of bendings	A	-----	120x

<p>Remarks:</p> <p>A = without preconditioning C = preconditioning with moisture E = preconditioning at temperature 1) = tests performed at 1.55 mm thick laminates 2) = specification UL 94 3) = DSC-method</p>	<p>All tests have been performed according to the IPC-650 test methods.</p>
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