

HANWHAFLEX FCCL Technical Information

Description

HANWHAFLEX copper-clad laminated composites are constructed of Kaneka Apical, Dupont Kapton and Taimid polyimide film with copper foil on one or both sides, bonded together with a proprietary C-staged modified epoxy adhesive. All copper-clad laminates are available with rolled, annealed copper or electro-deposited copper. In addition, both types are available with double treated copper (nodules of electro-deposited copper on both sides of the copper foil). Double-treated copper, if used, eliminates surface preparation steps prior to resist or coverlay lamination.

HANWHAFLEX laminated composites are typically used to produce high reliability, high density circuitry of flexible, rigid-flex, and all-flexible multilayer constructions

Packaging

Hanwha Coverlay are supplied on 24in (610mm), 250mm, 500mm wide by 100m long rolls, on nominal 3in(76mm) cores. Narrow or another widths are also available by special order.

Storage

HANWHAFLEX flexible composites will retain their original properties for a minimum of one year when stored in the original packaging at temperatures of 30°C (86°F) and below 70% humidity. The products do not need refrigeration and should not be frozen. Keep the material clean and well protected.

Copper-clad laminates should not be automatically discarded if storage conditions have deviated from these limits. We recommend that material which has been stored outside of these conditions be examined in a practical test before being committed to production.

Flexible Copper Clad Laminate

HFLK : HANWHAFLEX Laminate Kaneka PI

HFLT : HANWHAFLEX Laminate Taimid PI

HFL : HANWHAFLEX Laminate Kapton PI

S : Single Side

Adhesive, PI Film, Copper foil thickness

E : Electro deposite, R : Rolled annealing

Table 1. Construction of Single-Sided Product Code

Product Code	Adhesive []	PI Film [mil ()]	Cu-Foil [oz ()]
HFLK(T)-S541RN	25	2(50)	1(35)
HFLK(T)-S511RN	25	1(25)	1(35)
HFLK(T)-S512RN	25	1(25)	1/2(18)
HFLK(T)-S511EN	25	1(25)	1(35)
HFLK(T)-S512EN	25	1(25)	1/2(18)
HFLK(T)-S411EN	20	1(25)	1(35)
HFLK(T)-S412EN	20	1(25)	1/2(18)
HFLK(T)-S222EN	10	1/2(12.5)	1/2(18)

- HFLK : Apical NPI(Kaneka)
- HFLT : Taimide TH
- HFL : Kapton VN(Dupont)
- EN : Nikko Japan Energy ED foil
- RN : Nikko Japan Energy RA foil
- UL Certification File No. : E229475
- IPC 4204 : flexible Metal-Clad Dielectrics for Use in Fabrication of Flexible Printed Circuitry.

Copper Clad Laminate Designation

HFLK - S5 4 1RN

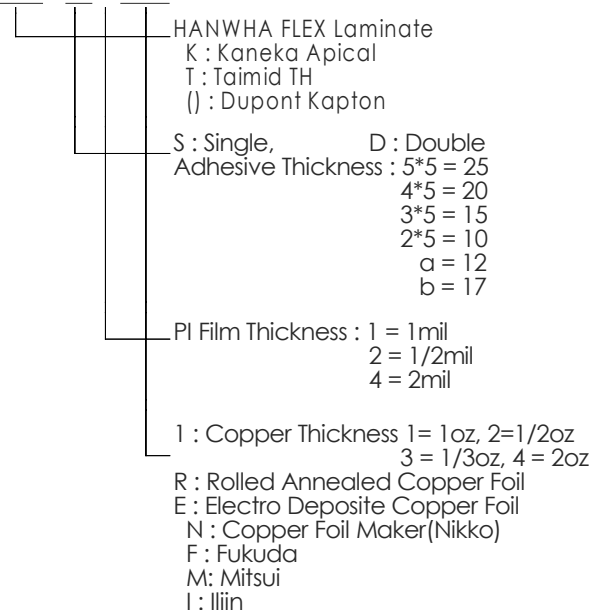


Table 2. Typical Values and Specification I

Test Item	Unit	IPC spec	Typical Single-Sided FCCL Value	Test Result	Method
Appearance	-	PASS	OK	PASS	Visual IPC-TM-650 Method 2.1.13
Peel Strength @ As received @ After solder	lb/in (f/)	8 (1.4) 7 (1.3)	9(1.6) 8(1.4)	PASS	IPC-TM-650 Method 2.2.4 Method B,C
Solder Resistance @ 280°C , 30sec Floating	-	PASS	Pass	PASS	IPC-TM-650 Method 2.4.13 Method B
Flammability	-		Pass	PASS	UL-94
MIT(without CL 0.38R)	cycle	1000	1500	PASS	
Dimensional Stability	after Etching	%	0.2	PASS	IPC-TM-650 Method 2.2.4 Method B,
	after Bake E-0.5/150	%	0.2		
Chemical Resistance @ MEK @ NAOH @ HCl @ IPA	-	80%	≥ 90% ≥ 90% ≥ 90% ≥ 90%	PASS	IPC-TM-650 Method 2.3.2 Method A
Surface Resistance @ C-96/20/65	Ω	min 10 ⁴	X10 ¹²	PASS	IPC-TM-650 Method 2.5.17
Volume Resistance @ C-96/20/65	Ω-	min 10 ⁴	X10 ¹³	PASS	IPC-TM-650 Method 2.5.17
Dielectric Constant	@1MHz	4.0	3.6	PASS	IPC-TM-650 Method 2.5.5.3
Dissipation Factor	@1MHz	0.04	0.03	PASS	IPC-TM-650 Method 2.5.5.3

Table 3. Typical Values and Specification II

Test Item	Unit	IPC spec	Typical Double-Sided FCCL Value	Test Result	Method	
Appearance	-	Pass	OK	PASS	IPC-TM-650	
Peel Strength	@ As received	f/	A side	9(1.6)	PASS	IPC-TM-650 Method 2.2.4 Method B,C
			B side	9(1.6)		
	@ After solder		A side	8(1.4)		
			B side	8(1.4)		
Solder Resistance @ 320°C , 30sec Floating	-	PASS	Pass	PASS		
Flammability	-		Pass	PASS	UL-94	
Dimensional Stability	after Etching	%	0.2	PASS	IPC-TM-650 Method 2.2.4 Method B	
	after Bake E-0.5/150	%	0.2			±0.20 ±0.20
Chemical Resistance @ MEK @ NAOH @ HCl @ IPA	-	80%	≥ 90% ≥ 90% ≥ 90% ≥ 90%	PASS	IPC-TM-650 Method 2.3.2 Method A	
Surface Resistance @ C-96/20/65	Ω	min 10 ⁴	X10 ¹²	PASS	IPC-TM-650 Method 2.5.17	
Volume Resistance @ C-96/20/65	Ω-	min 10 ⁴	X10 ¹³	PASS	IPC-TM-650 Method 2.5.17	
Dielectric Constant	@1MHz	4.0	3.6	PASS	IPC-TM-650 Method 2.5.5.3	
Dissipation Factor	@1MHz	0.04	0.03	PASS	IPC-TM-650 Method 2.5.5.3	

Safe Handling

HANWHAFLEX Copper Clad Laminates contain fully cured(C-staged) adhesive.

Although HANWHA is not aware of anyone developing contact dermatitis when using HANWHAFLEX Laminates product, some individuals may be more sensitive than others.

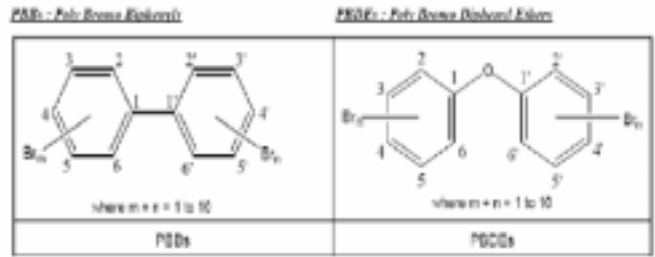
Anyone handling HANWHAFLEX FCCL should wash their hands with soap before eating, smoking, or using restroom facilities.

Gloves, finger cots, and finger pads should be changed daily. Clothes should be washed frequently.

The unreacted epoxy in the adhesive may impart a mild odor when the release film or paper is removed. We recommend that areas where B-staged materials are used, as well as lay-up and lamination areas, be well ventilated with a fresh air supply.

Thin copper-clad laminates can have sharp metal edges. People handling these materials should be cautioned and provided with suitable gloves to prevent cuts

HANWHAFLEX FCCL DO NOT contain polybrominated biphenyls(PBBs), polybrominated biphenyl oxides(PBBOs), or polybrominated diphenyl ethers(PBDEs). We have the SGS certification it can be identified



HANWHA Electronic Materials FCCL Division. HANWHA Bldg 14F

TEL) 82-2-729-1330, 82-43-279-8533 E-Mail) h9600754@hanwha.co.kr

<http://www.hlcc.co.kr/english/>

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