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PRODUCT SPECIFICATION

**Product Name: Halogen Free
Polyimide Base film CCL**

THKD101020JY

Customer:

HD-FLEX TECHNOLOGY CO; LTD.

TAIFLEX Scientific Co., Ltd		
Q.A.	Manu.	R.D.
Eliza	Duck	Geli

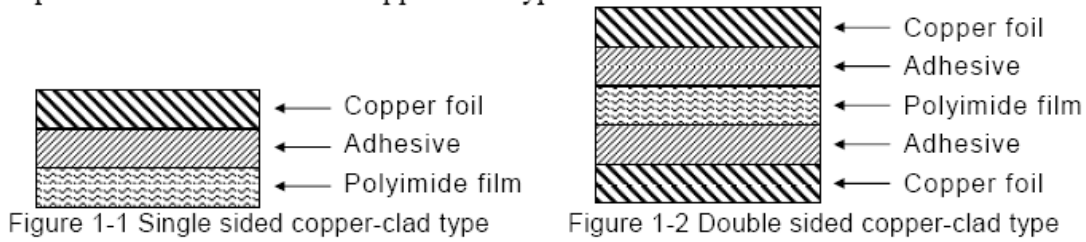
1. Scope

This specification shall apply to copper-clad laminated sheets as follows (hereafter called CCL)

2. Composition of product

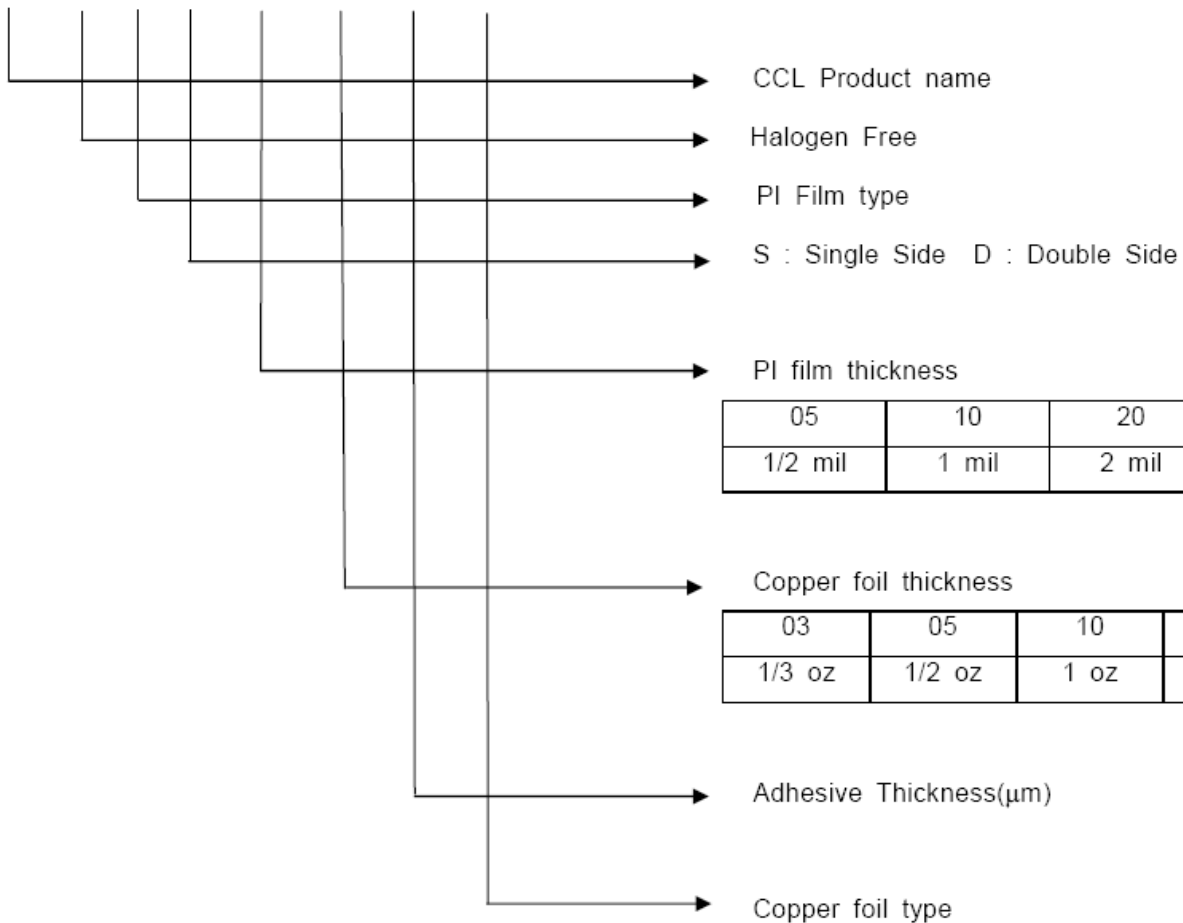
CCL is made of a polyimide film, one side or both sides of which is coated with a prescribed adhesive and then overlaid with copper foil.

Figure 1-1 shows the composition of single sided copper-clad type, and figure 1-2 shows the composition of double sided copper-clad type.



The product number of each CCL is represented as follows:

I H K D 10 10 20 JY



3. Properties

PI Base FCCL Specification

Test Items		Condition of Treatment	THKD101020JY	Test method
PI film type		---	1 mil	
Cu foil type		---	1 oz RA Cu foil (Double side)	
Adhesive		---	20 μ m	
Peel strength	As received	A	≥ 0.7 kgf/cm	IPC-TM-650,NO.2.4.9
	After immersion in chemicals	---	≥ 0.7 kgf/cm	
Solder Float Resistance		S1	300 $^{\circ}$ C/30sec	IPC-TM-650,NO.2.4.13
Flammability		-----	V-0	UL-94
Surface Resistivity	As received	C1	$\geq 1.0 \times 10^{13} \Omega$	IPC-TM-650,NO.2.5.17
Volume Resistivity	As received	C1	$\geq 1.0 \times 10^{15} \Omega \cdot \text{c.m}$	IPC-TM-650,NO.2.5.17
Chemical Resistivity		-----	No evident of defects	IPC-TM-650,NO.2.3.2
Dimensional Stability	MD	A	$\leq \pm 0.2\%$	IPC-TM-650,NO.2.2.4
	TD			
Insulation Resistance	As received	C1	$\geq 1.0 \times 10^{11} \Omega$	IPC-TM-650,NO.2.6.3.2
Shelf life		---	365days	<35 $^{\circ}$ C 65 \pm 20%RH

4. Defects and joints

4.1 Permissible number of defects per roll

Table 1 Defects and Joints

Length per roll (m)	Allowable number of defects(including joints)	Number of joints
100	Not more than 6	Not more than 3

4.2 Joint method

- (1) With two rolls butt-jointed, the entire width and both faces of the joint shall be taped with 20-mm-wide adhesive tape.
- (2) Then, green tape shall be placed on the side of the CCL.

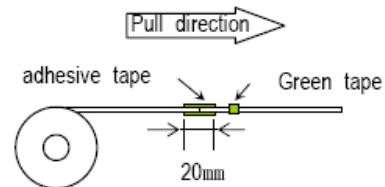


Figure 2 Joint Method

4.3 Defect marking

Defect is marked by black tape on the side of the CCL.

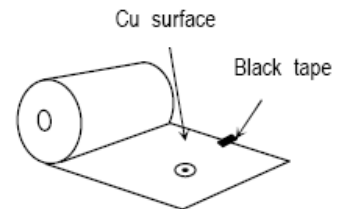


Figure 3 Defect Marking

4.4 Extra length

300 mm of extra length shall be provided for each defect or joint.

5 Standard condition for tests

Unless otherwise specified, all tests shall be conducted at a temperature of $25 \pm 10^\circ\text{C}$; humidity of $65 \pm 20\% \text{RH}$; and in a location that is not exposed to direct sunlight, and free of gas, steam, dust and other factors that may adversely affect the test. The location must also prove to have little ventilation.

6. Test methods

6.1 Appearance

Appearance shall be checked visually.

6.2 Width

Width shall be measured with a straightedge that has accuracy of 1 mm .

6.3 Length

Length shall be measured with a sizing reel that has accuracy of 0.1 m per 50 m.

6.4 Peel strength

Test pieces with 1/8 inch wide patterns etched on them shall be tested according to IPC-TM-650, method 2.4.9. With a peel angle of 90° and test speed of 50.8 mm/minute, three points shall be measured so that the measured values may be averaged.

6.5 Dimensional stability

Dimensional stability shall be measured according to IPC-TM-650, method 2.2.4. The test pieces shall be etched, then heated at $150 \pm 2^\circ\text{C}$ for $30 \pm 2, 0$ minutes. For the purposes of obtaining

measurements, the test pieces, after they are air-dried, shall be left as they are for 24 hours.

6.6 Soldering resistance

According to section IPC-TM-650, method 2.4.13 test pieces shall be preserved for 60 ± 5 minutes in a forced-circulating dryer where the inside temperature is maintained at $135 \pm 5^\circ \text{C}$. Then, they shall be immediately floated for 30 seconds on molten solder that is kept at $300 \pm 5^\circ \text{C}$, with the polyimide film upward, so that they can be visually checked for abnormalities such as dilations and peeling.

6.7 Chemical resistance

Test pieces shall be visually checked for dilation and peeling according to IPC-TM-650, method 2.3.2.

6.8 Product thickness

Product thickness shall be measured with a micrometer that has accuracy of 1/1000 mm (external micrometer) or an equivalent measuring device.

6.9 Insulation resistance

A direct voltage of 500 V shall be applied to the test piece for one minute according to IPC-TM-650, method 2.6.3.2 before insulation resistance is measured.

6.10 Surface Resistivity and Volume Resistivity

A direct voltage of 500 V shall be applied to the test piece for one minute according to IPC-TM-650, method 2.5.17 before insulation resistance is measured.

7. Test Reports

Shipped products shall be accompanied by a copy of each test report.(Form 1).

8. Shelf Life

The shelf life of CCL is 365 days after date of production in the case of good is kept unpacked and stored below 35 degrees centigrade and $65 \pm 20\%$ RH.

9. Packing and labeling

9.1 Packing

Each CCL shall be wound around the core, then packed so that no moisture is absorbed and so that it does not become damaged during shipment. For further details, please refer to the packing and packaging specifications described in the last section of this document.

9.2 Labeling

Packaged products shall be labeled with the following information :

- (1) Product name
- (2) Lot No.
- (3) Width
- (4) Roll Length
- (5) Splice
- (6) Produced date
- (7) Shelf life
- (8) Expiration date

(9) Storage

Sample



The image shows a label for TAI FLEX with a table for product information. The label has the TAI FLEX logo at the top left. The table has the following rows:

Product Name	
Lot No.	
Width	
Roll Length	
Splice	
Produced date	
Shelf Life	
Expiration date	
Storage	
Material Designation	

10. Notification and discussion

10.1 Control of change

Before making changes regarding raw materials and/or the production processes, the supplier shall notify the purchaser.

10.2 Change of a use

Before quality requirements for products are revised because of a change in the purpose of using the products, the supplier shall be notified so that both parties can exchange ideas relative to the issue of preventing possible problems.

10.3 Revision of specifications

When a change needs be made to this specification and/or a question arises about a matter not defined by this specification, it shall be discussed by both parties so that an immediate settlement can be reached.

Packing and packaging specifications of CCL

1. Core

(1) Single sided copper-clad type(ABS Tube)

250mm : an inner diameter of 76mm, an outer diameter of 84mm, and a length of 280 mm.

500mm : an inner diameter of 76mm, an outer diameter of 84mm, and a length of 530 mm.

(2)Double sided copper-clad type(ABS Tube)

250mm:an inner diameter of 152mm, an outer diameter of 162mm, and a length of 280mm.

500mm:an inner diameter of 152mm, an outer diameter of 162mm, and a length of 530mm.

2. Winding

- (1) The end of each CCL shall be attached with tape, to the core at three points (500-mm-wide products) or at one points (250-mm-wide products) in the center of the core.

- (2) Each CCL shall be wound as shown in Figure 1.

Polyimide film (Single sided copper-clad type)

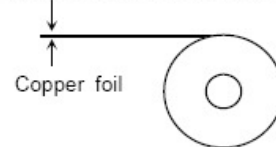


Figure 1

3. Internal Packaging



4. Packing



Form 1

TAIFLEX Scientific Co.,Ltd.
 No.4, South 3rd Road, K.E.P.Z.
 Kaohsiung,Taiwan,R.O.C.
 TEL:07-8139989
 FAX:07-8159457

TO:

DATE:

TEST REPORT
FLEXTEC

Product Name	Lot No.
PI film Thickness(μ m)	
Adhesive Thickness(μ m)	
Copper Foil Thickness(μ m)	
Width(mm)	

Item		Specification	Result	Test Method
Peel Strength (kgf/cm)	As Received			IPC-TM-650 2.4.9
	After MEK/10min			
Dimensional Stability(%)	MD	Less than ± 0.2		IPC-TM-650 2.2.4
	TD	Less than ± 0.2		
Solder Resistance		30 seconds at 300°C		IPC-TM-650 2.4.13
Surface Resistivity (Ω)		More than 1.0×10^{13}		IPC-TM-650 2.5.17
Volume Resistivity ($\Omega \cdot \text{cm}$)		More than 1.0×10^{15}		IPC-TM-650 2.5.17
Insulation Resistance (Ω)		More than 1.0×10^{11}		IPC-TM-650 2.6.3.2
Shelf Life (month)		<35°C/65% \pm 20%RH		Taiflex Spec.
Flammability		UL94V-0		E193078
Material Designation				

TAIFLEX Scientific Co.,Ltd.
 Quality Assurance Dept.