



ThinFlex



ThinFlex Corporation

No. 8, Luke 2nd.Rd., Luzhu Dist., Kaohsiung City, 821, Taiwan, R.O.C. (Kaohsiung Science Park) Tel: +886-7-6955236 Fax: +886-7-6955539 http://www.thinflex.com.tw e-mail: service@thinflex.com.tw

# ThinFlex-AR, AR-2002ED-N4 Adhesiveless Double Sided Copper Clad Laminate (Halogen Free)

ThinFlex-AR, AR-2002ED-N4 is an adhesiveless double-sided (D/S) copper clad laminate, using ARISAWA TPI film and laminated with ED copper foil on both sides. The AR-2002ED-N4 adhesiveless D/S composites are designed for a wide variety of flexible circuit applications which require advanced material performance and high reliability.

## 1. Product Characteristics:

- \* Excellent dimensional stability
- \* Excellent flexibility
- \* Excellent etching capability
- \* Excellent flame resistance
- \* Excellent chemical resistance
- \* Excellent thermal, mechanical, and electrical properties
- \* Low moisture absorption

## 2. Specifications:

AR - 20 02 E D-N4

Product	Thickness of PI	Thickness of Cu	Cu Type	Structure	Cu Supplier
AR-type FCCL	20 : 2.0 mil	02 : 1/4 oz	E : ED	D: D/S	Nanya
Product Size	W: 250/500 ± 1mm; L: 400~700 ± 2mm (sheet type) W: 250/500 ± 1mm; L: 100 +2/-0m (roll type)				

\* Other product size is also available on customer's demand.



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**3. Construction:**

Copper foil
Polyimide film
Copper foil

**4. Properties:**

Test item	Unit	AR-2002ED-N4	Test Method	
<b>Peel Strength</b>				
As Received	Kgf/cm	≥ 0.7	IPC-TM650 2.4.9 B	
Solder Float	Kgf/cm	≥ 0.7	IPC-TM650 2.4.13 B	
After Temp. Cycling	Kgf/cm	≥ 0.7	IPC-TM650 2.4.9	
Chemical Resistance	Kgf/cm	≥ 0.7	IPC-TM650 2.3.2	
Tensile Strength (Base Film)	Kg/mm <sup>2</sup>	≥ 26	IPC-TM-650 2.4.19	
Elongation (Base Film)	%	≥ 60	IPC-TM-650 2.4.19	
Tensile Modulus (Base Film)	Kg/mm <sup>2</sup>	≥ 450	ASTM D882	
Initial Tear Strength (Base Film)	g	≥ 1200	IPC-TM-650 2.4.16	
Propagation Tear Strength (Base Film)	g	≥ 18	IPC-TM-650 2.4.17.1	
<b>Flexural Endurance, MIT</b>				
M.D.	Cycles	NA	JIS-C 6471, 0.8mmR, 0.5kg	
T.D.	Cycles	NA	JIS-C 6471, 0.8mmR, 0.5kg	
<b>Electrical Properties</b>				
Surface Resistance	Ω	~10 <sup>11</sup>	IPC-TM650 2.5.17	
Volume Resistance	Ω-cm	~10 <sup>12</sup>	IPC-TM650 2.5.17	
Insulation Resistance	Ω	~10 <sup>9</sup>	IPC-TM650 2.6.3.2	
Dielectric Strength	kV/mil	6.5	ASTM-D149	
Dielectric Constant (1GHz)	-	3.3	IPC-TM650 2.5.5.3	
Dissipation factor (1GHz)	-	0.01	IPC-TM650 2.5.5.3	
<b>Physical and Thermal Properties</b>				
Dimensional Stability	M.D.	%	-0.1~0.1	IPC-TM650 2.2.4C
	T.D.	%	-0.1~0.1	IPC-TM650 2.2.4C
CTE	ppm/°C	26	ThinFlex	
T <sub>g</sub>	°C	330	ThinFlex	
Solder Float	30sec at 288°C (550°F)	-	Pass	IPC-TM650 2.4.13
Moisture Absorption	%	1.1	IPC-TM650 2.6.2	
Chemical Resistance	-	Pass	IPC-TM650 2.3.2	
Thickness tolerance	um	68±10%	ThinFlex	
UL Flame Class	-	VTM-0	UL94	

\* Above data are typical values, and are not guaranteed values.



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## 5. Storage:

ThinFlex-AR, AR-2002ED-N4 will meet its shelf-life for at least 12 months after arrival at purchaser's factory with original package, stored at temperature of 25°C or less and relative humidity of 70% or less. The product is no need to be kept in the refrigeration.

Note: The information and data contained in this technical literature is believed to be accurate and is offered in good faith for the benefit of the user. The user should make his own tests to verify the suitability of this product for any application before its use. All data are typical values only and subject to change without notice.

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