

Technical Information

VULCAPAS FR-2 COPPER CLAD LAMINATE

International Standard Recognition

- **UL**
- **BSI**
- **VDE**

Description

Vulcapas FR-2 copper clad laminate is halogen free, eliminating all kinds of brominated flame retardants, is absent of highly toxic dioxins in burning exhaust gas. Is also antimony-free, no toxic evolution during waste burning and has less odor, no cresol and its derivatives used.

Applications

Automatic vending machines, Heaters, Colour TV, Microwave Ovens, Measuring equipment, etc.

Technical Data

Test Item		Unit	Treatment Condition	ANSI Grade	FR-2
				Standard Value	Guaranteed Value
Flammability		sec	UL 94	avg : 3.0 max : 8.0	avg : 5.0 max : 10.0
Insulation Resistance		ohm	C-96/20/65 C-96/20/65+D-2/100	$5 \times 10^{11} - 5 \times 10^{12}$ $3 \times 10^8 - 3 \times 10^9$	above 1×10^{11} above 1×10^8
Volume Resistivity		ohm-cm	C-96/20/65 C-96/20/65+C-96/40/90	$5 \times 10^{13} - 5 \times 10^{14}$ $1 \times 10^{12} - 1 \times 10^{13}$	above 1×10^{12} above 1×10^{11}
Surface Resistance	Adhesive Surface	ohm	C-96/20/65 C-96/20/65+C-96/40/90	$1 \times 10^{12} - 1 \times 10^{13}$ $5 \times 10^{10} - 5 \times 10^{11}$	above 1×10^{12} above 1×10^{10}
	Laminate Surface	ohm	C-96/20/65 C-96/20/65+C-96/40/90	$5 \times 10^{11} - 5 \times 10^{12}$ $1 \times 10^{10} - 5 \times 10^{10}$	above 1×10^{11} above 5×10^9
Dielectric Constant (1 MHz)		-	C-96/20/65 C-96/20/65+D-48/50	4.3 - 4.8 4.5 - 5.0	less than 5.0 less than 5.3
Dissipation Factor (1 MHz)		-	C-96/20/65 C-96/20/65+D-48/50	0.020 - 0.030 0.025 - 0.035	less than 0.040 less than 0.050
Comparative Tracking Index		volt	IEC Method	600	above 600
Solder Float (260°C)		sec	A	30 - 40	above 15
Peel Strenth	Cu.Foil	kgf/cm	A	1.8 - 2.3	above 1.42
	1 oz (0.035mm)		S	1.8 - 2.3	above 1.42
Flexural Strength (LW) (CW)		Kgf/mm ²	A	14 - 17 13 - 16	above 8.16 above 8.16
Water absorption		%	E-24/50+D-24/23	0.6 - 0.7	Less than 0.75
Trichloroethylene Resistance		-	Immersion in boiling Trichloroethylene (For 2 minutes)	No abnormality	No abnormality
Punching Process ability			A	Suitable Temperature 40°C - 60°C	

**Availability**

Thickness: 0.6mm to 3.2mm
Sheet size: 1.020 x 1.020mm (40" x 40")
Tolerance: +3 mm

Copper foil: 1 oz/ft² (0.035mm) copper foil as standard

Printed Wiring Boards - UL 796

ANSI	UL94	Min Thick	Clad Thick. (µm)		Max. Area Dia.	Soldering Limits	Max Oper. Temp
		(mm)	Min	Max	(mm)		
FR-2	94V-O	1.45	35	105	50.8	*	105

* 265, 15sec/270, 10sec/280, 8sec/290, 6sec/299

These requirements apply to rigid printed wiring boards and flexible printed wiring board for use as components in devices or appliances. Compliance with these requirements does not indicate that the product is acceptable for use as a component of an end product without further investigation.

The flexible printed wiring boards covered by these requirements consist of conductors affixed to insulating base film, with or without a cover-lay film, with mid board connections.

These requirements do not cover flexible printed wiring boards of laminated film construction in which the conductors are parallel to each other and are completely covered by the base film with only point to point end connections.

These requirements do not apply to flexible, flex-to-install, rigid and multilayer rigid flex composite interconnect constructions with and without stiffener and adhesive materials as flexible materials interconnect constructions (FMIC's) for use as components in devices or appliances – that are covered by the Standard for Flexible Materials Interconnect Constructions, UL 796F.

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