



# VT-44

UL Approval: E214381

Version : Rev. 1

## Datasheet

## Halogen Free

VT-44TC/Laminate VT-44PP/Prepreg

### General Information

- **Halogen Free** & Phenolic Cured System
- Middle Tg (150°C)
- UV Blocking;
- Laser Fluorescing;
- Low CTE
- Excellent Thermal Reliability

### Application

For Single Side\Double Side\ Multilayer PWB & Lead Free Assembly Applications;

### Availability

VT-44TC Laminates are available in thickness from .002" to .200" and with the copper foil from 1/4oz to 12oz; Ventec can supply either reverse treated (RT) or double side treated copper foil. On cores  $\leq .005"$ , it is recommended to use the reverse treated copper due to the low profile. The peel strength for RT foil is  $\approx 1-2\text{lbs/in}$  (0.35Kg/m) less than Standard foil.

VT-44PP pre-pregs are available in many E-Glass styles, such as 7628, 7629, 1506, 1500, 2113, 2313, 3313, 2116, 1080, 1086, 1078, 106 & 1067.

### Storage Condition & Shelf Life

		Prepreg		Laminate
Storage	Temperature	Below 22°C(73°F)	Below 5°C(41°F)	Below 22°C(73°F)
Condition	Relative Humidity	Below 55%RH	/	Below 55%RH
Retest Time*		3 Month	6 Month	12Month(airproof)

\* The pre-preg exceeding retest time should be retested. If the Gel Time and Resin Flow is not out of the low limit of the specification(see C.O.C.), the pre-preg still can be use, but please modify the press condition with a higher rise of rate(Heat Ratio) and higher pressure



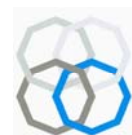
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## Properties Sheet: IPC-4101A Specification Sheet(s)/94

(Test Sample: .036"1/1)

Test Item		Test Condition	unit	Specification	Test Result	
					Halogen free	Normal FR4
Flexural Strength	Warp	As Recieve	MPa	>415	500	600
	Fill			>345	400	500
Peel Strength( for 1 oz)		As Recieve	Lb/in	6.0min	8.30	9.59
		After Solder			8.21	9.03
Glass Transition (Tg)	DSC	2.4.25	°C	-	152	136~140
	DMA	2.4.24C	°C	-	165	145~155
Decomposition Temp. (Td)		ASTM D3850	°C	-	340	290~310
Z-axis C.T.E Before Tg/After Tg		TMA	in/in/°C	60x10 <sup>-6</sup> /300x10 <sup>-6</sup>	3.8x10 <sup>-6</sup> /190x10 <sup>-6</sup>	50x10 <sup>-6</sup> /250x10 <sup>-6</sup>
Moisture Absorption		D-24/23	%	0.35max	0.18	0.28
Volume Resistance	After Moisture	2.5.17.1	MΩ-cm	≥106	5×10 <sup>8</sup>	5×10 <sup>8</sup>
	E-24/125			≥103	5×10 <sup>6</sup>	5×10 <sup>6</sup>
Surface Resistance	After Moisture	2.5.17.1	MΩ	≥104	5×10 <sup>7</sup>	5×10 <sup>7</sup>
	E-24/125			≥103	5×10 <sup>6</sup>	5×10 <sup>6</sup>
Electric Strength		2.5.6.2	KV/mm	≥30	54	54
Dielectric Constant (Dk)	250MHZ	C24/23/50	—	5.4max	4.62	4.42
	750MHZ				4.57	4.39
	1.0 GHz				4.57	4.38
	2.0 GHz				4.47	4.36
Dispassion Factor	250MHZ	C24/23/50	—	0.035max	0.014	0.022
	750MHZ				0.014	0.021
	1.0 GHz				0.014	0.021
	2.0 GHz				0.015	0.020
Solder Float		288°C	sec	60 Sec	>300	90~120
Pressure Cook Test		15psi/30min /288°C /10sec	cycle	2 cycles min	10~12	6~8
Time to Delamination---T260		TMA	min	—	>60.	18
Time to Delamination---T288		TMA	min	—	20	—
Halogen Content		—	ppm	<900	<900	—
Flame Resistance		UL94	—	V0	V0	V0
Comparative Tracking Index (CTI)		UL-7461 ASTM D3638	Voltage	—	175~250 (Grade 3)	175~250 (Grade 3)
Chemical Resistance in 10% NaOH , 60°C,30minutes		—	-	No measles	No	No

※ All test data provided are typical values and are not intended to be specification values.



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## Process Guideline

### Press Condition

1. Heating rate(Rise of Rate) of material [Material Temperature]:  
Programmable Press: 1.5-3.0°C/min (3~5°F/min). Manual Press:3~6°C /min (5~10°F/min)
2. Curing Temperature & Time: >50min at more than 180°C (356°F)[Material Temperature].
3. Full Pressure: ≥250-300psi
4. Vacuuming should be continued until **over 140°C** (284°F) [Material Temperature]

### Typical Drilling Parameters (φ0.3-1.0 mm)

1. Spindle Speed:	120-180	KRPM
2. Feed Rate:	120-220	Inch / min
3. Retract Rate:	596-1000	Inch / min
4. Chip Load:	0.6~2.0	mil / Rev.

### Desmearing Process

Desmear rate of **VT-44** is less that of the conventional FR-4;  
Minor adjustments to the desmear process may be necessary for the higher Tg materials.  
Check with your chemical supplier for recommendations.