

# VT-90H

UL Approval: E214381    Version: Rev. 5

## DATASHEETS & PROCESS GUIDELINE - POLYIMIDE MATERIAL HIGH TG & HIGH RELIABILITY

VT-90H TC /Laminate VT-90H PP/Prepreg

### General Information

- High Tg (Tg 250°C) and Extreme Operating Temperature
- High Thermal Resistance(Td 390°C) and Several Assembly Processing
- Improved Fracture Toughness
- Low Z-axis CTE for Through Hole Reliability

### Application

- Chip Manufacturers
- Engine/Flight Controls
- Down Hole
- Power Supply /Backplane
- Military and Burn-in Board

### Availability

VT-90H TC Laminates are available in thickness from .004” to .125” and with the copper foil from 1/2oz to 3oz; Ventec can supply double side treated copper foil and single side treated copper foil, but double side treated copper foil and reverse copper foil are not suggested using on VT-901 laminates because the peel strength would not be as good as conventional material's.

VT-90H PP pre-pregs are available in many E-Glass styles, such as 7628, 7629, 1506, 1500, 2113, 2313, 3313, 2116.

### Storage Condition & Retest Time

		Prepreg		Laminate
Storage Condition	Temperature	Below 23°C (73°F)	Below 5°C (41°F)	Room
	Relative Humidity	Below 55% RH	/	/
Shelf Time*		3 Months	4 Months	12 Months (airproof)

\*The pre-preg exceeding shelf time should be retested.

# VT-90H

## PROPERTIES SHEETS

### IPC-4101C Slash Sheet(s)/42

Properties	Test Method	Units	Specification	Typical Value
<b>Thermal Properties</b>				
Glass Transition Temp. (Tg)				
DSC	IPC-TM-650 2.4.25	°C	-	-
TMA	IPC-TM-650 2.4.24	°C	200 minimum	250
Decomposition Temp. (Td) By TGA (at 5% weight loss)	ASTM D3850	°C	-	390
Time to Delamination---T260	IPC-TM-650 2.4.24.1	Minute	-	>60
Time to Delamination---T288	IPC-TM-650 2.4.24.1	Minute	-	>60
Z-axis CTE				
Before Tg	IPC-TM-650 2.4.24	ppm/°C	-	50
After Tg	IPC-TM-650 2.4.24	ppm/°C	-	150
Total Expansion (50~260°C)	IPC-TM-650 2.4.24	%	-	1.5
Thermal Stress @ 288°C	IPC-TM-650 2.4.13.1	Second	Pass 10s	>1200
<b>Electrical Properties</b>				
Dielectric Constant @ 1GHz	IPC-TM-650 5.5.5.9	-	5.4 maximum	4.15
Dissipation Factor @ 1GHz	IPC-TM-650 5.5.5.9	-	0.035 minimum	0.016
Volume Resistivity				
After Moisture Resistance	IPC-TM-650 2.5.17.1	MΩ-cm	-	5*10 <sup>8</sup>
E-24/125	IPC-TM-650 2.5.17.1	MΩ-cm	-	5*10 <sup>6</sup>
Surface Resistivity				
After Moisture Resistance	IPC-TM-650 2.5.17.1	MΩ	-	5*10 <sup>7</sup>
E24/125	IPC-TM-650 2.5.17.1	MΩ	-	5*10 <sup>6</sup>
Electrical Strength	IPC-TM-650 2.5.6.2	Volt/mil (KV/mm)	762 (30) minimum	1200~1400 (54)
Dielectric Breakdown	IPC-TM-650 2.5.6	KV	40 minimum	60
Comparative Tracking Index (CTI)	ASTM D3638	Rating (Volt)	-	Grade 4 (100~175)
Arc Resistance	IPC-TM-650 2.5.1	Second	120 minimum	135
<b>Mechanical Properties</b>				
Peel Strength (1oz)				
As received	IPC-TM-650 2.4.8	lb/in (N/mm)	-	6~9 (1.05~1.58)
After thermal stress	IPC-TM-650 2.4.8	lb/in (N/mm)	6 (1.05) minimum	6~9 (1.05~1.58)
Flexural Strength				
Warp	IPC-TM-650 2.4.4	Kpsi (MPa)	60 (415) minimum	72 (500)
Fill	IPC-TM-650 2.4.4	Kpsi (MPa)	47 (325) minimum	55 (380)
<b>Physical Properties</b>				
Moisture Absorption	IPC-TM-650 2.6.2.1	%	1.0 maximum	0.3
Flammability	UL-94	Rating	HB minimum	HB

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

# VT-90H

## 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: >150min at more than 220°C (428°F) [Material Temperature]
3. Full Pressure: ≥450psi
4. Vacuuming should be continued until over 200°C (392°F) [Material Temperature]
5. Cold Press condition: Keep Plate @ Room Temperature by water; Pressure:100psi; Keep Time: 60minutes

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

1. Spindle Speed:	120-180	KRPM
2. Feed Rate:	100-200	inch / min
3. Retract Rate:	550-1000	inch / min
4. Chip Load:	0.6~1.8	mil / Rev.
5. Entry board:	t0.15mm Al	
6. Stacked number (t1.6mm):	1-3 stacks	

The use of undercut drill bits has yielded better quality on smaller holes. Check with your drill supplier for more information.

### Desmearing Process

Desmear rate of **VT-90H** is less than that of the conventional FR-4;  
Adjustments to the desmear process is necessary for the polyimide materials;  
Check with your chemical supplier for recommendations.