

tec-speed 4.0H-PK VT-464LT

PROCESS GUIDE

UL Approval: E214381 Version: 03/02/2025

Precautions in Handling

Storage Condition & Shelf Life

		Prepreg		Laminate
Storage Condition	Temperature	Below 23°C (73°F)	Below 5°C (41°F)	Room
	Relative Humidity	Below 55%	/	/
Shelf Life		3 Months	6 Months	24 Months (airproof)

- Laminate should be stored flat in a cool dry environment. Avoid bending or scratching the laminate surface.
- Prepreg should be stored flat in a cool dry controlled environment 23°C or less and 50% RH or less. Extended storage of prepreg should be at a reduced temperature of 5°C.
- Open bags of prepreg must be resealed. Prepreg should not be exposed to open environments for more than 8 hours total cumulatively under the above conditions or as agreed upon between user and supplier.
- A first-in-first-out inventory system and a method to track material lot numbers through PCB processing and delivery of finished circuits is recommended.

Designing and Inner layer Process

- Before feed please baking to remove any absorbed moisture or surface moisture especially for thinner core. A racked bake at 150 °C for 120 minutes is preferred.
- Oxide Alternative is preferred & recommended over the other oxide chemistry for the advanced boards fabrications, especially for lead free and high layer count applications.
- Holding time between brown oxide and press process: best control within 24 hours.

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Prepreg Availability

PP Type	R/C [%]	Delivered Thickness	Dk					Df				
		(μ m)	@ 1GHz	@ 2GHz	@ 5GHz	@ 10GHz	@ 20GHz	@ 1GHz	@ 2GHz	@ 5GHz	@ 10GHz	@ 20GHz
1017	75%	25	3.59	3.54	3.54	3.50	3.45	0.0067	0.0070	0.0075	0.0085	0.0090
	79%	30	3.54	3.49	3.49	3.44	3.40	0.0069	0.0072	0.0077	0.0087	0.0092
1027	69%	35	3.69	3.65	3.65	3.60	3.55	0.0063	0.0066	0.0071	0.0081	0.0086
	73%	40	3.63	3.58	3.58	3.54	3.50	0.0066	0.0069	0.0074	0.0084	0.0089
	75%	45	3.59	3.54	3.54	3.50	3.45	0.0067	0.0070	0.0075	0.0085	0.0090
1037	75%	50	3.59	3.54	3.54	3.50	3.45	0.0067	0.0070	0.0075	0.0085	0.0090
	77%	55	3.58	3.53	3.53	3.48	3.44	0.0067	0.0070	0.0075	0.0085	0.0090
	79%	60	3.54	3.49	3.49	3.44	3.40	0.0069	0.0072	0.0077	0.0087	0.0092
1067	74%	60	3.63	3.58	3.58	3.54	3.50	0.0066	0.0069	0.0074	0.0084	0.0089
	76%	65	3.59	3.54	3.54	3.50	3.45	0.0067	0.0070	0.0075	0.0085	0.0090
	78%	72	3.54	3.49	3.49	3.44	3.40	0.0069	0.0072	0.0077	0.0087	0.0092
1078	62%	69	3.76	3.71	3.71	3.66	3.61	0.0061	0.0064	0.0069	0.0079	0.0084
	64%	72	3.76	3.71	3.71	3.66	3.61	0.0061	0.0064	0.0069	0.0079	0.0084
	66%	77	3.71	3.67	3.67	3.62	3.57	0.0062	0.0065	0.0070	0.0080	0.0085
1086	66%	80	3.71	3.67	3.67	3.62	3.57	0.0062	0.0065	0.0070	0.0080	0.0085
	68%	85	3.69	3.65	3.65	3.60	3.55	0.0063	0.0066	0.0071	0.0081	0.0086
3313	55%	93	3.90	3.85	3.85	3.80	3.75	0.0055	0.0058	0.0063	0.0073	0.0078
	57%	100	3.85	3.80	3.80	3.76	3.72	0.0056	0.0059	0.0064	0.0074	0.0079
2116	53%	112	3.95	3.90	3.90	3.85	3.80	0.0054	0.0057	0.0062	0.0072	0.0077
	55%	119	3.90	3.85	3.85	3.80	3.75	0.0055	0.0058	0.0063	0.0073	0.0078
	57%	125	3.85	3.80	3.80	3.76	3.72	0.0056	0.0059	0.0064	0.0074	0.0079
	59%	136	3.81	3.76	3.76	3.71	3.66	0.0057	0.0060	0.0065	0.0075	0.0080

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Laminates Availability

Laminate Thickness (µm)	Glass Style	Piles	RC	Dk					Df				
				@ 1GHz	@ 2GHz	@ 5GHz	@ 10GHz	@ 20GHz	@ 1GHz	@ 2GHz	@ 5GHz	@ 10GHz	@ 20GHz
30	1027	1	65%	3.71	3.67	3.67	3.62	3.57	0.0062	0.0065	0.0070	0.0080	0.0085
50	1067	1	70%	3.69	3.65	3.65	3.60	3.55	0.0063	0.0066	0.0071	0.0081	0.0086
60	1078	1	59%	3.81	3.76	3.76	3.71	3.66	0.0057	0.0060	0.0065	0.0075	0.0080
80	1086	1	63%	3.76	3.71	3.71	3.66	3.61	0.0061	0.0064	0.0069	0.0079	0.0084
90	3313	1	53%	3.95	3.90	3.90	3.85	3.80	0.0054	0.0057	0.0062	0.0072	0.0077
100	3313	1	57%	3.85	3.80	3.80	3.76	3.72	0.0056	0.0059	0.0064	0.0074	0.0079
	1067	2	70%	3.69	3.65	3.65	3.60	3.55	0.0063	0.0066	0.0071	0.0081	0.0086
110	2116	1	53%	3.95	3.90	3.90	3.85	3.80	0.0054	0.0057	0.0062	0.0072	0.0077
125	1078	2	59%	3.81	3.76	3.76	3.71	3.66	0.0057	0.0060	0.0065	0.0075	0.0080
	2116	1	55%	3.90	3.85	3.85	3.80	3.75	0.0055	0.0058	0.0063	0.0073	0.0078
150	1086	2	63%	3.76	3.71	3.71	3.66	3.61	0.0061	0.0064	0.0069	0.0079	0.0084
200	3313	2	57%	3.85	3.80	3.80	3.76	3.72	0.0056	0.0059	0.0064	0.0074	0.0079
254	2116	2	55%	3.90	3.85	3.85	3.80	3.75	0.0055	0.0058	0.0063	0.0073	0.0078
305	3313	3	57%	3.85	3.80	3.80	3.76	3.72	0.0056	0.0059	0.0064	0.0074	0.0079

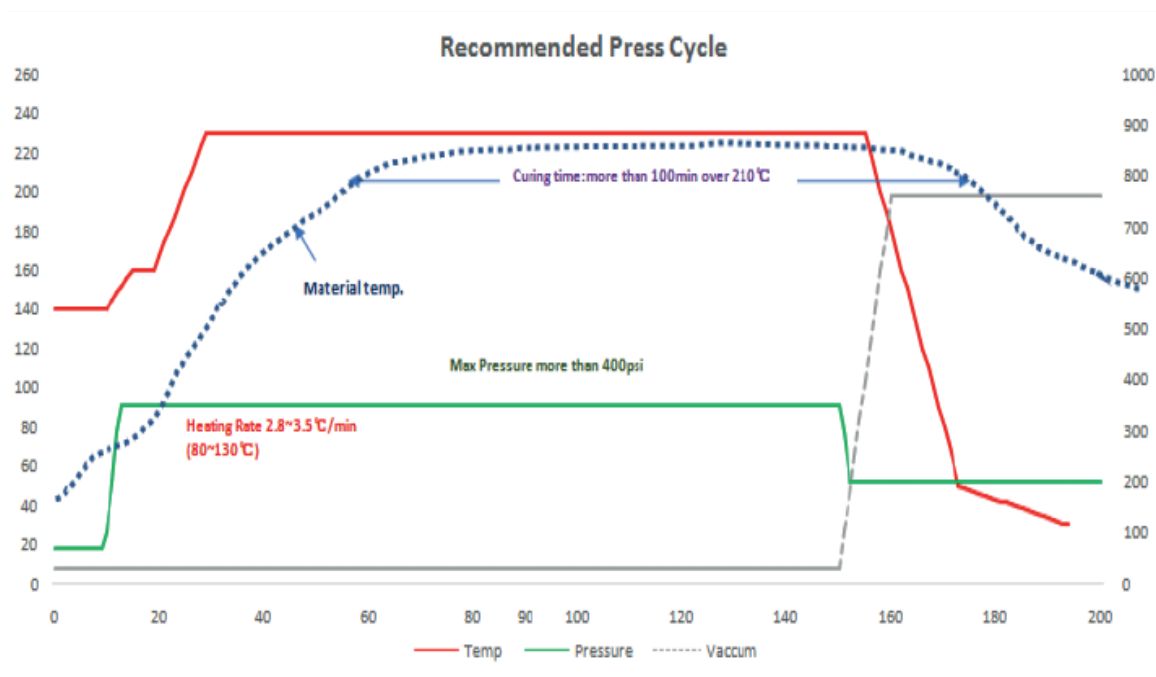
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Press Condition

1. Heating rate [Rate of Rise] of material [Material Temperature]: Programmable Press: $\geq 2.8^{\circ}\text{C}/\text{min}$
2. Curing Temperature & Time: $>100\text{min}$ at more than 210°C and peak temperature $>215^{\circ}\text{C}$
3. Full Pressure: $\geq 400\text{psi}$ ($28\text{Kg}/\text{cm}^2$) should be applied full pressure before 100°C
4. Cushion for pressure evenness is needed



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Typical Drilling Parameters

- Drilling parameters should be adjusted depending on hole size, layer count, panel thickness, stack count and stack height etc
- Please adjust drilling parameters after checking qualities of through holes
- Suggest Drilling parameter as below:

Diameter (mm)	Spindle Speed (krpm)	Feed Rate (mm/sec)	Chip Load (μm/rev)	Hit Counts
0.25	145	25	8~13	500
1.0	53	31	30~45	1000

Desmear Process

- Please test desmear rate and check whether the smear is cleaned clearly by SEM , Ventec could provide the specimen for pilot.
- 1 cycle Plasma and 1 cycle desmear or 2 cycles desmear is recommended.
- Holding time from desmear to PTH process: < 24 hours

Packaging and baking recommendation

- It is recommended to bake the board before packaging at 125°C/4~8h to avoid moisture causing a decrease in heat resistance.
- If the PCBs needs to be stored for a long time before use, it is recommended to use aluminum foil vacuum packaging.
- If exceed 3 months after packaging , It is best to bake the PCBs at 125°C/4~6h before assembly before use.