tec-speed 4.0H-PK VT-464LT PROCESS GUIDE

UL Approval: E214381 Version: 20/05/2026

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

Dk values are for impedance design

PP Type	R/C (%)	Delivered Thickness	Dk					Df				
		(µm)	@ 1GHz	@ 2GHz	@ 5GHz	@ 10GHz	@ 20GHz	@ 1GHz	@ 2GHz	@ 5GHz	@ 10GHz	@ 20GHz
1027	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	3.55	3.50	3.50	3.46	3.44	0.0068	0.0071	0.0076	0.0086	0.0091
1067	72%	60	3.66	3.61	3.61	3.57	3.53	0.0065	0.0068	0.0073	0.0083	0.0088
	74%	65	3.61	3.56	3.56	3.52	3.48	0.0066	0.0069	0.0074	0.0084	0.0089
	76%	72	3.57	3.52	3.52	3.48	3.43	0.0067	0.0070	0.0075	0.0085	0.0090
1078	66%	76	3.70	3.65	3.65	3.61	3.57	0.0062	0.0065	0.0070	0.0080	0.0085
	69%	84	3.68	3.63	3.63	3.59	3.55	0.0063	0.0066	0.0071	0.0081	0.0086
	72%	95	3.66	3.61	3.61	3.57	3.53	0.0065	0.0068	0.0073	0.0083	0.0088
2113	59%	100	3.81	3.76	3.76	3.71	3.66	0.0057	0.0060	0.0065	0.0075	0.0080
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
7628	48%	192	4.10	4.05	4.05	4.00	3.95	0.0051	0.0054	0.0059	0.0069	0.0074

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Laminates Availability

Dk values are for impedance design

Laminate Thickness		Glass Style	RC	Dk					Df				
(µm)	(mil)			@ 1GHz	@ 2GHz	@ 5GHz	@ 10GHz	@ 20GHz	@ 1GHz	@ 2GHz	@ 5GHz	@ 10GHz	@ 20GHz
30	1.2	1027x1	65%	3.71	3.67	3.67	3.62	3.57	0.0062	0.0065	0.0070	0.0080	0.0085
50	2.0	1067x1	66%	3.70	3.65	3.65	3.61	3.57	0.0062	0.0065	0.0070	0.0080	0.0085
60	2.5	1078x1	59%	3.81	3.76	3.76	3.71	3.66	0.0057	0.0060	0.0065	0.0075	0.0080
80	3.0	1078x1	66%	3.70	3.65	3.65	3.61	3.57	0.0062	0.0065	0.0070	0.0080	0.0085
90	3.5	1086x1	66%	3.70	3.65	3.65	3.61	3.57	0.0062	0.0065	0.0070	0.0080	0.0085
100	4.0	2113x1	58%	3.83	3.78	3.78	3.74	3.70	0.0056	0.0059	0.0064	0.0074	0.0079
		1067x2	66%	3.70	3.65	3.65	3.61	3.57	0.0062	0.0065	0.0070	0.0080	0.0085
110	4.5	2116x1	52%	3.98	3.93	3.93	3.88	3.83	0.0054	0.0057	0.0062	0.0072	0.0077
130	5	1078x2	59%	3.81	3.76	3.76	3.71	3.66	0.0057	0.0060	0.0065	0.0075	0.0080
		2116x1	56%	3.88	3.83	3.83	3.78	3.73	0.0055	0.0058	0.0063	0.0073	0.0078
150	6	1078x2	65%	3.71	3.67	3.67	3.62	3.57	0.0062	0.0065	0.0070	0.0080	0.0085
180	7	7628x1	43%	4.22	4.17	4.12	4.07	4.02	0.0049	0.0052	0.0057	0.0067	0.0072
200	8	2113x2	58%	3.83	3.78	3.78	3.74	3.70	0.0056	0.0059	0.0064	0.0074	0.0079
		7628x1	48%	4.10	4.05	4.05	4.00	3.95	0.0051	0.0054	0.0059	0.0069	0.0074
254	10	2116x2	56%	3.88	3.83	3.83	3.78	3.73	0.0055	0.0058	0.0063	0.0073	0.0078
305	12	1506x2	47%	4.13	4.08	4.08	4.03	3.98	0.0051	0.0054	0.0059	0.0069	0.0074
381	15	7628x2	45%	4.18	4.13	4.13	4.08	4.03	0.0050	0.0053	0.0058	0.0068	0.0073
461	18	1506x3	47%	4.13	4.08	4.08	4.03	3.98	0.0051	0.0054	0.0059	0.0069	0.0074
510	21	7628*2+ 2113x1	48%	4.10	4.05	4.05	4.00	3.95	0.0051	0.0054	0.0059	0.0069	0.0074
610	24	7628x3	48%	4.10	4.05	4.05	4.00	3.95	0.0051	0.0054	0.0059	0.0069	0.0074
710	28	7628x4	43%	4.22	4.17	4.12	4.07	4.02	0.0049	0.0052	0.0057	0.0067	0.0072
790	31	7628x4	48%	4.10	4.05	4.05	4.00	3.95	0.0051	0.0054	0.0059	0.0069	0.0074
1000	39	7628x5	48%	4.10	4.05	4.05	4.00	3.95	0.0051	0.0054	0.0059	0.0069	0.0074
1200	47	7628x6	48%	4.10	4.05	4.05	4.00	3.95	0.0051	0.0054	0.0059	0.0069	0.0074
		2116x11	55%	3.90	3.85	3.85	3.80	3.75	0.0055	0.0058	0.0063	0.0073	0.0078

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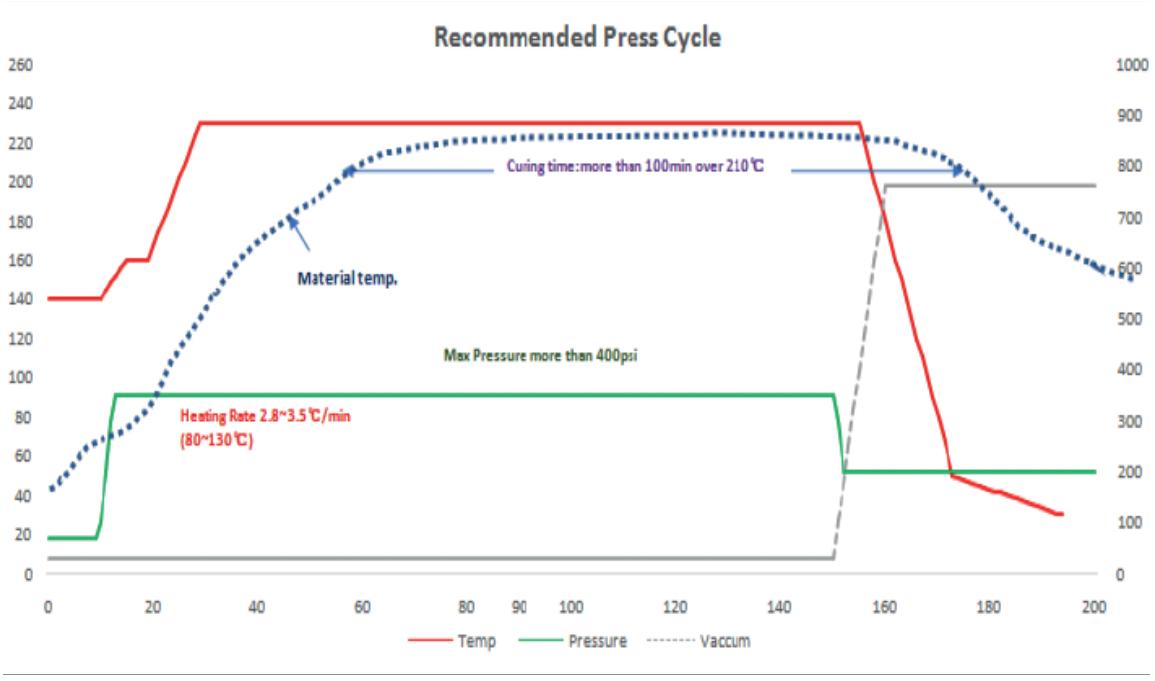
Press Condition

1. Heating rate (Rate of Rise) of material [Material Temperature]: Programmable Press: ≥2.8°C/min
2. Curing Temperature & Time: >100min at more than 210°C and peak temperature>215 °C
3. Full Pressure: ≥400psi (28Kg/cm2) 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.