

Tec-speed 2.0 VT-464

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)

- The pre-preg exceeding shelf time should be retested.
- Take care in handling thin core laminates as they are easily damaged.
- If the pre-preg is not consumed within 48hrs after opening the vacuum package, it is recommended that the bags be resealed.
- Material is available in both long and short grain. The grain direction is indicated on the label with an arrow.

Designing and Inner layer Process

- Please be careful when single ply of 1080, 1086, 1078 or 106 prepreg is designed to the dielectric layer.
- Before feed please baking to remove any absorbed moisture or surface moisture especially for thinner core. Baking 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 6 hours.

Tec-speed 2.0 VT-464

PROCESS GUIDE

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Prepreg Availability

E-Glass styles: 7628, 2116, 2113, 1080, 106, etc.

Delivered Thickness (Inches)	Glass Style	Resin Content	Dk					Df				
			@ 1GHz	@ 2GHz	@ 5GHz	@ 10GHz	@ 20GHz	@ 1GHz	@ 2GHz	@ 5GHz	@ 10GHz	@ 20GHz
0.002	106	72%	3.45	3.25	3.21	3.18	3.13	0.0101	0.0106	0.0112	0.0121	0.0126
0.0024	106	76%	3.35	3.18	3.15	3.1	3.05	0.0104	0.0109	0.0113	0.0124	0.0129
0.0031	1080	66%	3.55	3.5	3.44	3.37	3.32	0.0098	0.0101	0.0109	0.0116	0.0121
0.0033	1080	68%	3.48	3.44	3.39	3.35	3.3	0.0100	0.0105	0.0110	0.0118	0.0123
0.0038	2113	56%	3.82	3.76	3.72	3.62	3.57	0.0082	0.0085	0.0091	0.0102	0.0107
0.0048	2116	54%	3.85	3.81	3.75	3.65	3.6	0.0078	0.0081	0.0088	0.0099	0.0104
0.0051	2116	56%	3.82	3.76	3.72	3.62	3.57	0.0082	0.0085	0.0091	0.0102	0.0107
0.0078	7628	45%	4.07	4.03	3.97	3.88	3.83	0.0067	0.007	0.0078	0.0088	0.0093
0.0085	7628	48%	4.01	3.97	3.91	3.81	3.76	0.0068	0.0071	0.0079	0.0089	0.0094

Remark:

- ① Press thickness test condition---Prepreg lamination size 18"*24", Copper Foil---1oz/1oz, Flow---about 5%;
- ② Make laminated prepreg to micro-section and measure the thickness with microscope; this thickness is used for resistance design calculation.
- ③ The thickness measured with micrometer is 0.2~0.4 mil larger than that measured with micro-section; and mainly used for total thickness design calculation.

Tec-speed 2.0 VT-464

PROCESS GUIDE

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Laminates Availability

Laminate Thickness (Inches)	Glass Style	Piles	Resin Content	Dk					Df				
				1GHz	2GHz	5GHz	10GHz	20GHz	1GHz	2GHz	5GHz	10GHz	20GHz
0.002	1067	1	66%	3.55	3.5	3.44	3.37	3.32	0.0098	0.0101	0.0109	0.0116	0.0121
0.0025	1078	1	57%	3.78	3.76	3.72	3.58	3.57	0.0086	0.0085	0.0091	0.0104	0.0107
0.003	2112	1	53%	3.86	3.82	3.75	3.66	3.61	0.0078	0.0081	0.0088	0.0099	0.0104
0.0035	2113	1	52%	3.86	3.82	3.75	3.66	3.61	0.0078	0.0081	0.0088	0.0099	0.0104
0.004	2113	1	56%	3.82	3.76	3.72	3.62	3.57	0.0082	0.0085	0.0091	0.0102	0.0107
0.005	2116	1	55%	3.85	3.79	3.75	3.65	3.6	0.0080	0.0083	0.0089	0.0100	0.0105
0.006	2112	2	53%	3.86	3.82	3.75	3.66	3.61	0.0078	0.0081	0.0088	0.0099	0.0104
0.007	2113	2	52%	3.86	3.82	3.75	3.66	3.61	0.0078	0.0081	0.0088	0.0099	0.0104
0.008	2113	2	56%	3.82	3.76	3.72	3.62	3.57	0.0082	0.0085	0.0091	0.0102	0.0107
0.01	2116	2	55%	3.85	3.79	3.75	3.65	3.6	0.0080	0.0083	0.0089	0.0100	0.0105
0.012	1506	2	44%	4.13	4.09	4.03	3.94	3.89	0.0066	0.0069	0.0077	0.0087	0.0092
0.014	7628	2	41%	4.22	4.18	4.12	4.03	3.98	0.0064	0.0067	0.0075	0.0085	0.0090
0.015	7628	2	44%	4.13	4.09	4.03	3.94	3.89	0.0066	0.0069	0.0077	0.0087	0.0092
0.016	7628	2	46%	4.07	4.03	3.97	3.88	3.83	0.0067	0.0070	0.0078	0.0088	0.0093
0.021	7628	3	41%	4.22	4.18	4.12	4.03	3.98	0.0064	0.0067	0.0075	0.0085	0.0090
0.022	7628	3	44%	4.13	4.09	4.03	3.94	3.89	0.0066	0.0069	0.0077	0.0087	0.0092
0.024	7628	3	46%	4.07	4.03	3.97	3.88	3.83	0.0067	0.0070	0.0078	0.0088	0.0093

More types could be available upon request.

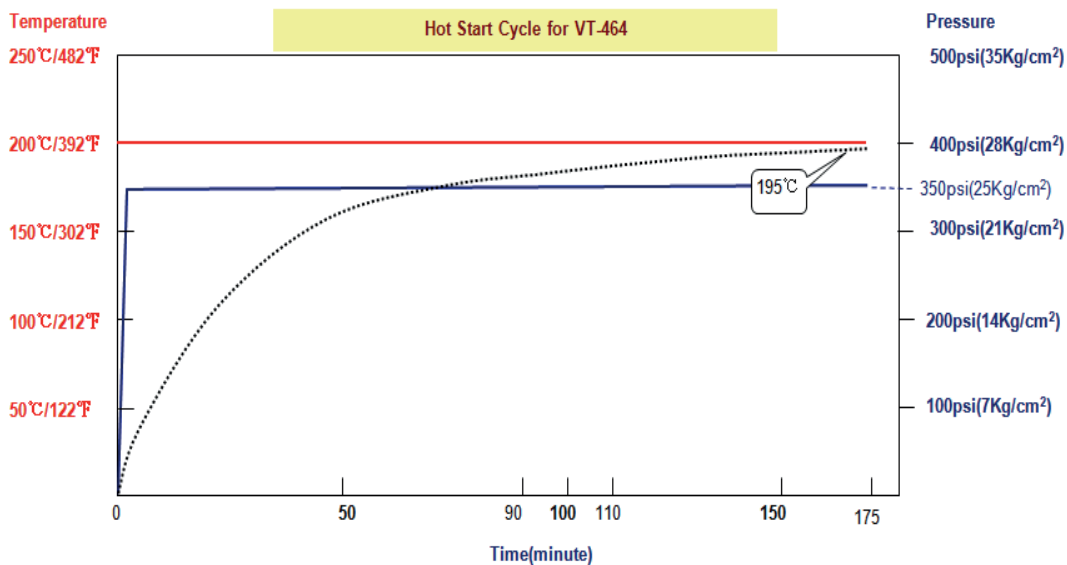
Tec-speed 2.0 VT-464

PROCESS GUIDE

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Press Condition

1. Heating rate [Rate of Rise] of material [Material Temperature]: Programmable Press: $\geq 3.0^{\circ}\text{C}/\text{min}$
2. Curing Temperature & Time: $>60\text{min}$ at more than 190°C and peak temperature $>195^{\circ}\text{C}$
3. Full Pressure: $\geq 350\text{psi}$ ($25\text{Kg}/\text{cm}^2$) should be applied full pressure before 80°C
4. Vacuuming should be continued until over 140°C [Material Temperature]
5. Cushion for pressure evenness is needed



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)	Retract Rate ($\mu\text{m}/\text{rev}$)	Hit Counts
0.25	125	25	10~15	500
1.0	53	31	30~45	800

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Desmear Process

- Use 1 cycle Plasma and 1 cycle desmear or 2 cycles desmear based upon customers' process condition.
- Please test desmear rate and check whether the smear is cleaned clearly by SEM , Ventec could provide the specimens.
- Typical plasma conditions.

Process	Temperature (°C)	Gas Mixture	Power (W)	Duration (min)
Parameter	80-100	10%CF ₄ , 80% O ₂ , 10% N ₂	4000	60-80

- Typical Chemical conditions. (Atotech chemical)

Process	Temperature (°C)	Duration (min)
Sewll	60-70	5-10
Permanganate Oxidizer	70-80	10-15

If use other chemical, please consult the chemical supplier for suggested conditions.

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.