

tec-speed 6.0 VT-462S

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 prepreg exceeding shelf time should be retested.
- Take care in handling thin core laminates as they are easily damaged.
- If the prepreg 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.

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Prepreg Availability

E-Glass styles: 2116, 3313, 1078, 1067, 1037, 1035, etc.

Delivered Thickness (mil)	Glass Style	Resin Content	Dk					Df				
			@ 1GHz	@ 2GHz	@ 5GHz	@ 10GHz	@ 20GHz	@ 1GHz	@ 2GHz	@ 5GHz	@ 10GHz	@ 20GHz
0.0021	106	72%	3.27	3.25	3.19	3.16	3.13	0.0027	0.003	0.0035	0.0041	0.0044
0.0025	106	76%	3.24	3.22	3.16	3.13	3.1	0.0026	0.0029	0.0034	0.004	0.0043
0.0030	1078	64%	3.35	3.33	3.29	3.26	3.23	0.0029	0.0032	0.0038	0.0044	0.0047
0.0033	1078	66%	3.33	3.31	3.27	3.24	3.21	0.0029	0.0032	0.0038	0.0044	0.0047
0.0035	1078	68%	3.31	3.29	3.25	3.23	3.2	0.0028	0.0031	0.0037	0.0043	0.0046
0.0041	3313	56%	3.64	3.63	3.6	3.54	3.51	0.0031	0.0035	0.0041	0.0048	0.0051
0.0049	2116	54%	3.69	3.67	3.64	3.59	3.56	0.0031	0.0035	0.0042	0.0049	0.0052

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.

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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	65%	3.35	3.33	3.29	3.26	3.23	0.0029	0.0032	0.0038	0.0044	0.0047
0.003	1078	1	64%	3.35	3.33	3.29	3.26	3.23	0.0029	0.0032	0.0038	0.0044	0.0047
0.004	2113	1	56%	3.64	3.63	3.6	3.54	3.51	0.0031	0.0035	0.0041	0.0048	0.0051
0.004	1067	2	65%	3.35	3.33	3.29	3.26	3.23	0.0029	0.0032	0.0038	0.0044	0.0047
0.005	2116	1	54%	3.69	3.67	3.64	3.59	3.56	0.0031	0.0035	0.0042	0.0049	0.0052
0.005	1078	2	60%	3.42	3.4	3.37	3.32	3.29	0.003	0.0034	0.0041	0.0048	0.0051
0.006	1078	2	64%	3.35	3.33	3.29	3.26	3.23	0.0029	0.0032	0.0038	0.0044	0.0047
0.008	2113	2	56%	3.64	3.63	3.6	3.54	3.51	0.0031	0.0035	0.0041	0.0048	0.0051
0.01	2116	2	54%	3.69	3.67	3.64	3.59	3.56	0.0031	0.0035	0.0042	0.0049	0.0052
0.012	2113	3	56%	3.64	3.63	3.6	3.54	3.51	0.0031	0.0035	0.0041	0.0048	0.0051
0.014	7628	2	43%	3.96	3.94	3.91	3.86	3.83	0.0034	0.0038	0.0045	0.0052	0.0055
0.016	2113	4	56%	3.64	3.63	3.6	3.54	3.51	0.0031	0.0035	0.0041	0.0048	0.0051
0.018	7628*2+ 2113*1	3	45%	3.91	3.89	3.86	3.81	3.78	0.0033	0.0036	0.0043	0.005	0.0053
0.020	2116	4	54%	3.69	3.67	3.64	3.59	3.56	0.0031	0.0035	0.0042	0.0049	0.0052
0.024	7628*2+ 2116*2	4	47%	3.91	3.89	3.86	3.81	3.78	0.0033	0.0036	0.0043	0.005	0.0053
0.025	2116	5	54%	3.69	3.67	3.64	3.59	3.56	0.0031	0.0035	0.0042	0.0049	0.0052
0.025	7628*2+ 2116*2	4	47%	3.91	3.89	3.86	3.81	3.78	0.0033	0.0036	0.0043	0.005	0.0053
0.028	7628	4	43%	3.96	3.94	3.91	3.86	3.83	0.0034	0.0038	0.0045	0.0052	0.0055
0.030	2116	6	54%	3.69	3.67	3.64	3.59	3.56	0.0031	0.0035	0.0042	0.0049	0.0052
0.030	7628	4	46%	3.91	3.89	3.86	3.81	3.78	0.0033	0.0036	0.0043	0.005	0.0053
0.059	7628	8	46%	3.91	3.89	3.86	3.81	3.78	0.0033	0.0036	0.0043	0.005	0.0053

More types could be available upon request.

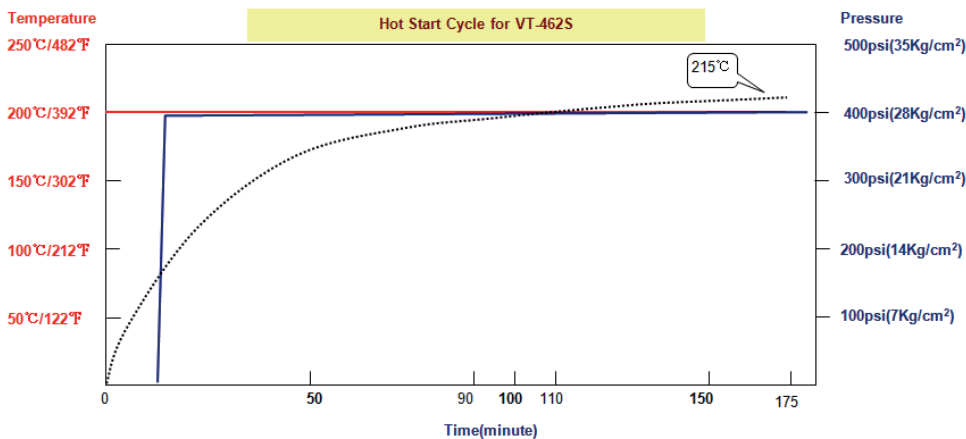
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Press Condition

1. Heating rate [Rate of Rise] of material [Material Temperature]: Programmable Press: $\geq 4^{\circ}\text{C}/\text{min}$
2. Curing Temperature & Time: $>90\text{min}$ 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. 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)	Chip Load ($\mu\text{m}/\text{rev}$)	Hit Counts
0.25	145	25	8~13	500
1.0	53	31	30~45	1000

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Desmear Process

- Before using plasma or desmear, a post baking @150°C for 120min is preferred.
- 1 cycle Plasma and 1 cycle desmear is recommended.
- 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.