

UL Approval: E214381 Version: 03/02/2025

Precautions in Handling

Storage Condition & Shelf Life

		Prepreg		Laminate
Storage	Temperature	Below 23°C (73°F)	Below 5°C (41°F)	Room
Condition	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.



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Prepreg Availability

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

Delivered	Pacin	Dk					Df					
Thickness Style	Style	Content	ര 1GHz	ଜ 2GHz	ര 5GHz	ାର 10GHz	ି 20GHz	ଜ 1GHz	ି 2GHz	ି SGHz	ାର 10GHz	ି 20GHz
0.002	1067	66%	3.61	3.57	3.5	3.43	3.36	0.0029	0.0033	0.0038	0.0047	0.0052
0.0023	1067	70%	3.52	3.48	3.42	3.35	3.28	0.0028	0.0032	0.0036	0.0045	0.0049
0.0025	1067	72%	3.49	3.45	3.39	3.32	3.25	0.0027	0.0031	0.0035	0.0044	0.0048
0.003	1078	65%	3.63	3.59	3.52	3.45	3.38	0.0029	0.0033	0.0038	0.0047	0.0052
0.0035	1078	69%	3.56	3.52	3.45	3.38	3.31	0.0029	0.0032	0.0037	0.0046	0.0051
0.0045	3313	60%	3.74	3.69	3.62	3.55	3.48	0.003	0.0034	0.0039	0.0049	0.0054
0.005	2116	56%	3.81	3.76	3.69	3.62	3.55	0.0031	0.0035	0.004	0.005	0.0055

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	Glass				Dk				Df				
Thickness (Inches)	Style	Piles	RC	୍ଭ 1GHz	ି 2GHz	ି 5GHz	ାର 10GHz	ାର 20GHz	ାର 1GHz	ര 2GHz	ାର 5 GHz	ିର 10GHz	ିର 20GHz
0.002	1067	1	66%	3.61	3.57	3.5	3.43	3.36	0.0029	0.0033	0.0038	0.0047	0.0052
0.0025	1067	1	72%	3.49	3.45	3.39	3.32	3.25	0.0027	0.0031	0.0035	0.0044	0.0048
0.003	1078	1	65%	3.63	3.59	3.52	3.45	3.38	0.0029	0.0033	0.0038	0.0047	0.0052
0.004	3313	1	57%	3.79	3.74	3.67	3.6	3.53	0.0031	0.0035	0.004	0.005	0.0055
0.004	1067	2	66%	3.61	3.57	3.5	3.43	3.36	0.0029	0.0033	0.0038	0.0047	0.0052
0.005	2116	1	56%	3.81	3.76	3.69	3.62	3.55	0.0031	0.0035	0.004	0.005	0.0055
0.005	1067	2	72%	3.49	3.45	3.39	3.32	3.25	0.0027	0.0031	0.0035	0.0044	0.0048
0.006	1078	2	65%	3.63	3.59	3.52	3.45	3.38	0.0029	0.0033	0.0038	0.0047	0.0052
0.008	3313	2	57%	3.79	3.74	3.67	3.6	3.53	0.0031	0.0035	0.004	0.005	0.0055
0.01	2116	2	56%	3.81	3.76	3.69	3.62	3.55	0.0031	0.0035	0.004	0.005	0.0055
0.015	2116	3	56%	3.81	3.76	3.69	3.62	3.55	0.0031	0.0035	0.004	0.005	0.0055
0.02	2116	4	56%	3.81	3.76	3.69	3.62	3.55	0.0031	0.0035	0.004	0.005	0.0055
0.025	2116	5	56%	3.81	3.76	3.69	3.62	3.55	0.0031	0.0035	0.004	0.005	0.0055
0.03	2116	6	56%	3.81	3.76	3.69	3.62	3.55	0.0031	0.0035	0.004	0.005	0.0055

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: >4°C/min
- 2. Curing Temperature & Time: >90min at more than 210°C and peak temperature>215 °C
- 3. Full Pressure: >400psi (28Kg/cm2) should be applied full pressure before 100 $^{\rm o}{\rm C}$
- 4. Vacuuming should be continued until over 140°C [Material Temperature]
- 5. 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

- 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%CF4 , 80% 02, 10% N2	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.