

## Process Guidelines

# **MEGTRON6**

**Laminate R-5775**

**Prepreg R-5670**

High Speed, Low Loss Multi-layer Materials

## General

### Material Storage

Laminate should be stored flat in a cool dry environment. Avoid bending or scratching the laminate surface.

When possible store the laminate in the original container.

Prepreg should be stored flat in a cool dry controlled environment, 73 F(23 C) or less and 50% RH or less.

Extended storage of prepreg should be at a reduced temperature of 41 F(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.

### Laminate Surface Preparation

Regular Shiny Copper can be cleaned using industry standard chemical clean or mechanical clean.

Reverse Treat Copper should be cleaned using industry standard chemical clean.

### Inner Layer Bond Treatment

Black or Brown Oxide can be used. In the case of using Black Oxide, please check whether peel strength is acceptable for the usage.

Alternative Oxide Treatment with organic coating using a Peroxide/Sulfuric etch technology is preferred.

### Drying

Dry finished inner layers completely to remove any absorbed moisture or surface moisture. A racked bake at 225 F(105 C) for 20-30 minutes is preferred. For conveyORIZED alternative oxide processing, some equipment may have sufficient drying capability. However, a racked bake is suggested.

**Note**

The following guidelines are provided as general recommendations. Process optimization may be necessary.

## Drilling (1) Drilling parameters in general condition

Drilling parameters should be adjusted depending on hole size, layer count, panel thickness, stack count and stack height etc.

Diameter	Spindle speed	velocity	min		max		bit life
			infeed	chipload	infeed	chipload	
mm	k rpm	m/min	m/min	$\mu$ /rev	m/min	$\mu$ /rev	hits
0.20	160	100	1.6	10	2.4	15	700–1,000
0.25	160	126	1.8	11	2.8	18	700–1,000
0.30	160	151	1.9	12	3.2	20	700–1,000
0.35	137	151	1.8	13	3.0	22	700–1,000
0.40	120	151	1.8	15	2.9	24	700–1,000
0.45	107	151	1.8	17	2.7	25	700–1,000
0.50	96	151	1.8	19	2.7	28	1,400–2,000
0.55	87	150	1.8	21	2.6	30	1,400–2,000
0.60	80	151	1.7	21	2.6	33	1,400–2,000
0.65	74	151	1.7	23	2.6	35	1,400–2,000
0.70	68	149	1.7	25	2.6	38	1,400–2,000
0.75	64	151	1.6	25	2.6	41	1,400–2,000
0.80	60	151	1.6	27	2.5	42	1,400–2,000
0.85	56	149	1.6	29	2.4	43	1,400–2,000
0.90	53	150	1.6	30	2.4	45	1,400–2,000

Note:

- 1) Spindle speed should be adjusted to make velocity 100 – 150 m/min.
- 2) To use lubricant sheets like LE sheets as entry sheets is recommendable.
- 3) To use drilling bits with high helix angle is recommendable.
- 4) Peck drilling is recommendable for thin drilling bits.
- 5) Please adjust drilling parameters after checking qualities of through holes.

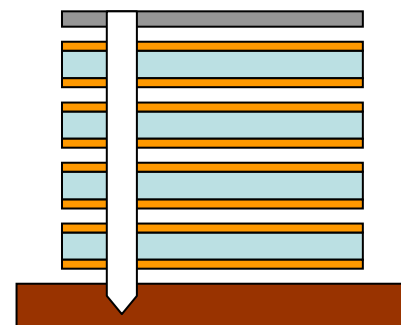


### Note

The following guidelines are provided as general recommendations. Process optimization may be necessary.

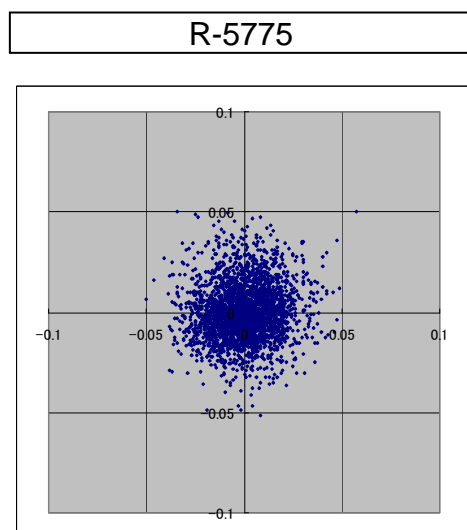
## Drilling (2) Positioning accuracy

Drill size	mm	$\phi$ 0.30
Velocity	m/min	151
Spindle Speed	krpm	160
Chip load	micron/rev	20
Hit count		3000
Entry board		0.15 Aluminum (lubricated is preferred)
Panel thickness	mm	0.8 ( #7628 X 4 )
Copper thickness	micron	35 / 35
Stack count		4

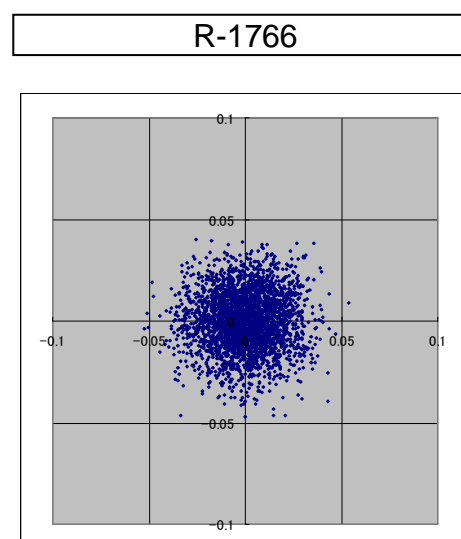


\* No peck drilling

Positioning accuracy map of R-5775 and R-1766 as our conventional FR-4



positioning accuracy : 46.8 micron



positioning accuracy : 47.2 micron



### Note

The following guidelines are provided as general recommendations.  
Process optimization may be necessary.

## Laminate

Curing temperature time will be determined by the thickness of multilayer package being laminated.

Laminate parameters should be adjusted depending on board thickness, stack count and stack thickness etc.

**Please Note** : below is NOT a press control program. The graph represents the recommended pressure/temperature profile of actual panels subjected to during the lamination program cycle.

### Points

#### 1. Product temperature

- Product temperature should be kept at higher 185C for more than 75 minutes.  
195C for 120 minutes is preferred

#### 2. Press pressure

- It's a guide line that Ramping up of pressure is started after 90C of material temp. at the platen side and finished before 110C of material temp. at the platen side.
- 3.0MPa in the case that ROR of material is 4.0C/min, 3.5MPa in the case of 3.0C/min and 4.0MPa in the case of 2.0C/min are guide lines.
- \* Pressure is optimized according to Circuit Pattern by our customers.

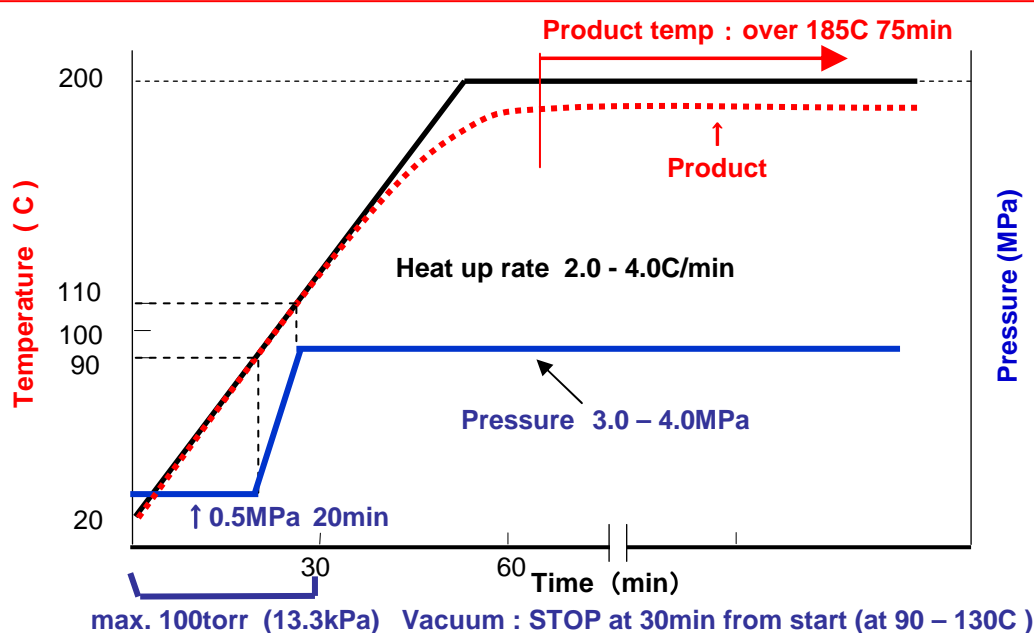
#### 3. Vacuum

- Stop at 30minute from start (at 90-130C of material temp. at the platen side).

#### 4. Cushion

- Cushion for Pressure evenness is needed. (Sheets of kraft paper etc.)

\* It's recommendable that Tg of PCBs by DSC is above 180C.



### Note

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## Desmear

### 1) Permanganate Desmear

The weight loss of R-5775 laminate and R-5670 prepreg is less than that of R-1766 as our conventional FR-4 material. Twice of FR-4 condition is recommendable.

Desmear parameters should be adjusted depending on board thickness, stack count and stack thickness etc.

process	reagent type	temp. (C)	time (min)
Swelling	alkaline	65-85	5-10
Etching	permanganate	70-85	10-15

process	reagent type	temp. (C)	time (min)
Swelling	organic solvent	35-40	6-10
Etching	permanganate	70-85	10-15

Part number	Weight loss ratio
R-5775	0.2 - 0.4
R-1766	1.0

### 2) Plasma Desmear

Half time of FR-4 conditions is recommendable.

### 3) Combined Desmear for Hybrid construction with FR-4 materials

First, Plasma Desmear for the half time of FR-4 condition is done and Permanganate Desmear without swelling process for the half time of FR-4 condition is done continuously.



#### Note

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## Finishing

- Ag plating, Sn plating, Direct gold plating and OSP are good for R-5775.
- If you use Ni plating like ENIG, baking or long time holding at room temperature  
- (E.g. 5H at 150°C, 1week at room temperature) is needed before Ni plating.
- It depends on circuit pattern and conditions (circulation, bubbling etc.) of equipment, though.

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- \* Specifications and appearances are subject to change without prior notice for product improvement.
- \* For details of the products contained in this catalog, contact your dealer or our sales representative.
- \* ALL data are our actual values and not assured values.

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