

**Process Guidelines**

**Halogen-free**

**Laminate R-1566(W/WN)**

**Prepreg R-1551(W/WN)**

Halogen-free Glass Epoxy Multi-layer Materials

## General

### Material Storage

R-1566(W/WN) (R-1566) laminate and R-1551(W/WN) (R-1551) prepreg is the same as our conventional FR-4 material.

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, 68 F(20C) or less and 50% RH or less.

### 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.

Alternative Oxide Treatment using a Peroxide/Sulfuric etch technology can be also used.

### 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.

### (1) Drilling parameters in general condition

diameter	spindle	velocity	min		max		bit life
			infeed	chipload	infeed	chipload	
mm	rpm	m/min	m/min	$\mu$ /rev	m/min	$\mu$ /rev	hits
0.20	160,000	100	1.6	10	2.4	15	750-2,000
0.25	160,000	126	1.8	11	2.8	18	750-2,000
0.30	160,000	151	1.9	12	3.2	20	1,500-3,000
0.35	137,000	151	1.8	13	3.0	22	1,500-3,000
0.40	120,000	151	1.8	15	2.9	24	1,500-3,000
0.45	107,000	151	1.8	17	2.7	25	1,500-3,000
0.50	96,000	151	1.8	19	2.7	28	1,500-3,000
0.55	87,000	150	1.8	21	2.6	30	1,500-3,000
0.60	80,000	151	1.7	21	2.6	33	1,500-3,000
0.65	74,000	151	1.7	23	2.6	35	1,500-3,000
0.70	68,000	149	1.7	25	2.6	38	1,500-3,000
0.75	64,000	151	1.6	25	2.6	41	1,500-3,000
0.80	60,000	151	1.6	27	2.5	42	1,500-3,000
0.85	56,000	149	1.6	29	2.4	43	1,500-3,000
0.90	53,000	150	1.6	30	2.4	45	1,500-3,000



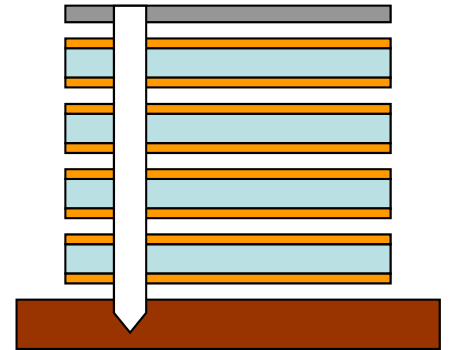
#### Note

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

## Drilling (2) Positioning accuracy

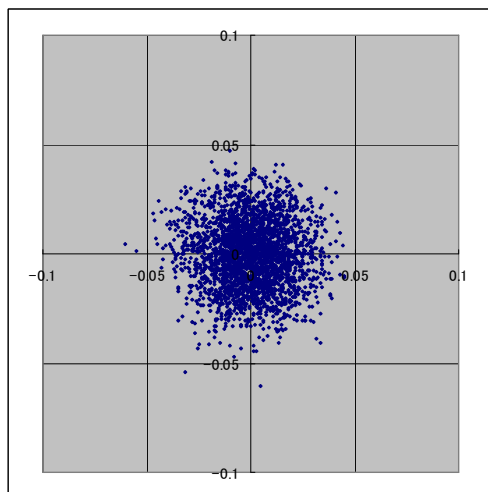
### (2) Positioning accuracy

Drill size	mm	0.3
Surface speed	m/min	151
Revolution	rpm	160000
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



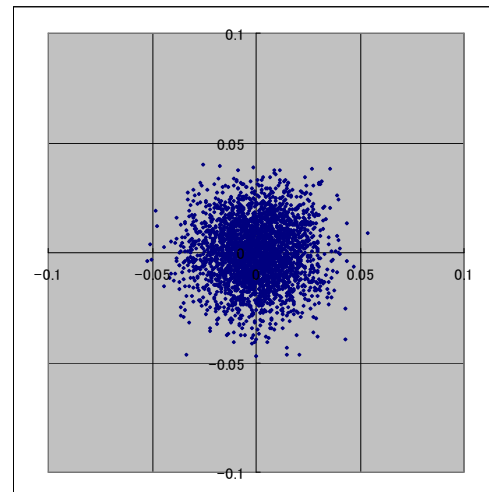
Positioning accuracy map of R-1566(W/WN) and R-1766 as our conventional FR-4

R-1566(W)



positioning accuracy : 48.6 micron

R-1766



positioning accuracy : 47.2 micron



### Note

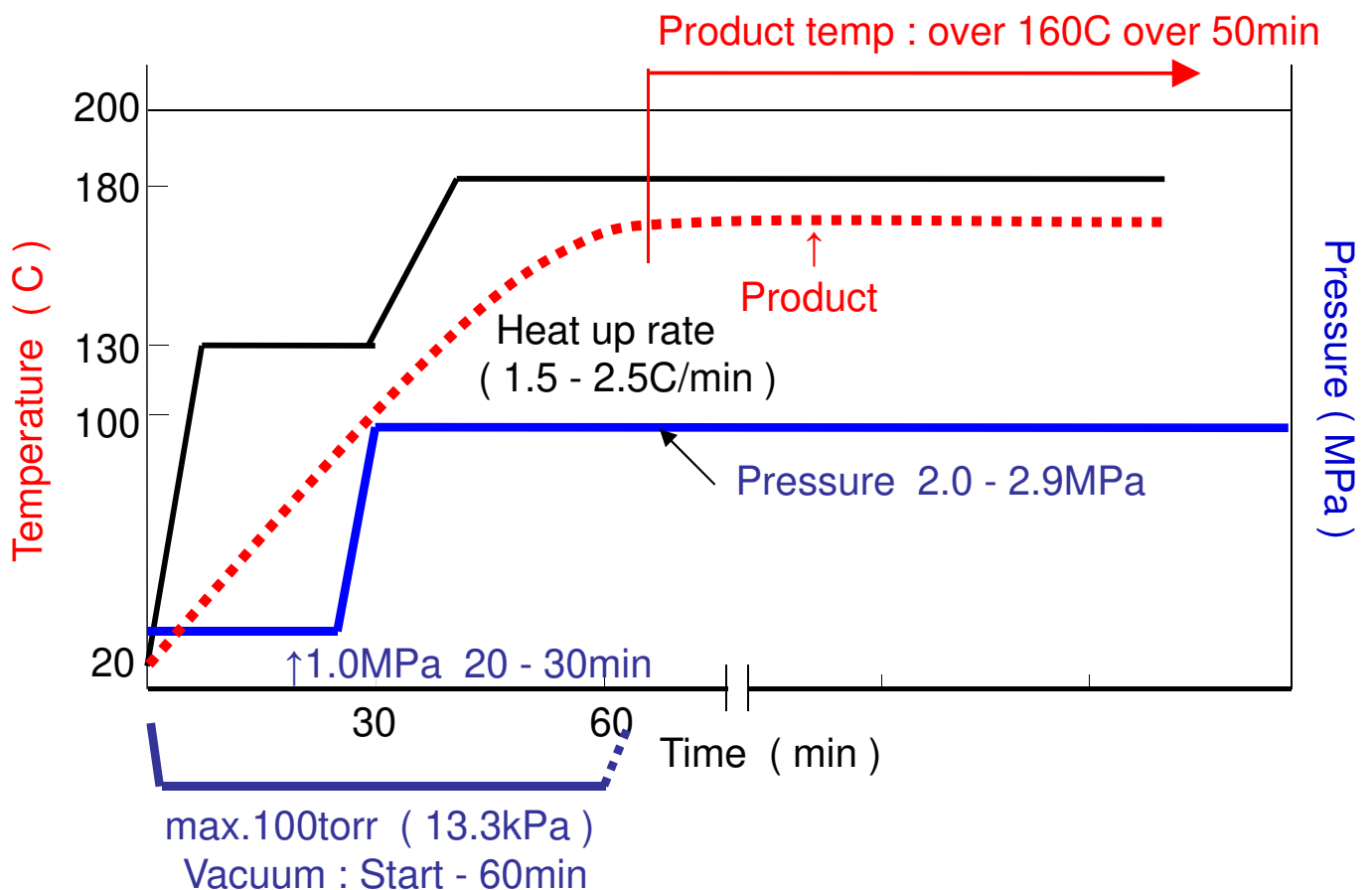
The following guidelines are provided as general recommendations. Process optimization may be necessary.

## Laminate

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

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 that the actual panels are subjected to during the lamination program cycle.



### Note

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

## Desmear

The weight loss of R-1566(W/WN) laminate and R-1551(W/WN) prepreg is larger than that of R-1766 as our conventional FR-4 material.

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-1566(W/WN)	1.3 - 1.7
R-1766	1.0



### Note

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

**++Before purchase++**

## 【Notes before you use】

- Please verify the suitability and fitness for intended application by quality testing, evaluation or other means at your own option before any adoption, use or change of use conditions of a product listed in the Process Guideline.
- We would like to have a delivery specifications mutually agreed for the product that you have decided to use.  
The agreements defined in the delivery specifications are assigned higher priority.
- Please note that images shown may somewhat differ from the actual product in color.
- Please note that specifications and external design are subject to change for product improvement without notice.
- For details on products in the Process Guideline, please contact your distributor or our sales department.

## 【Safety Information】

- Before using the product, please read the delivery specifications carefully or contact the distributor from which you purchased the product or our sales department in order to use the product correctly.
- The products in the Process Guideline are Electronic circuit board materials for electronic and electrical devices. Please do not use them for other than specified use.

**Please Contact us of more**

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