



IT-180ABS/IT-180ATC

High Tg, Low CTE, Multifunctional Filled Epoxy Resin and Phenolic-Cured Laminate & Prepreg

IT-180A is an advanced high Tg (175 °C by DSC) multifunctional filled epoxy with low CTE, high thermal reliability and CAF resistance. It's design for high layer PCB and can pass 260 °C Lead free assembly and sequential lamination process.

Key Features =====

Advanced High Tg Resin Technology

Industrial standard material with high Tg (175 °C by DSC) multifunctional filled epoxy resin and excellent thermal reliability.

Lead-Free Assembly Compatible

RoHS compliant and suitable for high thermal reliability needs, and Lead free assemblies with a maximum reflow temperature of 260 °C.

Friendly Processing and CAF Resistance

Friendly PCB process like high Tg FR4. Users can short the learning curve when using this material.

CAF Resistance

Low thermal expansion coefficient (CTE) helps to excellent thermal reliability and CAF resistance providing long-term reliability for industrial boards and automobile application.

Available in Variety of Constructions

Available in a various of constructions, copper weights and glass styles, including standard(HTE), RTF and VLP copper foil.

Applications

Multilayer and High Layer PCB

Automobile

Backplanes

Servers and Networking

Telecommunications

Data Storage

Heavy Copper Application

Industrial Approval

UL 94 V-0

IPC-4101C Spec / 99/ 101/ 126

RoHS Compliant

Global Availability

| Area | Address | Contact e-mail | TEL |
|-------------|---|---|--|
| Taiwan | 22,Kung Yen 1st Rd. Ping Chen Industry Zone. Ping Chen, Taoyuan, Taiwan, R.O.C. | Sales : jeff@iteq.com.tw Technician : tompeng@iteq.com.tw | 886-3-4152345 #3168 886-3-4152345 #3203 |
| East China | Chun Hui Rd., Xishan Economic Development Zone, Wuxi City, Jiangsu Province, China | Sales : Alan@wxmail.iteq.com.cn Technician : tlfang@wxmail.iteq.com.cn | 86-510-8223-5888 #5168 86-510-8223-5888 #3000 |
| South China | 168, Dongfang Road, Nanfang Industrial Park, Beice Village, Humen Town, Dongguan City, Guangdong Province, China | Sales : lo@iteq.com.cn Technician : jimmypeng@iteq.com.cn | 86-769-88623268 #320 86-769-88623268 #550 |
| Japan | No.2, Huafang Rd, Yonghe Economic Zone, Economic and Technological Development Zone, Guangzhou, Guangdong Province, China | Sales : Stephen@iteq.com.cn Technician : anderson@iteq.com.tw | 86-20-6286-8088 #8027 886-3-4152345 #5388 |
| Overseas | 22,Kung Yen 1st Rd. Ping Chen Industry Zone. Ping Chen, Taoyuan, Taiwan, R.O.C. | Sales : kevin_wang@iteq.com.tw Technician : paul_lee@iteq.com.tw | 886-3-4152345 #3200 886-3-4152345 #5300 |

ITEQ Laminate/ Prepreg : IT-180ATC / IT-180ABS

IPC-4101C Spec / 99 / 101 / 126

LAMINATE(IT-180ATC)

| Property | Thickness < 0.50 mm [0.0197 in] | | Thickness ≥ 0.50 mm [0.0197 in] | | Units | Test Method |
|--|--|--|--|--|--|-----------------------------|
| | Typical Value | Spec | Typical Value | Spec | Metric (English) | IPC-TM-650 (or as noted) |
| Peel Strength, minimum A. Low profile copper foil and very low profile copper foil - all copper weights > 17µm [0.669 mil] B. Standard profile copper foil 1. After Thermal Stress 2. At 125°C [257 F] 3. After Process Solutions | 0.88 (5.0) 1.23 (7.0) 1.05 (6.0) 1.05 (6.0) | 0.70 (4.00) 0.80 (4.57) 0.70 (4.00) 0.55 (3.14) | 0.88 (5.0) 1.40 (8.0) 1.23 (7.0) 1.23 (7.0) | 0.70 (4.00) 1.05 (6.00) 0.70 (4.00) 0.80 (4.57) | N/mm (lb/inch) | 2.4.8 2.4.8.2 2.4.8.3 |
| Volume Resistivity, minimum A. C-96/35/90 B. After moisture resistance C. At elevated temperature E-24/125 | 3.0x10 ¹⁰ -- 5.0x10 ¹⁰ | 10 ⁶ -- 10 ³ | -- 3.0x10 ¹⁰ 1.0x10 ¹⁰ | -- 10 ⁴ 10 ³ | MΩ-cm | 2.5.17.1 |
| Surface Resistivity, minimum A. C-96/35/90 B. After moisture resistance C. At elevated temperature E-24/125 | 3.0x10 ¹⁰ -- 4.0x10 ¹⁰ | 10 ⁴ -- 10 ³ | -- 3.0x10 ¹⁰ 4.0x10 ¹⁰ | -- 10 ⁴ 10 ³ | MΩ | 2.5.17.1 |
| Moisture Absorption, maximum | | - | 0.12 | 0.8 | % | 2.6.2.1 |
| Dielectric Breakdown, minimum | - | - | 60 | 40 | kV | 2.5.6 |
| Permittivity (Dk, 50% resin content) (Laminate & Laminated Prepreg) A. 1MHz B. 1GHz C. 2GHz D. 5GHz E. 10GHz | 4.4 4.4 4.2 4.1 4.0 | 5.4 | 4.4 4.4 4.3 4.1 4.1 | 5.4 | -- | 2.5.5.9 2.5.5.13 |
| Loss Tangent (Df, 50% resin content) (Laminate & Laminated Prepreg) A. 1MHz B. 1GHz C. 2GHz D. 5GHz E. 10GHz | 0.015 0.015 0.015 0.016 0.017 | 0.035 | 0.014 0.015 0.015 0.016 0.016 | 0.035 | -- | 2.5.5.9 2.5.5.13 |
| Flexural Strength, minimum A. Length direction B. Cross direction | -- -- | -- -- | 580(84,300) 450(65,400) | 415 (60,190) 345 (50,140) | N/mm ² (lb/in ²) | 2.4.4 |
| Arc Resistance, minimum | 125 | 60 | 125 | 60 | s | 2.5.1 |
| Thermal Stress 10 s at 288°C [550.4F], minimum A. Unetched B. Etched | Pass Pass | Pass Visual Pass Visual | Pass Pass | Pass Visual Pass Visual | Rating | 2.4.13.1 |
| Electric Strength, minimum (Laminate & Laminated Prepreg) | 45 | 30 | -- | -- | kV/mm | 2.5.6.2 |
| Flammability, (Laminate & Laminated Prepreg) | V-0 | V-0 | V-0 | V-0 | Rating | UL94 |
| Glass Transition Temperature(DSC) | 175 | 170 minimum | 175 | 170 minimum | °C | 2.4.25 |
| Decomposition Temperature | -- | -- | 345 | 340 minimum | °C | 2.4.24.6 (5% wt loss) |
| X/Y Axis CTE (40°C to 125°C) | -- | -- | 10-13 | -- | PPM/°C | 2.4.24 |
| Z-Axis CTE A. Alpha 1 B. Alpha 2 C. 50 to 260 Degrees C | -- -- -- | -- -- -- | 45 210 2.7 | 60 maximum 300 maximum 3.0 maximum | PPM/°C PPM/°C % | 2.4.24 |
| Thermal Resistance A. T260 B. T288 | -- -- | -- -- | >60 >30 | 30 minimum 15 minimum | Minutes Minutes | 2.4.24.1 |
| CAF Resistance | -- | -- | Pass | AABUS | Pass/Fail | 2.6.25 |

The above data and fabrication guide provide designers and PCB shop for their reference. We believe that these information are accurate, however, the data may vary depend on the test methods and specification used. The actual sales of the product should be according to specification in the agreement between ITEQ and its customer. ITEQ reserves the right to revise its data at any time without notice and maintain the best information available to users.



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Process Guideline

1. Prepreg Handling & Storage

- (1) Shelf life is at least 3 months when prepreg stored in a cool dry environment (Temperature: <20 °C and Humidity: <50%).
- (2) Prepreg exposed to humidity should be resealed to minimize moisture absorption.
- (3) Prepreg should be stored in controlled environment for 12 hours prior to use.
- (4) Prepreg supplied in rolls or panels should be stored horizontally. To avoid damage, no stacking is recommended.

2. Laminate Handling & Storage

- (1) Laminates should be stored in a dry environment
- (2) Laminate should always be stored flat

3. Inner Layer Process

- (1) First around must be taken to determine suitable parameters (such as dimensional compensation, etc) before mass production.
- (2) Inner layers should be baked for at least 40 min at 120 °C after black or brown oxides treatment.
Note: The material temperature is not allowed to >195 °C in lamination process if brown oxide treatment is used.

4. Lamination Overview

- (1) Stacks must be prepared in lay-up room to avoid moisture absorption.
- (2) Recommended pressure ranges should be as follows:
Hydraulic/350~400psi
Vacuum Hydraulic/300~400psi
- (3) For Lien Chieh press, heating rate is 1.3~1.8°C/min from 80°C to 140°C, and for Burkle press, the heating rate is 1.5~3.0°C/min from 80°C to 140°C. Cooling rate below 3°C/min is recommended.
- (4) When the board temperature reaches 180°C during the pressing process, the lamination process should be kept for at least 60 minutes.

5. Drilling

Drilling parameters are mainly dependent on the hole size, layer thickness, layer number, copper thickness, and stack height. The following drilling parameters are for reference only. Typical drilling parameters for 0.4~1.0 mm drills are as follows:

| | |
|---|-------------------------------------|
| Spindle speed: 45~105 KRPM | Feed rate: 50~150 IPM |
| Retract rate: 500~1000 IPM | Max. hit count: <1000 HITS |
| Stack height: ≤2pnls(2~6layers), 1pnl(≥8layers) | Entry Material: 0.2mm Aluminum |
| Back-up Material: 1.5mm Phenolic laminate | Drilling Machine: Hitachi ND-6L210E |
| Baking condition: | After Drilling: 170 °C /2 hours |

6. Desmear

The following desmear parameters are for reference only:

| | |
|------------------------|-----------------------------------|
| Horizontal (JETCHEM) | |
| Swell : 75°C for 100 s | Mn+7 : 55-65 g/l at 85°C for 180s |
| Vertical (ROHMHAAS) | |
| Swell : 65°C for 365 s | Mn+7 : 65-75 g/l at 75°C for 750s |

Normally, the typical parameters used to desmear FR-4 product may not produce optimum hole topography for IT-180A. One should consult with your chemical supplier to optimize your desmear condition, e.g. desmear two times or adjust other parameters, etc.