

品质承认书 Quality specification

客户 Customer:		
供应商: 广东东溢新材料科技有限公司 Supplier: GUANGDONG DONGYI HIGH-TECH MATERIAL SCIENCE&TECHNOLOGY CO., LTD.		
产品类型 Product type: 无卤环氧纯胶 Epoxy Resin based Bonding Sheet		
材料品名 Material name: P-E		
编号 No:B051 版本 Ver: F6 制作日期 Date of production:2024/01/11		
客户确认 Customer:		
采购 Purchase:	品质 Quality:	工程 Engineering:
职务 Position:	职务 Position:	职务 Position:
备注 Note: (盖章 Seal)		
广东东溢新材料科技有限公司 GUANGDONG DONGYI HIGH-TECH MATERIAL SCIENCE&TECHNOLOGY CO., LTD.		
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职务 Position:总监	职务 Position:经理	职务 Position: 经理
备注 Note: (盖章 Seal)		

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产品名称 Product name

序号 No	东溢型号 DY model	胶厚 (um) AD Thickness	包装规格 Packaging
1	P12.5-250E (F)	12.5	250mm*100m
2	P12.5-500E (F)	12.5	500mm*100m
3	P15-250E (F)	15	250mm*100m
4	P15-500E (F)	15	500mm*100m
5	P25-250E (F)	25	250mm*100m
6	P25-500E (F)	25	500mm*100m
7	P35-250E (F)	35	250mm*100m
8	P35-500E (F)	35	500mm*100m
9	P40-250E (F)	40	250mm*100m
10	P40-500E (F)	40	500mm*100m
11	P50-250E (F)	50	250mm*100m
12	P50-500E (F)	50	500mm*100m
13	P65-250E (F)	65	250mm*100m
14	P65-500E (F)	65	500mm*100m

● 产品特性 Product Features

- 高剥离强度 Excellent peel strength
- 优异的电性能 Excellent dielectric performance
- 较低的流动性和优良的加工性 Low fluidity and excellent processability
- 优异的耐化学性和耐热性 Excellent chemical and thermal resistance
- 符合 ROHS 环保指令 ROHS compliant

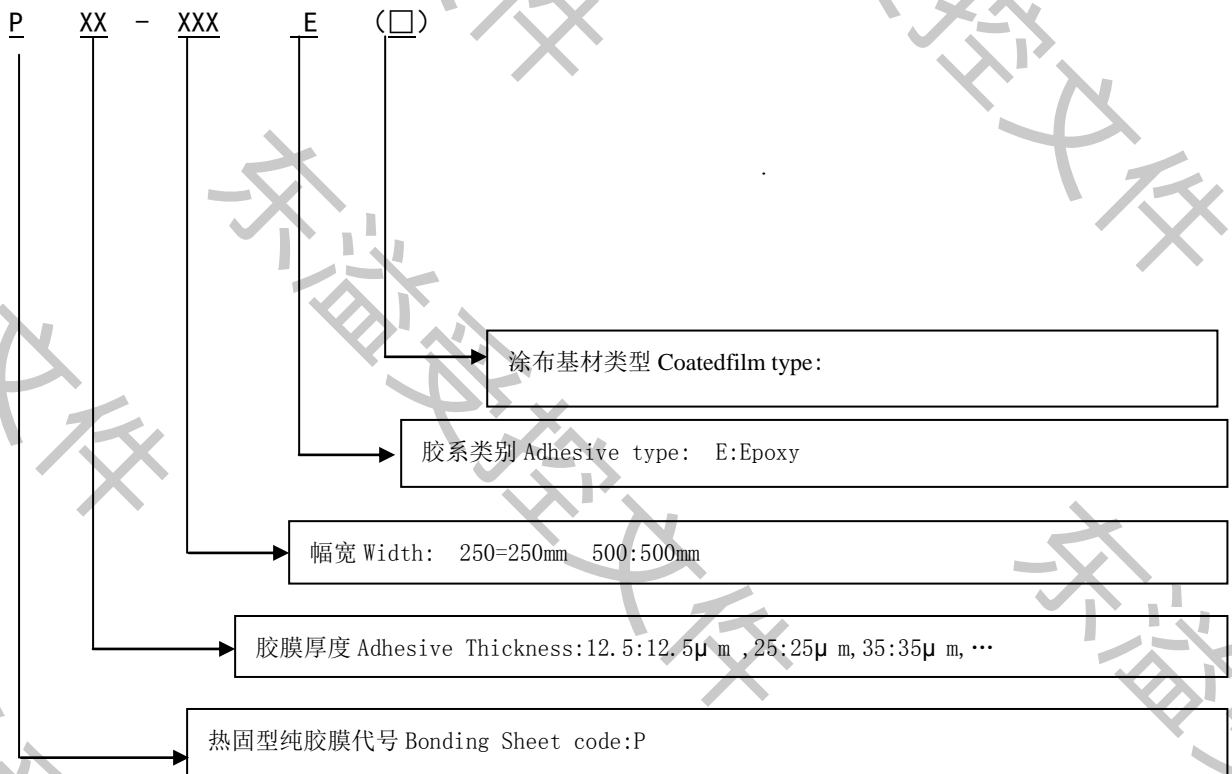
● 产品结构 Product Structure



● 编码原则 Product coding principle

品名示意图如下 The diagram as follows:

注：□：表示英文字母 English alphabet； x：阿拉伯数字 Arabic numeral.



●物性指标 General Properties

序号 Item	性能项目 Test Item	单位 Unit	测试条件 TestCondition	标准 Standard	测试方法 Test Method
1	厚度 Thickness	um	<25um	±2	东溢规范 DongyiMethod
			25~30um	±3	
			>30	±10%	
2	幅宽 Width	mm	A	标准 Standard+2/-0	东溢规范 DongyiMethod
3	剥离强度 Peel Strength	kgf/cm	A	≧1.0	IPC-TM-650-2.4.9
4	耐化学品性 Chemical Resistance	%	HCl&NaOH 2mol/L	≧20	IPC-TM-650-2.3.2
5	焊锡耐热性 Solder Resistance	---	288℃/10S	无分层、起泡 No delamination, sparking	IPC-TM-650-2.4.13
6	溢胶量 Resin Flow	mm	180℃/10s /100kgf/90s	12.5um: ≧0.07 25um: ≧0.15 35/40um: ≧0.2 50um: ≧0.24	IPC-TM-650-2.3.1 7.1

注 Note : A 代表常态 “A” Means normal.

当两块单面聚酰亚胺覆铜箔基材 PI 面与 PI 面贴合时，剥离强度 ≧1.0 N/mm。注：PI 膜表面能必须 ≧50 达因值/cm²；在与胶膜贴合前，先把两块单面基材用丙酮擦干净，然后放在 125℃ 烘干 10-15 分钟（因为 PI 膜有很强的吸湿性）。目前我公司都是按此条方法进行检测。when two pieces of single-sided polyimide copper-clad PI surface and PI surface fitting, peeling strength more than or equal to 1 N/mm. Note: the PI film surface must be greater than or equal to 50 dyne value / cm²; before fitting, clean PI surface of single copper-clad PI with acetone wipe, then parched them at 125 °C for 10-15 minutes (Because PI membrane is very hygroscopic). At present our company are inspecting by this method.

●外观管控 Appearance requirement

异常类型 Exception classes	异常大小 Abnormal size	允许个数 Allowed value (250*400mm)
杂质 Impurity	0.1~0.5mm	≧8 个 dots
垫伤 Pad injury	0.5~1mm	≧1 个 dots
气泡 Bubble	≧1mm	不允许 Not allowed
接头 Joint		≧3 个

注 Note: 产品边缘 3mm 以内异常，不作管控要求 From the product within 3 mm of the edge of exception, don't do control requirements.

●储存 Storage

1. 温度 -20~10℃、湿度 <70% RH、真空包装、无腐蚀性气体的室内，制造日期后保

存 3 个月。Temperature-20~10℃, humidity <70% RH, airproofvacuumedpackaging, no corrosive gas chamber for 3 months.

2. 产品开封后，常温储存，温度 15~30℃、湿度 40~70% RH，储存周期 7 天。After the product is opened, storage at room temperature , Temperature 15~30℃, humidity 40~70% RH, Storage time for 7 days (储存周期是指产品从开封到压合固化前整个过程。Storage cycle refers to the whole process of the product from unpacking to pressing and curing)

●包装 Packing

1. 每一卷成品用纸管卷取。每批出货的每个规格提供一份品质检验报告 Each volume of finished paper tube winding.

2. 每一卷成品用纸箱包装，避免在运输上碰撞。产品采用防潮、干燥、密封包装，成卷装入纸箱 Each volume of finished carton packaging, in the transport collision avoidance. Products using moistureproof, dry, sealed packaging, rolls into cartons.

3. 包箱标签 Package box label

无卤标签 Halogen free label: 环保标签 Green label: 合格标签 Inspection tag:



唛头 Shipping mark:

月份标签 Month label:

一月 Jan.	二月 Feb.	三月 Mar.	四月 Apr.	五月 May.	六月 June.	七月 July.	八月 Aug.	九月 Sept.	十月 Oct.	十一月 Nov.	十二月 Dec.
1	2	3	4	5	6	7	8	9	10	11	12

● 装运 Shipment

每批提供一份质量检验报告，如下表（报告模版仅供参考）：Each shipment of each specification provides a quality inspection report. The following table (Report format for reference only):

 广东东溢新材料科技有限公司 GUANGDONG DONGYI HIGH-TECH MATERIAL SCIENCE&TECHNOLOGY CO., LTD.			
环氧纯胶膜出厂检验报告			编号: JL-Q-02-004-15
日期 (Date):		客户: (customer):	
品名 (Material spec)			
批号 (Lot No.)			
保存期限 (Shelf life)		-20℃~10℃, <70%RH 保存3个月 (-20℃~10℃, <70%RH for 3 months)	
检验项目 (Test item)	检验方法 (Test method)	品质标准 (Quality Spec)	测试结果 (Test Result)
Adhesive厚度 (Adhesive thickness)	东溢规范 (Unit: μm)	胶层厚度<25um, ±2 胶层厚度25-30um, ±3 胶层厚度>30um, ±10%	
幅宽 (Width)	东溢规范 (Unit:mm)	250 +2/-0	
溢胶量 (Resin flow)	东溢规范 (Unit:mm)	胶厚12.5um: ≥0.07 胶厚25um: ≥0.15 胶厚35/40um: ≥0.2 胶厚50um: ≥0.24	
剥离强度 (Peel Strength)	IPC-TM-650 2.4.9 (Unit:kgf/cm)	≥1.0	
转移性 (Transitivity)	东溢规范	在120℃-150℃下, 通过塑封机转移, 胶膜应能转移于覆铜箔聚酰亚胺薄膜面上, 揭掉载体纸(膜)而不破坏胶膜。	
焊锡耐热性 (Solder Float Resistance) 288℃/10sec	IPC-TM-650 2.4.13	无分层起泡 (No Blistering or Delamination)	
产品判定结果			
备注:			
1. 以上测试数据仅供参考。 2. E胶膜适用于FPC线路多层板用胶。 3. 上述产品不含[RoHS]所规定的禁用物质。 4. 以上焊锡耐热性测试所用基材先经120℃/5~10min烘烤处理后, 再与胶膜贴合进行测试。 5. 如产品被放置在低温下储存环境(尤为冬季), 建议客户在使用前将产品静置回暖直至产品温度回升至室温(20~30℃)后方才使用, 以确保最佳产品使用特性, 同时也应避免放置在阳光直接照射及高温环境下。 6. 在背胶前, 如接触界面做表面清洁, 须保证接触界面干燥及不残留溶剂(如酸碱、油污等)。 7. 压合后的产品建议使用干层架烘烤, 如无干层架建议叠层张数不超过20PNL, 以避免叠层太多而影响产品固化效果。			
审核 (APPROVED BY):		检验员 (CHECKED BY):	

● **环氧纯胶使用流程 Epoxy using the process:**

背胶→预压合→贴合→压合→固化

Coating→Pre-pressing→Stick→Pressing→Curing

1. 背胶工艺 Adhesive technology:

① 过塑机 Machine: 用 $135 \pm 15^\circ\text{C}$ 过塑, 最佳温度 135°C 。Plastic with $135 \pm 15^\circ\text{C}$, the optimal temperature of 135°C .

② 干膜机 Dry film machine: 上下温度: $135 \pm 15^\circ\text{C}$ 、压力: $5 \pm 1\text{MPa}$ 、速度: 6-7 格。Upper and lower temperature: $120 \pm 10^\circ\text{C}$, the pressure: $5 \pm 1\text{MPa}$, speed: 5-7 lattice.

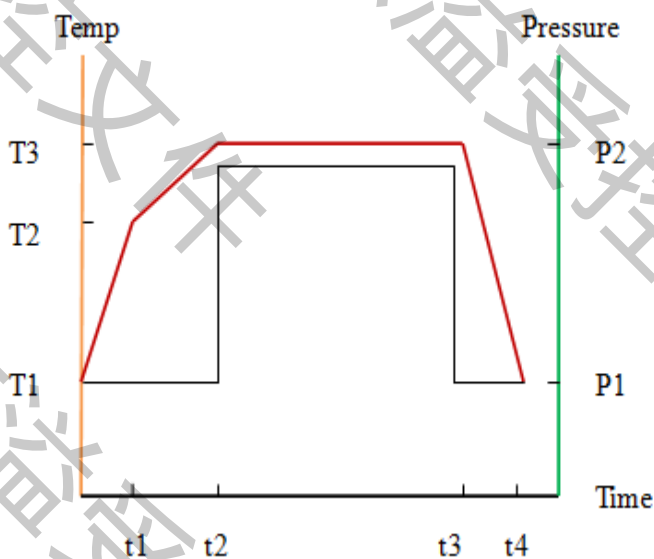
2. 预压合 Pre-pressing

完成背胶工艺后, 进行预压合, 温度: $130^\circ\text{C} \pm 10^\circ\text{C}$, 预压 5-10S, 压合时间: $20\text{S} \pm 10\text{S}$, 压合压力: $100 \pm 10 \text{Kgf/cm}^2$; After finishing the Adhesive technology, the product should be pre-pressed, Temperature: $130 \pm 10^\circ\text{C}$, preloading: 5-10s, molding: $20 \pm 10\text{S}$, pressure: $100 \pm 10 \text{Kgf/cm}^2$

● **建议压合工艺 Recommendations for pressing process**

1. 传统压合方式 Traditional Lamination

温度 Temp 压力 Pressure



传压工艺 Traditional pressing:

第一段: 温度 Temp T1~T2 $50^\circ\text{C} \rightarrow 120^\circ\text{C}$

压力 Pressure P1 $15 \pm 5\text{kgf/cm}^2$

时间 Time t1 $15 \pm 5\text{min}$

第二段: 温度 Temp T2~T3 $120 \rightarrow 165 \pm 5^\circ\text{C}$

压力 Pressure P2 $15 \pm 5\text{kgf/cm}^2$

时间 Time t2 $25 \pm 5 \text{min}$

第三段: 温度 Temp T3 $165 \pm 5^\circ\text{C}$

压力 Pressure P2 $35 \pm 5\text{kgf/cm}^2$

时间 Time t2~t3 $75 \pm 15 \text{min}$

第四段: 温度 Temp T2~T1 $165 \pm 5^\circ\text{C} \rightarrow 50^\circ\text{C}$

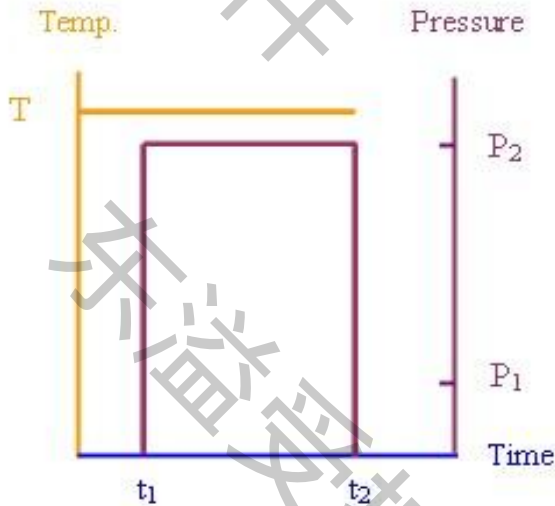
压力 Pressure P1 $15 \pm 5\text{kgf/cm}^2$

时间 Time t3~t4 $45 \pm 15 \text{min}$

● 建议快速压合工艺 Recommendations for pressing process

2. 快速压合方式 Fast Lamination

温度 Temp 压力 Pressure



快压工艺 The quick pressing:

第一段：温度 Temp: 180±5°C

Stage I 压力 Pressure: 0Kgf/cm²

时间 Time: 5~20Sec

第二段：温度 Temp: 180±5°C

Stage II 压力 Pressure: 110±10Kgf/cm²

时间 Time: 135±15Sec

固化 Curing Process:

温度 Temp: 170±10°C;

时间 Time: 90±30min.

注 Note: 以上建议压合参数, 鉴于各厂家机台及生产工艺差异, 故仅供参考。建议尽量使用传统压合工艺。Customers can according to their own technology, equipment conditions and performance requirements, through the test to determine the appropriate operating conditions. It is recommended that the traditional pressing process be used as far as possible.

● 使用注意事项 Matters needing attention

1. 如产品被放置在低于 10 度以下储存环境, 建议客户在使用前将产品静置 4 小时以上回暖直至产品温度回升至室温温度 (20--30°C) 后方才使用、以确保最佳产品使用特性, 回温循环次数不得超过 3 次, 同时也应避免放置在阳光直接照射及高温环境下。if product was placed in under Temperature 10°C for storage, the product should be placed in the room temperature 20~30°C more than 4 hours before using, in order to make the product temperature up to 20~30°C, to ensure the best product features. The number of temperature return cycles should not exceed 3 times. At the same time should also avoid placing it in direct sunlight and high temperature environment.

2. 在背胶前, 如接触界面做表面清洁, 须保证接触界面干燥及不残留溶剂 (如酸碱、油污等)。Before lamination, such as contact interface makes the surface cleaning, must also ensure that the contact interface and not dry residual solvents (such

as acid and alkali, oil etc.).

3. 压合前注意化学清洗线抗氧化剂对铜面与纯胶结合力及耐热性的影响，为确保压合外观，产品在完成背胶工艺后务必进行预压合（温度：130℃±10℃，预压 5-10S，成型：20S±10S，压力：100±10 Kgf/c m²），预压合后需在 24H 内完成贴合、压合及固化。Pay attention to the effect of chemical cleaning line antioxidants on the adhesion between copper face and pure rubber before pressing , In order to make sure there is no problem with the pressure appearance, the product must be pre-pressed after completing the lamination process. (temperature: 130℃±10 °C, preloading:5-10s, molding:20±10S, pressure:100±10 Kgf/cm²) Must complete laminating, pressing and curing in 24 hours after preloading

4. 压合后的产品建议使用千层架烘烤，如无千层架建议叠层张数不超过 20PNL，以避免叠层太多而影响产品固化效果。Pressing products recommend the use of multi-layer frame, such as no proposal for multi-layer frame lamination number no more than 20 PNL, to avoid the laminated too much and influence product curing effect.

5. 此规格书中表述的所有测试数据以及建议之工艺条件和参数仅供参考，产品使用方需要按照自身实际生产设备及产品要求等因素自行确认最优生产工艺及作业参数。特此声明！Hereby declared that all test data and recommended process conditions and operating parameters presented in this technical datasheet are for informational purposes only. Product users need to confirm the optimal production process and operating parameters according to their actual production equipment and product requirements.

●物性测试方法 Properties Test Method

剥离强度检验方法 Peel Test Method

1、范围 The range:

本检验方法适用本公司纯胶产品剥离强度之量测。This test method for bonding sheet measurement of peel strength.

2、检测仪器 Testing instruments:

剥离强度测试仪 Peel strength testing instruments

3、样品制作 The sample:

a) 切取两块 DSIF0120 单面板，切取 10cm×10cm 大小，先用 120℃烘烤 5~10 分钟，然后待用（注：必要时用丁酮轻擦一遍再烘干）。Cut two pieces of DSIF0120 , cut the size of 10cm×10cm, first with 120℃ bake for 5 to 10 minutes, and then stand (Note: when necessary for butanone graze again and drying).

b) 切取一块大小相同的纯胶膜，先与一块覆铜箔 PI 面进行贴合，放在 120℃ 过塑机上过一遍，冷却后撕掉涂胶基材，再与另外一块覆铜箔 PI 膜贴合，再放在 120℃ 过塑机上过一遍。Cut a piece of bonding sheet of the same size, to fit with a piece of copper clad PI, placed in 120℃ on the machine again, after cooling off coating substrate, and then another piece of copper clad PI film, and then placed in 120℃ on the machine again.

c) 快压：温度 180℃、压力 100kgf/cm²、预热 10s、成型 90s；熟化：160℃ × 60min；Quick pressure: temperature 180℃, pressure 100 kgf/cm², Time 10 s, 90 s; Cure: 160℃ x 60 min.

4、样品测试 The sample test:

a) 取熟化过后之样片，裁切 1cm 宽度，烧开使得 FCCL 与纯胶分开然后用手撕开约 3cm。Take samples after curing, cutting 1 cm width to boil make FCCL is separated from bonding sheet.

b) 把样品 FCCL 面用双面胶固定在测试仪的滚轮上，用夹具夹住 FCCL 一端，与滚轮垂直，然后匀速上升，每隔 1 秒，按打印机一次，共打印出 15~30 个数据即可，取打印数据的平均值作为此条样品的剥离强度值。The samples FCCL surface with double-sided adhesive fixed on the roller tester, fixture for clipping FCCL at one end, and vertical roller, and then rising at a constant speed, every 1 second, print 1 data, print out together 15 ~ 30 data, take the print data as the average of the peel strength value of this sample.

c) 注意事项：剥离机上升速度：50mm/min，剥离距离：10~20mm；拉铜箔、样品与滚轮垂直。Note: machine rise: 50 mm/min, stripping distance: 10 ~ 20 mm; Pull copper foil, samples and vertical roller.

5、公式计算 Formula to calculate:

$$\text{剥离强度 Peel strength} = \frac{\text{拉力 Tensile force (kgf)}}{\text{宽度 The width (cm)}}$$

注：以上规范参考 IPC-TM-650, Method 2.4.9. Note: The above specification reference IPC - TM - 650, Method 2.4.9.

焊锡耐热性检验方法 Solder Resistance Test Method

1. 范围 The range:

本检验方法适用于东溢公司纯胶产品焊锡耐热性之量测。The test method for bonding sheet measurement of solder resistance.

2. 检测设备 Testing instruments:

锡炉。Wave solder

3. 样品制作 The sample:

- a) 切取两块 DSIF0120 单面板, 切取 10cm×10cm 大小, 先用 120℃ 烘烤 5~10 分钟, 然后待用 (注: 必要时用丁酮轻擦一遍再烘干)。Cut two pieces of DSIF0120, cut the size of 10cm×10cm, first with 120℃ bake for 5 to 10 minutes, and then stand (Note: when necessary for butanone graze again and drying).
- b) 切取一块大小相同的纯胶膜, 先与一块覆铜箔 PI 面进行贴合, 放在 120℃ 过塑机上过一遍, 冷却后撕掉涂胶基材, 再与另外一块覆铜箔 PI 膜贴合, 再放在 120℃ 过塑机上过一遍。Cut a piece of bonding sheet of the same size, to fit with a piece of copper clad PI, placed in 120℃ on the machine again, after cooling off coating substrate, and then another piece of copper clad PI film, and then placed in 120℃ on the machine again.
- c) 快压: 温度 180℃、压力 100kgf/cm²、预热 10s、成型 90s; 熟化: 160℃×60min; Quick pressure: temperature 180℃, pressure 100 kgf/cm², Time 10 s, 90 s; Cure: 160℃ x 60 min.

4. 样品测试 The sample test:

将固化好的样品立即裁成 3cm×3cm 大小三块, 用镊子夹住浸入恒温焊锡液中, 焊锡液温度 288℃, 每个样品浸锡 10S, 然后拿出观察其表面是否有分层或起泡. 以上测试请务必在 5 分钟完成, 以防止再次吸湿影响测试结果。The cured samples were immediately cut into three of 3cm×3cm, with tweezers in constant temperature liquid solder, solder liquid temperature is 288℃, each sample dipping 10S, then take out to observe the surface whether delamination or blistering. Please complete the above test must be in 5 minutes, again to prevent moisture absorption effect the test results.

注: 以上参考 IPC-TM-650, Method 2.4.13。Note: The above specification reference IPC - TM - 650, Method 2.4.13.

溢胶量检验方法 Resin Flow Test Method

1. 范围 The range:

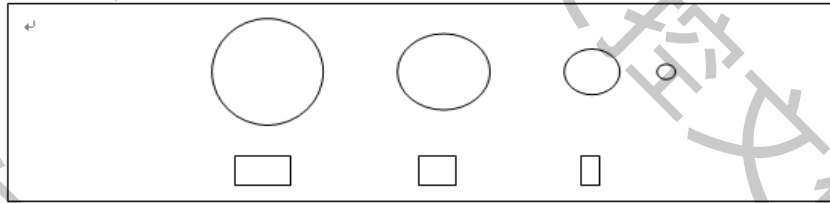
本检验方法适用于本公司产品中纯胶膜溢胶量之量测。This test method for bonding sheet measurement of resin flow.

2. 检测设备 Testing instruments:

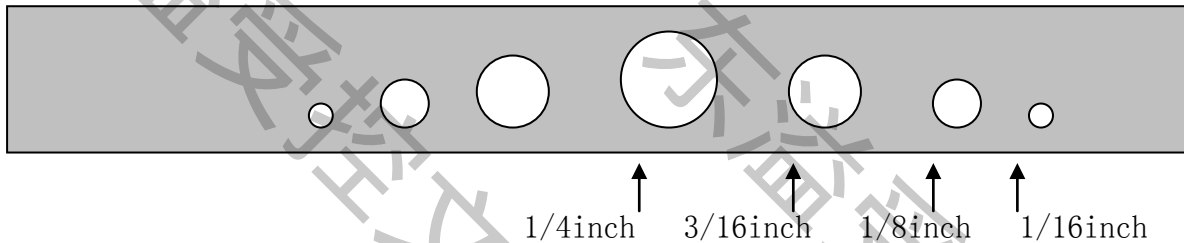
冲孔机、过塑机、快压机、镜像显微镜。Punching machine, laminator, press, microscope.

3. 样品制作 The sample:

取试样尺寸 25mm*40mm, 过塑背胶于半对半单面板 PI 面上, 依次冲出 $\Phi 6.4\text{mm}$ 、 $\Phi 4.8\text{mm}$ 、 $\Phi 2.4\text{mm}$ 、 $\Phi 1.6\text{mm}$ 的四个圆孔, 同时在孔下方再依次冲出 $3\text{mm} \times 2\text{mm}$ 、 $2\text{mm} \times 2\text{mm}$ 、 $1\text{mm} \times 2\text{mm}$ 的三个方孔, 如下图所示: Take the sample size 25mm*40mm, punching $\Phi 6.4\text{mm}$, $\Phi 4.8\text{mm}$, $\Phi 2.4\text{mm}$, $\Phi 1.6\text{mm}$ four holes, and then punching $3\text{mm} \times 2\text{mm}$, $2\text{mm} \times 2\text{mm}$, $1\text{mm} \times 2\text{mm}$ three square holes, as shown below:



如有条件, 可按 IPC-TM-650, Method 2.3.17.1 冲切: If there are conditions, according to Method, 2.3.17.1 IPC-TM-650 to make samples:



4. 压合方法 Pressing method:

a) 将冲好孔的试片样品与半对半单面电解覆铜箔贴合, 然后用 120°C 过塑机过一遍。

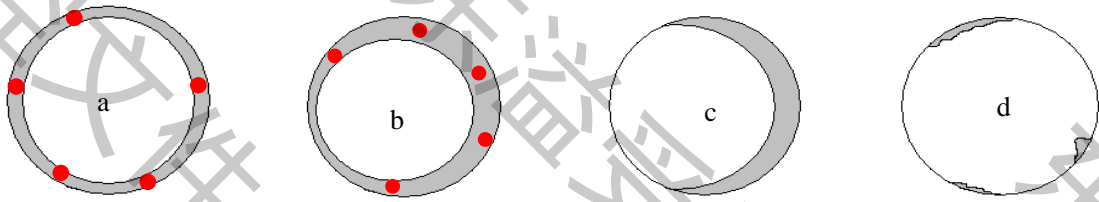
The punched specimen is bonded to on the smooth surface of copper foil, in the 120°C molding machine again.

b) 放入快压机时, 垫上绿硅胶, 上下用 $25\mu\text{m}$ 离型膜夹住样品, 快压: 温度 180°C 、压力 100 kg f/cm^2 、预压 10s、成型 90s。Quick pressure: temperature 180°C , pressure 100 kgf/cm^2 , Time 10 s, 90 s; Cure: $160^\circ\text{C} \times 60\text{ min}$.

5. 溢胶量判定 Determination of resin flow:

用影像测绘仪量测样品溢胶量大小, 分别观测并记录不同孔径的之四边溢胶刻度值, 再计算各孔径平均值即为测试值。The scale values of the four sides of different aperture were observed and recorded respectively, and then the average values of each aperture were calculated as the test values.

注: 取样点需为压合均匀的圆(如图:a 为溢胶较均匀孔, b 为溢胶尚可孔位), 溢胶量值取圆孔测试(方孔仅作参考), 不计算最小值 20% 区域, 其余 80% 区域取平均值(至少取样 5 点, 含最大值位置)。如图, c, d 两种溢胶孔需重新做样进行测试。Note: The Sampling Point should be a well-pressed circle (as shown in figure: A is a well-filled hole, b is a well-filled hole), and the value of the overflow should be measured by a circle hole (square hole is for reference only). The minimum value of 20% area should not be calculated, the remaining 80% are averaged (at least 5 points are sampled, including the maximum position). As shown in figure, C, D two overflow holes need to be re-sample for testing.



注：以上规范参考 IPC-TM-650, Method 2.3.17.1; Note: The above specification
reference IPC - TM - 650, Method 2.3.17.1.