Printed Circuit Board

TROJAN
Discover the Truth of Material

Purpose:

Metallographic cross-sectioning is performed to examine voids, intermetallic compound (IMC) layers, and other potential defects in PCB solder joints. The specimen is prepared by sectioning using the Table Cut 200 automatic flatbed cutting machine, cold mounting with TJ2226 cold mounting resin, and grinding and polishing using the Alpha 610 automatic grinding and polishing machine. The detailed sample preparation procedure is described in the following preparation method.

Force Recommendation by Specimen Size				
Sample size/ diameter (mm)	25	30	40	50
Individual loading mode, Force per Specimen (N)	-5	0	+(5~10)	+(5~10)

*Based on a standard specimen diameter of Ø30 mm, the applied force should be adjusted according to the actual specimen size.

Recommended Equipment and Consumables(Grinding and polishing consumables should be selected according to the actual sample condition.)



TableCUT-200 Automatic Precision Cut-Off Machine

Cutting

Equipment	TableCUT-200 Automatic Precision Cut-Off Machine	
Cutting disc	DP Electroplated Diamond Cut Off Wheels	Order No: 01.03.551
Cutting coolant	TJ 1410 cutting coolant	Order No: 01.07.857
Fixture	Small Vertical Clamping	
Cutting method	Horizontal Cutting (Y-Axis)	
Cutting parameters	Feeding speed	0.2mm/s
	Pulse Settings	Off
	Speed	2500rpm

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ThetaVAC–2 Vacuum Cold Mounting Machine

Cold Mounting

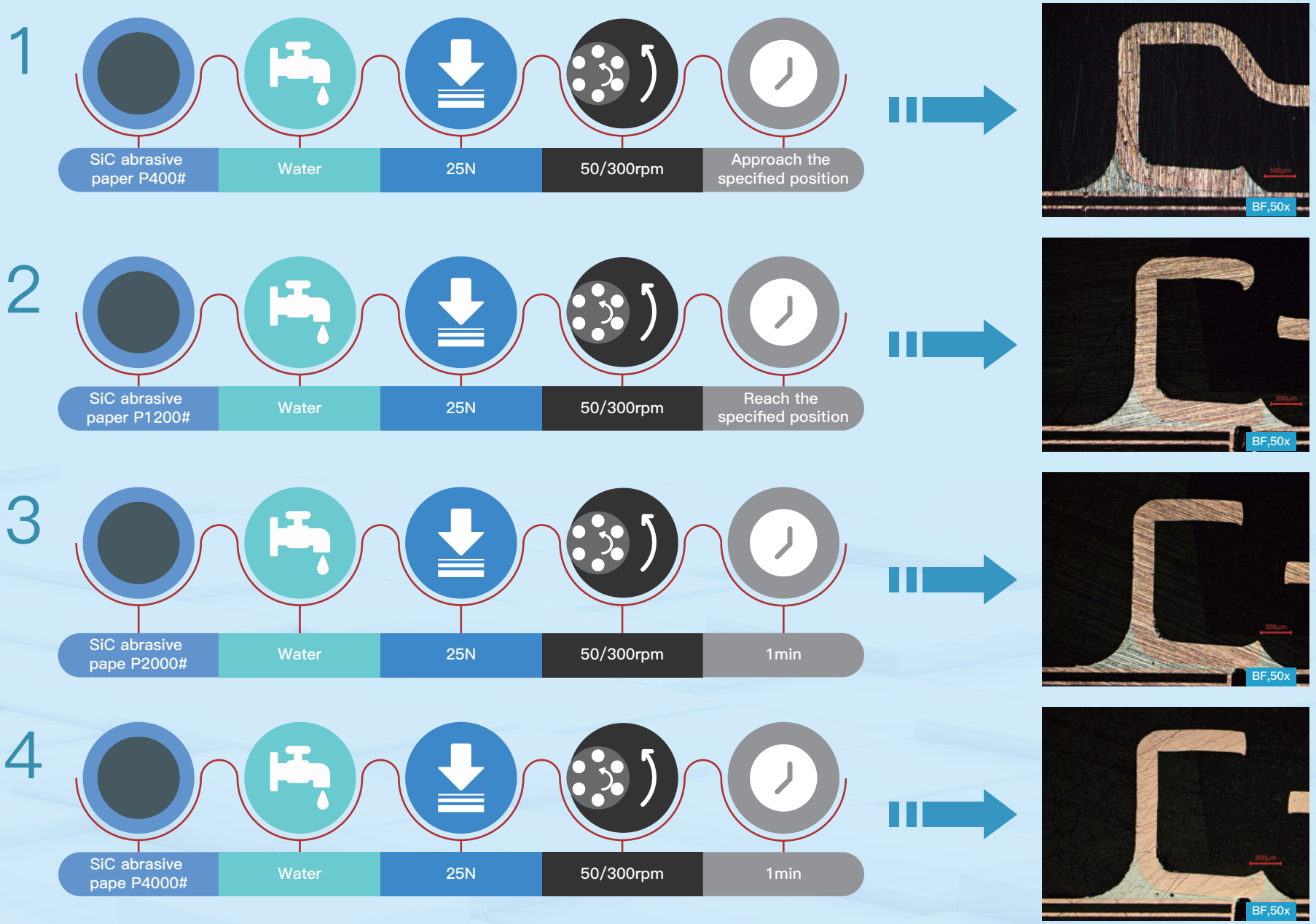
Equipment	ThetaVAC–2 Vacuum Cold Mounting Machine	
Injection Pressure (kPa)	–70	
Cycle Pressure (kPa)	–70	
Vacuum Hold Time per Cycle (s)	60	
Number of vacuum cycles	3	
Cold Mounting Resin	TJ 2226 Epoxy Resin	A: Order No: 02.04.773
		B: Order No: 02.04.774
Mixing Ratio	A: B=4.5:1	
Time	4–6h	

Basic Preparation Guide

- **Cutting**
  1.For PCB samples, select a DP electroplated diamond cutting wheel. The specific wheel specification should be selected according to the Trojan Cutting Guide.
  2.Select non–pulse mode for cutting. The recommended maximum cutting speed is ⩽ 0.25 mm/s.
- **Mounting**
  Mount the specimen using vacuum impregnation in combination with a high edge–retention cold mounting resin.
- **Grinding**
  1.Method 1:Grind with abrasive papers starting from P400 to approach the edge of the target area, use P1200 to grind to the target position, and perform fine grinding with P2000 and P4000.
  2.Method 2:Grind with metallographic grinding papers starting from P400 until reaching the edge of the target area.
  3.Continue fine grinding using a POS disc in combination with 9μm PD–WT polycrystalline diamond suspension, grinding to the target position.
  4.After each grinding step, thoroughly clean the specimen, specimen holder, and hands.
- **Polishing**
  1.Before starting polishing, the polishing cloth, specimen holder, and hands must be thoroughly cleaned. This cleaning procedure shall be repeated after each subsequent polishing step.
  2.Polishing discs used with different abrasive particle sizes must not be mixed.
  3.After polishing, rinse the specimen with alcohol and dry the surface using a blower to remove residual water stains.
  4.After each polishing step, examine the specimen under a metallurgical microscope to verify that the scratch size corresponds to the polishing particle size and that the scratches are randomly oriented.
  5.After use, polishing cloths should be thoroughly cleaned with running water and a soft brush, drained, and stored properly.
  6.Polishing cloths used for PCB samples shall be dedicated exclusively to PCB polishing and must not be used for polishing specimens of other materials.

Preparation Procedure 1

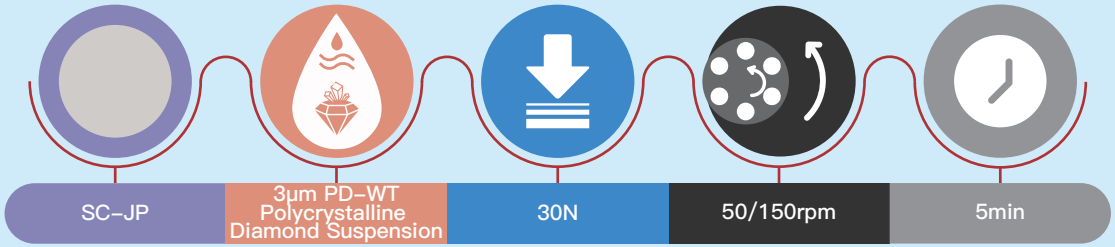
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Preparation Procedure 1

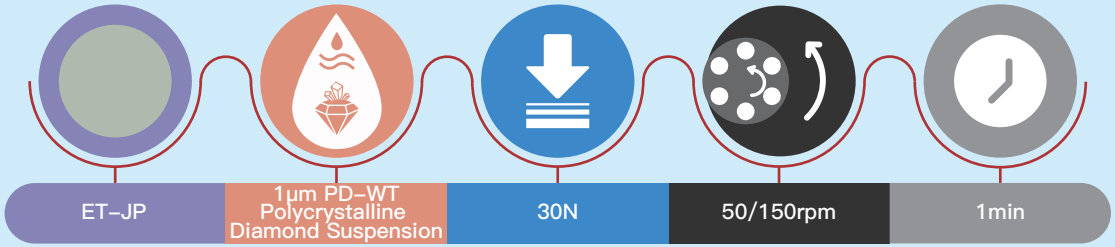
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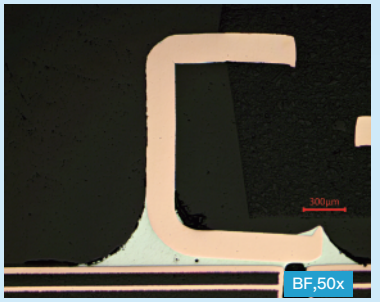
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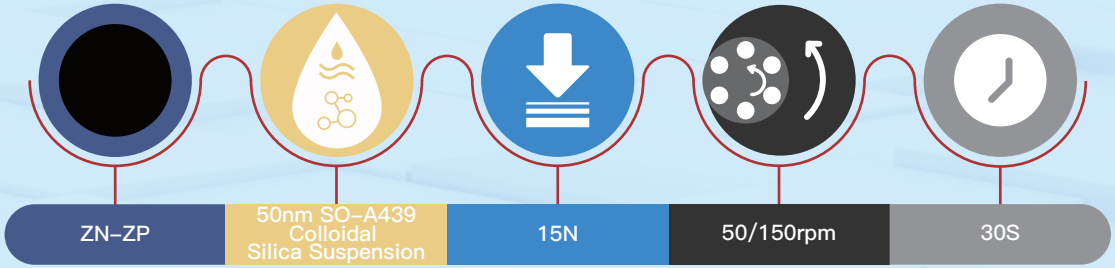


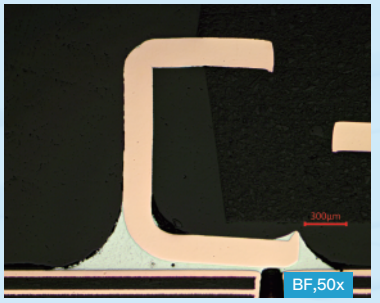
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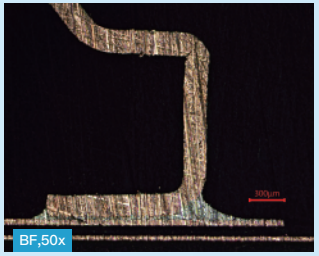
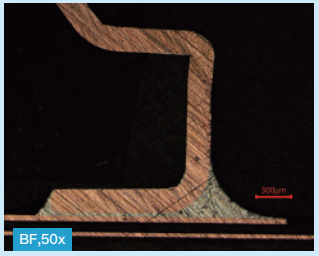
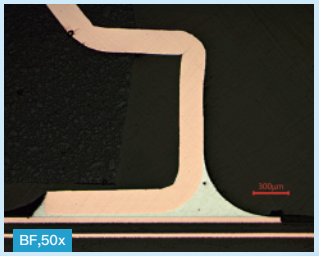
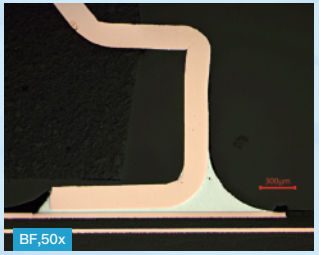
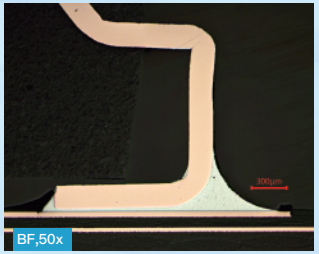
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Preparation Procedure 2

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1	SiC abrasive paper P400#	Water	25N	50/300rpm	Approach the specified position	 BF,50x
2	POS disc	9μm PD-WT Polycrystalline Diamond Suspension	25N	50/150rpm	Reach the specified position	 BF,50x
3	SC-JP	3μm PD-WT Polycrystalline Diamond Suspension	30N	50/150rpm	5min	 BF,50x
4	ET-JP	1μm PD-WT Polycrystalline Diamond Suspension	30N	50/150rpm	1min	 BF,50x
5	ZN-ZP	50nm A439 Colloidal Silica Suspension	15N	50/150rpm	30S	 BF,50x

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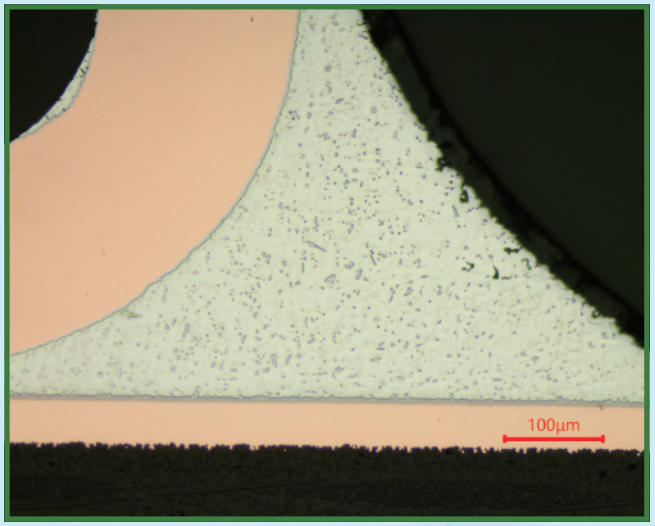
Printed Circuit Board– Image after Polishing with ZN–ZP Polishing Cloth

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Specimen after ZN—ZP Polishing–50X



Specimen after ZN—ZP Polishing–200X



Specimen after ZN—ZP Polishing–500X

