Silicon Carbide Wafer

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Discover the Truth of Material

Purpose:

Observe the cross-sectional microstructure of silicon carbide (SiC) wafers. Compared to first-generation silicon-based semiconductors, SiC exhibits superior electrical properties such as high voltage resistance, high temperature resistance, wide bandgap, and high thermal conductivity, making it a core material for third-generation semiconductors. It is widely used in new energy vehicle power devices, photovoltaics, and rail transportation. However, the high hardness and brittleness of SiC pose challenges in metallographic sample preparation. Samples undergo cold mounting (TJ2226 cold-curing resin), grinding/polishing (Alpha610), and a 5-step grinding/polishing process.

Recommended Equipment and Consumables (select grinding/polishing consumables based on sample conditions):



TJ 2226 Epoxy Resin

Cold Mounting

Equipment	/	
Cold mounting resin	TJ 2226 Epoxy Resin	A: Order No: 02.04.777
		B: Order No: 02.04.778
Mixing Ratio	A: B=4.5:1	
Curing Time	4-6h	

Recommended parameters for different specimen size				
Sample size/ diameter (mm)	25	30	40	50
Individual force loading mode, individual sample pressure force (N)	-5	0	+(5~10)	+(5~10)

*Standard pressure: ϕ30mm (adjust according to sample size).

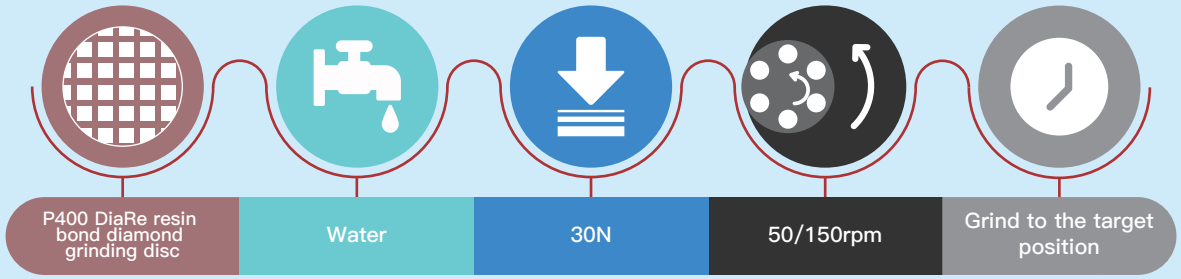
Basic Guide

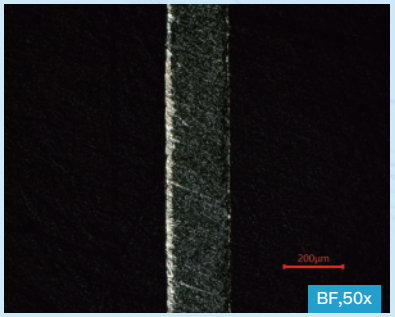
- **Mounting** Use high-edge-retention cold-curing resin (e.g., TJ2226).
- **Grinding**
  1.Begin grinding with a P400 DiaRe resin-bonded diamond grinding disc until the target observation area is reached.
  2.Continue grinding with a POS disc + 9 μm diamond polishing suspension.
  3.Clean the sample, sample holder, and hands after each grinding step.
- **Polishing**
  1.Clean the polishing cloth, sample holder, and hands before polishing. Repeat cleaning after each step.
  2.Do not mix polishing disks with different abrasive particle sizes.
  3.Rinse the sample surface with alcohol and dry with a blower to remove water residue.
  4.After each polishing step, inspect under a metallographic microscope to ensure scratch size matches the abrasive grit and direction is random.
  5.Clean polishing cloths with running water and a soft brush after use, then air-dry.
  6.Dedicate polishing cloths used for SiC wafers exclusively to such samples.

Preparation Procedure——Silicon Carbide Wafer

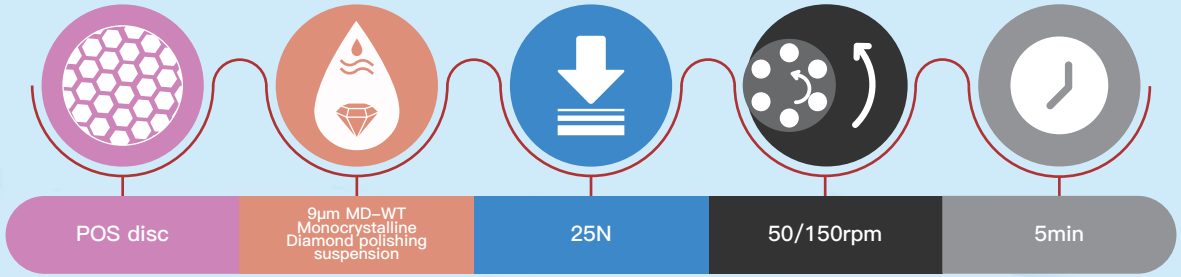
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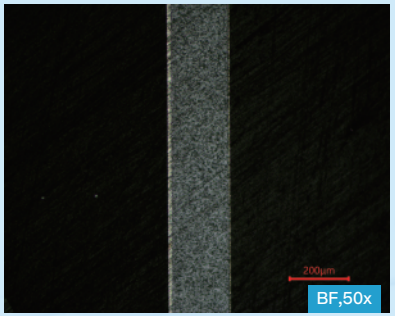
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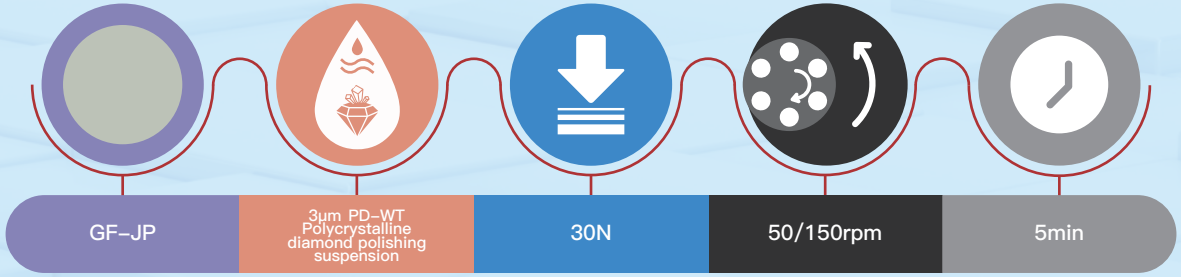


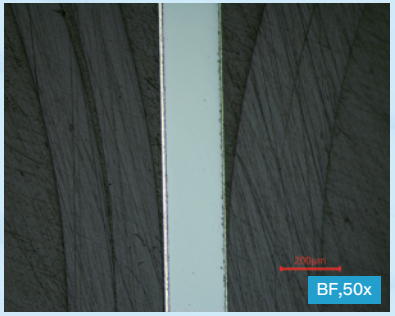
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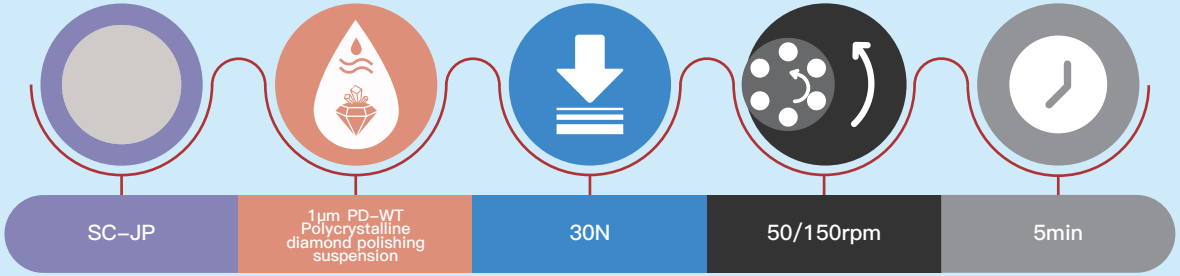


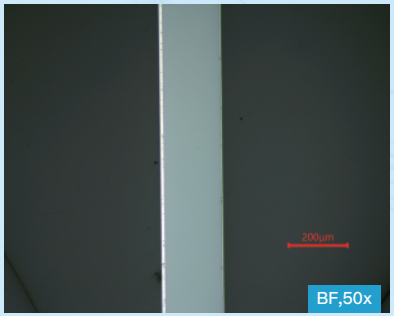


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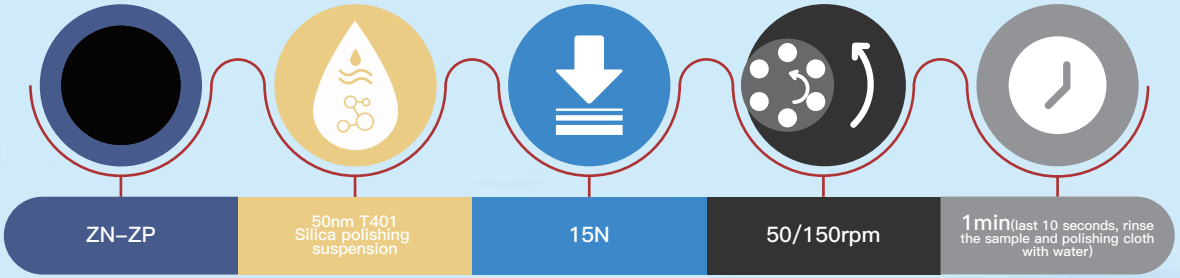
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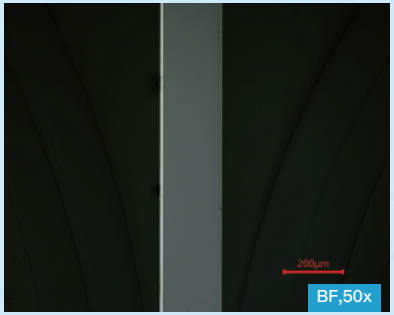
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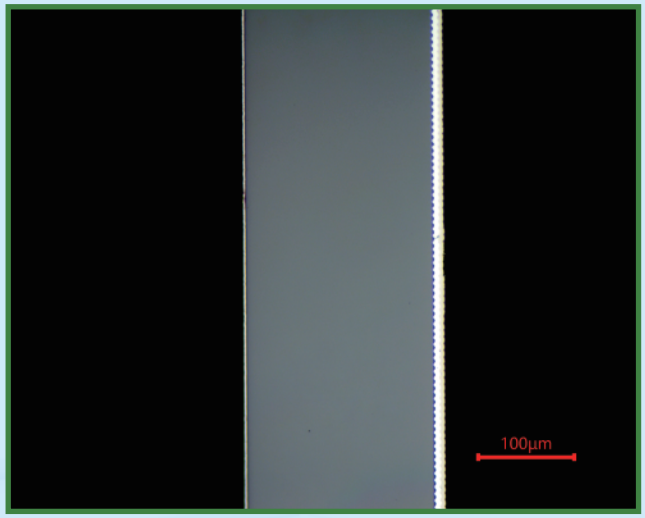




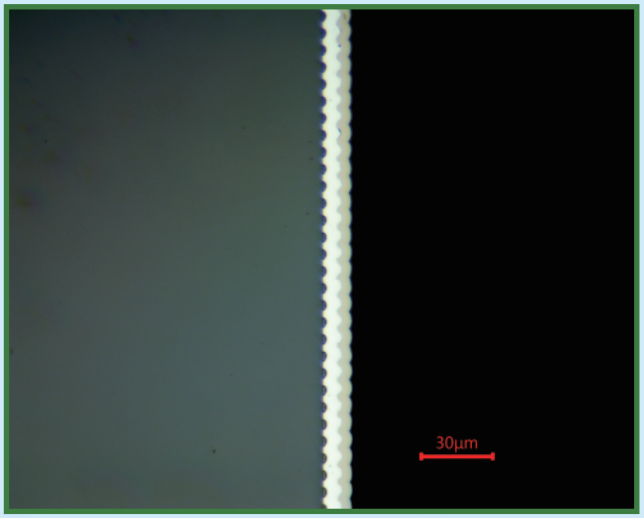
Silicon Carbide Wafer-Micrograph after ZN-ZP polishing

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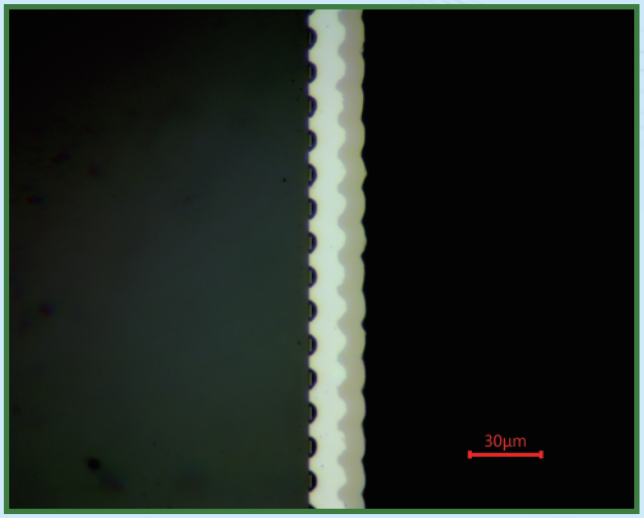
Micrograph after ZN–ZP polishing (200X magnification)



Micrograph after ZN–ZP polishing (500X magnification)



Micrograph after ZN–ZP polishing (1000X magnification)



- Clear sample structure with a clean, scratch–free surface.