Pure Tin

TROJAN
Discover the Truth of Material

Purpose:

Observe the microstructure of pure tin. Tin exhibits excellent ductility, low melting point, softness, and corrosion resistance. Tin and its alloys are widely used in bearing manufacturing, aerospace, electronics, and other fields. Pure tin samples undergo cutting (TableCUT–200), mounting (TJ2228 cold–curing resin), grinding/polishing (Alpha–610), and final vibratory polishing (VP430 vibratory polisher). The sample surface is then examined under a microscope. The microstructure is observed under polarized light mode.

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

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).



TableCUT–200 manual/automated precision cutting machine

Cutting

Equipment	TableCUT–200 manual/automated precision cutting machine	
Cutting disc	S20 Silicon Carbide Cutting wheel	Order No: 01.02.422
Cutting coolant	TJ 1410 Metallographic Cutting coolant	Order No: 01.07.857
Fixture	Horizontal push fixture	
Cutting method	Horizontal cutting (Y–axis)	
Cutting parameters	Feed rate	0.2mm/s
	Cutting mode	pulse mode
	Cutting disc rotation speed	2200rpm

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TJ 2228 Epoxy Slow-Cure Resin

Cold Mounting

Equipment	/	
Cold Mounting Resin	TJ 2228 Epoxy Slow-Cure Resin	A: Order No: 02.04.871
		B: Order No: 02.04.872
Mixing Ratio	A: B=2:1	
Curing Time	8-12h	

Basic Guide

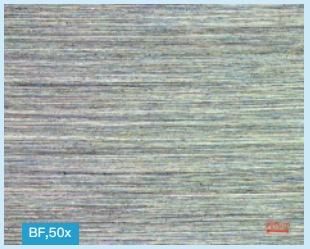
- **Cutting** Pure tin is soft. Use an S20 silicon carbide abrasive cutting wheel. Refer to the Trojan Cutting Guide for specific model selection.
- **Mounting** To observe internal structures, use low-reaction-temperature cold-curing resin (tin and its alloys are temperature-sensitive).
- **Grinding**
  1.Start with finer grits (P800 sandpaper) and progress to P2500. Apply wax to the sandpaper to prevent embedded abrasive particles.
  2.Clean the sample, sample holder, and hands after each grinding step.
- **Polishing**
  1.Before polishing, clean the polishing cloth, sample holder, and hands. Repeat cleaning after each polishing step.
  2.Do not mix polishing suspensions with different abrasive particles.
  3.Rinse the sample surface with alcohol and dry with a blower to remove water residue and prevent oxidation.
  4.After each polishing step, inspect under a metallographic microscope to ensure that the scratch size matches the abrasive grit and direction is random.
  5.If surface blurring occurs after ET white synthetic velvet cloth for polishing, the sample and working disc can be repeatedly polished in the same direction for 3-5 minutes.
  6.Clean the polishing cloth with running water and a soft brush after use, then air-dry.

Preparation Procedure——Pure Tin

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1

*P800、P1200、P2500	Water	20N	50/150rpm	Until plane



*Apply wax to sandpaper to prevent particle embedding.

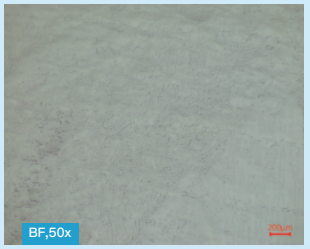
2

ET–JP	0.05μm AO–W Alumina polishing suspension	25N	50/150rpm	3min



3

ZN–ZP	50nm A439 Silica polishing suspension	15N	50/150rpm	2min



4

*ET–JP	50nm T401 Silica polishing suspension	Individual loading sample holder	30min



*The final polishing step uses the VP430 vibratory polisher.

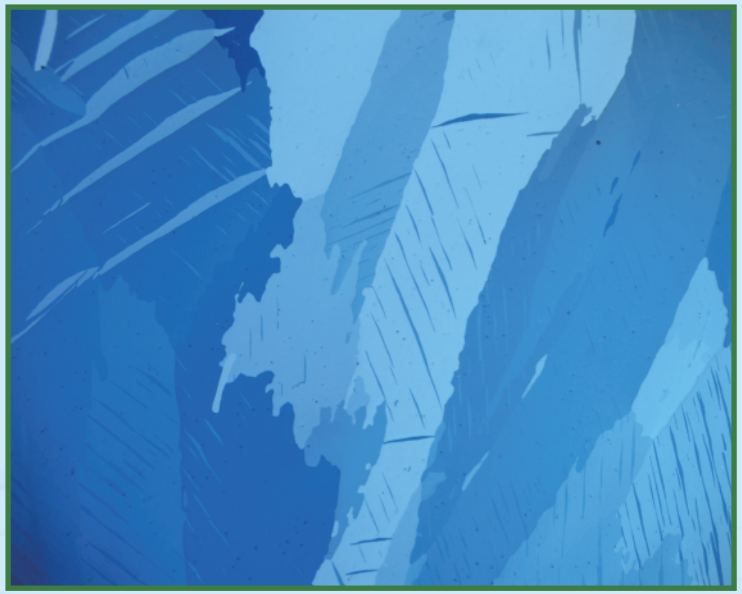
Use polarized light mode to observe tin grain structure.



Pure Tin-Polishing Defect Sample

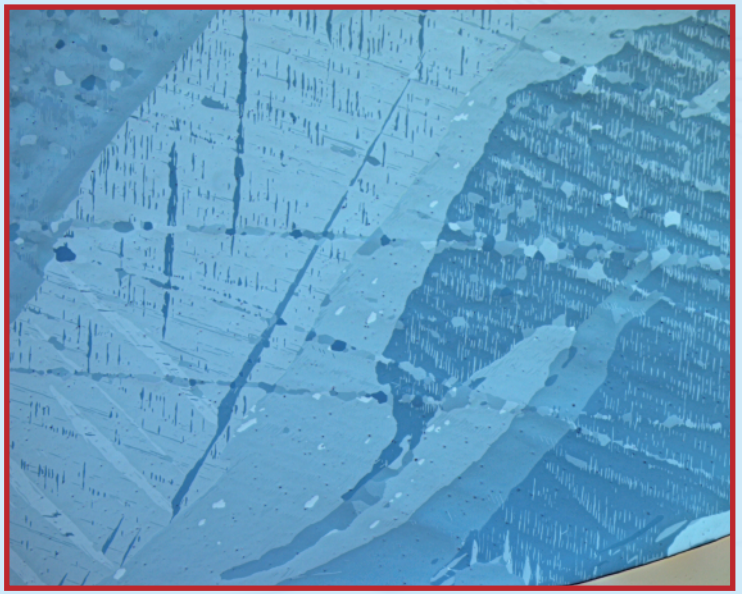
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Photos of qualified polished samples



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

Photos of unqualified polished samples



- Surface deformation layer not fully removed;
- Solution: Regrind with lighter pressure and extend rough polishing time.