

Wirebonder 7476E SOP



Location: B08

Standard Operation Procedure for the Irwin Lab Westbond Wirebonder **Model 7476E-79 (serial No. 21614)**

Super Users (SU):

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Users:

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Step 1 - Setup and Power On

- Always wear clean gloves!
- Check area around manipulator. This area should always remain clear. Never leave tools, pens, parts, etc.
- Turn on air flow to tool. Check that this is > 40 psi
- Flip on general power lever.
- Flip on microscope LED lights

Step 2 - Setting the work height

- Your piece should be polished clean ready for bonding. For example, you need to "polish" all copper pads right before bonding using erasers followed by IPA Q-tip wipe.
- Your piece to be bonded should be properly mounted on its own stage (see tutorial). Place this stage on the work platform. Keep it away from the wedge. The platform should already be at its lowest height.
- With your piece away, gently place your right hand on the manipulator and slowly lower to its limit. Make sure the wedge is clear of all obstructions. From this point on, do not remove your hand from the manipulator.
- Viewing through eyepiece, focus at the protruding wire from the tip of the wedge.
- Now look directly at your piece (not through eyepiece). With your right hand holding down the manipulator, very slowly slide your piece under the wedge, carefully watching the clearance. You may need to gently raise the manipulator to go over some obstacle. Be very attentive of this! Ideally, with the platform at the lowest height, you should have at least an inch clearance between your piece and the wedge.
- Look back through the eyepiece at the wire and wedge tip directly over your piece.
- While still holding down the manipulator, start raising the platform by turning the height knob. Keep raising it until the very tip of the wire just barely touches the lowest bonding surface on your piece.
- Very gently raise the manipulator to the balanced central position. Keep your hand on it.
- Raise the platform with a one half turn. This sets the work height.

Step 3 - Setting the bond parameters

- Change the program numbers for Power, Time and Force to recall your saved settings (Program 1 is practice/default).
- Step through and review the settings. **DO NOT change settings under "Machine setting"!**
- Make a couple test bonds.
- Estimate the bond width to wire width ratio. (1.2 - 1.3 for optimal bond).
- Do a pull test. Wire should break in the middle.

Step 4 - Bonding

- Continue bonding your piece. Make changes to the settings as needed.
- If you have to leave temporarily in the middle of bonding: Remove your piece from under the wedge. You can leave it on the platform. Leave a note.
- Never touch the wedge (even with gloves).
- Never touch the wire.

Step 5 - Threading

- Only manipulate the wire with tweezers. Never touch it!
- Slide your piece out from under the wedge. Raise manipulator if needed.
- Flip switch to unclamp. Use a small tool to open the clamp wider if needed.

- Pull out one inch of wire.
- Cut tip with shears.
- Use ultrasonic pulse to shake loose any wire fragments.
- In a gentle and controlled curved motion, bring wire into wedge at a 45 degree angle right at the bottom of the clamp. Try not to crimp the wire anywhere.
- Feed in a few millimeters through the wedge.
- With tweezers pull tip of wire through wedge.
- Close clamp while gently pulling wire.
- Bond off excess.
- Put magnetic mirror on platform and adjust the angle roughly. Gently rotate the mirror on the magnet to slide under the wedge. Be very careful not to bump into anything!
- Focus on the clamp and the back zig zag. Inspect the wire position within the clamp. Inspect the wire position leaving the clamp. Inspect the bottom of the wedge for debris.

Step 6 - If you have a problem

- Bonds won't stick: Was your surface properly cleaned and prepared? Check program settings. See SU for wedge cleaning. Drink less coffee.
- Unable to thread the wedge: Inspect with mirror. See SU for wedge cleaning.
- Forever bond (won't break at second bond): Inspect wire position in clamp with mirror.
- Short bonds have no arch: Practice bond motion. Adjust drop before clamp.

Step 7 - Shutdown

- Gently raise the manipulator and carefully slide out your piece from under the wedge.
- Lower the platform to the minimum height position.
- Set the program to 1.
- Flip off the LED microscope light.
- Flip off the main Power lever.
- Shut off the air flow.
- Sign out in the log book.
- Clear any remaining parts or debris from area.