

University of Minnesota, MN Nano Center

Standard Operating Procedure

Equipment Name: West Bond Wire Bonder

Revision Number: 1

Badger Name: West Bond Wire Bonder

Revisionist: M Fisher

Model: 7476D-79 **Date:** 4/24/2019

Location: PAN Bay 2

1 Description

Ultrasonic 1 mil (25um diameter) gold wire bonder for interconnect device or die to package.

2 Safety

- a. Be careful stage could be HOT!!!!!!!!!!!!!!
- b.

3 Required Facilities

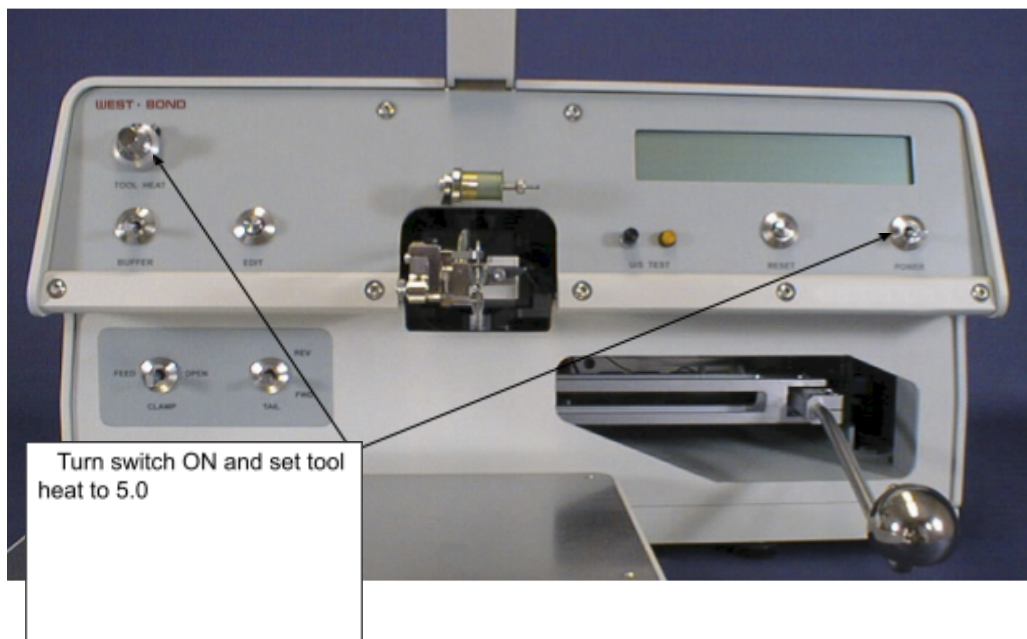
- a. Electrical: 120 VAC
- b. Process Gas (House): N₂

4 Definitions

- a. Forward bond- Bonding from the die (device) to package.
- b. Reverse bond- bond from the package to the die.
- c. Tool or wedge- the small part that is attached to the transducer by a set screw.
- d. Wire bond pads size 100umx100um minimum.
- e. Wire bond pad metal thickness 150nm or greater.
- f. Wire bond pad metals Al, Au, Ag, Pt, and Cu

5 Operating Instructions

- a. Enable the West Bond Wire Bonder in Badger.
- b. Turn on the Power switch on the machine and check to see that the tool heat is set to 5.0 (~105 C).



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- c. Turn on the temperature controller. Wait until the stage temperature controller reaches set point of 100 C, it will take ~5 minutes. If you would like to change the temperature press and hold the star button, then use the up/down arrows to increase or decrease the temperature.



Turn switch ON

- d. Turn LED light ON, the switch is located on the right side of the microscope. The scope switch has low and high settings, to the left is low setting and to right is high setting.



Switch on right side on light.

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- e. Adjusting microscope. Eye pieces can also be adjusted.



- f. Adjust work holder to fit your package and die.

Clamp
Clamp Open Close Button



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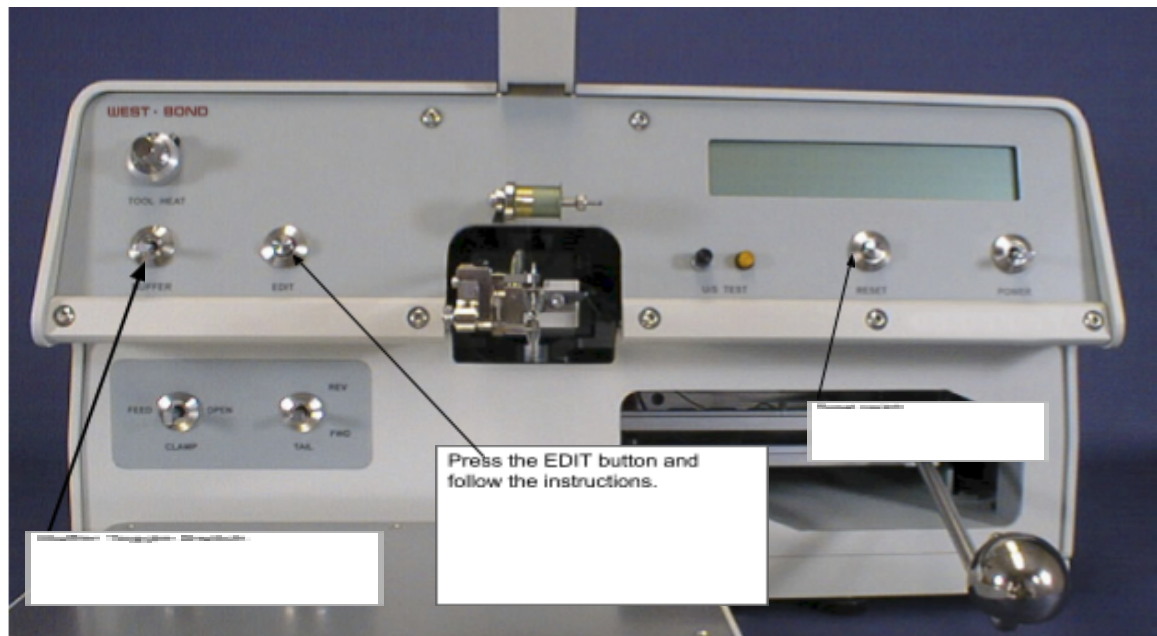
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g. Adjust stage height. Using the knurled knob at the front of the stage to set your stage height 10-20 mils (250um-500um) below your lowest bonding surface. The X-Y-Z manipulator must be in the back and down position before adjusting height of stage. **Careful not to run the wedge into to anything while adjusting height.**



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- h. Select Buffer 1, 2, or 3. To select buffer 1 put the toggle switch in the down position. To select buffer 2 put the toggle switch in the middle position. To select buffer 3 put the toggle switch in the up position.
- i. Only edit buffer 3. Buffer 1 and 2 will be fixed recipes. To edit buffer 3.
 - 1. Press the edit button.
 - 2. Edit the desired parameter by following the commands on the display.
 - 3. Press the reset button to return to bonding or press edit to page through the available menus and return to bonding menu.
 - 4.
- j. Disable the West bonder wire bonder in Badger.
- k.

6 Troubleshooting section

- a. No tail. Use the feed switch a couple of times to advance the wire. If this does not work, press the U/S Test momentarily a couple of times, this should help advance the wire. Do Not press and hold the U/S Test button, this could burn out the U/S.
- b. Wire not threaded or will not feed. Contact MNC staff.
- c. Wire will not stick to die. Increase bond power on first bond.
- d. Wire will not stick to Package. Increase bond power on second bond.
- e.

7 Parts and package section

- a. Package vendor-Chelsea Technology <http://chelseatech.com/>
- b. Package vendor-Addison Engineering, Inc.
<http://www.addisonengineering.com/ceramic-packages.html>
- c. Package vendor-NTK Technologies
<http://www.ntktech.com/products/semiconductor-components/>
- d. Tool vendor-KS Micro Swiss
- e. Tool vendor- Deweyl Tool Co., Inc. 800-821-8665

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- f. Wire vendor-Bonding Source 603-595-9600, www.bondingsource.com
- g. <https://www.youtube.com/watch?v=th1YxQHEpEU>
- h. <https://www.youtube.com/watch?v=DO104aoscxw>
- i. <https://www.youtube.com/watch?v=VwOEQodkBrY>

8 Pad Metal

- a. Thickness
- b. Type
- c.

9 Wedge Bonding

- a. Wedge <https://www.youtube.com/watch?v=mvZ1dJuvenw>

10 P

- a. P

11 P

- a. P

12

13