

# DISCO wafersaw Training

Tool Located in: Paul Allen Rm#159

Tape mounter



Tape Mounter Operation Guide

DISCO wafersaw



[This Document](#)

Test blades and blade change tools



Blade Change video



# DISCO wafersaw

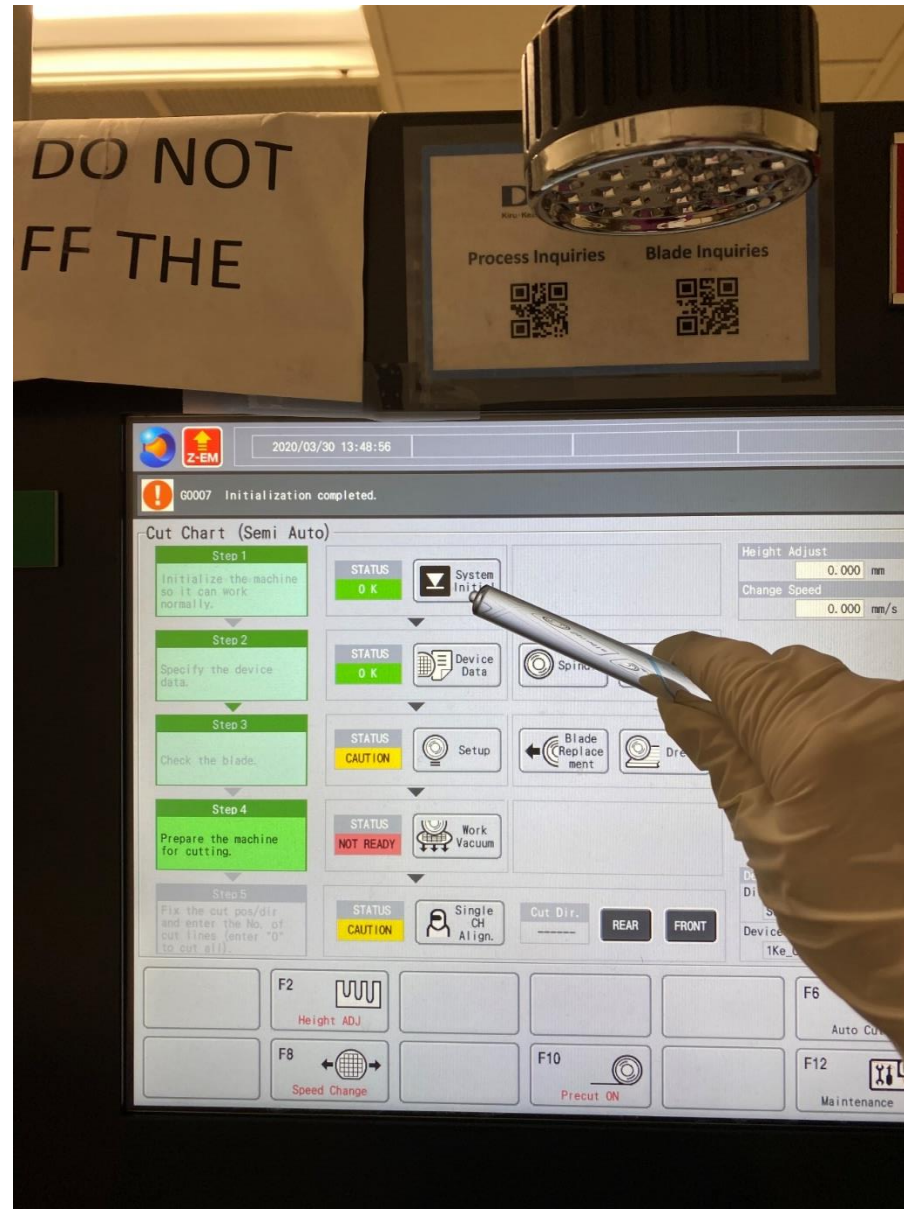


Front side



Back side

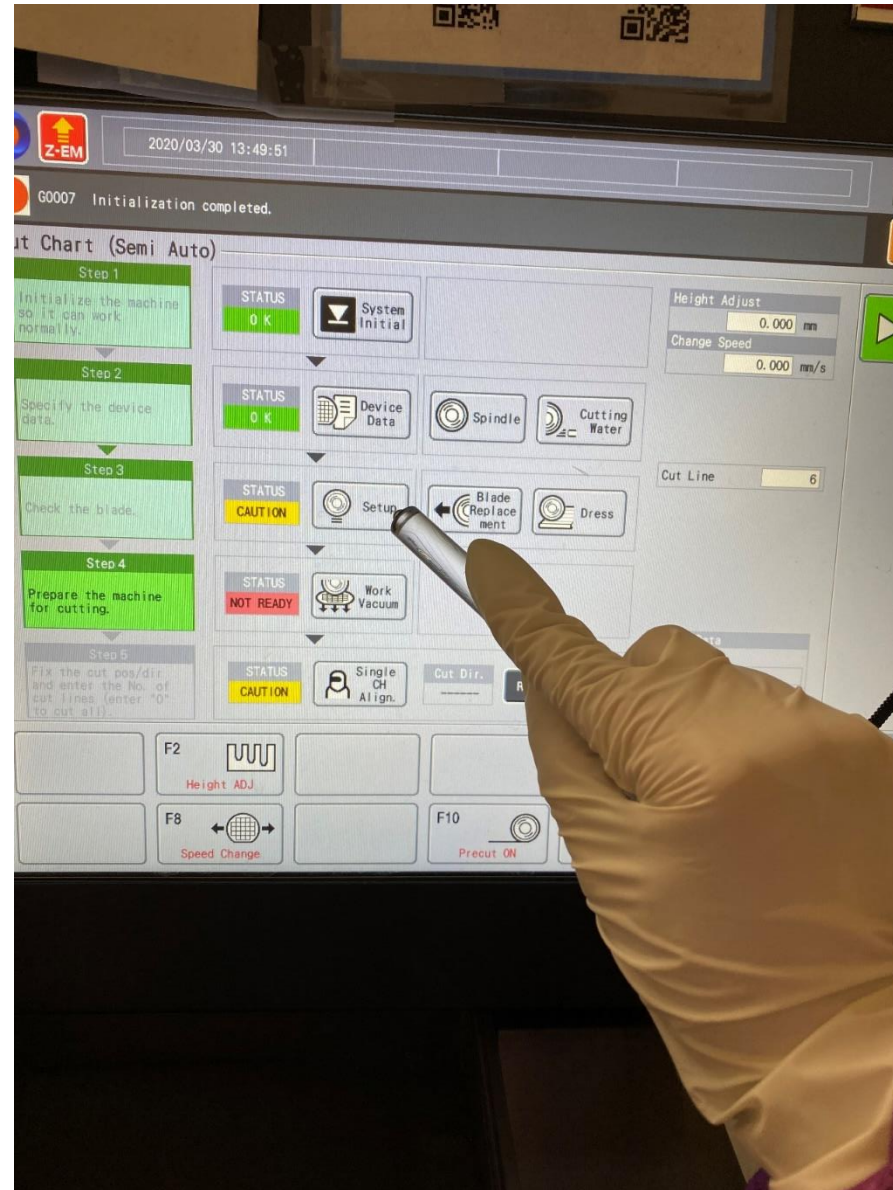
# 1. Initialization



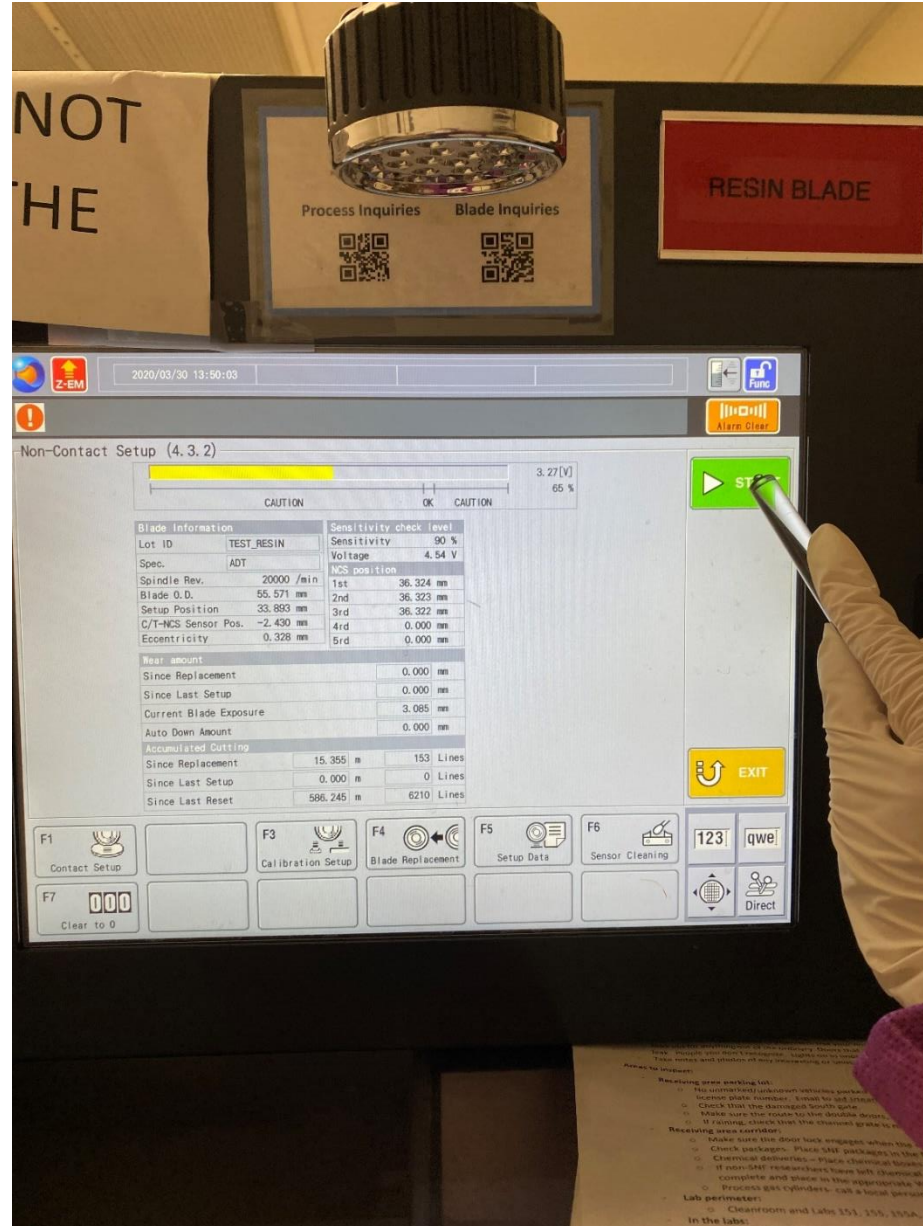
*Follow the pen step by step for the rest of the slides*



# 2. Blade setup

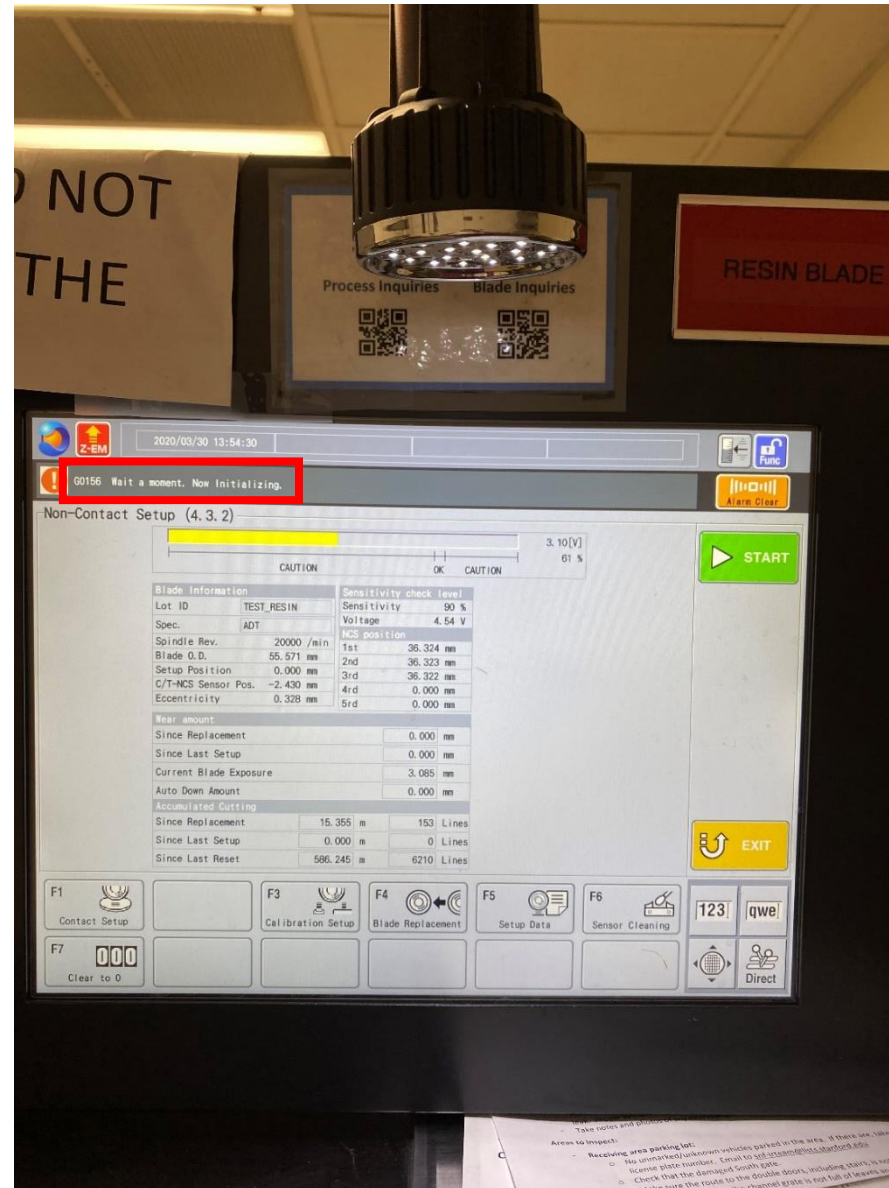


# 2. Blade setup

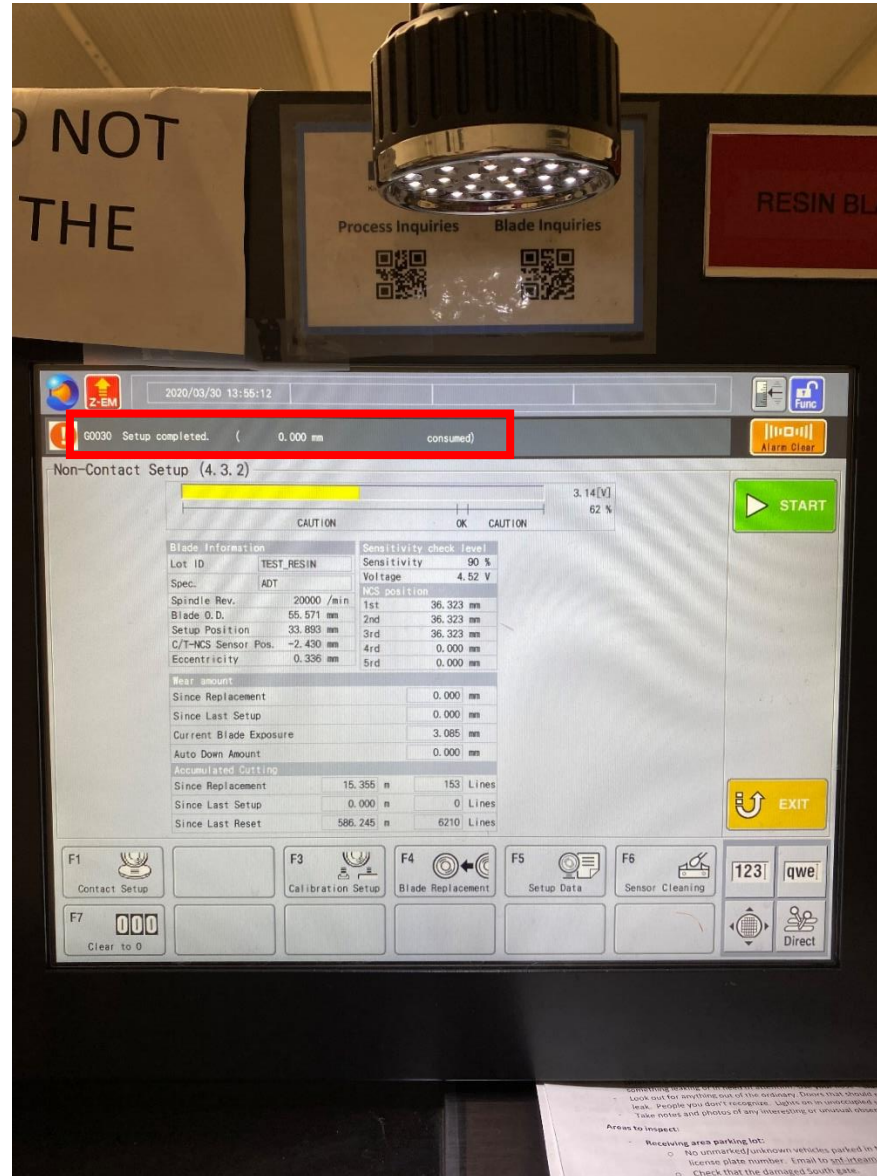




# 3. Check blade setup status

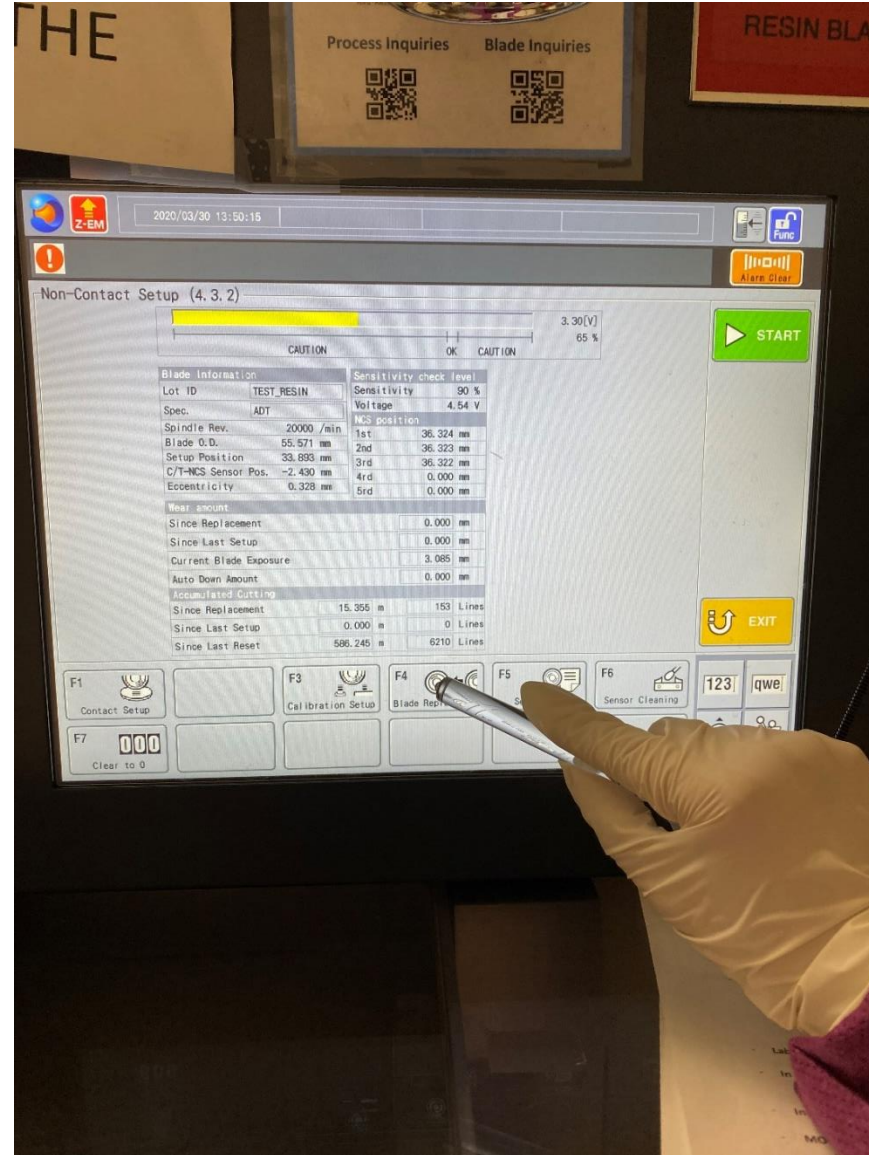


# 3. Check blade setup status

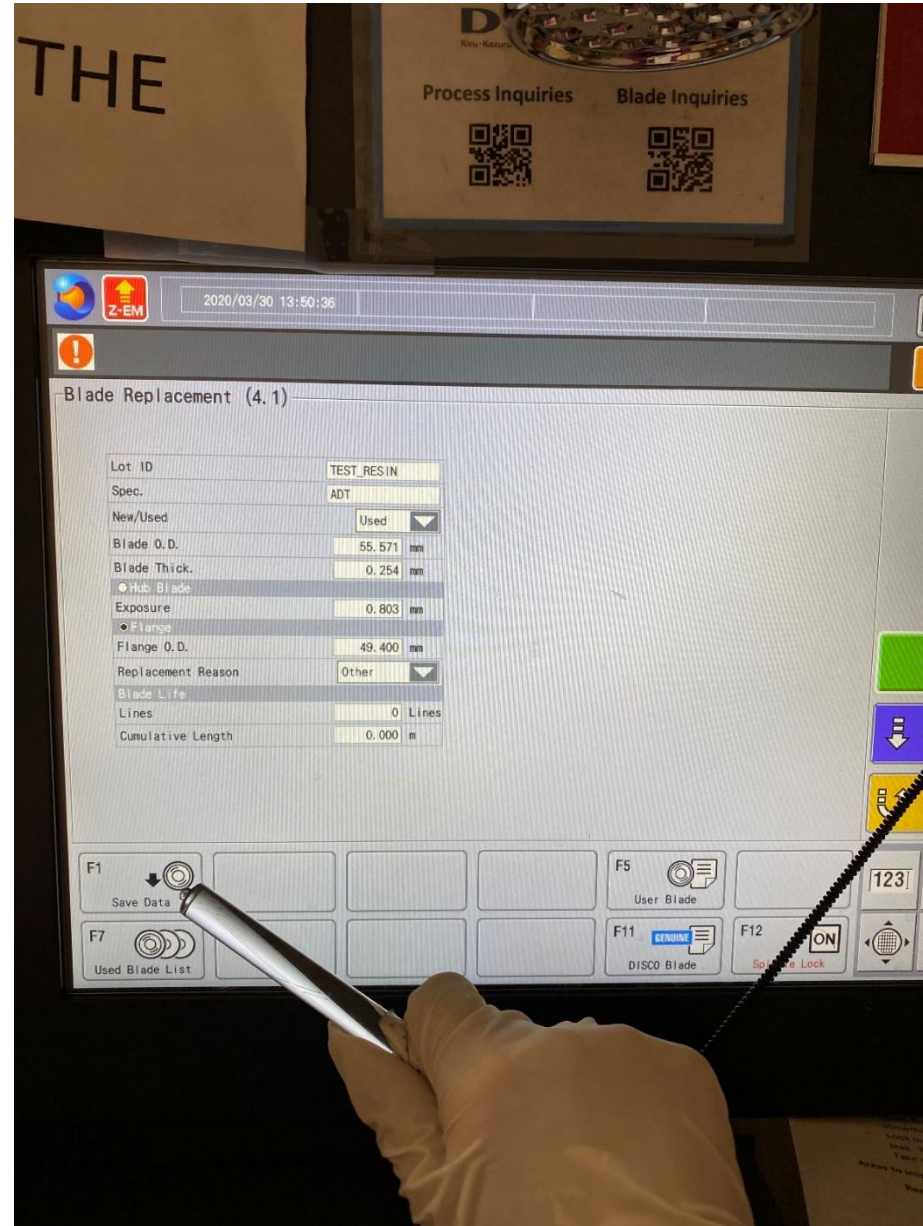




# 4. Blade replacement

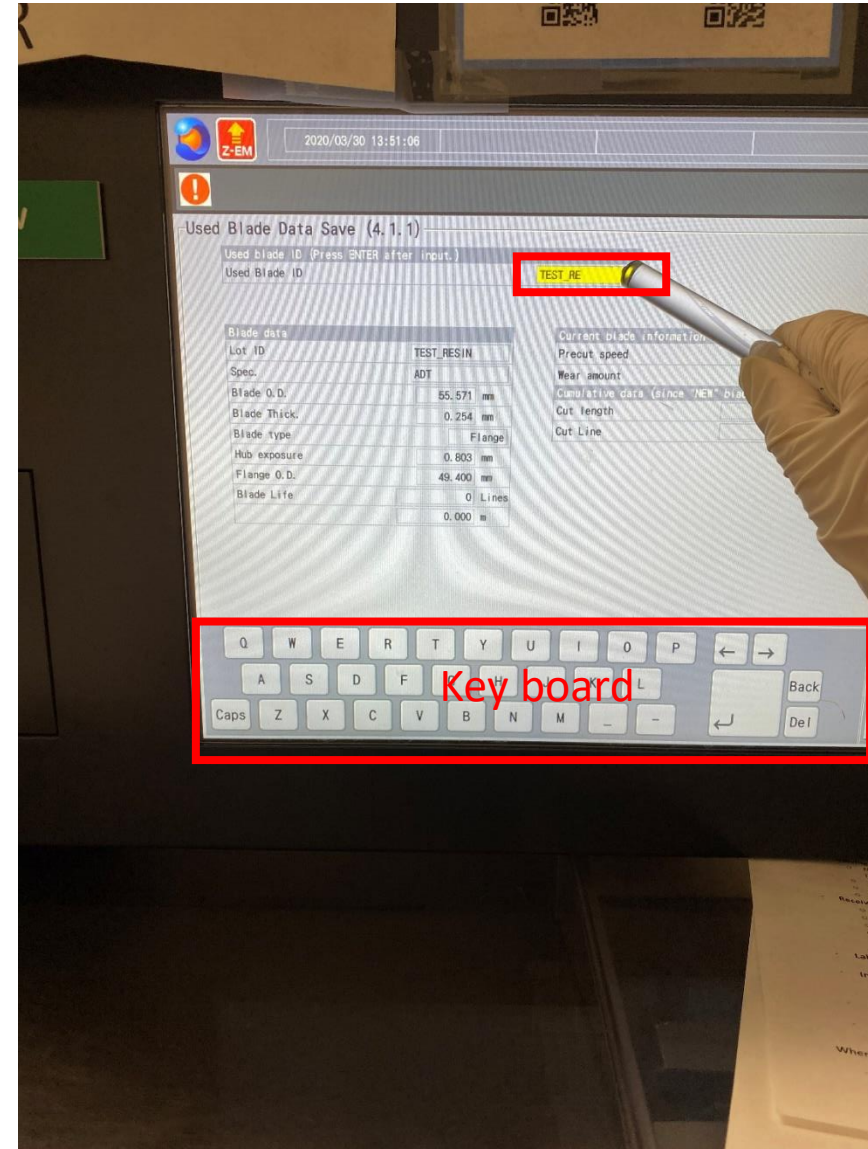


# 5. Save data for the blade installed

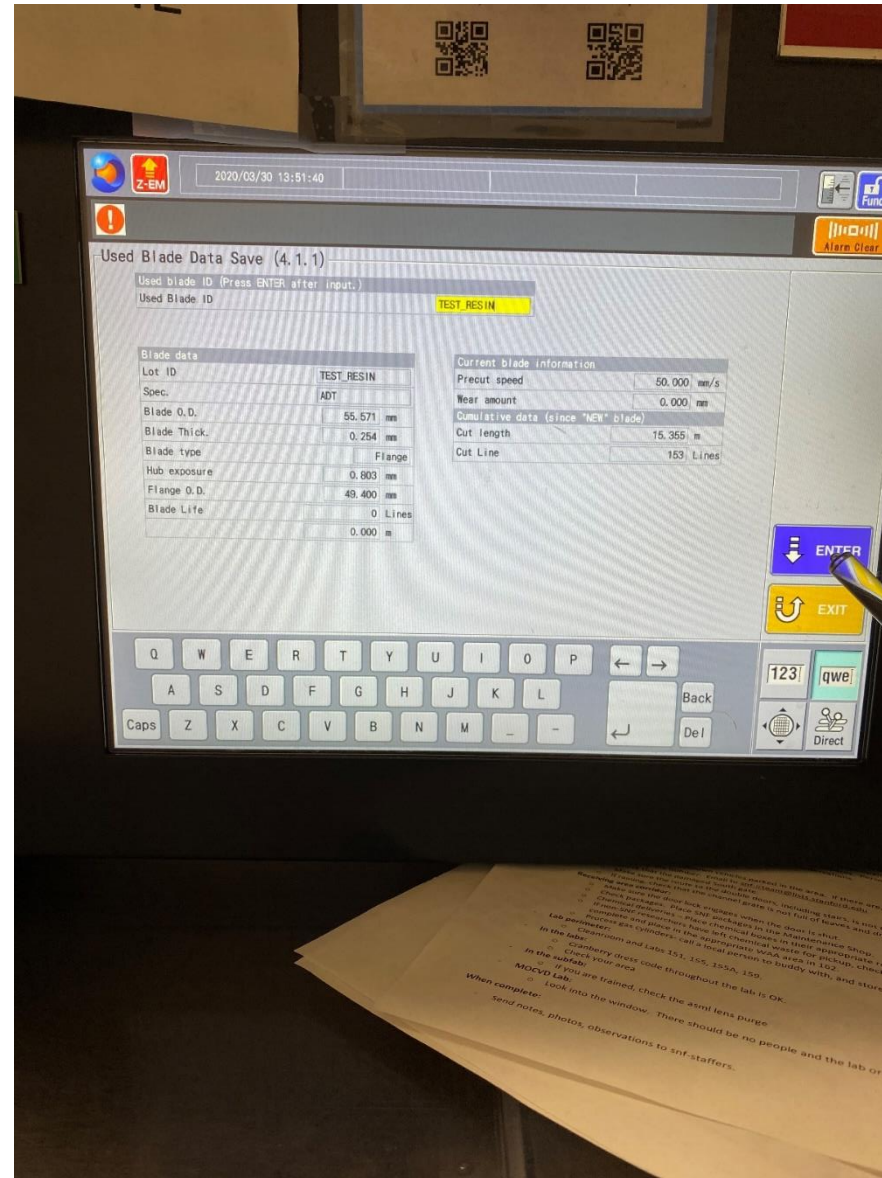




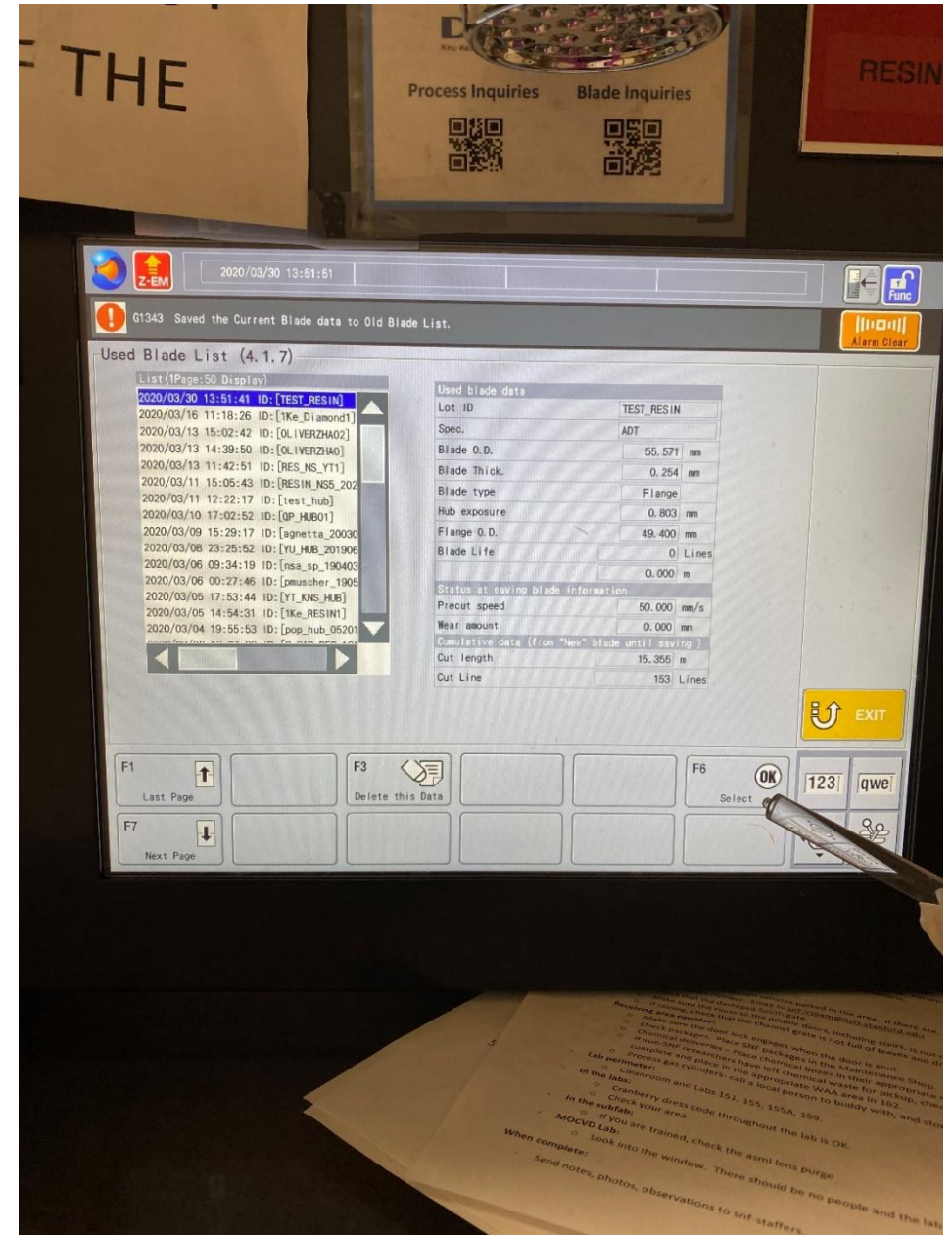
5. Save data for the blade installed: Type in blade ID using the key board



# 5. Save data for the blade installed: Click Enter

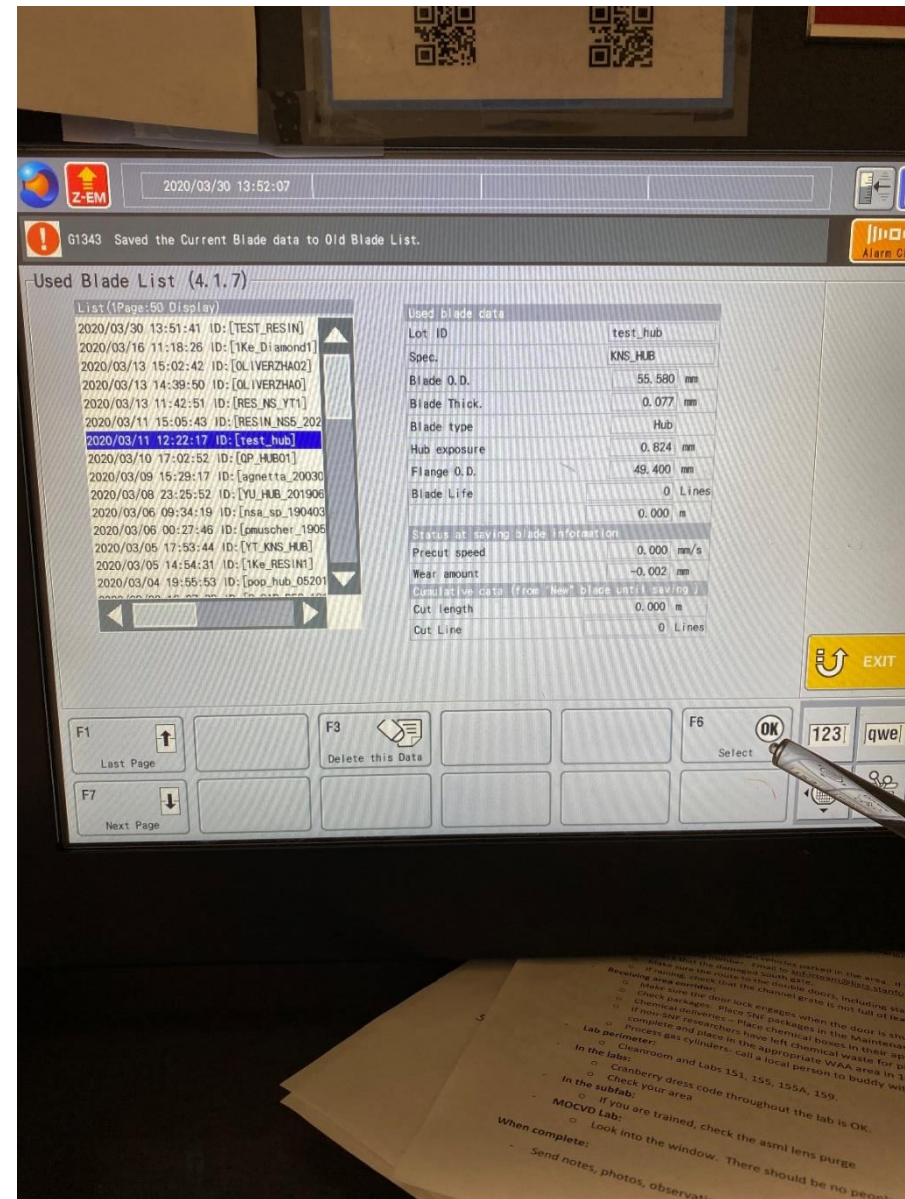


6. Choose the blade data for the blade to be installed (in case of used blade)

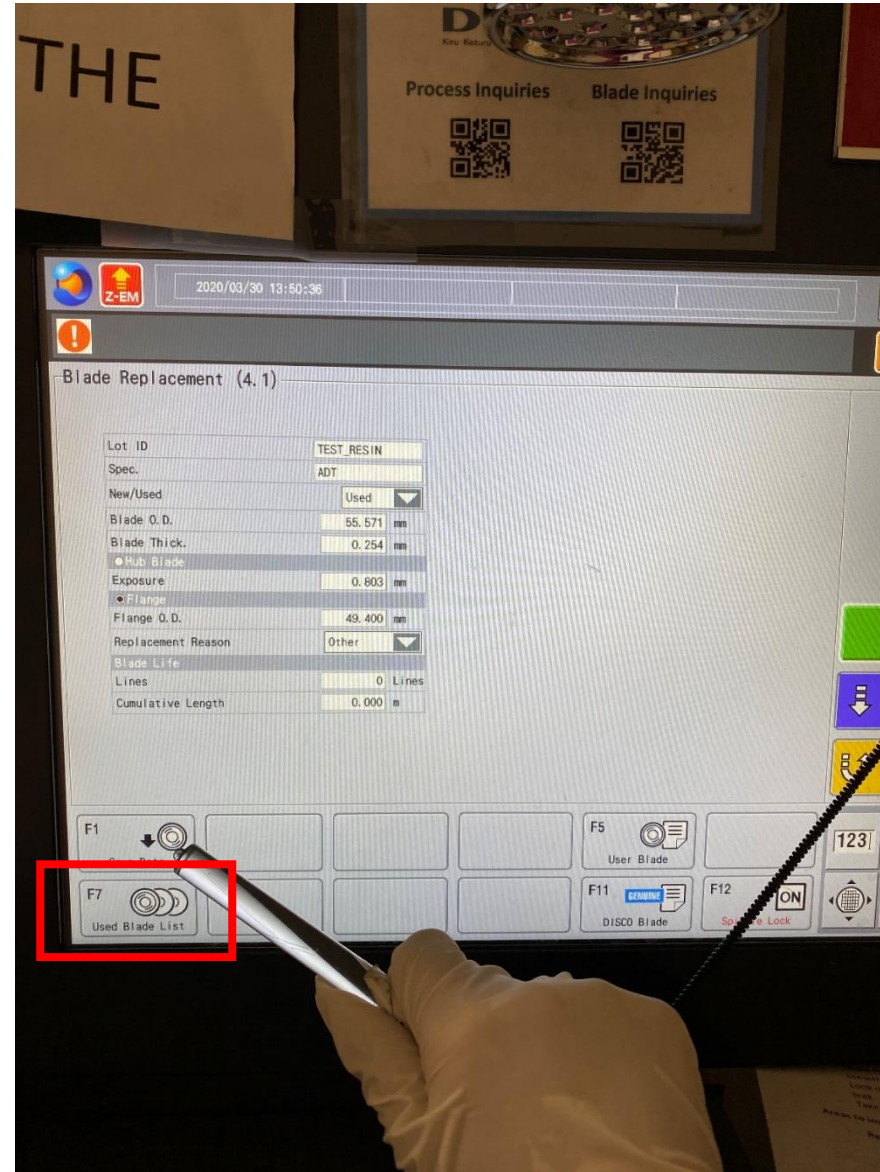




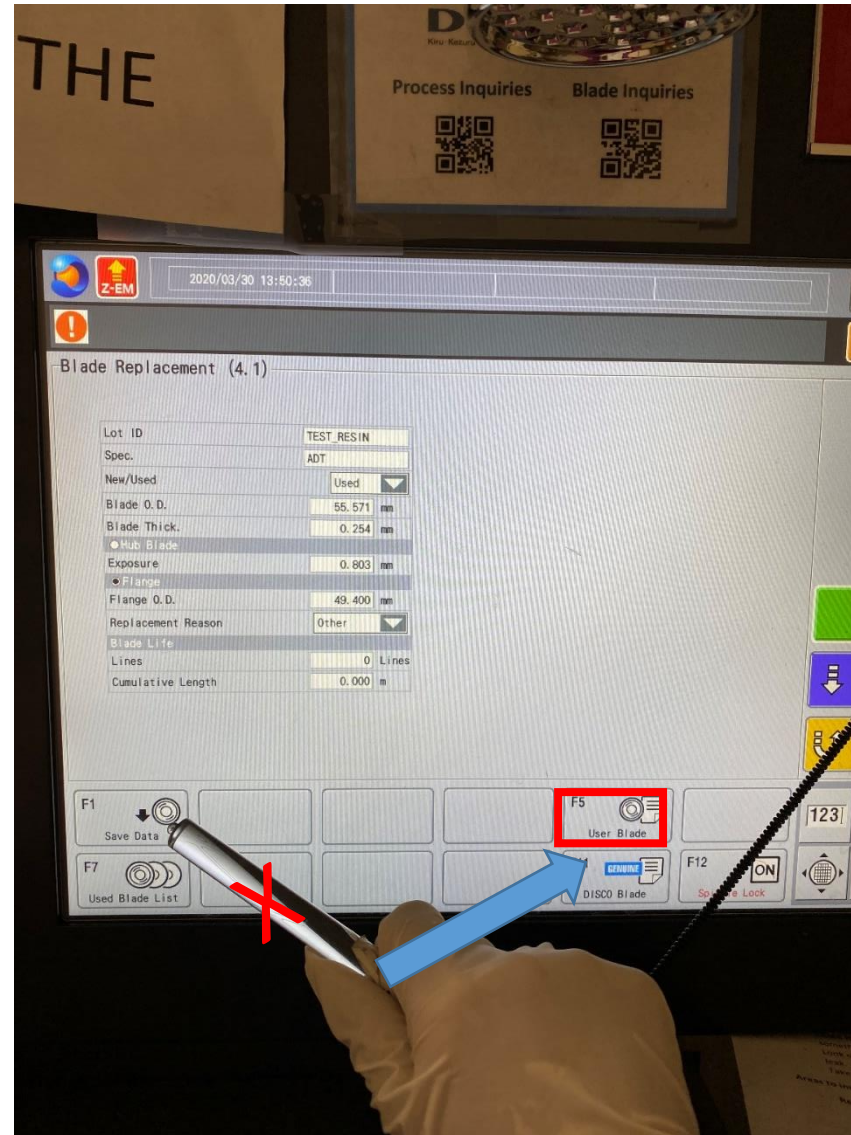
6. Choose the blade data for the blade to be installed (in case of used blade)



# 7. Used blade list

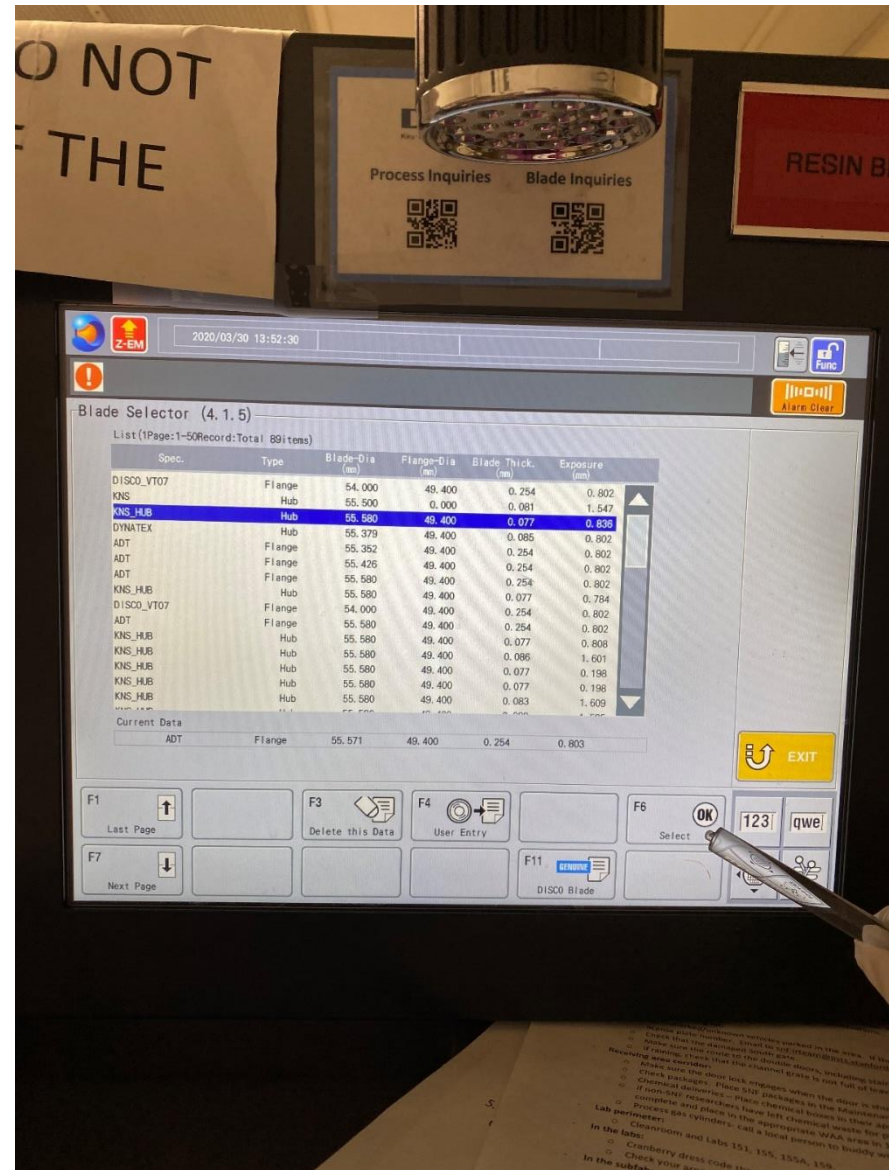


# 8. User blade list (new blade)

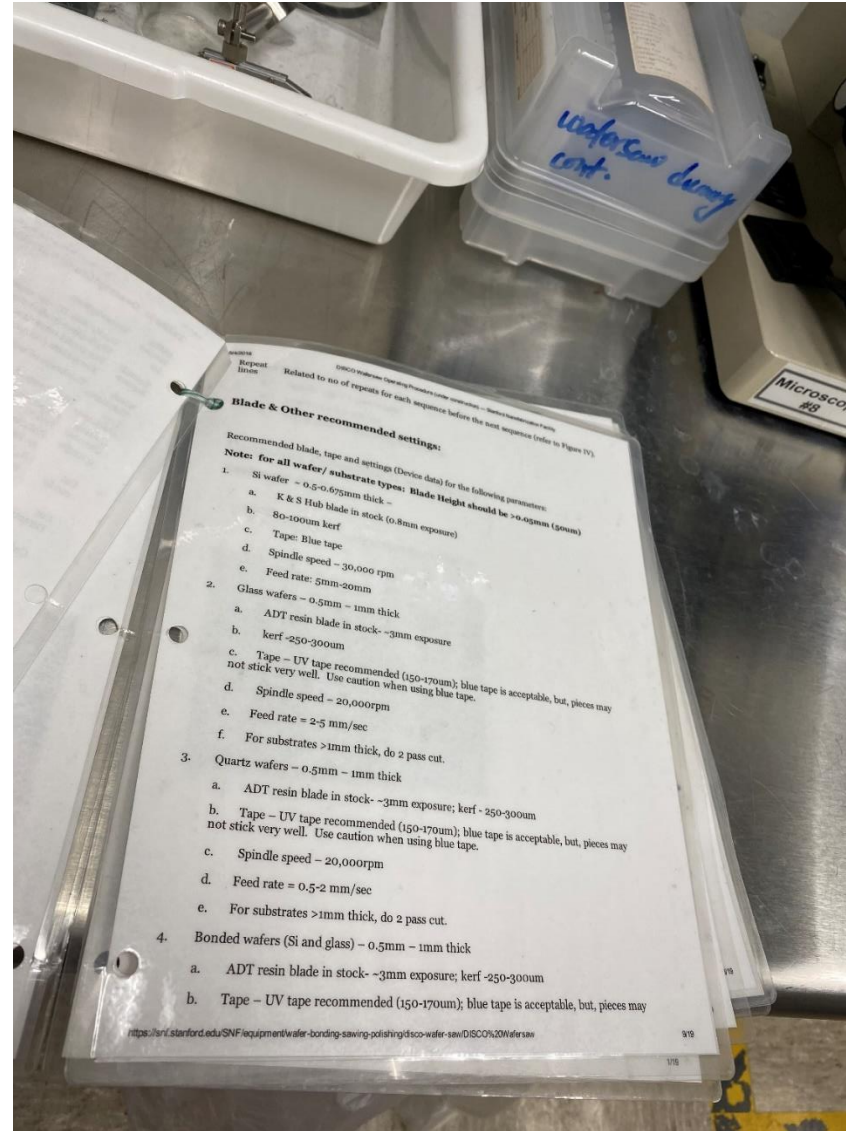




9. Choose the blade data for the blade to be installed (in case of user blade)

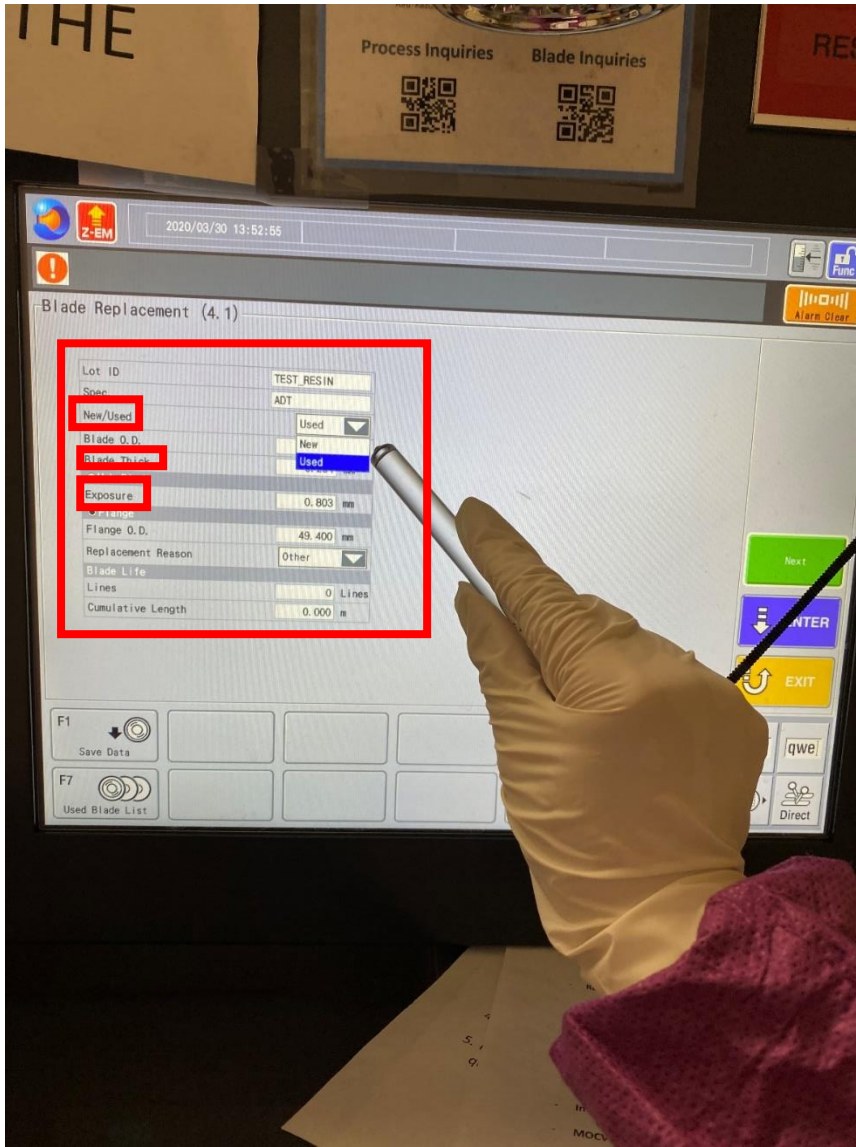


# 10. Blade settings





# 11. Change the blade information to match that on your blade container





12. Open the left cover for blade change

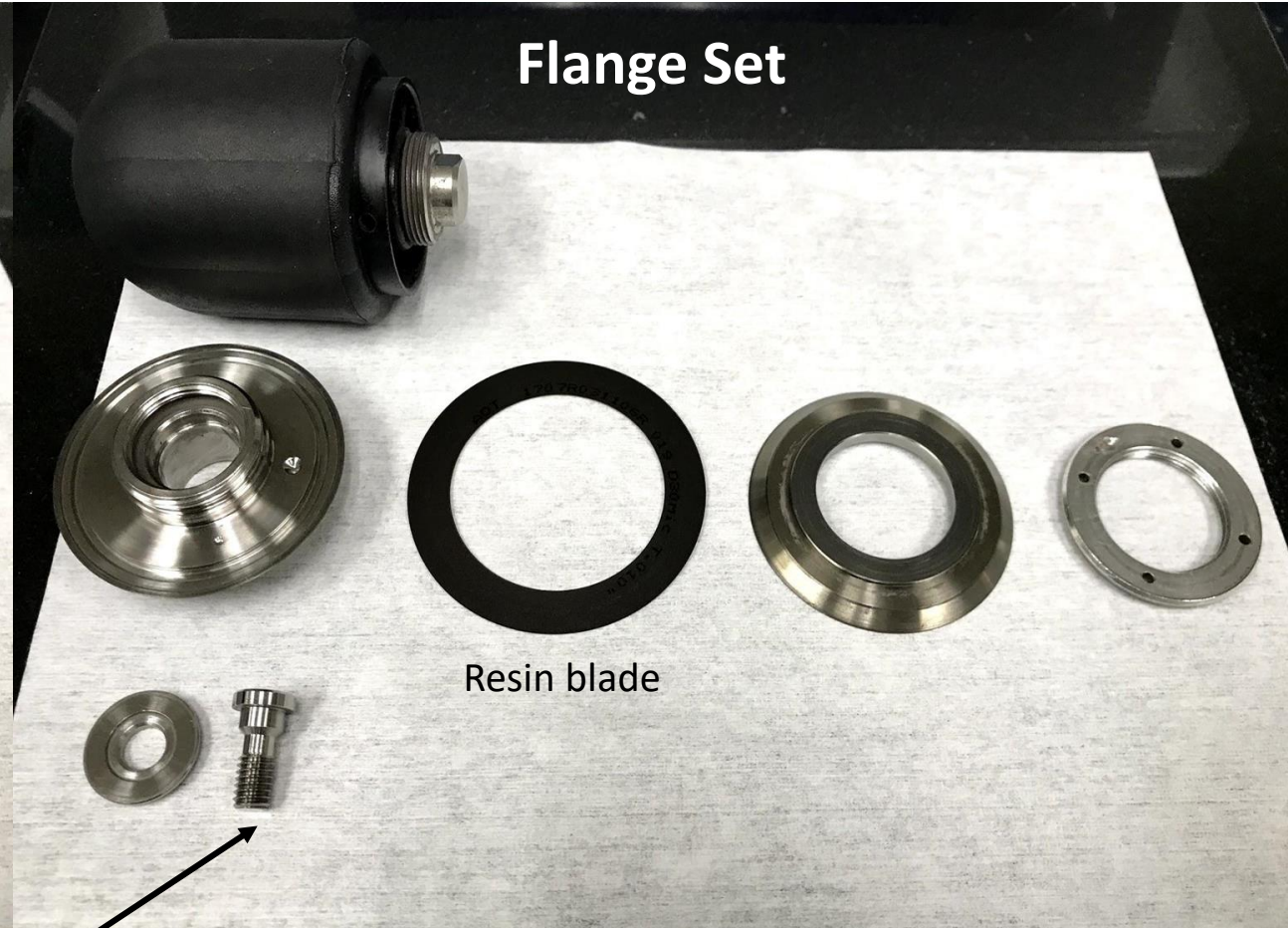
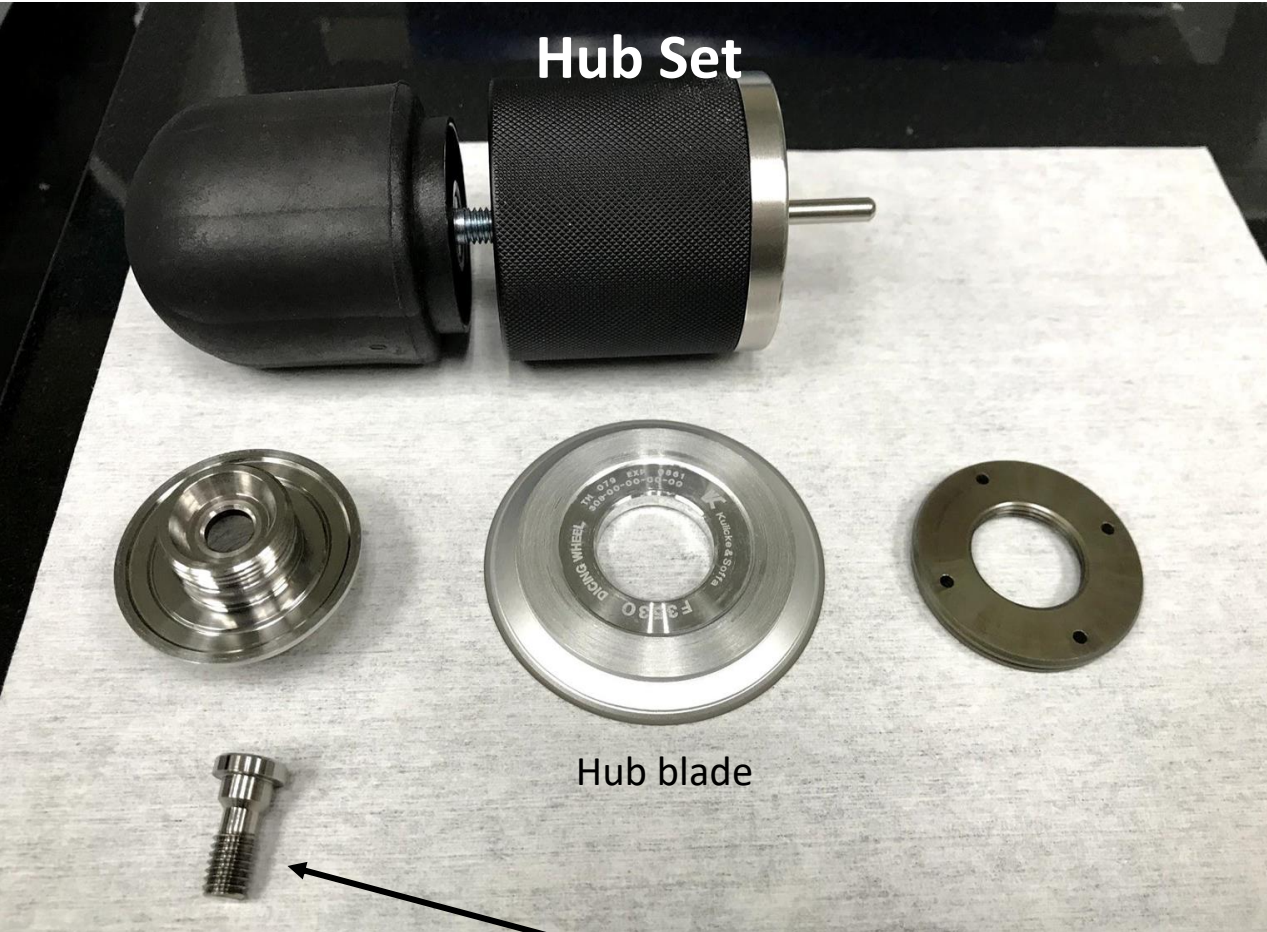


# Two blades: Resin & Hub





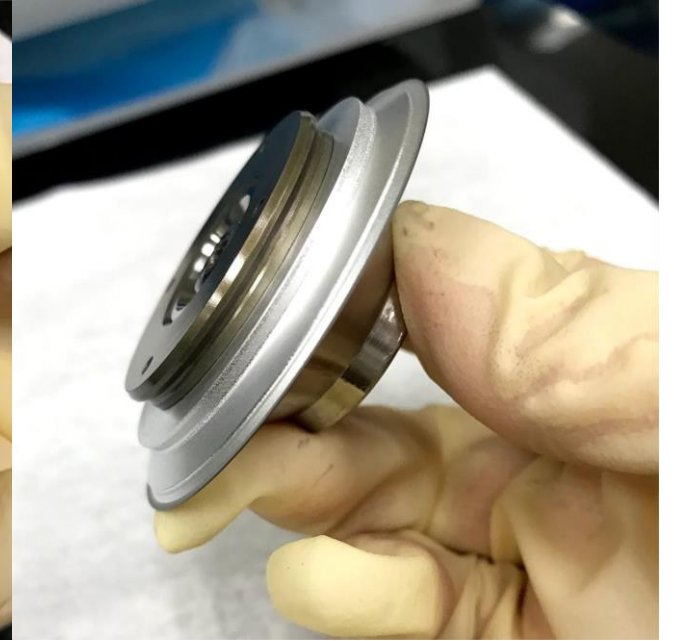
# Two blade sets: note the equipment



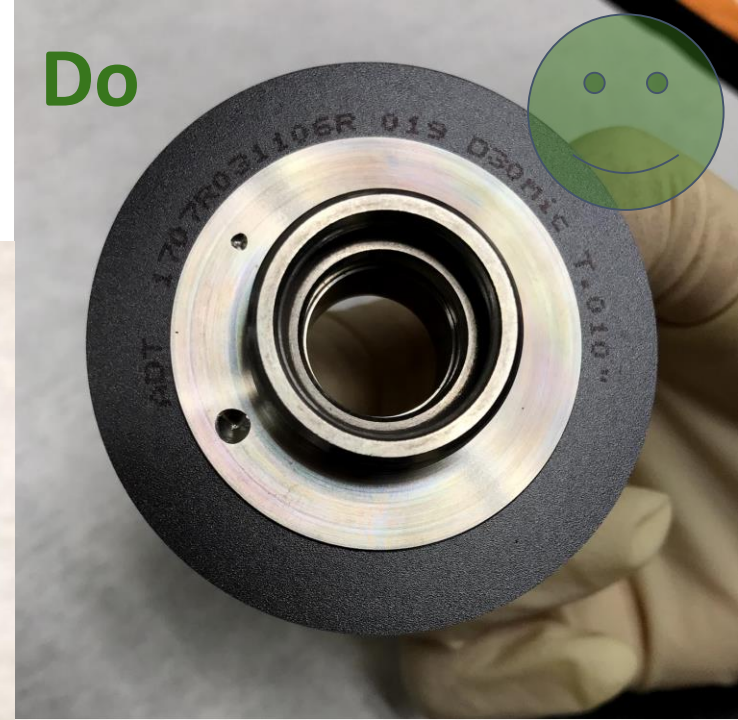
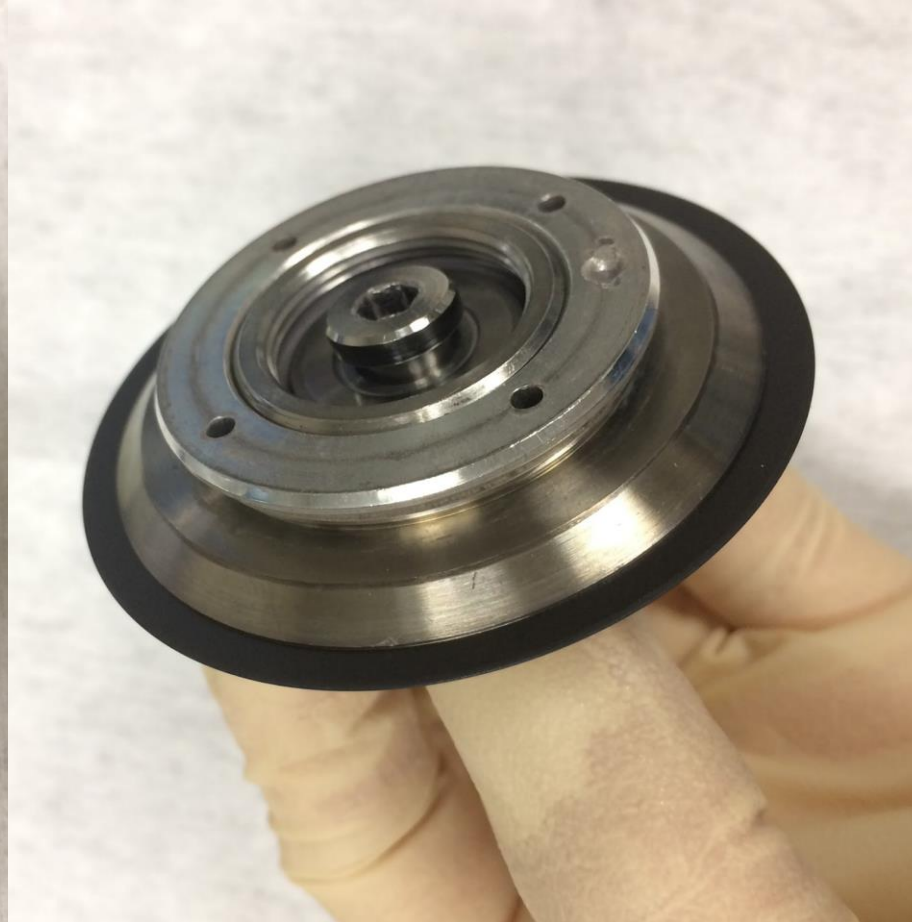
Note: common screw



# Final hub set assembly



# Final flange set assembly

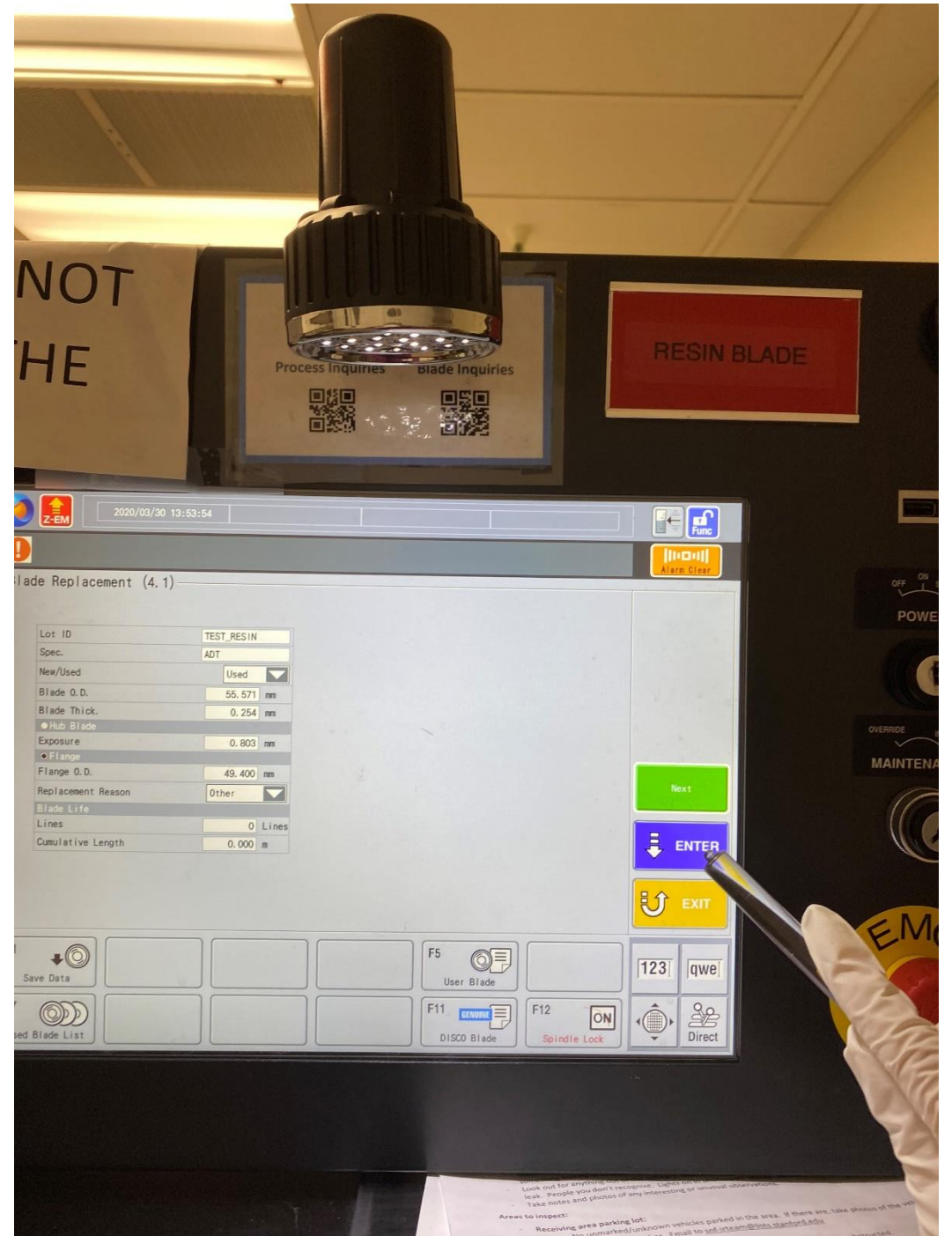


Resin blade can break very easily. Make sure to properly place the blade on the spindle!

Please refer to [blade change video](#), especially slides#14-29

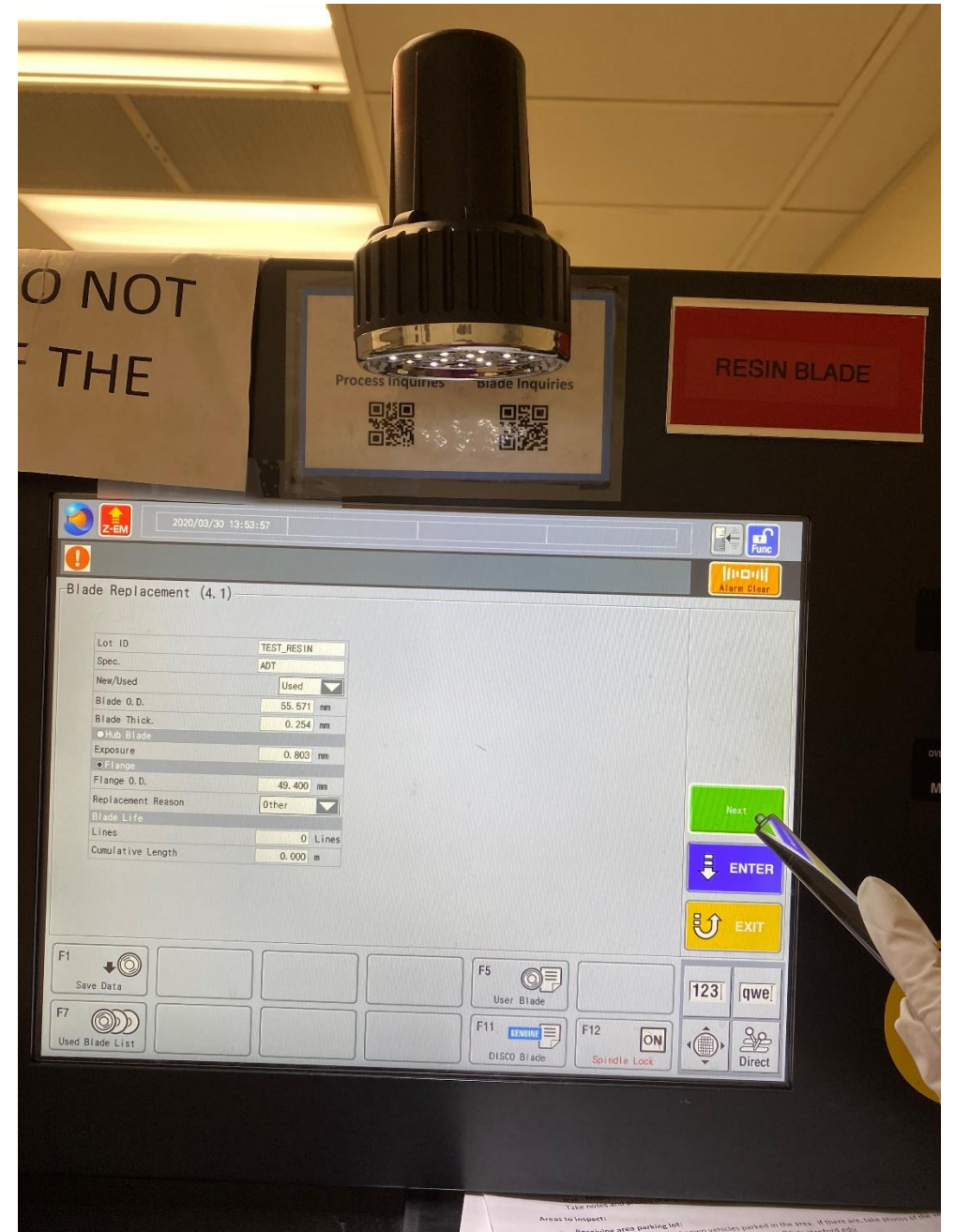


13. After changing the blade, Click Enter

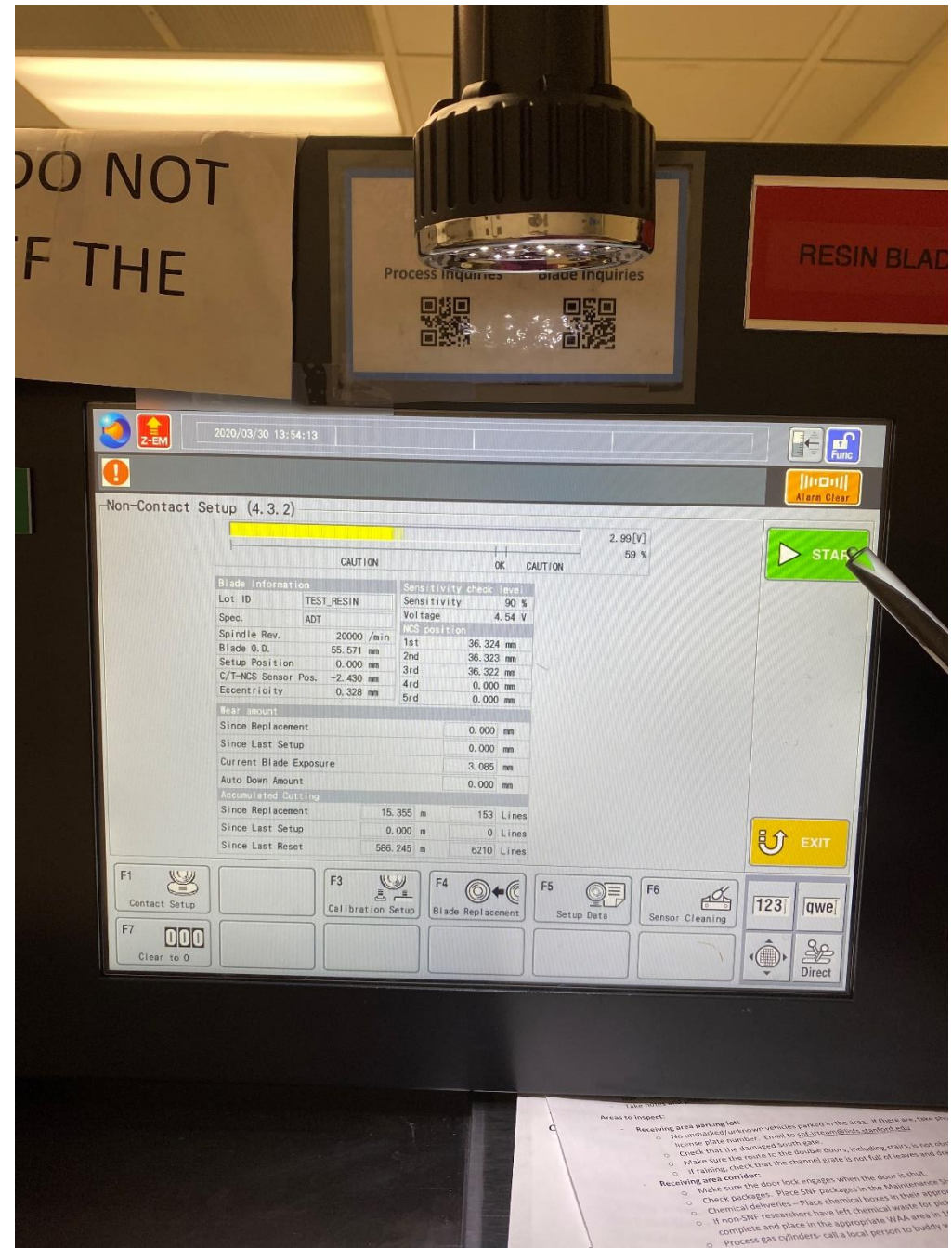




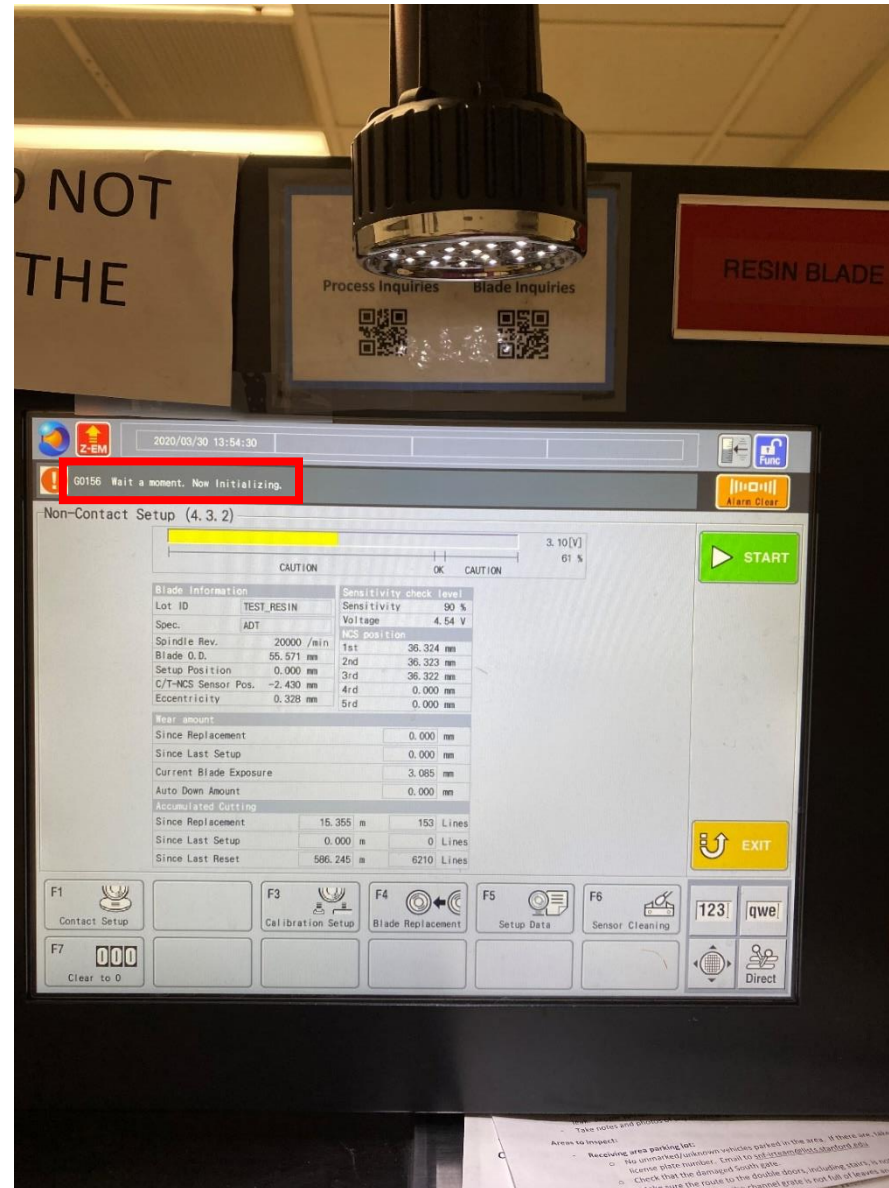
14. Then click Next



15. Start blade setup for the blade newly installed

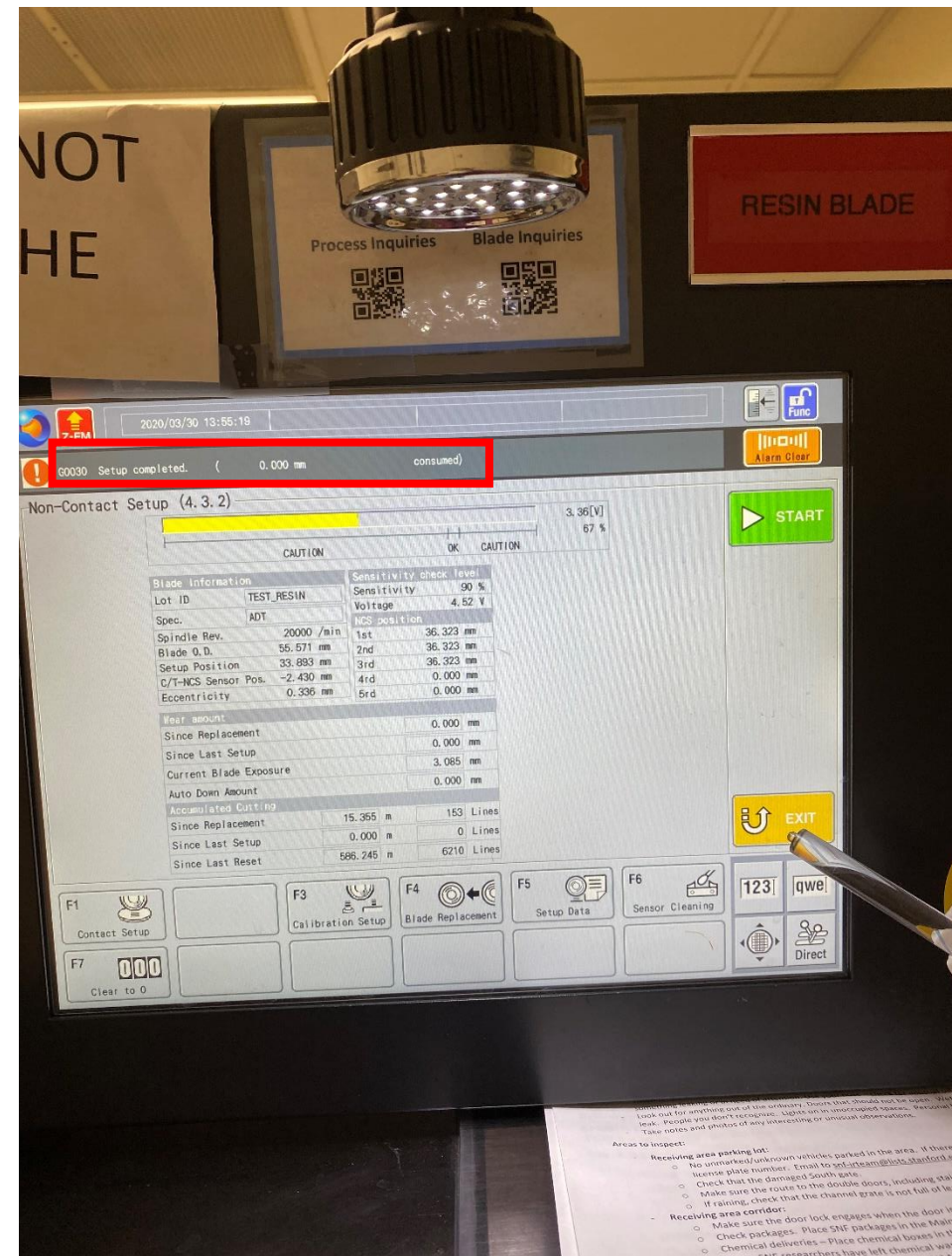


# 16. Check blade setup status

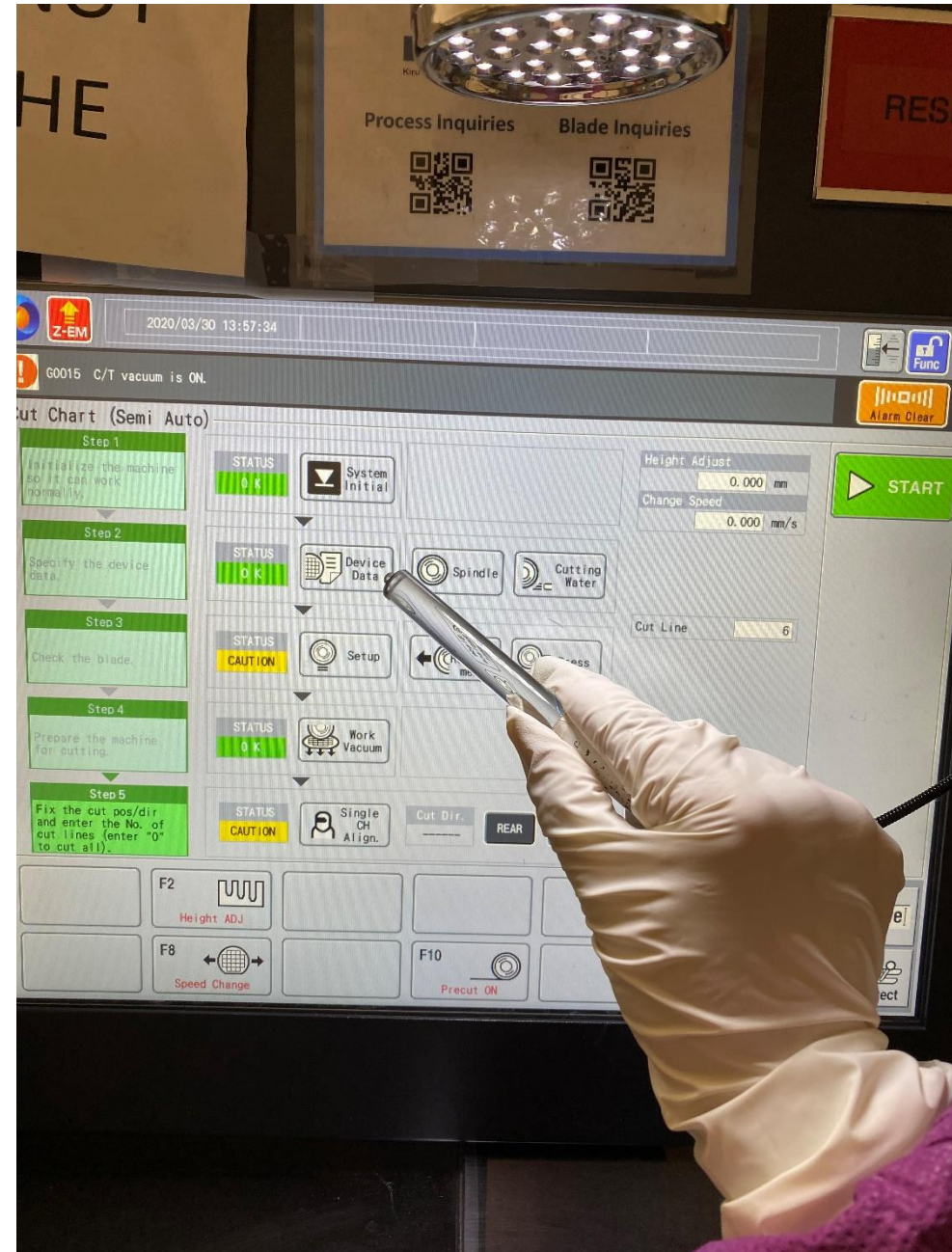




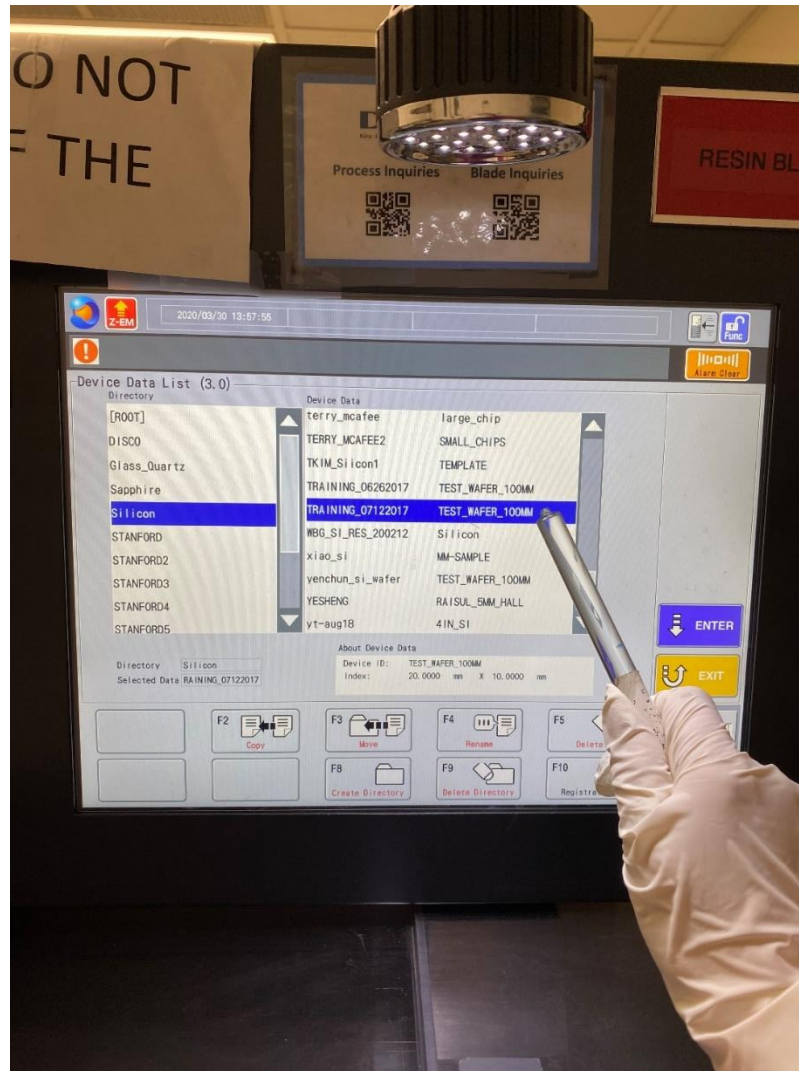
17. Once setup is completed, click Exit



# 18. Device Data

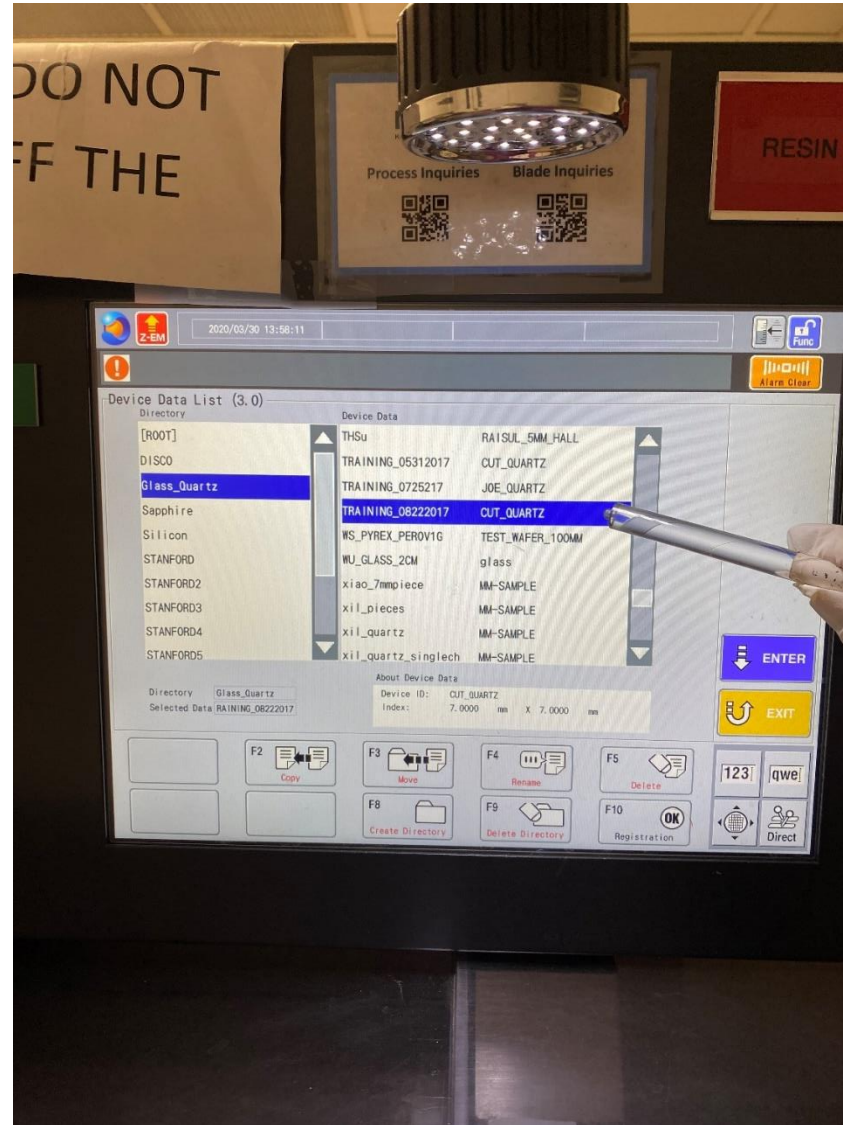


# 19. Choose the right device data folder/file: to cut Silicon

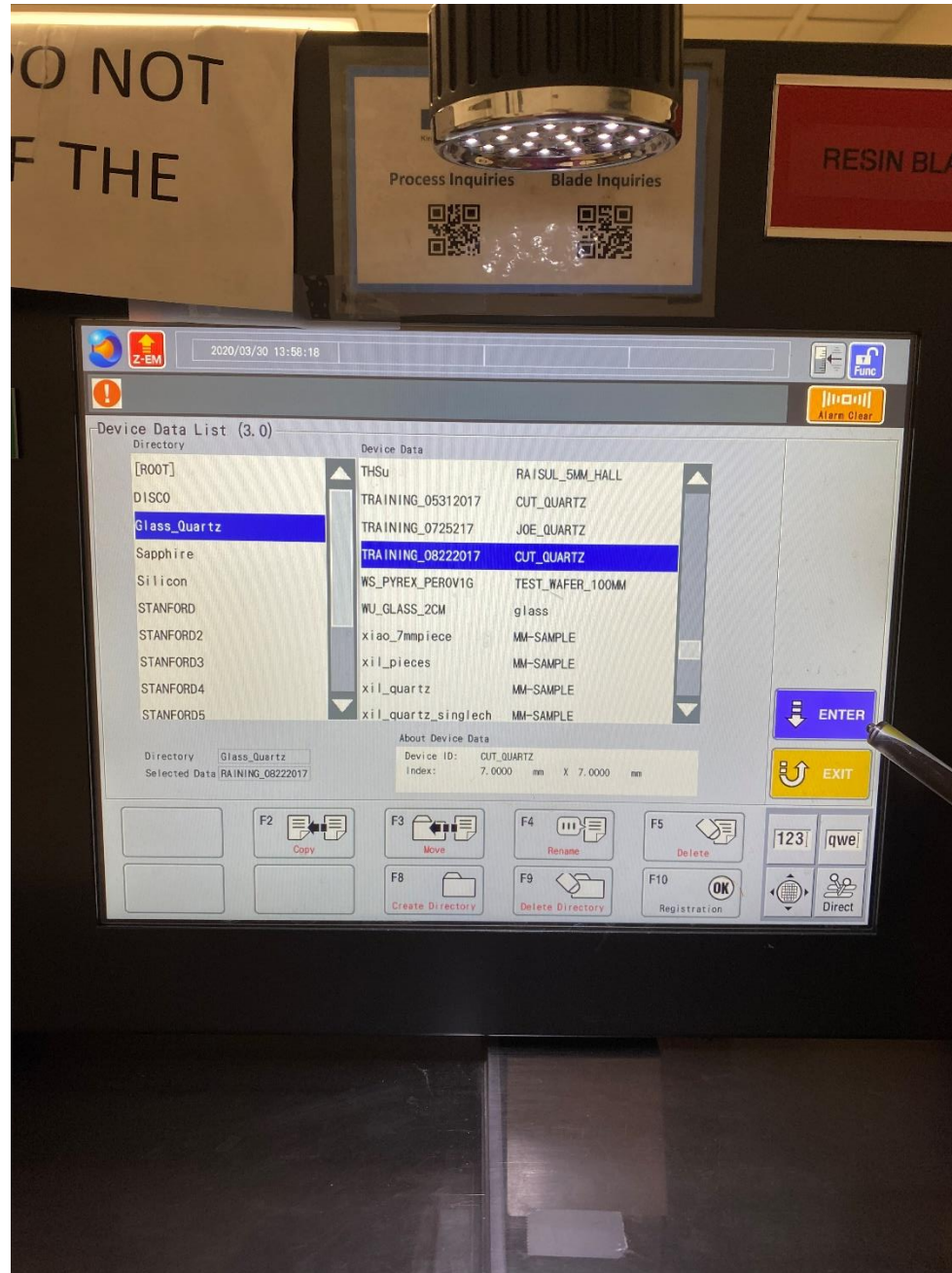




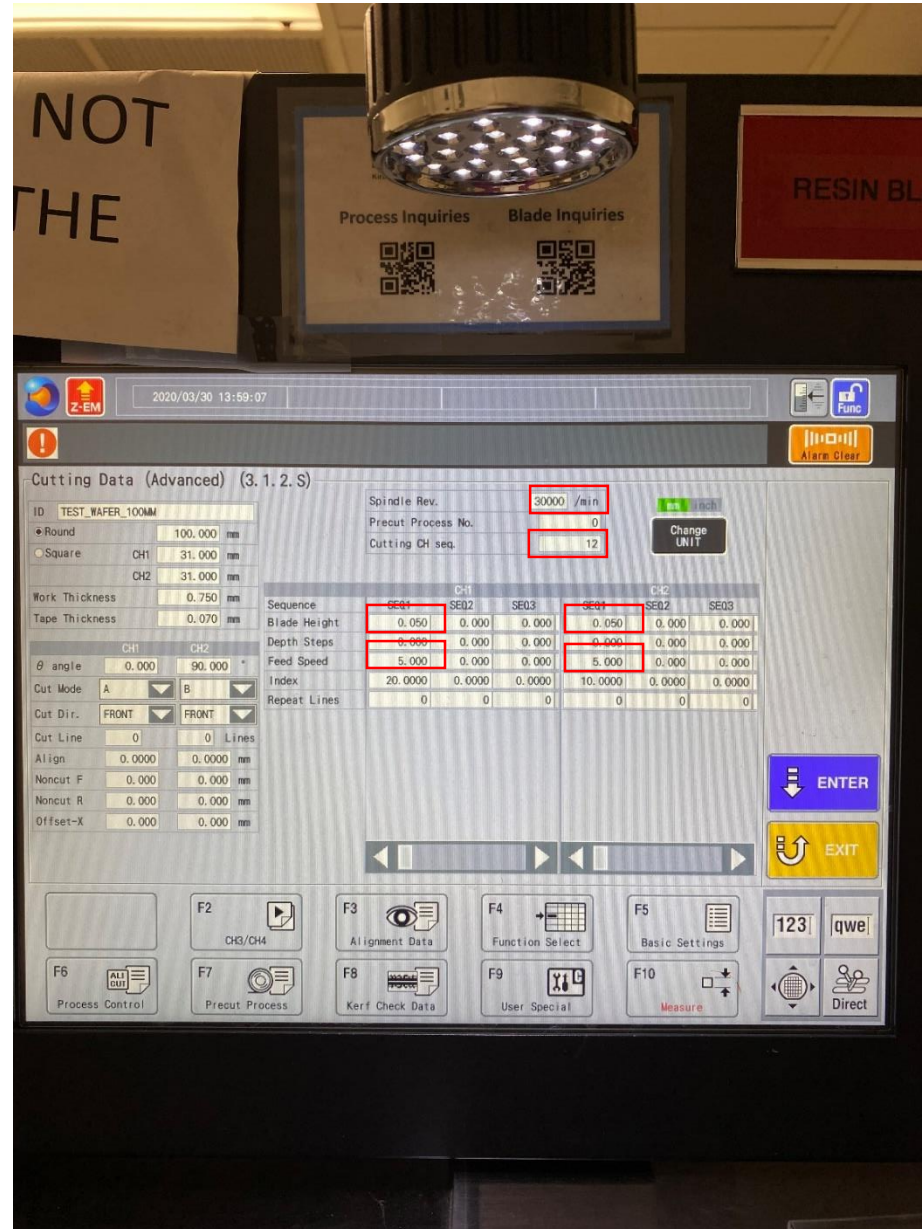
# 19. Choose the right device data folder/file: or to cut Glass/Quartz



# 20. Click Enter

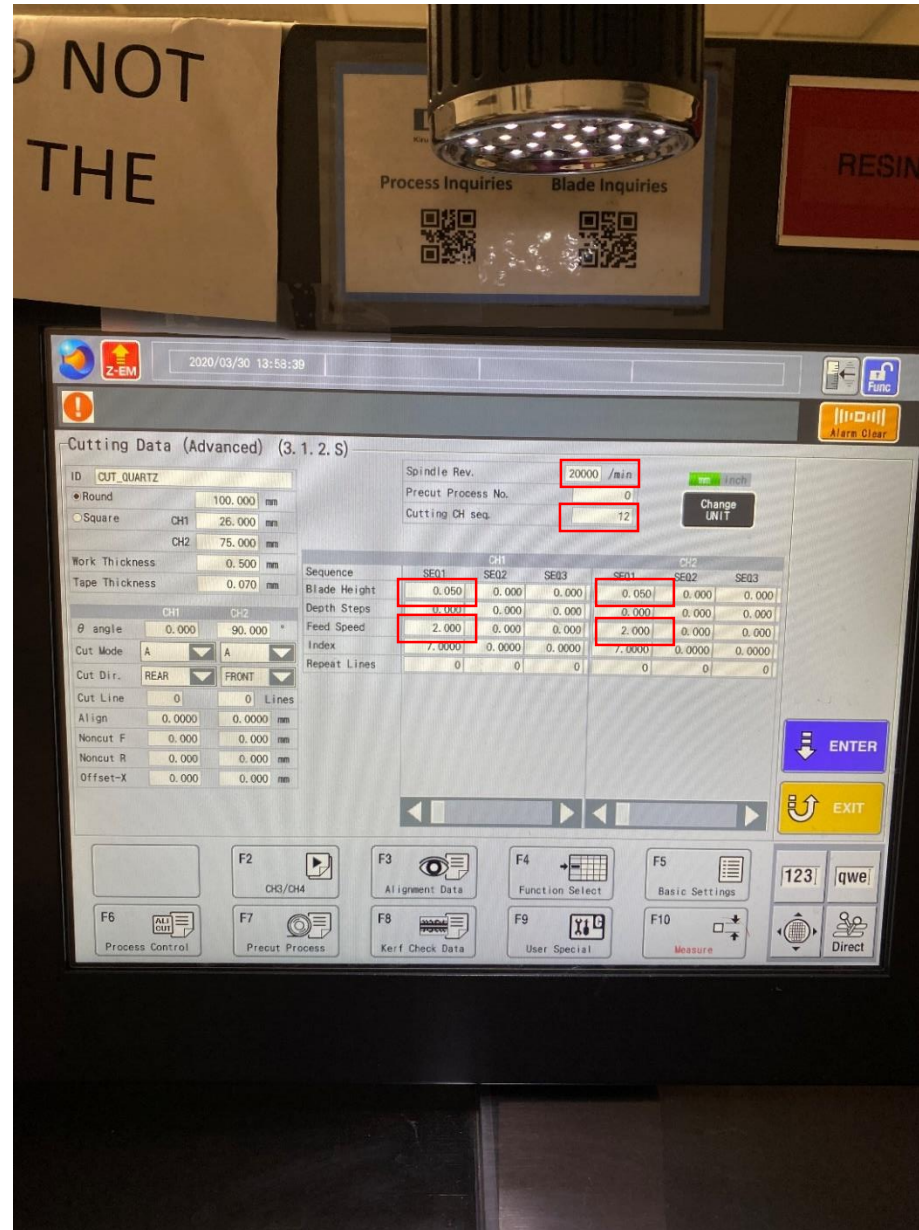


# 21. Check the device data: for Si





# 21. Check the device data: for Glass/Quartz



# 22. Refer to device data list

040016 DISCO Wafer Saw Operating Procedure (order construction) — Stanford Handwritten Facility

**Table 1: Description of Variable in Device Data**

Field Name	Description
ID	Device data ID - 30 characters maximum
Round/Square	Work piece (wafer) shape - round or rectangle For round substrates, specify wafer diameter
Work Thickness	Thickness of work piece/ substrate/ wafer
Tape thickness	Thickness of the tape underneath the work piece
Cutting Channel	Direction of cut. For example, to make rectangular dies, the cut has to be in 2 directions (x and y) that are at 90 degree angles from one another
q Angle	Rotation angle of each channel relative to initial position
Cut mode	A - Down cut; Cutting while chuck table is moving from right to left A_UP - Up cut; cutting while chuck table is moving from left to right B - Repetition of A and A_up cuts B-ZKEEP - Identical to B without Z-direction escape during indexing
Cut Direction	Front - From front to rear of the work piece Rear - from rear to front of work piece
Cut Line	No of lines to be cut; "o" - will calculate the number of lines that needed to be cut based on the work piece size, index value and specified exclusions
Align	Cutting is performed at the position shifted by the entered distance from the start adjusted position
Noncut F	Distance to be left uncut in the front
Noncut R	Distance to be left uncut in the rear
Offset-l	X-Axis Offset in the function select screen (F4) should be yes. - Offset between chuck table center and work piece; work piece center to the right of chuck table center is a positive offset.
Offset-q	Applicable only if the cut start position has to be offset as cut progresses
Spindle speed	Spindle revolution - 6000-60000 rpm; Typical for Si work piece: 30,000rpm; for glass substrates ~20,000 rpm
Precut Process	Precut process to be used
Cutting Ch. Seq	Sequence in which cuts will be made along different channels; 1234, 4321; 12, 21, etc.
Change Unit	Toggles measurements between mm or inch scale.
Sequence	Sequence of cuts for each channel; each sequence can have a different index, blade height and feed rate
Blade height	Distance between the chucktable and blade tip. Corresponds to the thickness left uncut; should not enter any number below 50um (0.05mm)
Feed speed	Speed at which chuck table moves; mm/sec
Index	Distance between cuts in the same direction
Depth Steps	For multi-level cutting; each time, the blade moves the work piece to a specified depth (cut depth). Cuts are repeated until the blade height limit is reached.

<https://snf.stanford.edu/SNF/equipment/wafer-bonding-sawing-polishing/disco-wafer-sawing/DCO%20Wafer%20Saw>

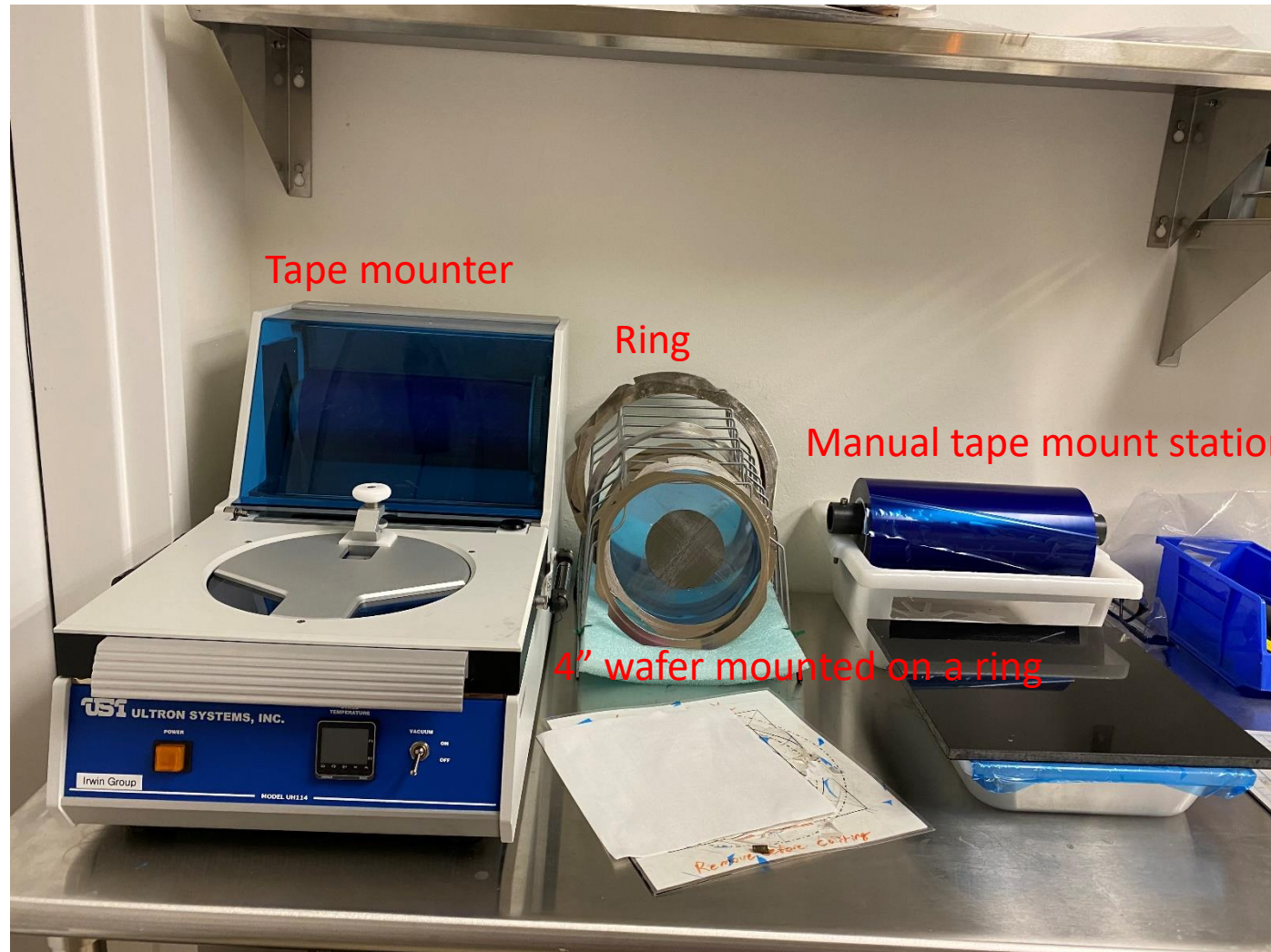
8/19

23. Open right side cover to load the sample



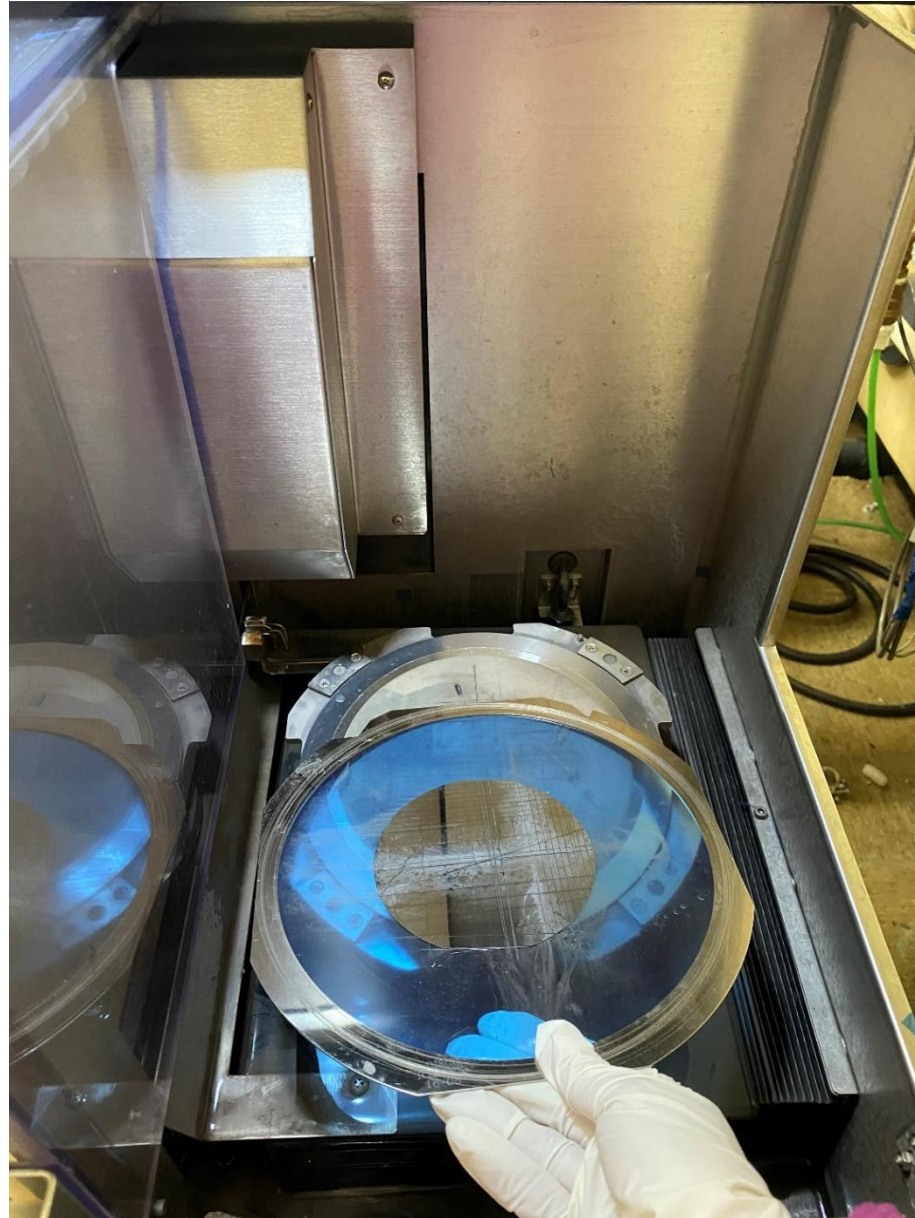


24. Use the tape mounter or the manual mount station to mount the dummy wafer to the ring



Please refer to  
*Tape Mounter Operation Guide*

25. Load the ring with the dummy wafer mounted for test cut

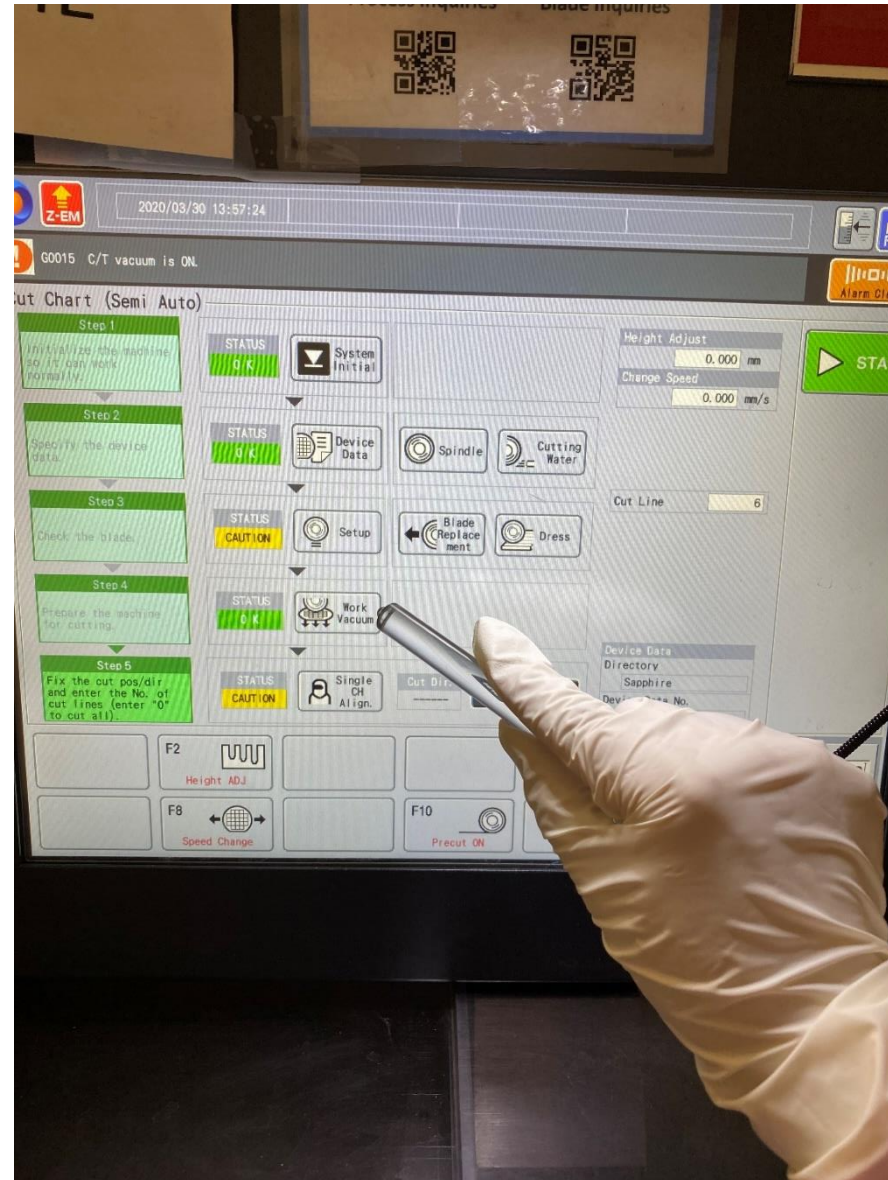


## 26. Close the right side cover

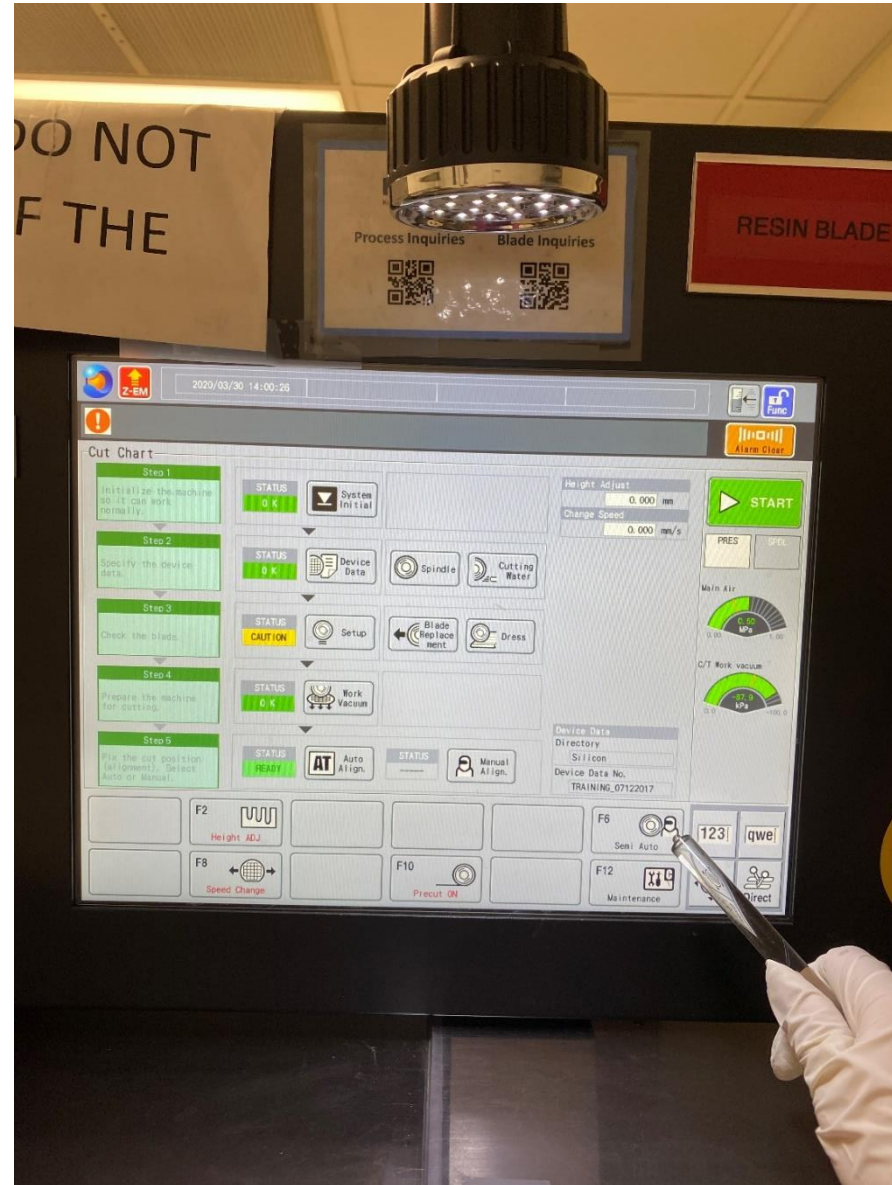




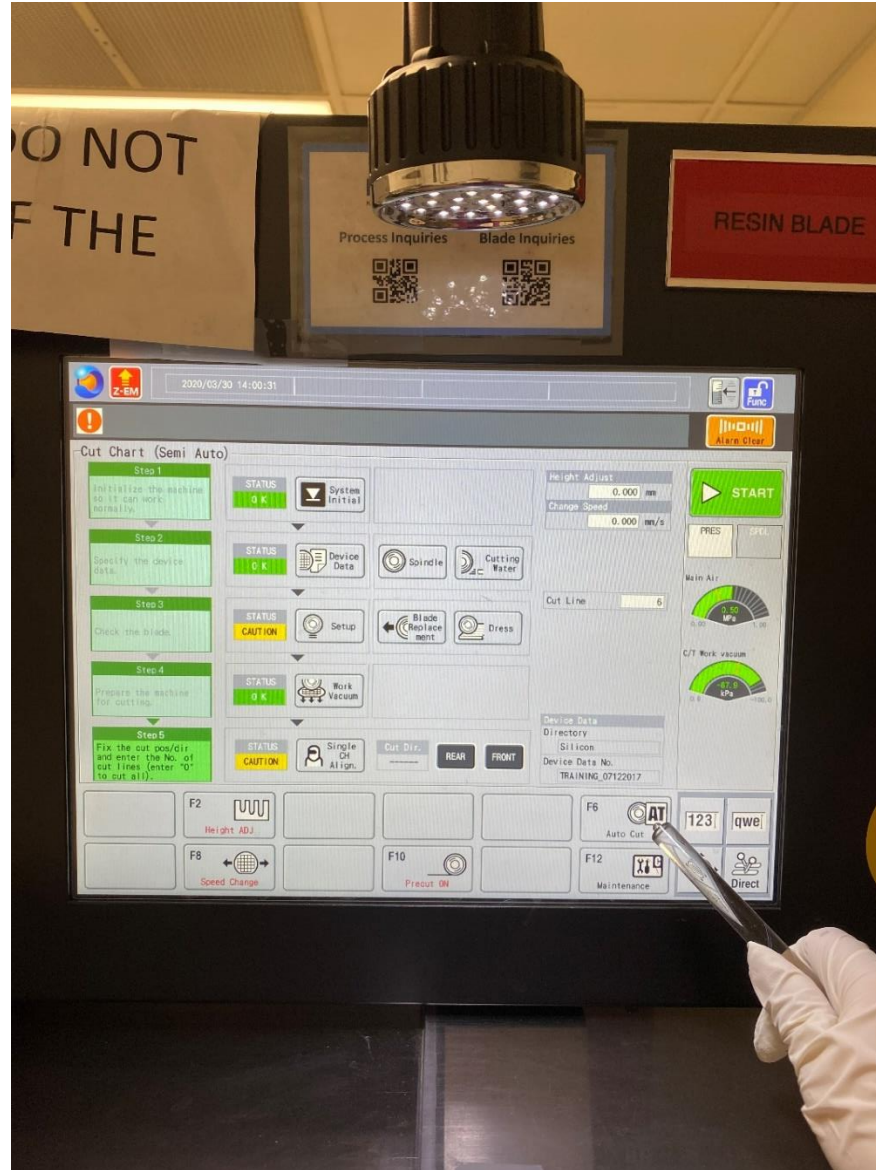
# 27. Turn on work vacuum



# 28. Toggle between Semi Auto and Auto Cut mode

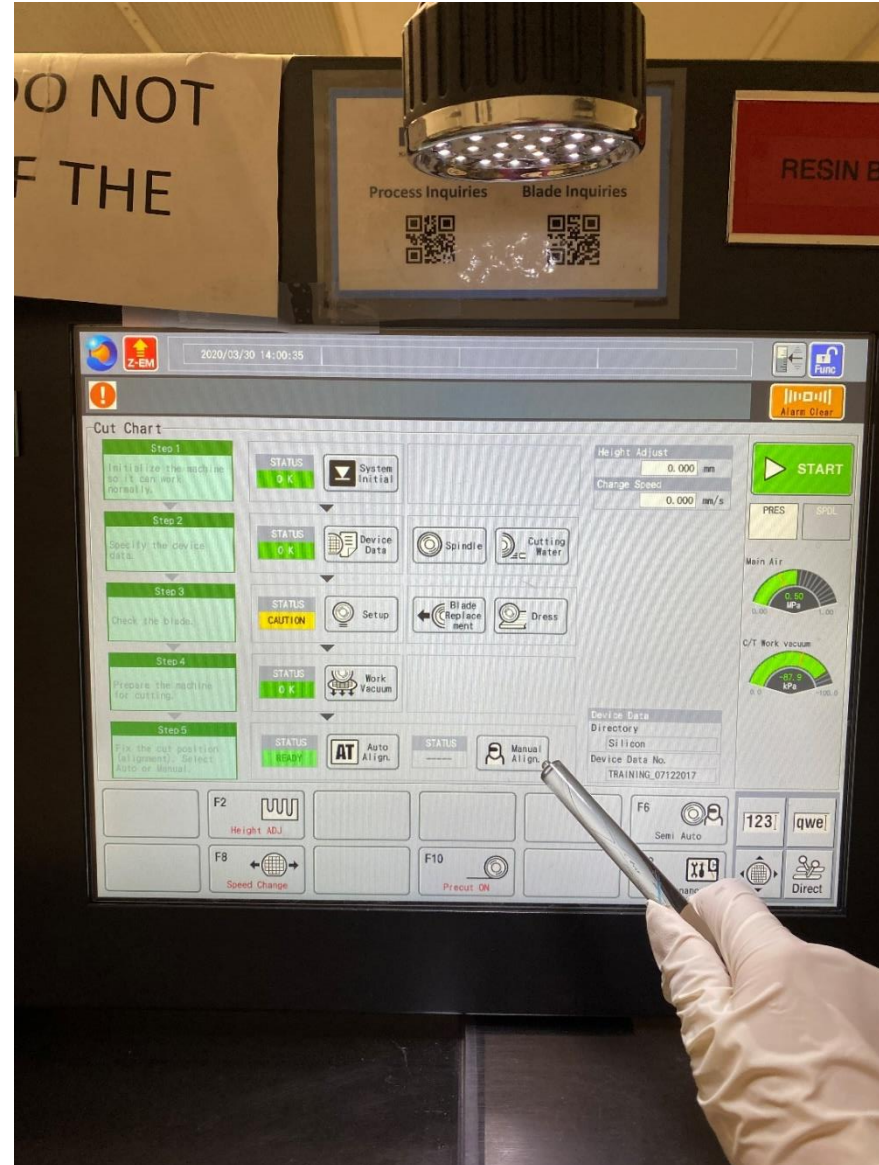


# 28. Toggle between Semi Auto and Auto Cut mode

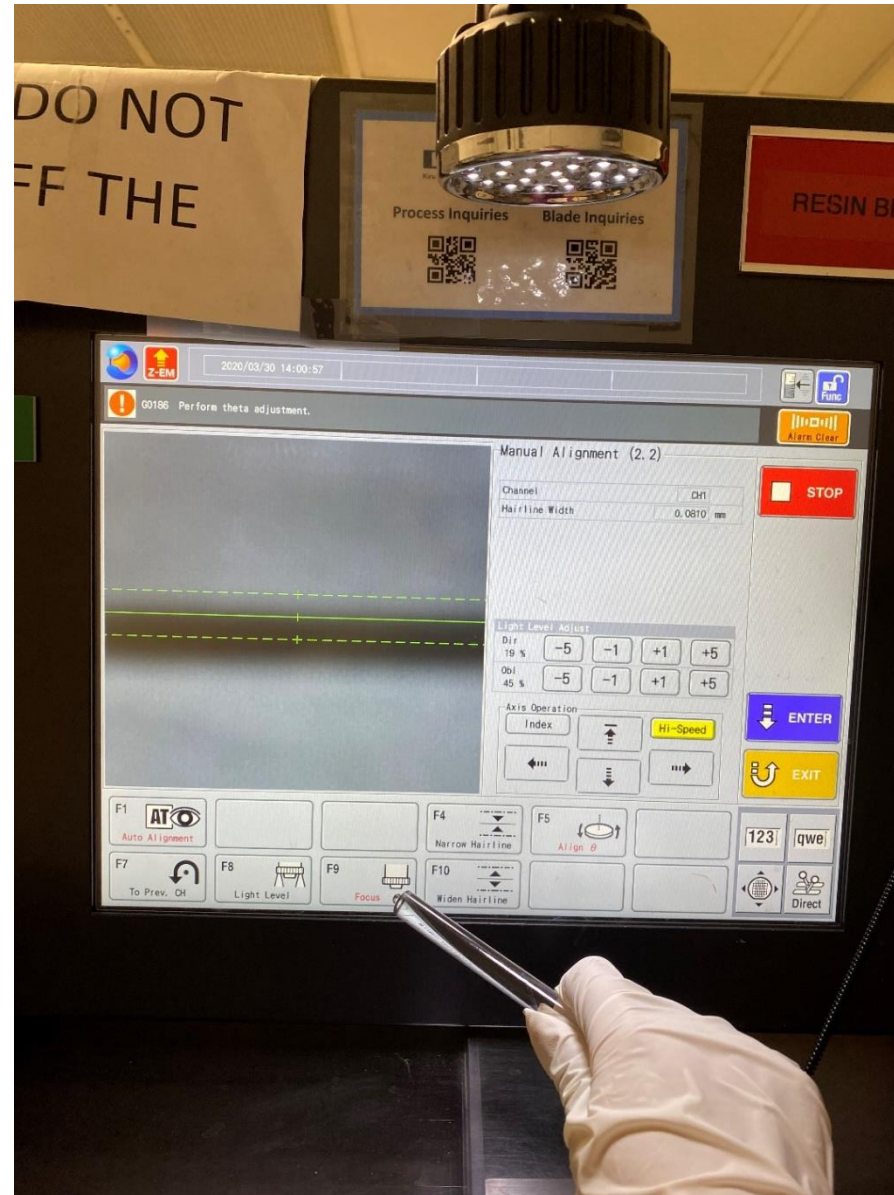




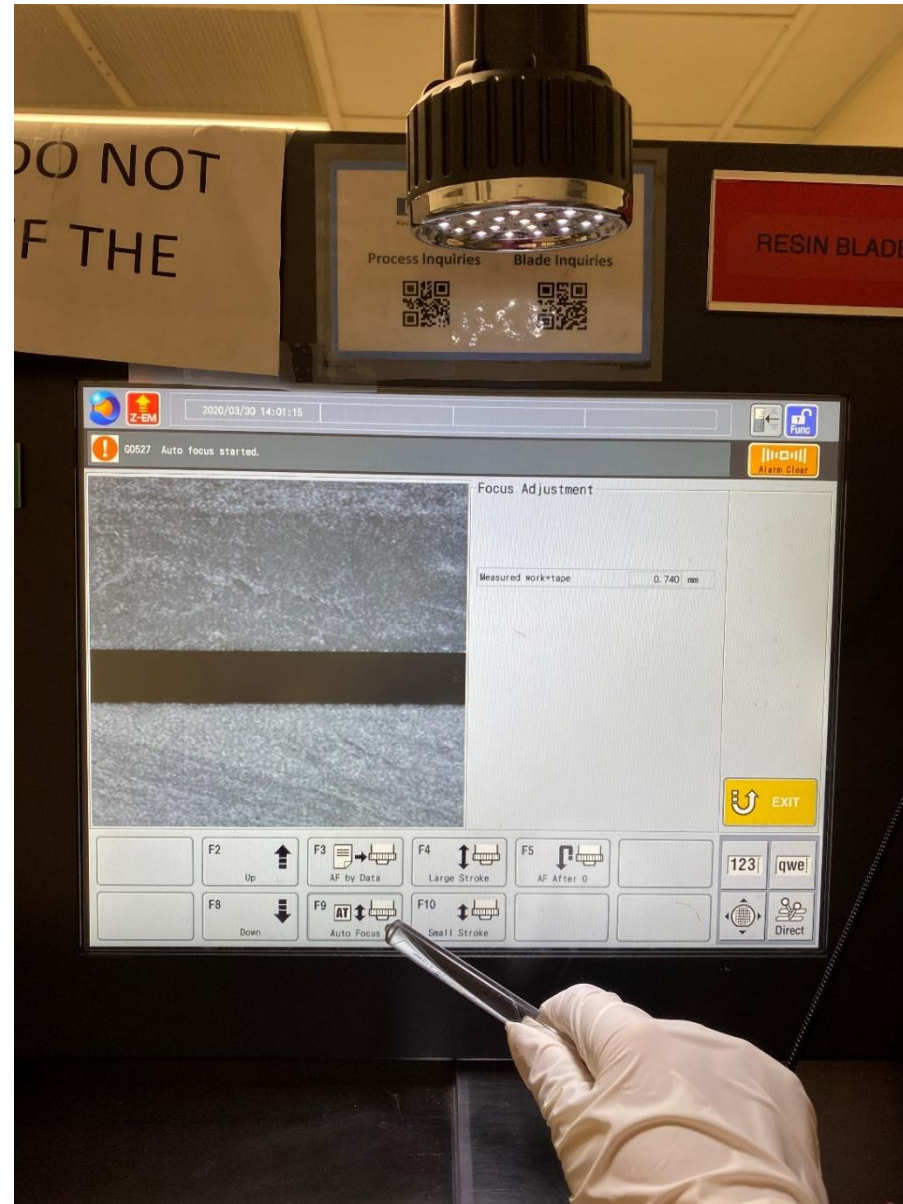
# 29. Do Manual Alignment when in Auto Cut mode



# 30. Focus if image is not clear

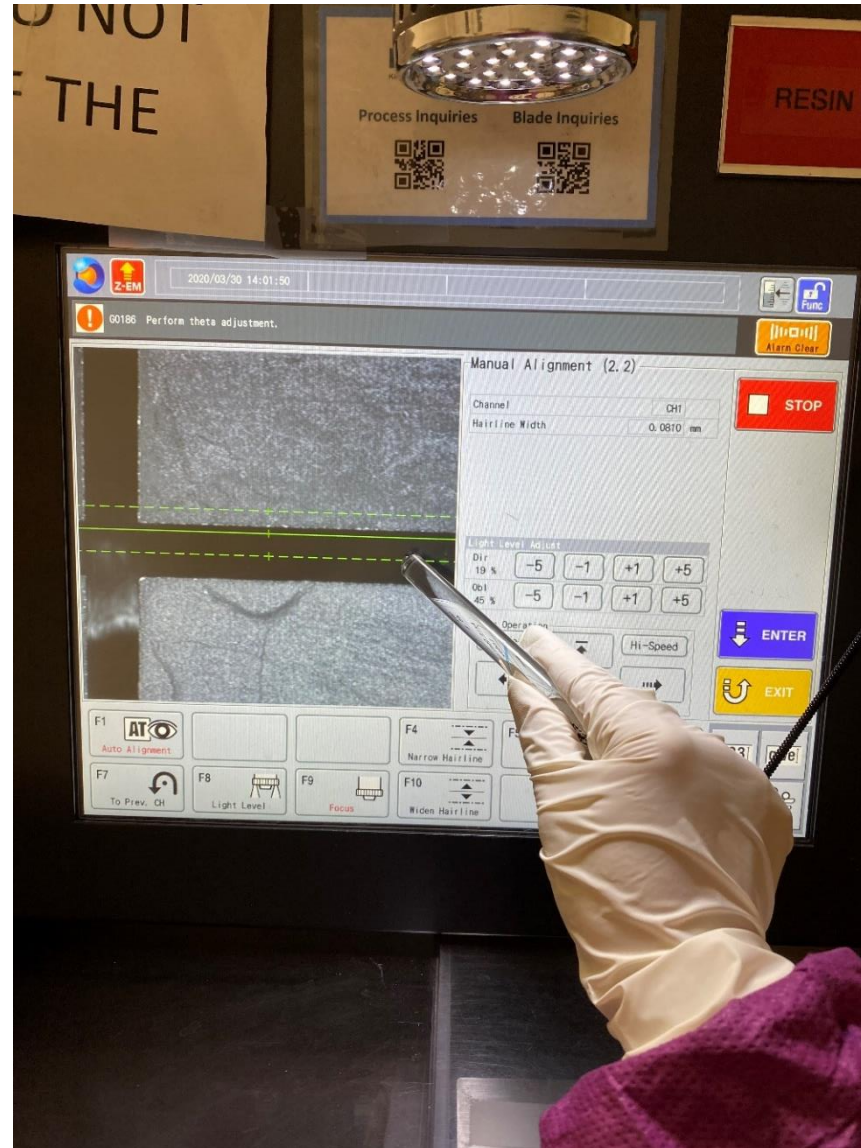


# 31. Click Auto Focus



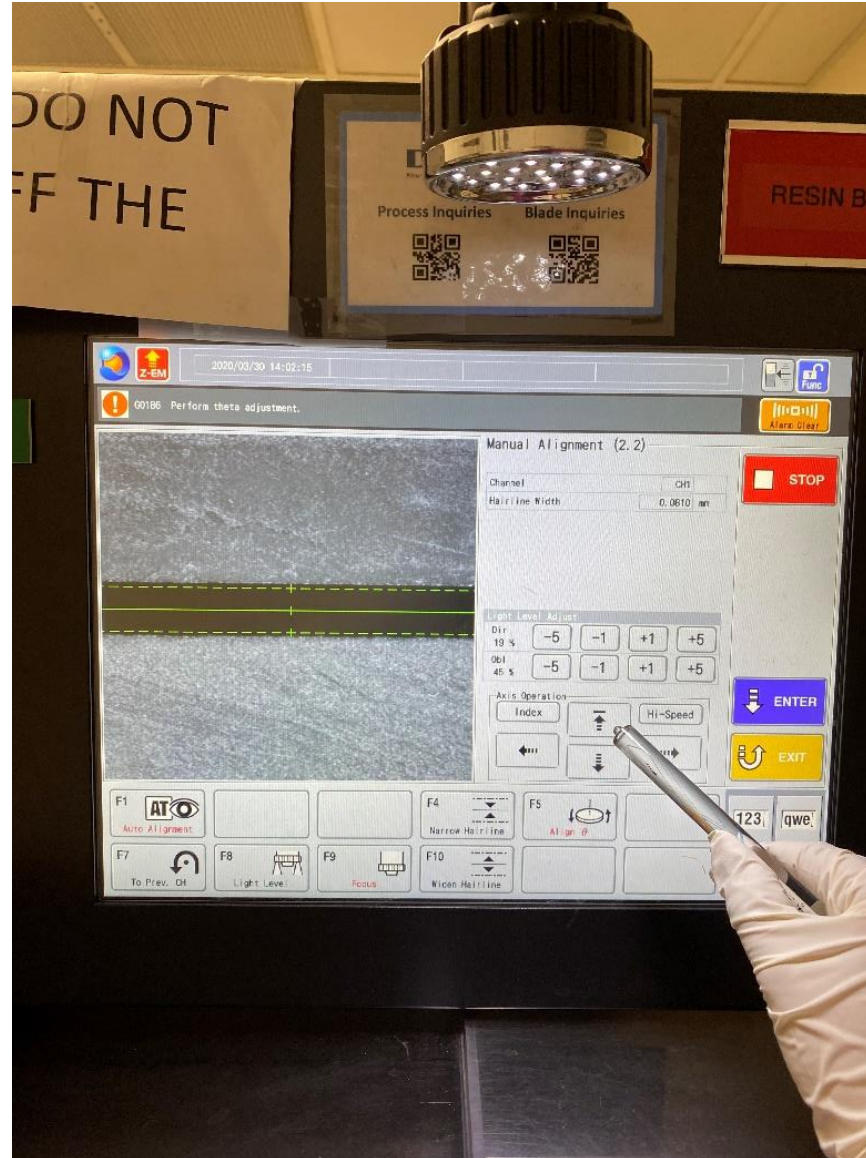


# 32. Align the green hairline with the alignment mark (center and width)

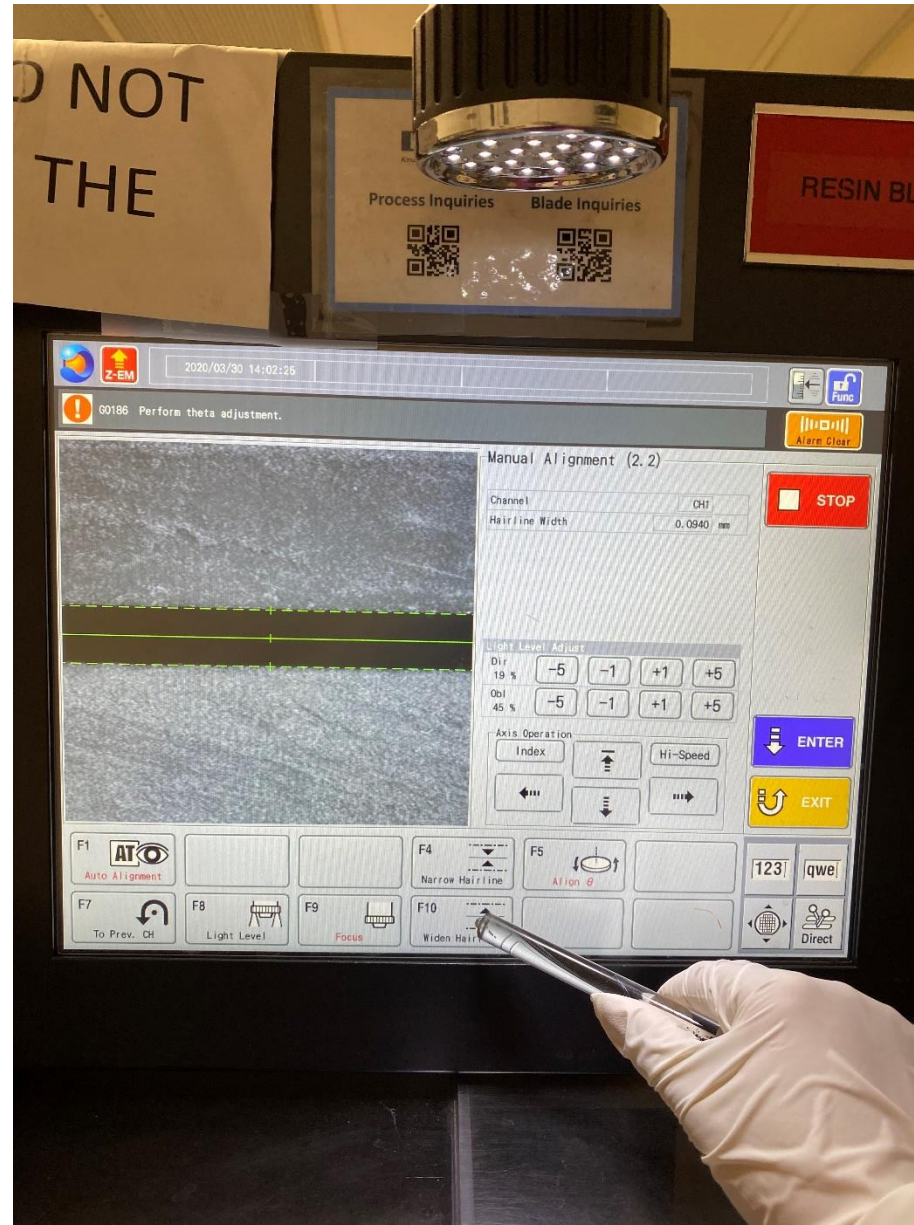


Here we use an existing cut as alignment mark, just to demonstrate how the alignment works. You should have your own alignment marks or street lines on your real sample

# 33. Fine tune the hairline location

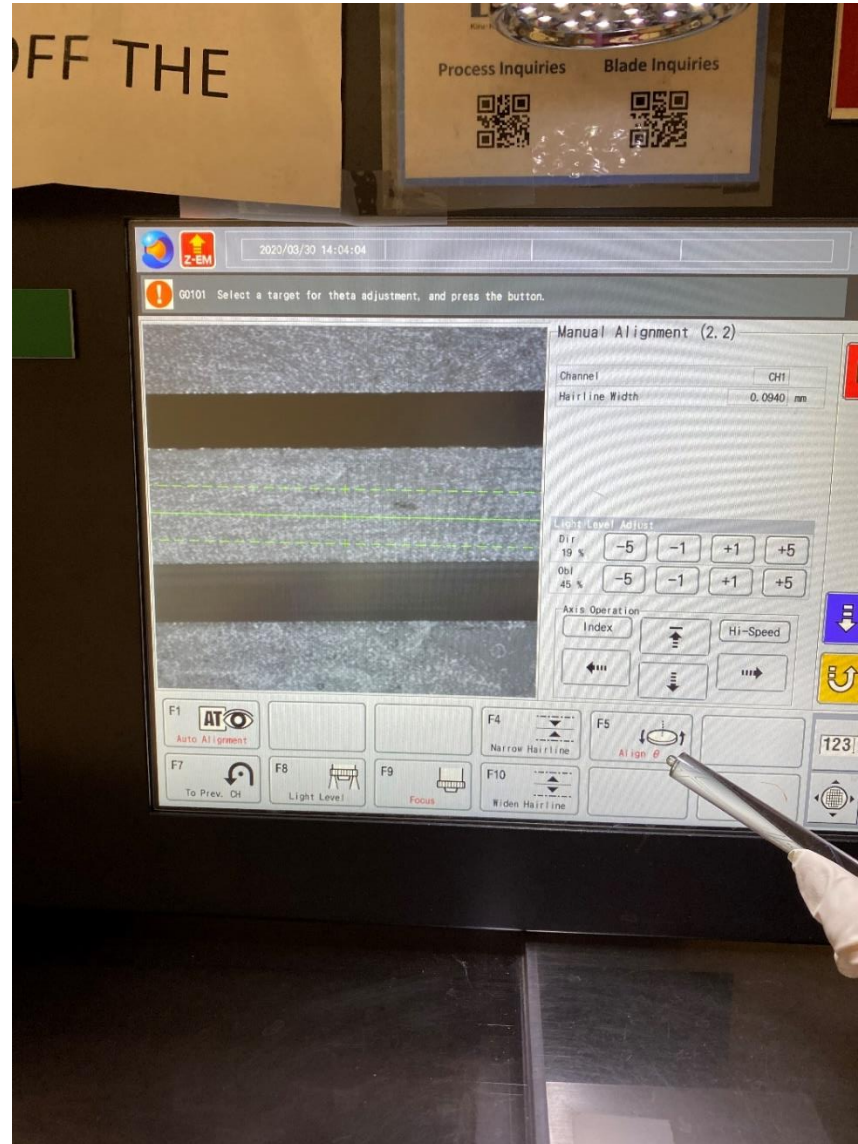


# 34. Fine tune the hairline width



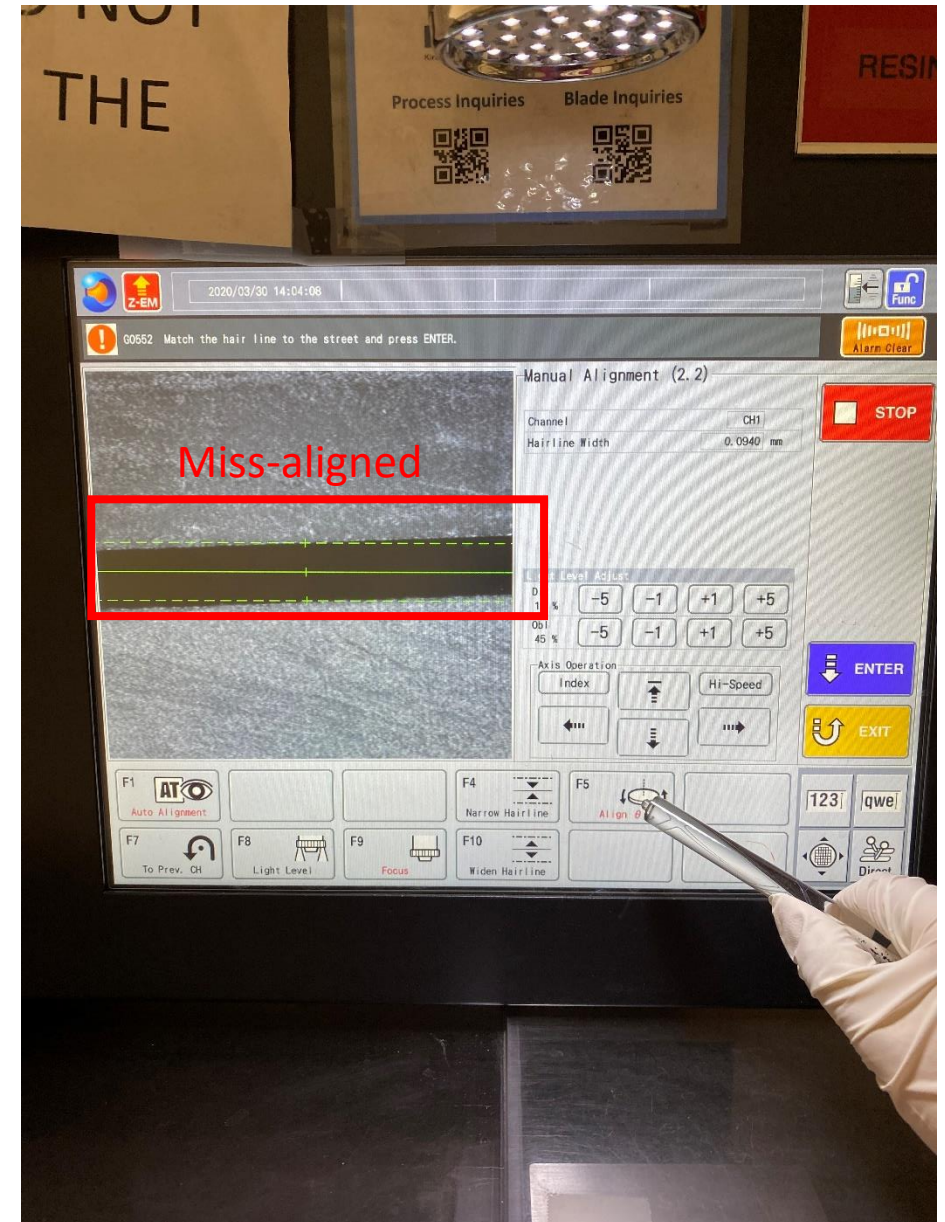


35. Go to the right side of the sample to find another alignment mark by clicking Align  $\theta$

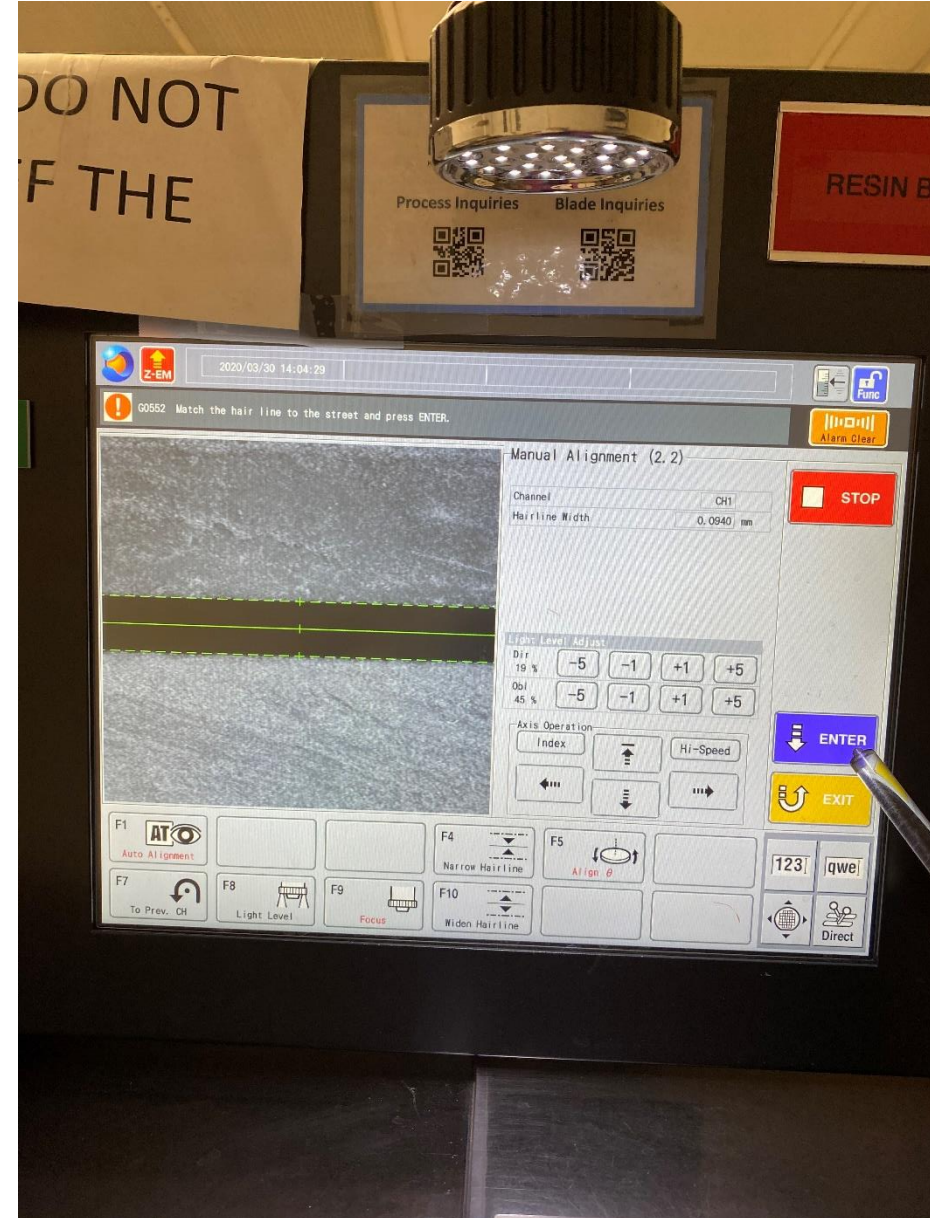


36. Move to the right side alignment mark using the pen tapping, and then click Align  $\theta$  again to go back to the left side alignment mark

If the green hairline and the alignment mark are miss aligned, click Align  $\theta$  again to go to the right side, and find another alignment mark. You can click Align  $\theta$  2X times to tune the locations, but will always go back to the left side when done



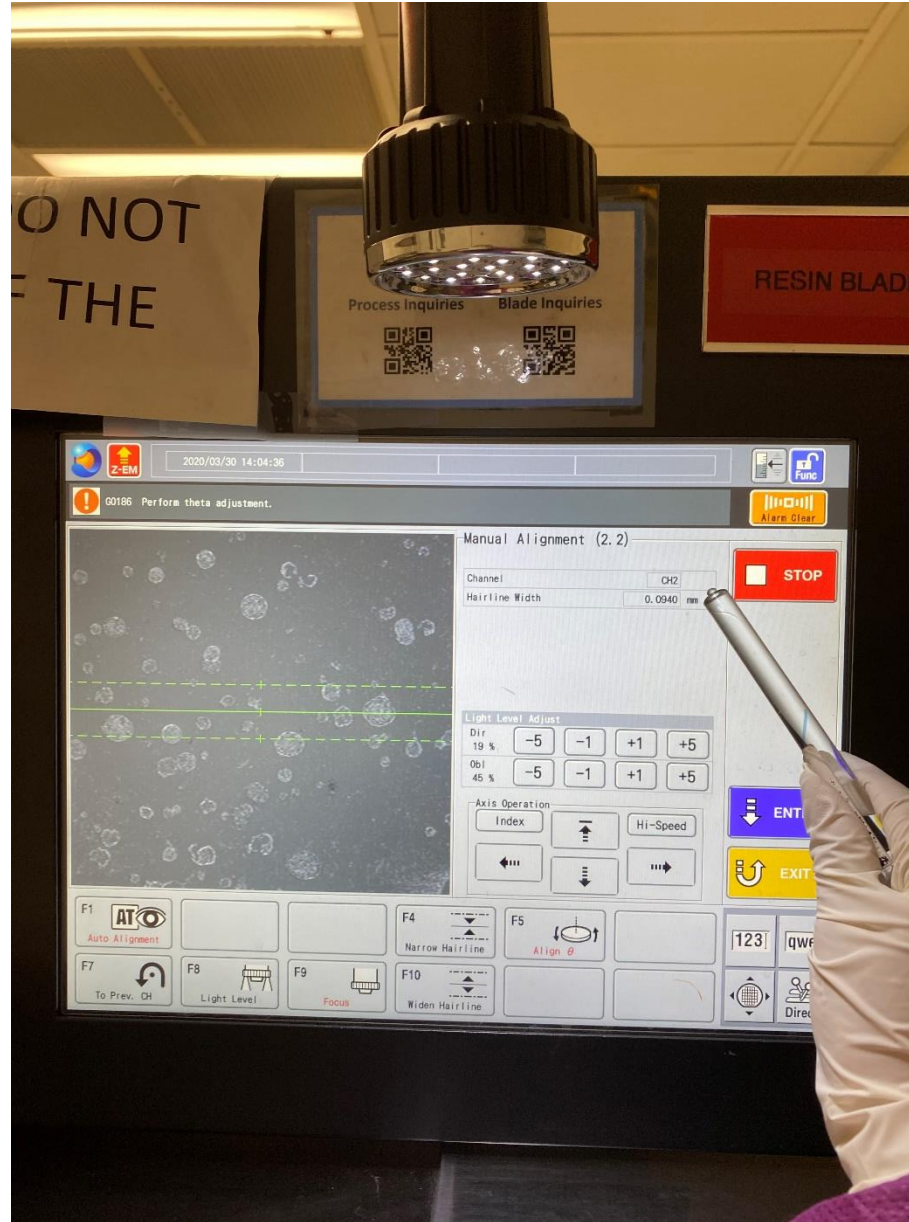
37. When left and right side marks are aligned (and back at the left side), click Enter





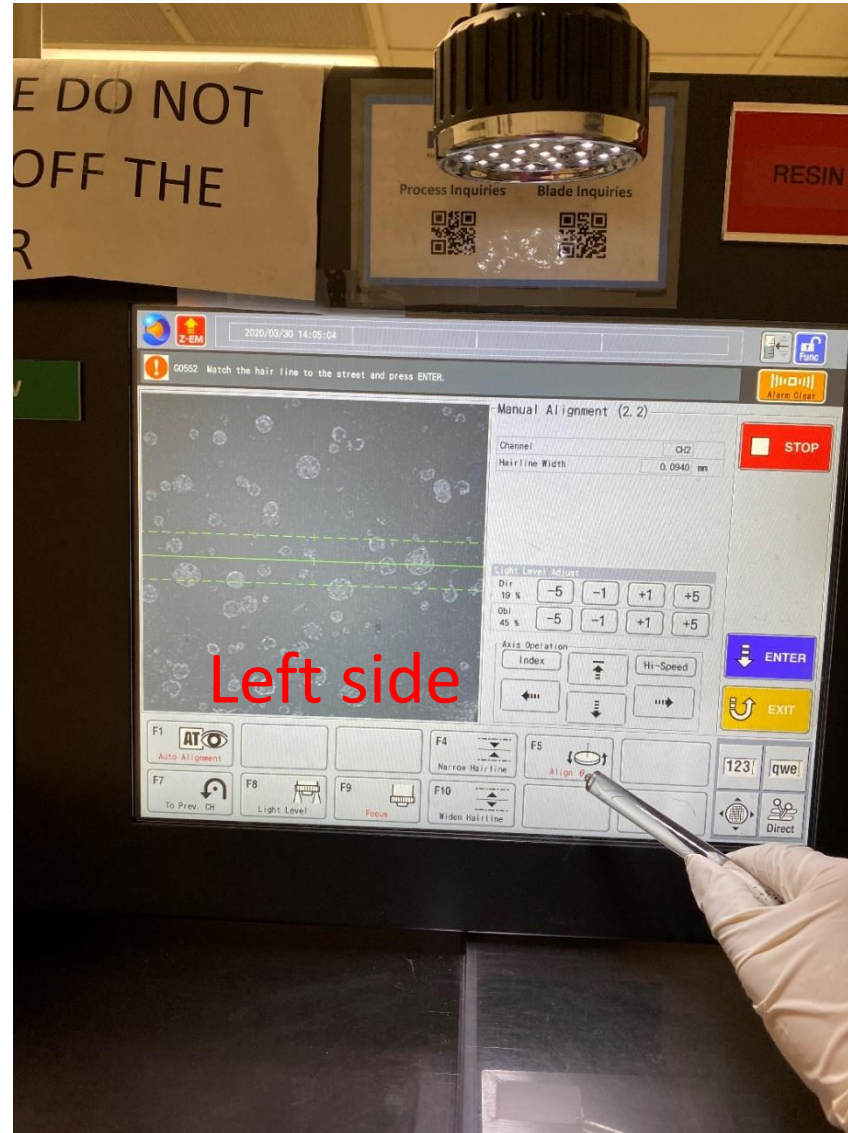
# 38. The chuck will automatically rotate to CH2 in Manual Alignment

In manual alignment, the default is two direction. Starting with CH1, then automatically rotate to CH2 after clicking Enter



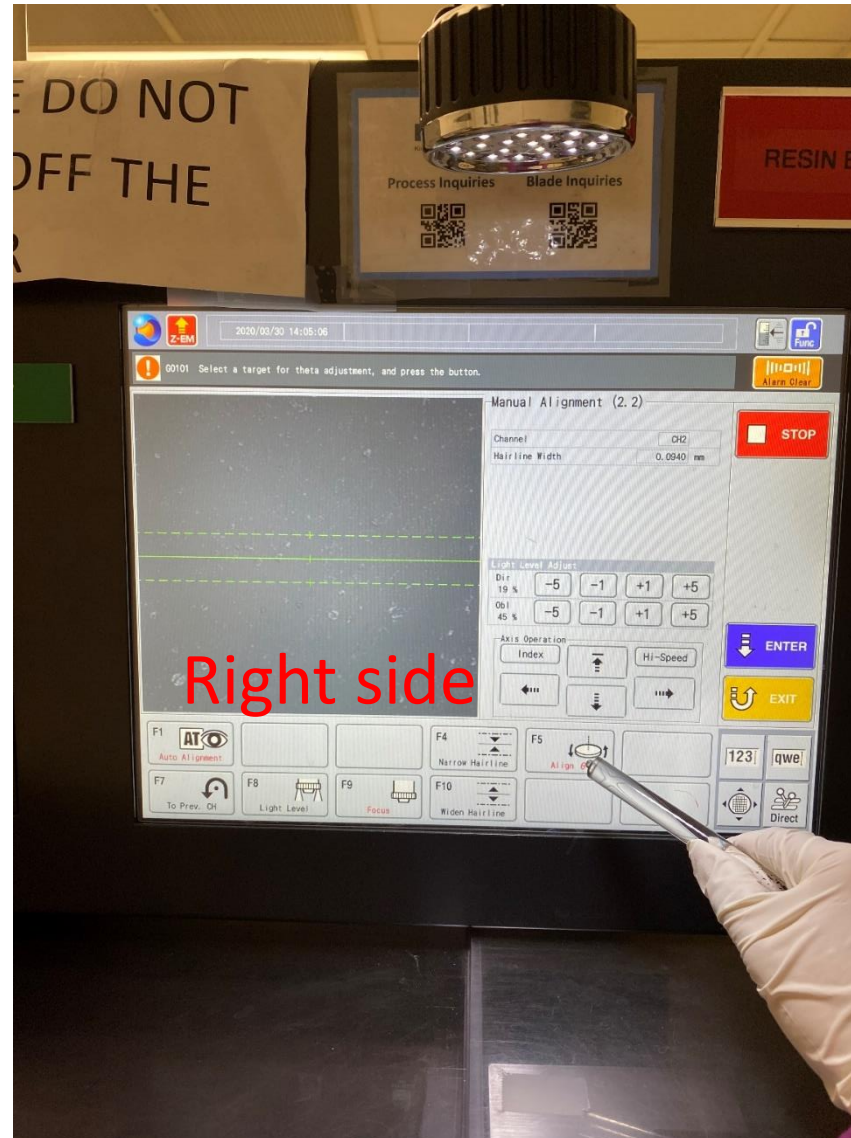
39. In CH2, click Align  $\theta$  2X times without changing the alignment, if you are going to cut CH1

Otherwise click Align  $\theta$  2X times in CH1 without changing the alignment, if you are going to cut CH2



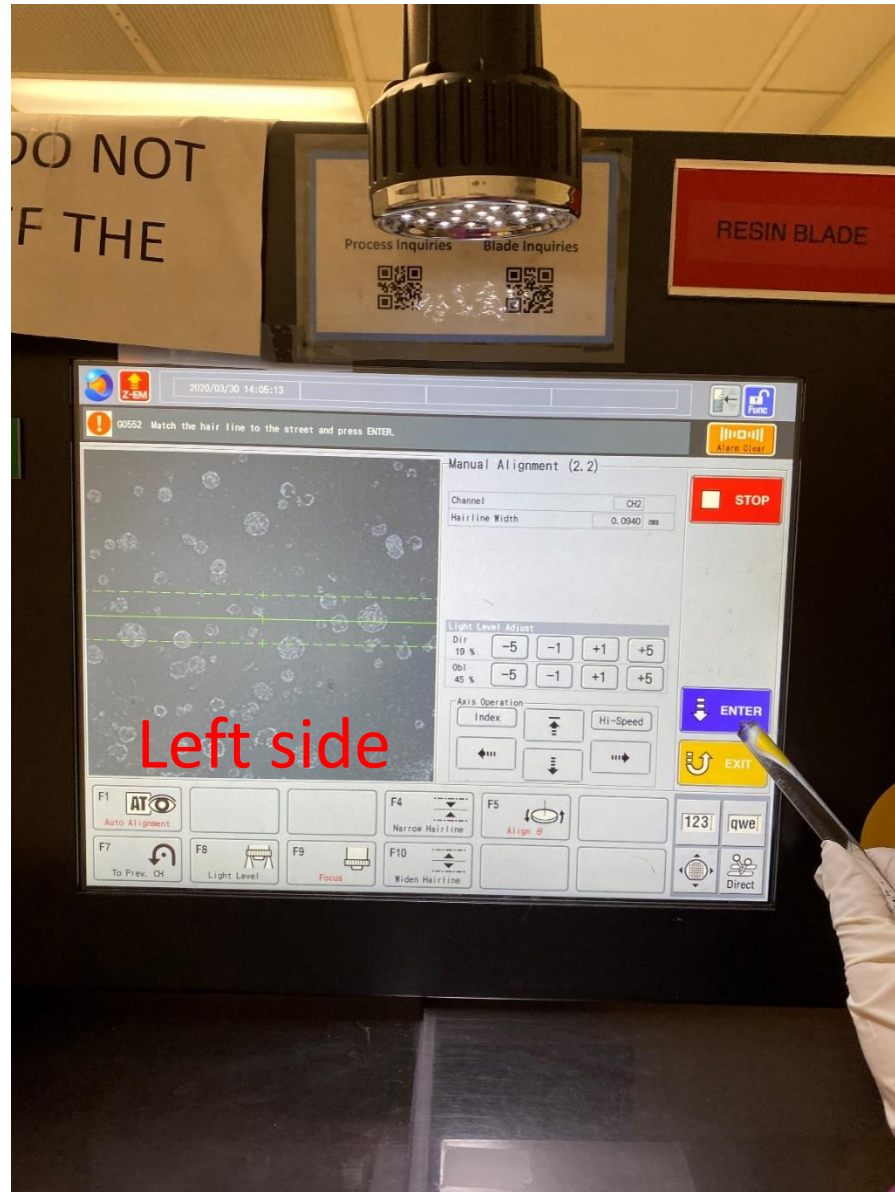
39. In CH2, click Align  $\theta$  2X times without changing the alignment, if you are going to cut CH1

Otherwise click Align  $\theta$  2X times in CH1 without changing the alignment, if you are going to cut CH2

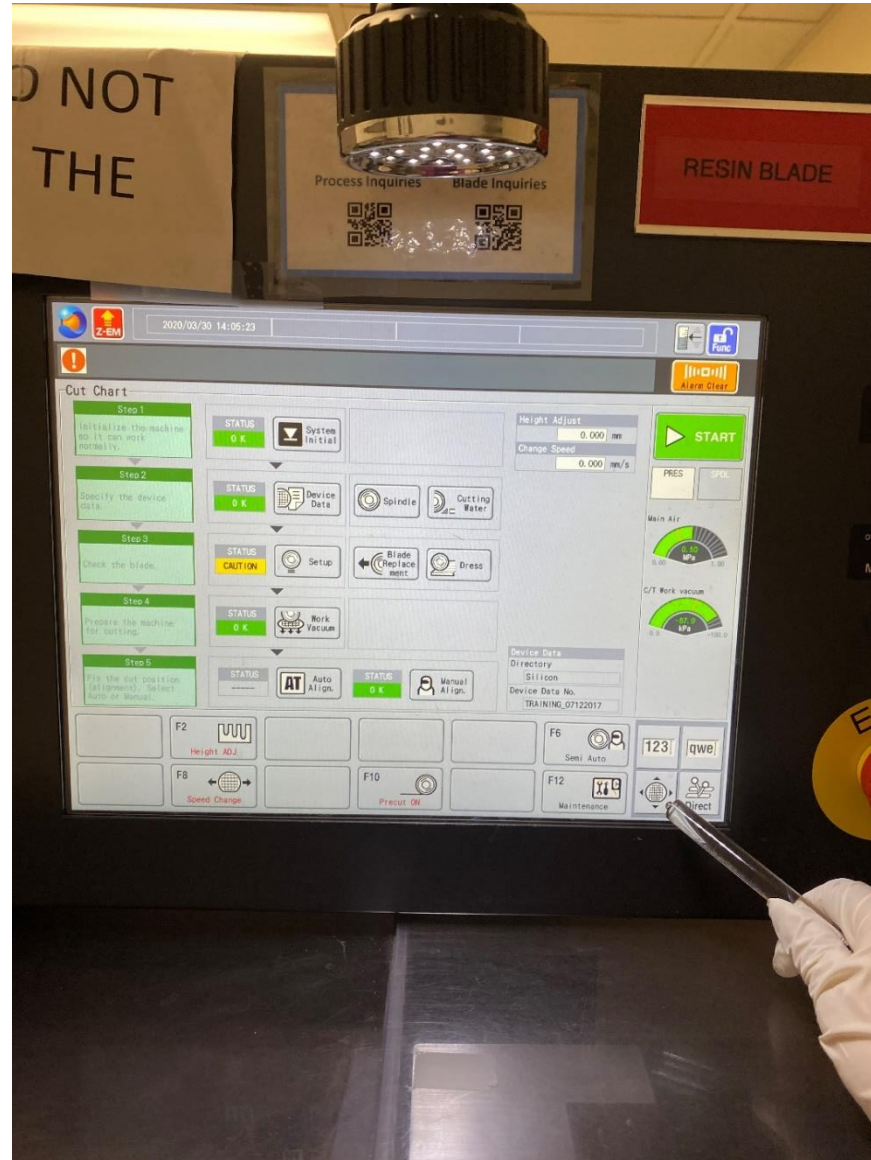




40. When at the left side, click Enter

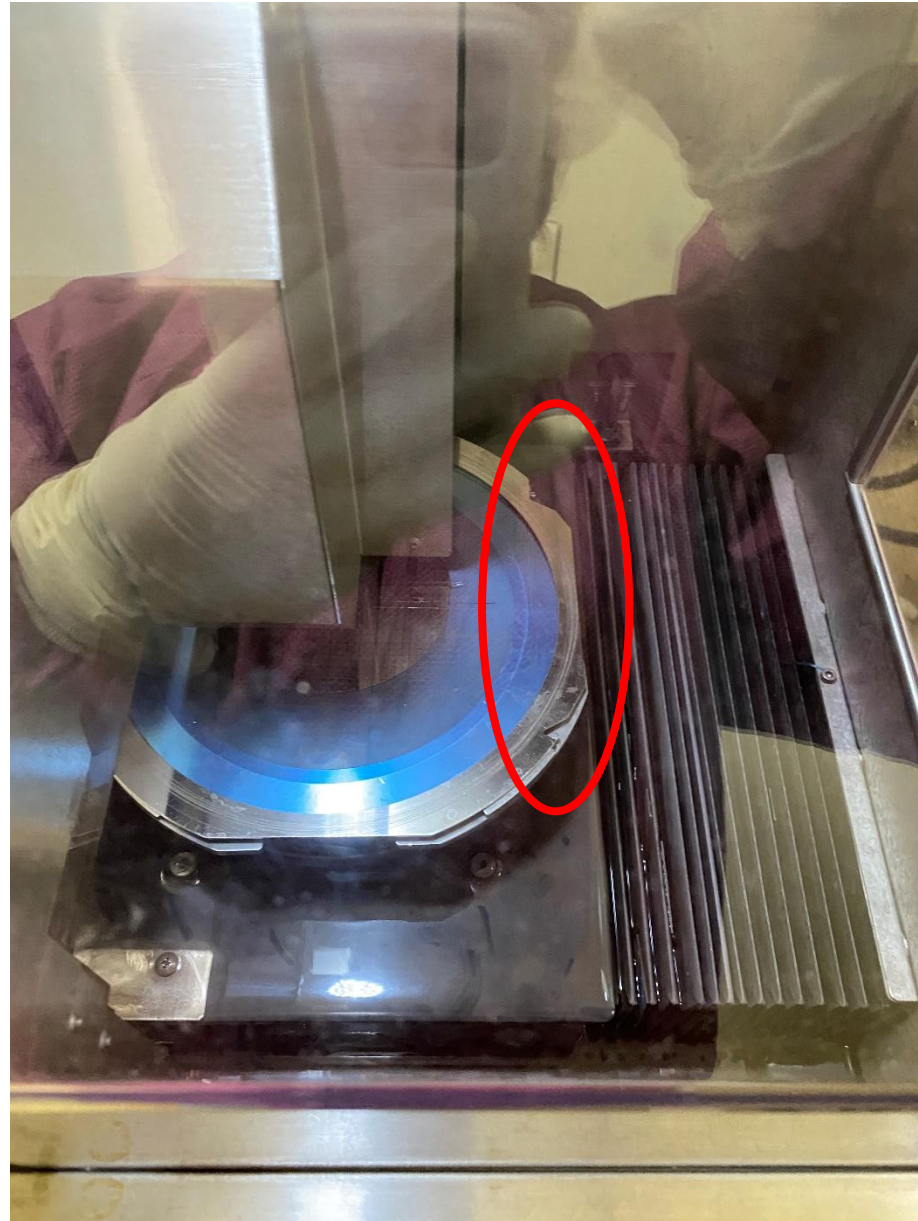


# 41. Click the arrows session



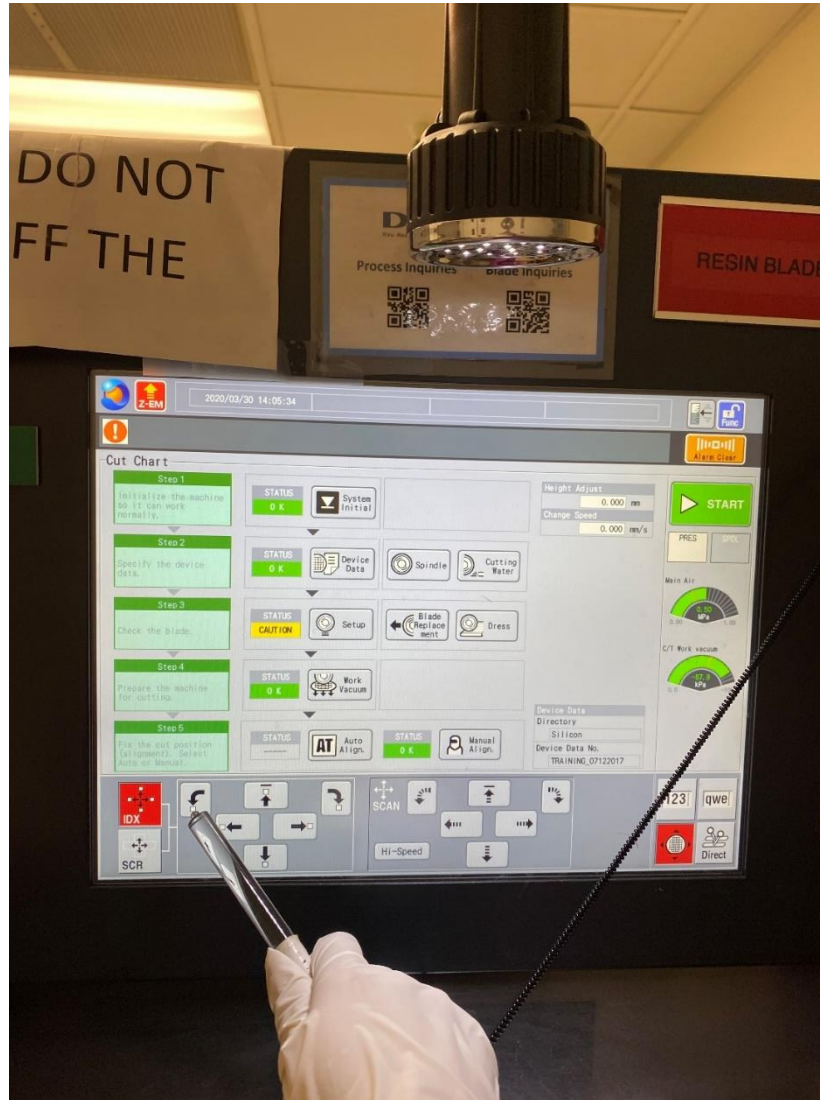
After the Manual Alignment, the chuck stays at CH2. If you are going to cut CH2, then you can skip this step; If you are Going to cut CH1, then you need to Rotate back to CH1

CH2

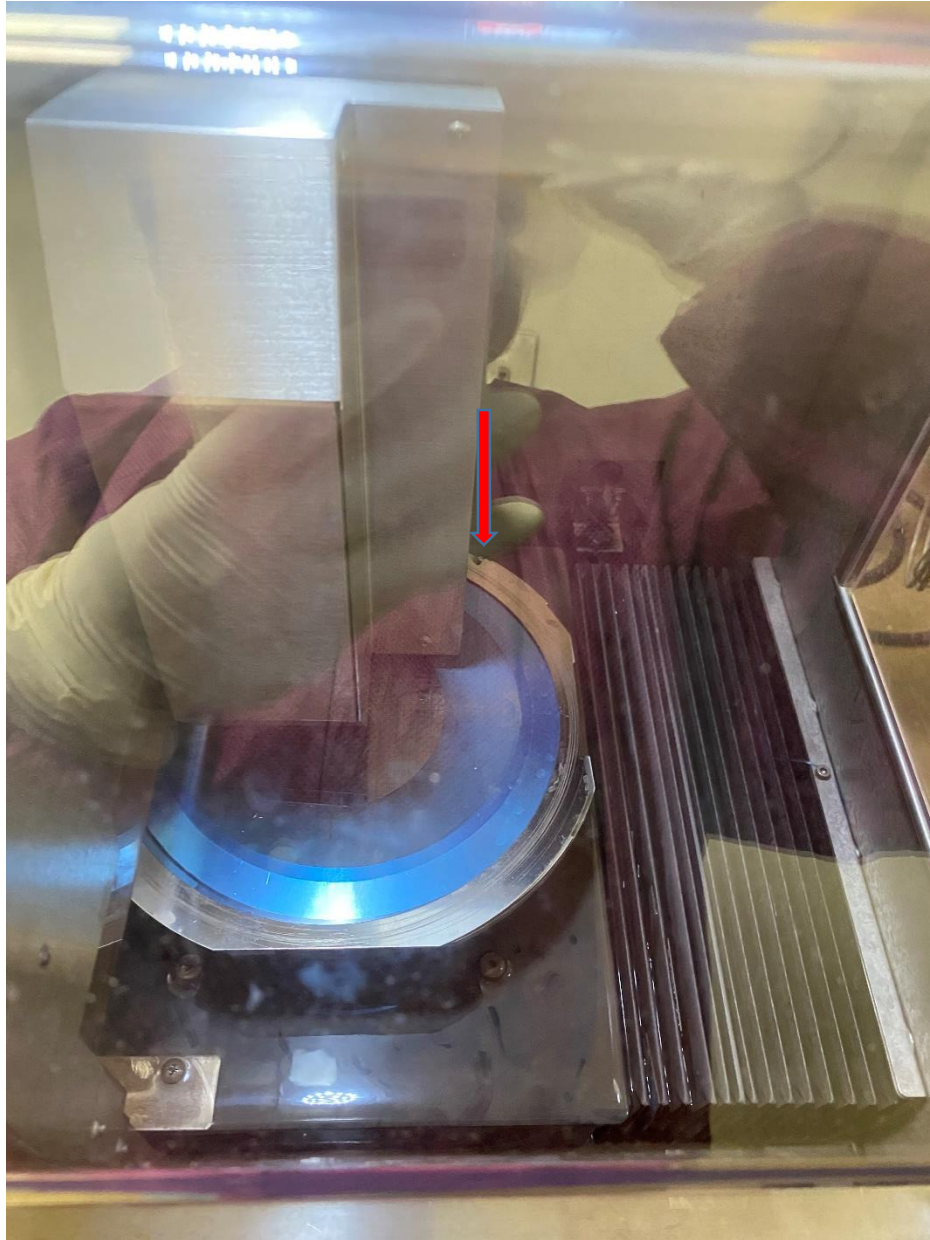




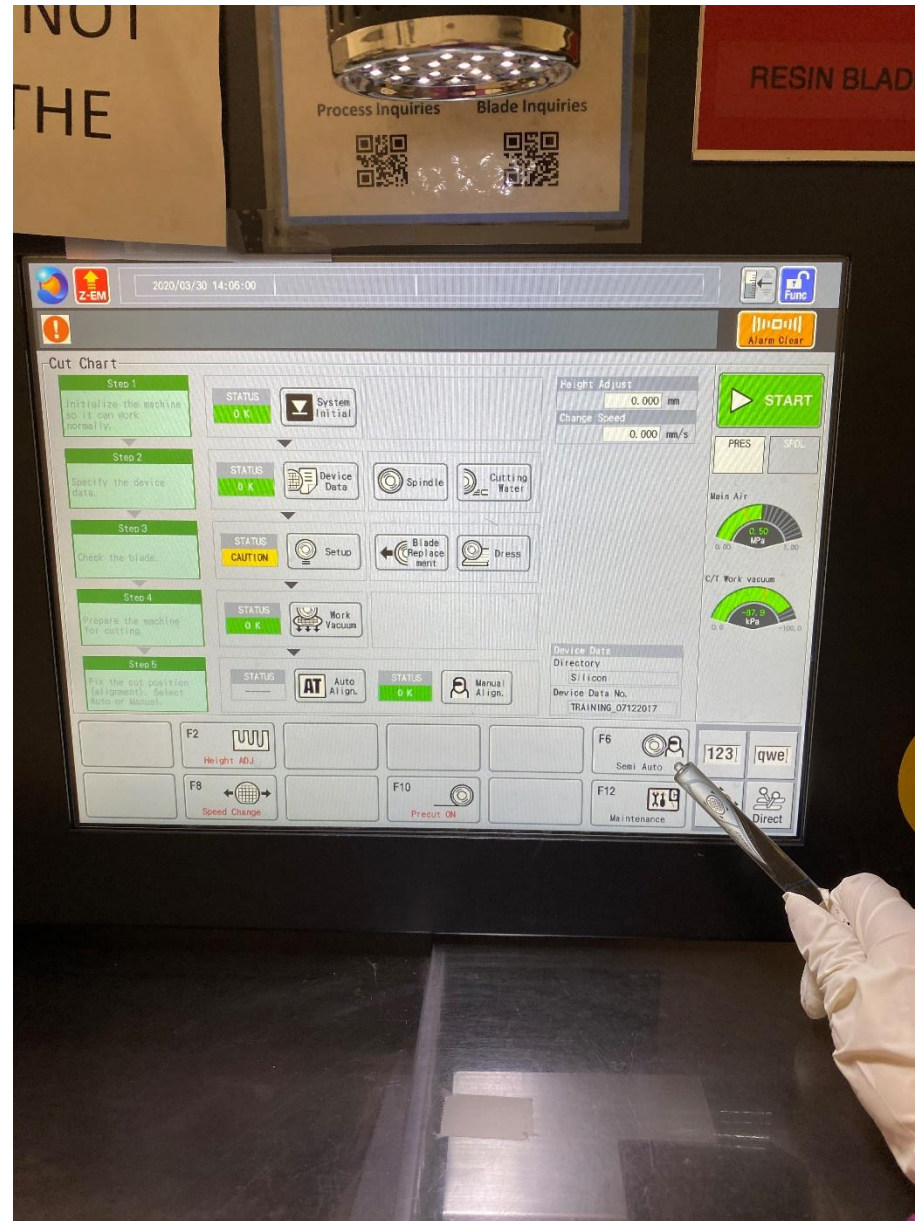
42. Turn counter clockwise for 90degree to rotate back to CH1, if you are going to cut CH1



CH1



# 43. Go to Semi Auto mode

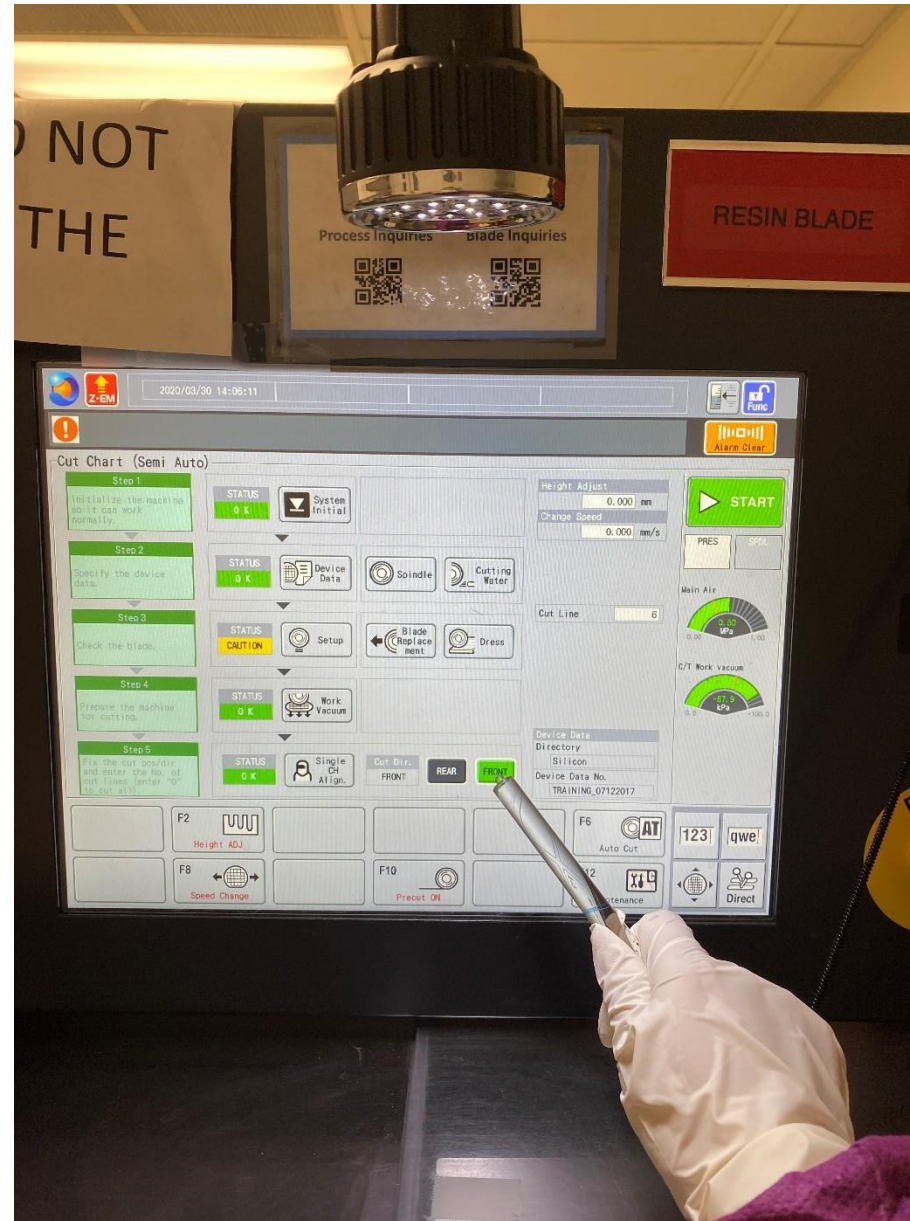




# 44. Choose cut direction

Front:  
from where you assign/align toward  
the front (near you)

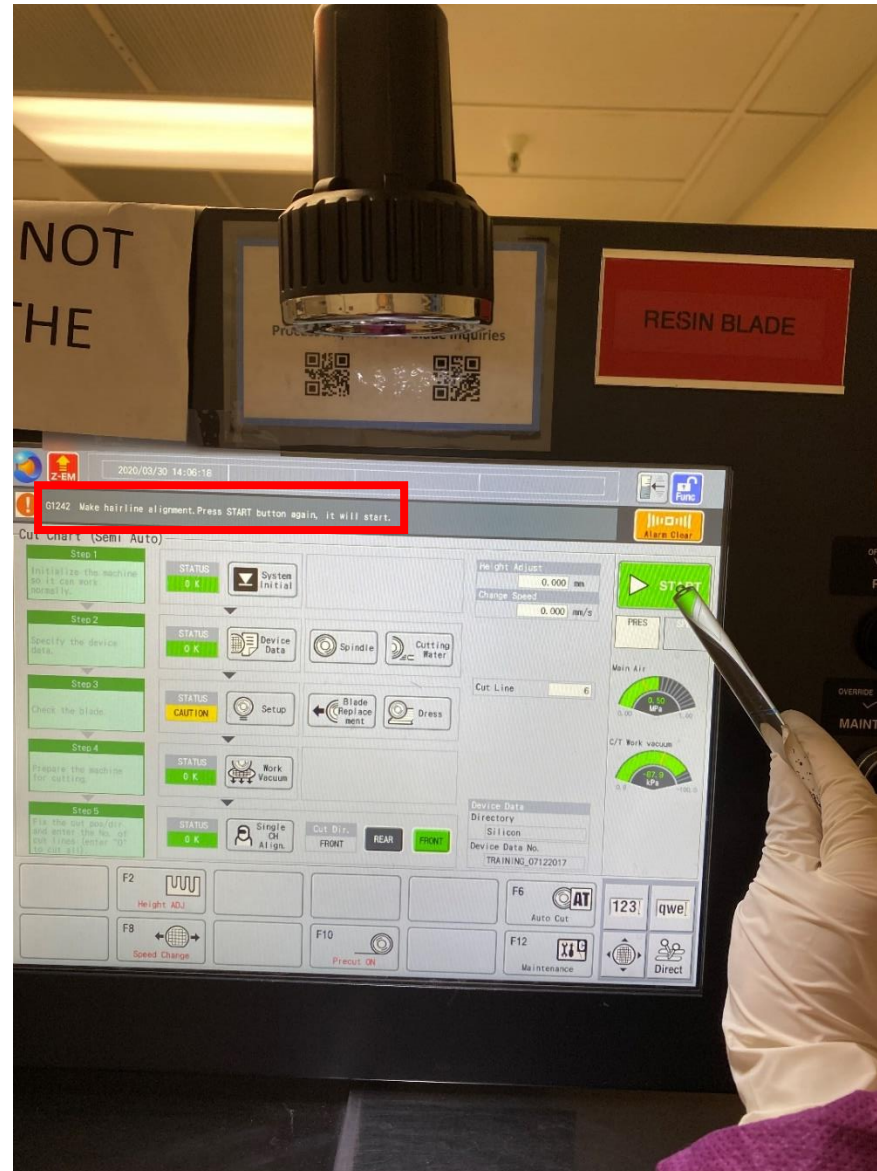
Back:  
from where you assign/align toward  
the back (away from you)



# 45. Click Start



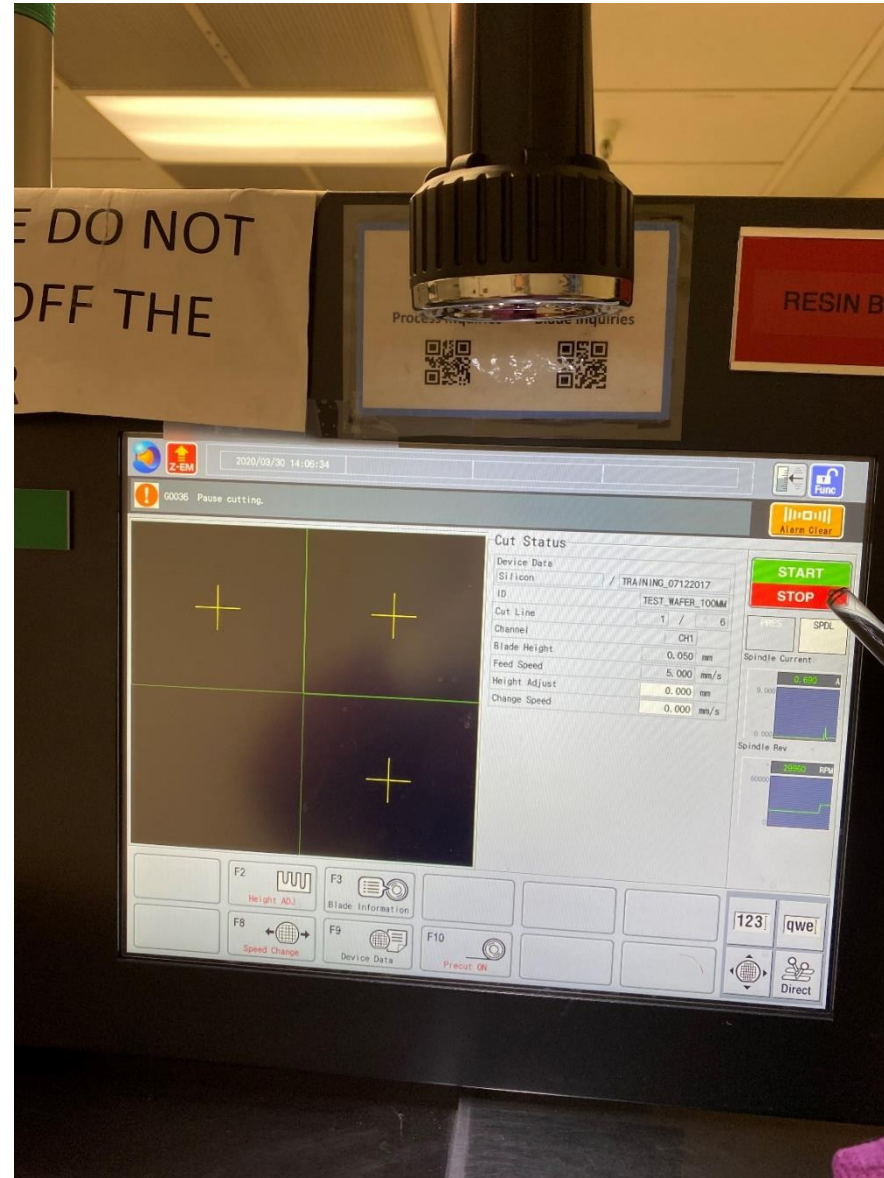
# 46. Check the status and click Start again





# 47. Click Stop, it will finish the current cut then stop

Usually you only need one test cut to do hairline alignment

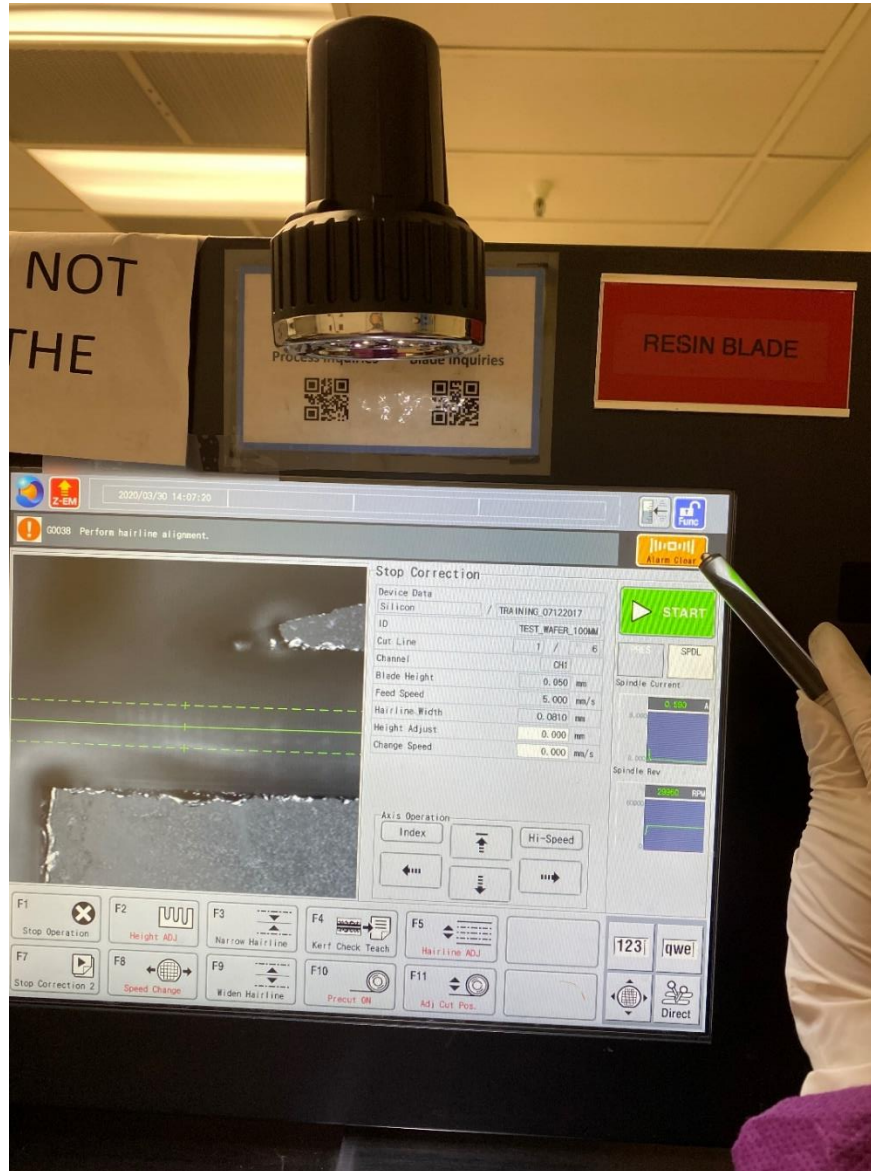


# 48. Check cooling water level

Default setting is 1 for  
Both BLADE and SHOWER;  
You may reduce to 0.5 for  
small die size

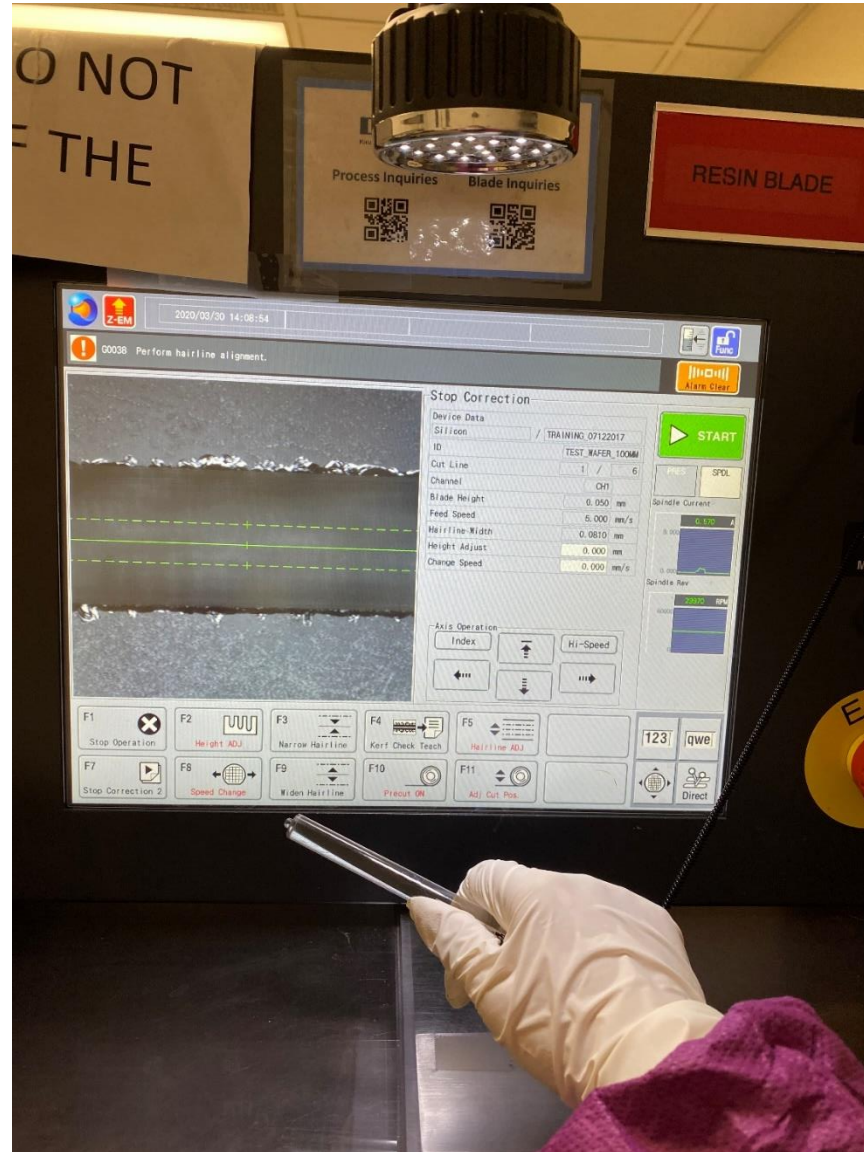


49. There will be beeping alarm after the cut, clear the alarm

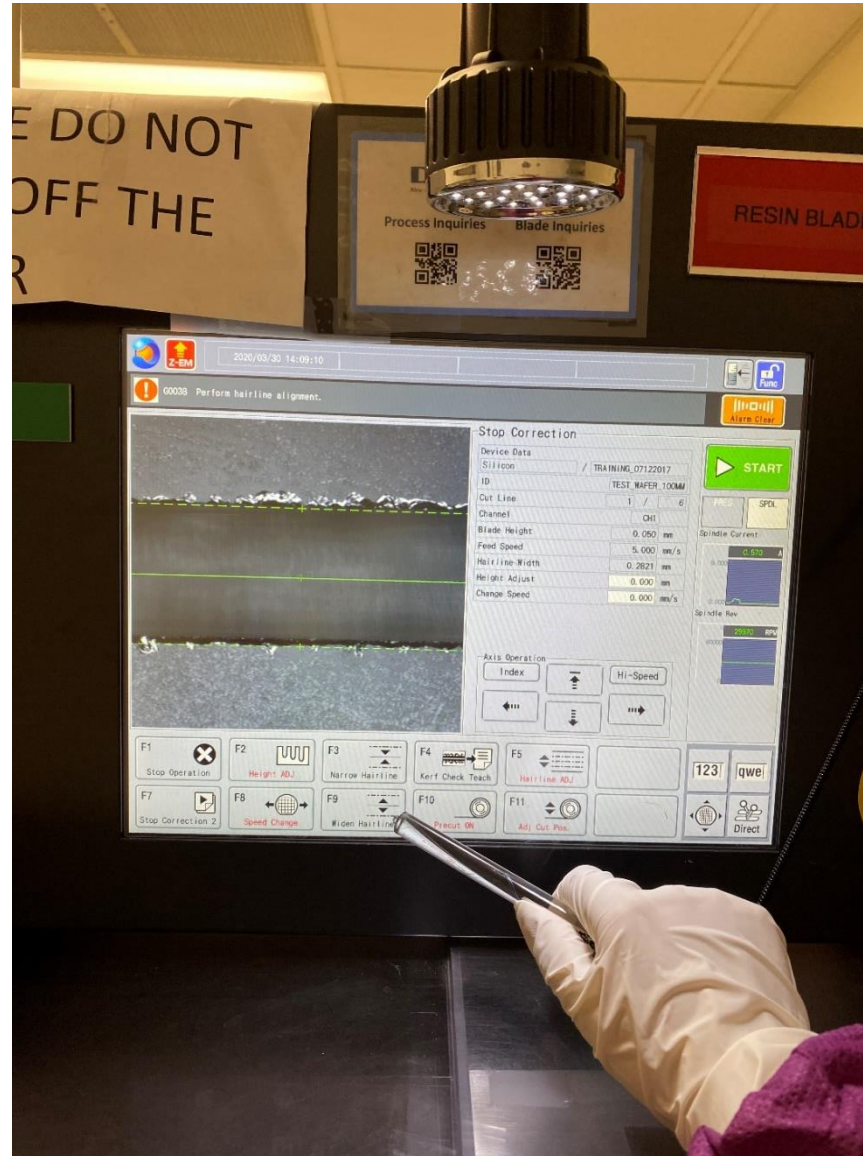




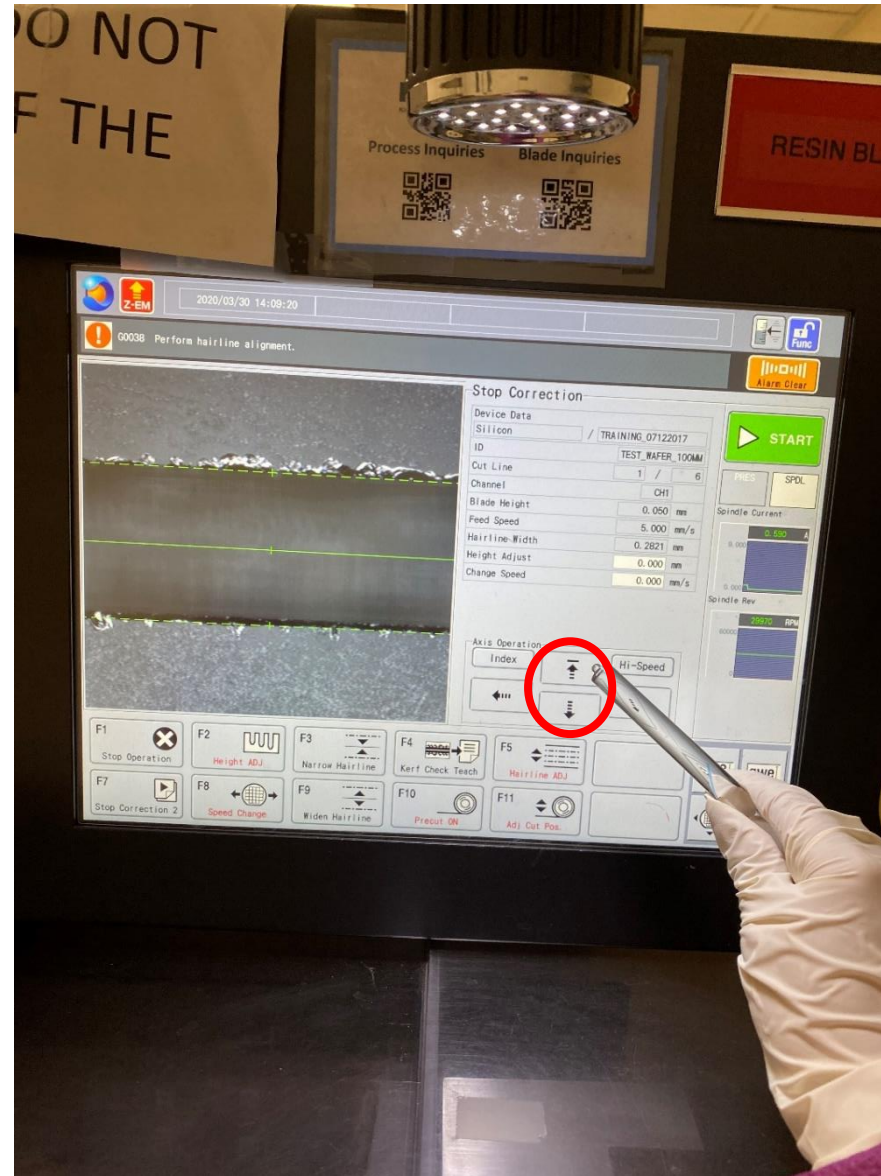
# 50. Check the test cut and hairline



# 51. Align the hairline with the test cut



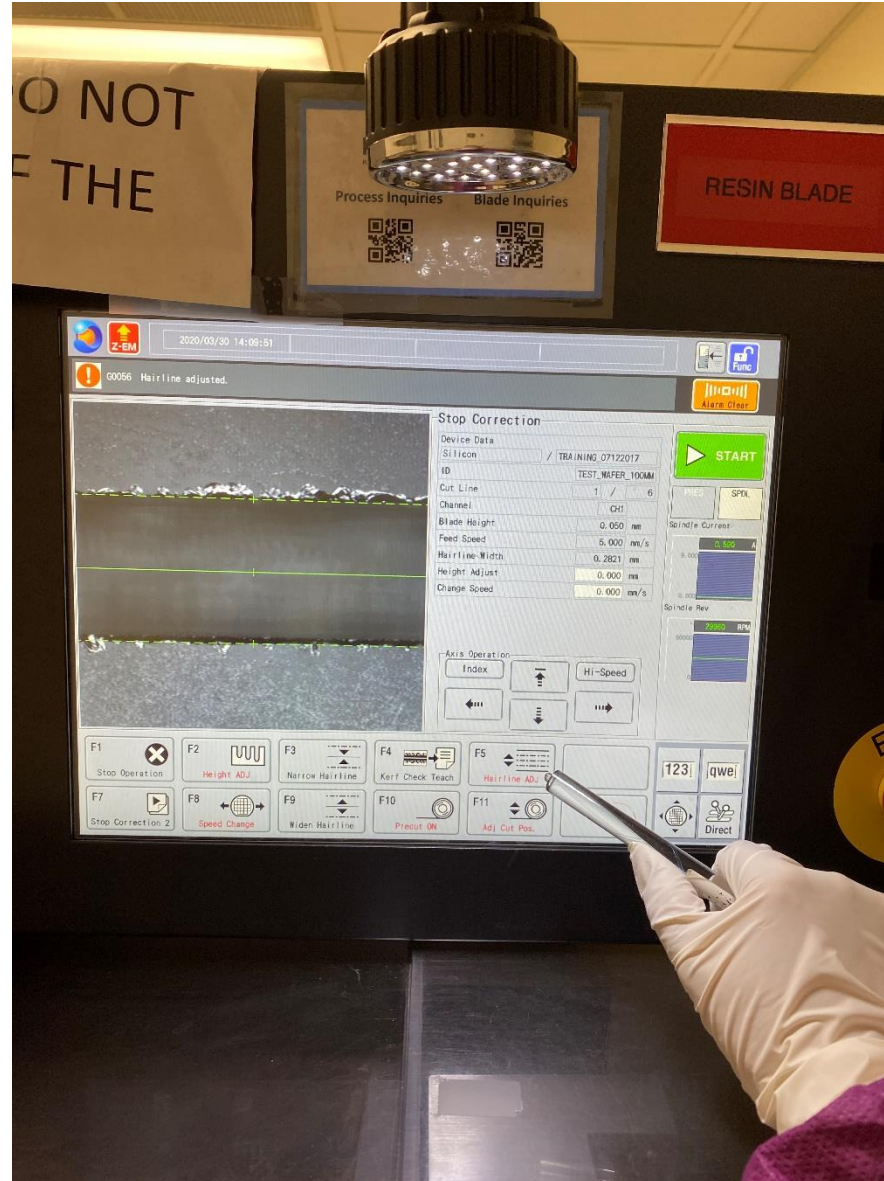
# 51. Align the hairline with the test cut



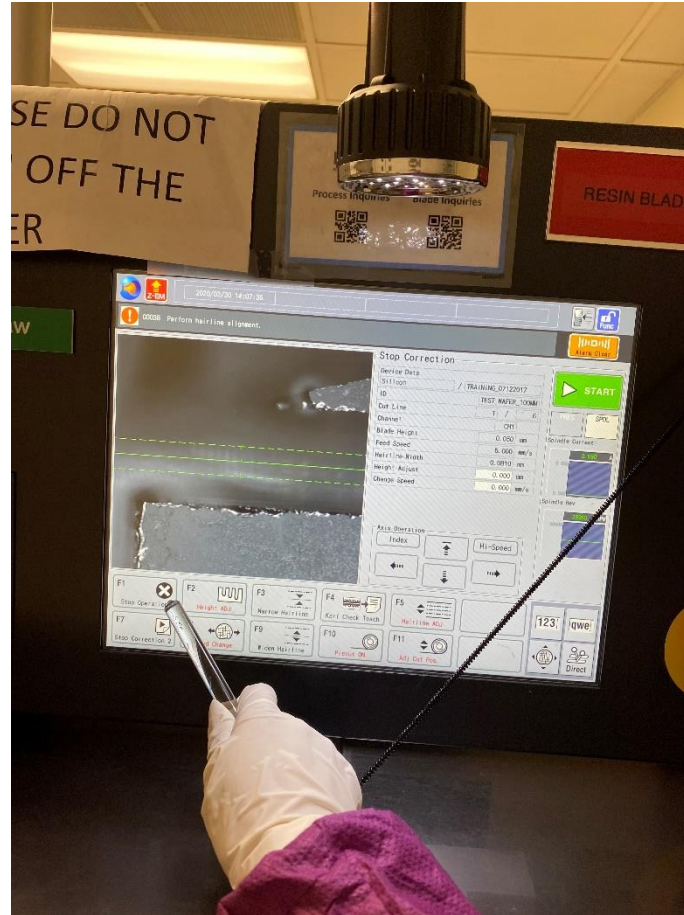
The last click can NOT be down arrow



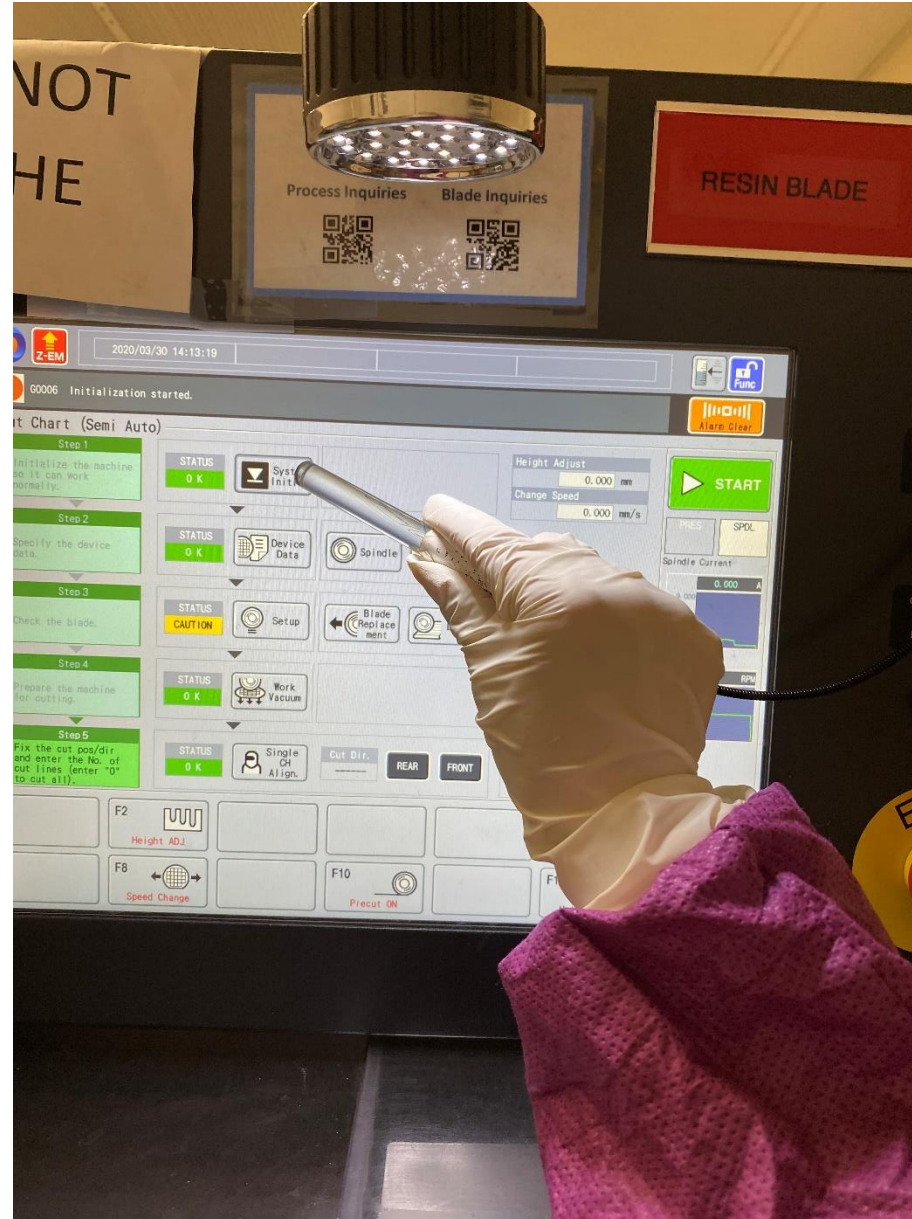
# 52. Click Hairline ADJ to finish hairline alignment



# 53. Stop Operation

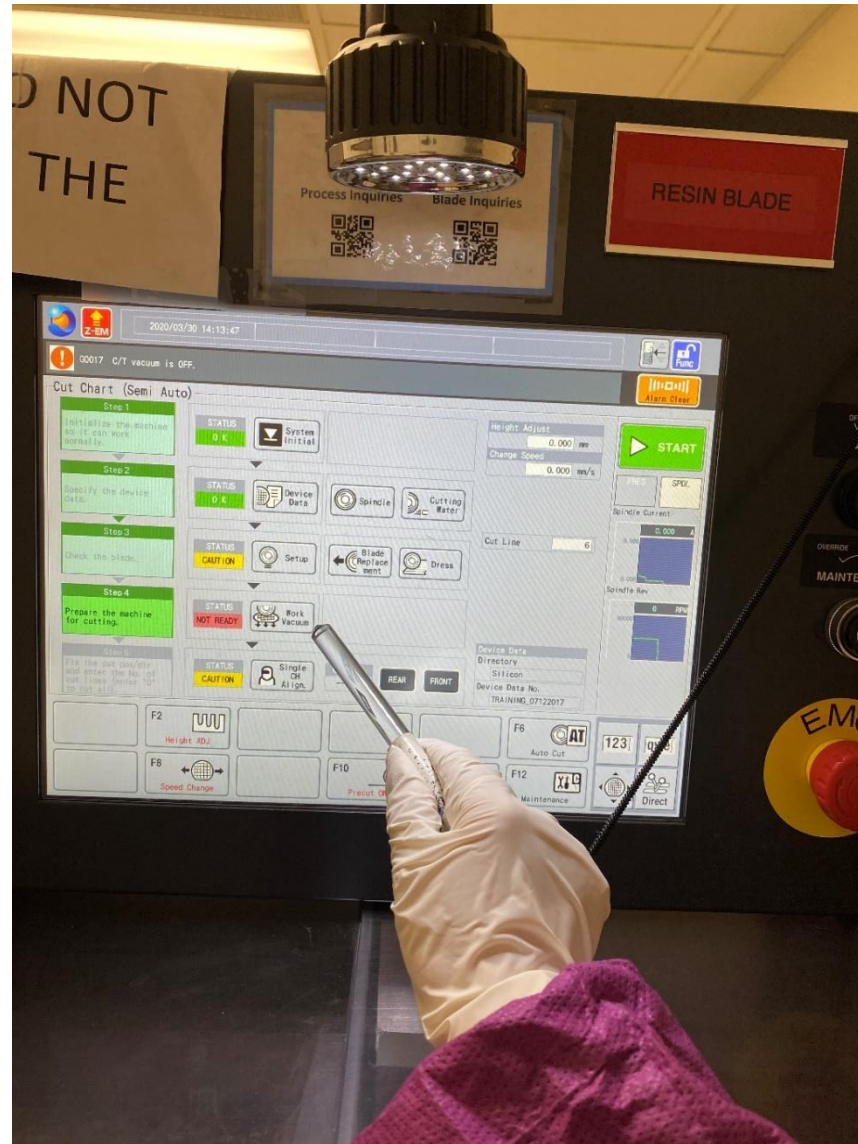


# 53. System Initialize to move the chuck to unloading position

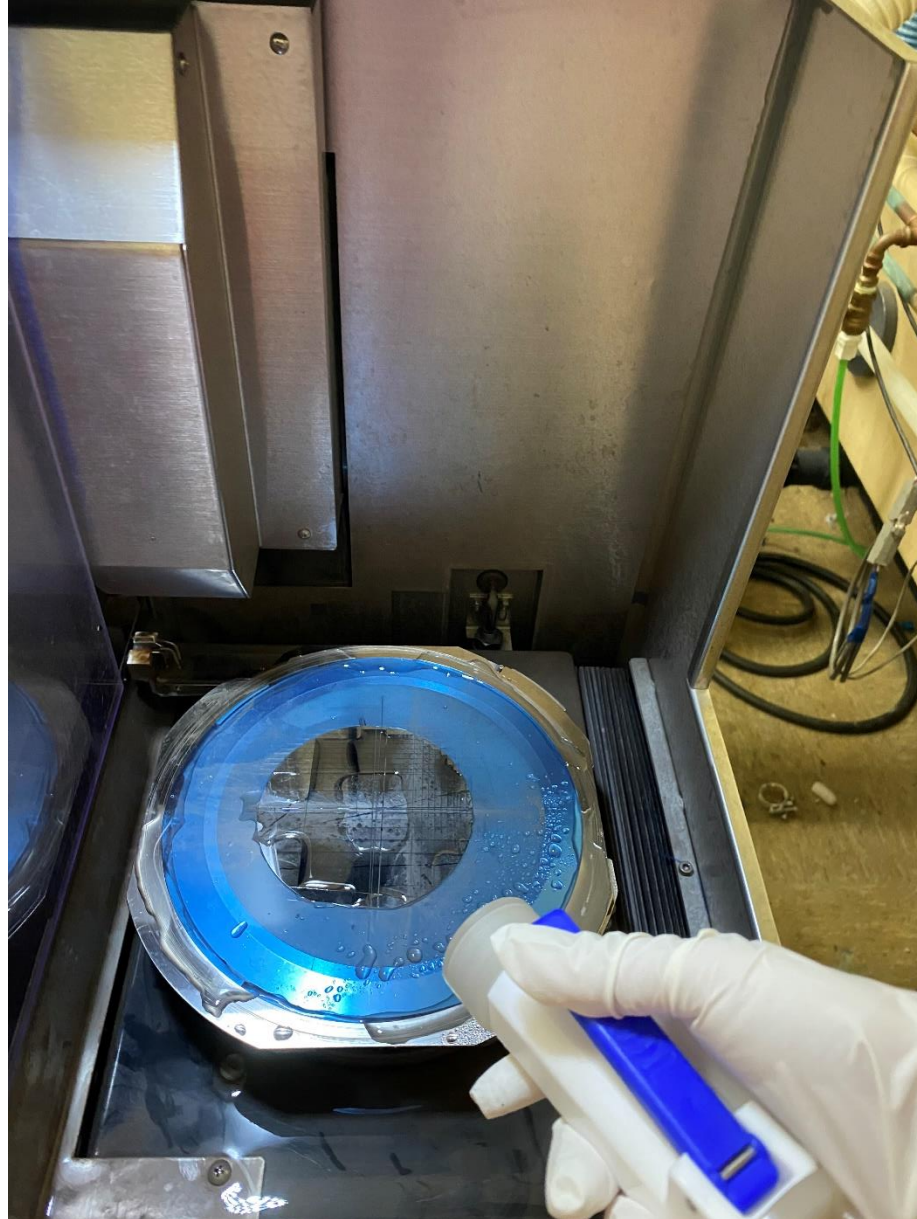




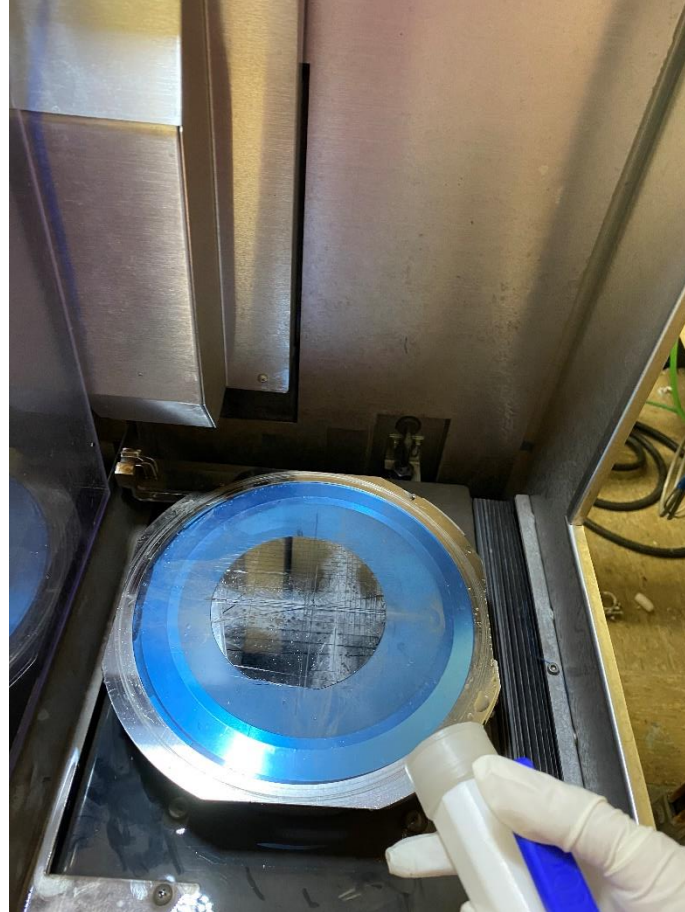
# 54. Turn off Work Vacuum



55. Use the N<sub>2</sub> gun to blow off the water



55. Use the N<sub>2</sub> gun to blow off the water

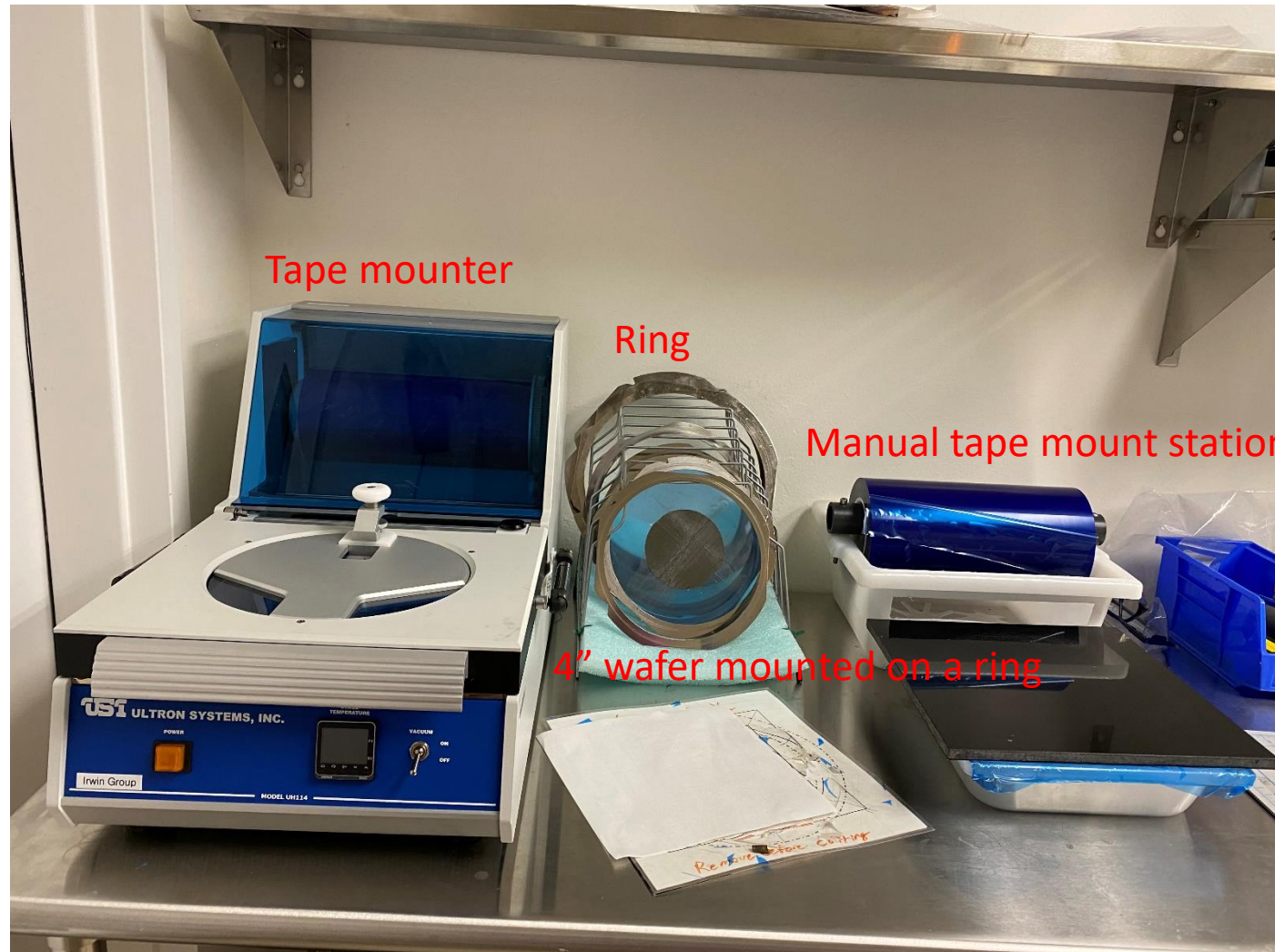




56. Remove the dummy wafer

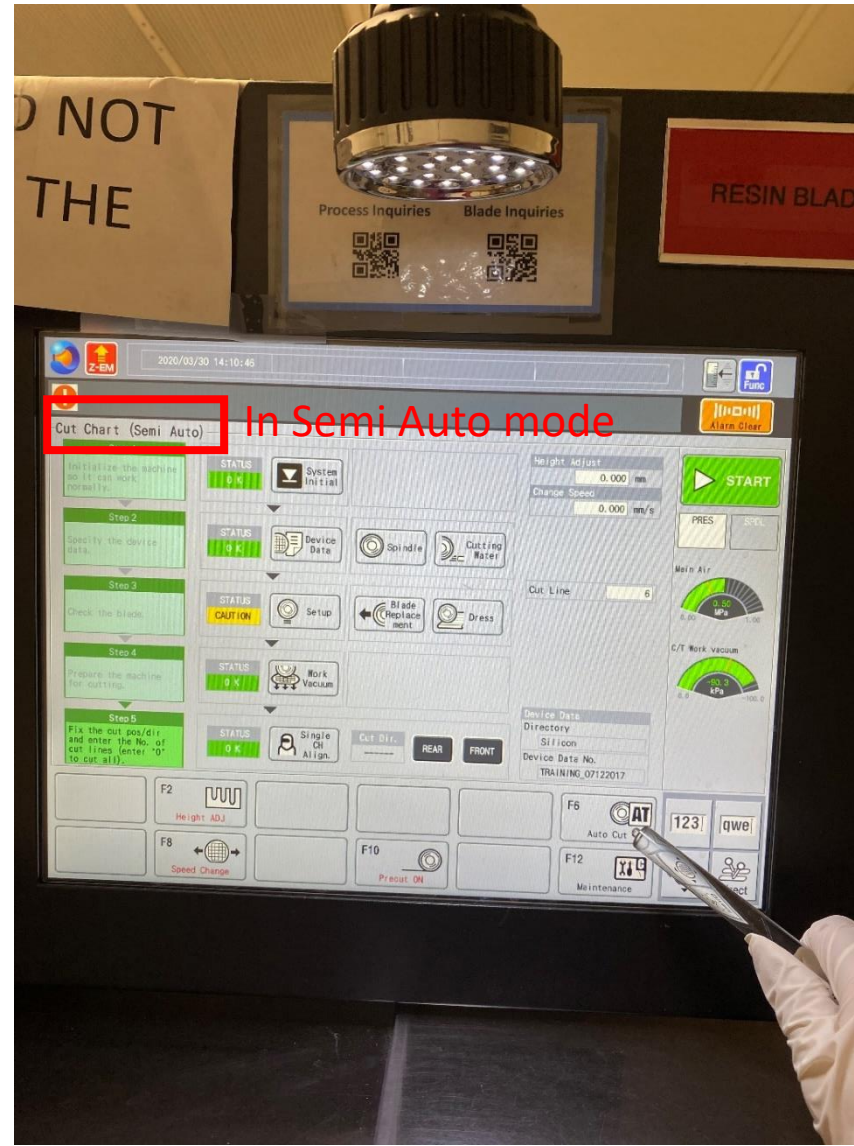


57. Put the dummy wafer back to the Ring Rack, and mount your sample to a ring



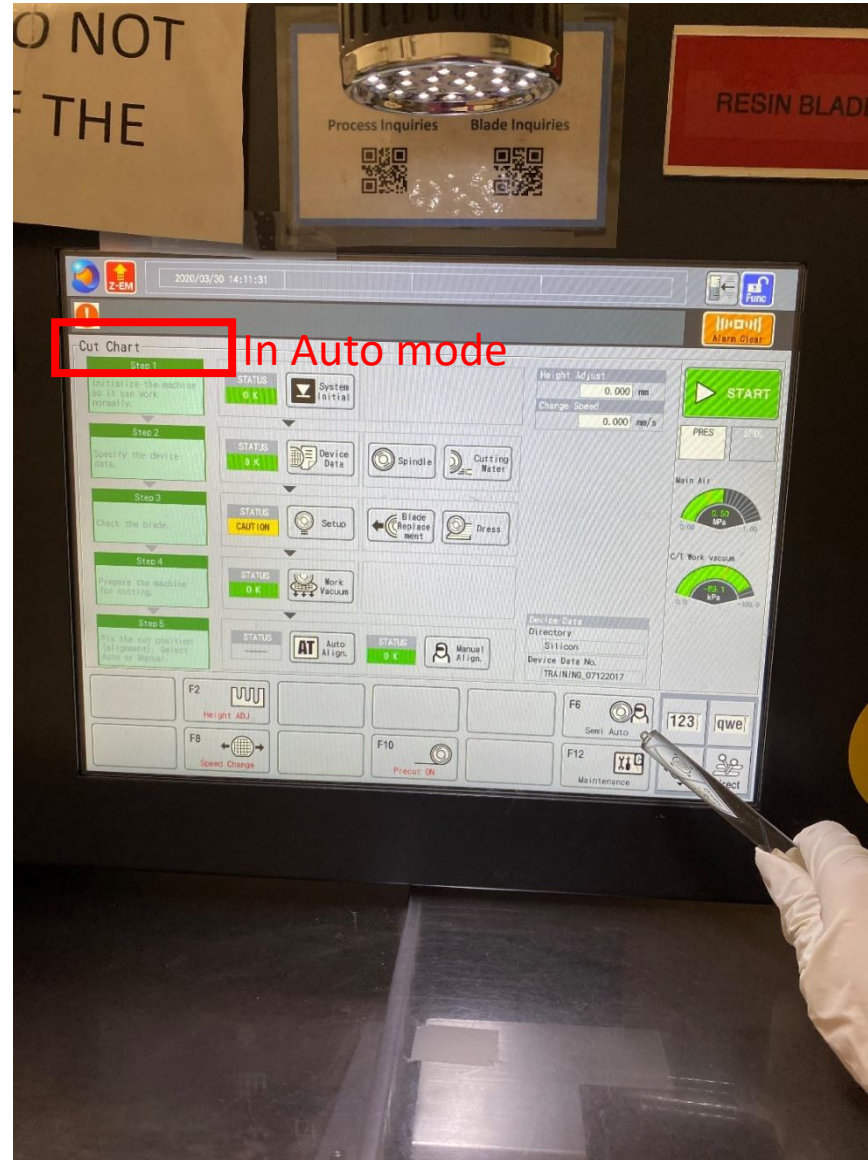
Please refer to  
*Tape Mounter Operation Guide*

# 58. Toggle between Semi Auto and Auto Cut mode, depending on your need

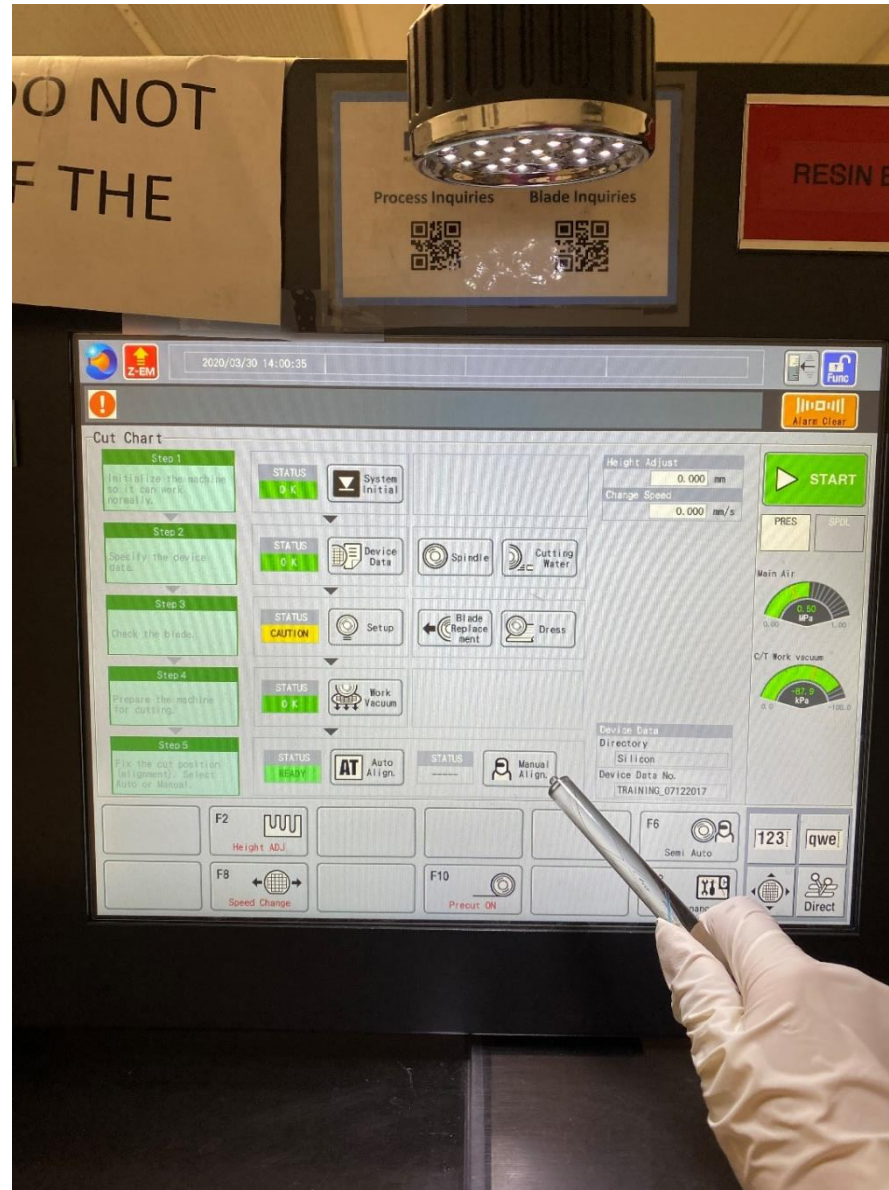




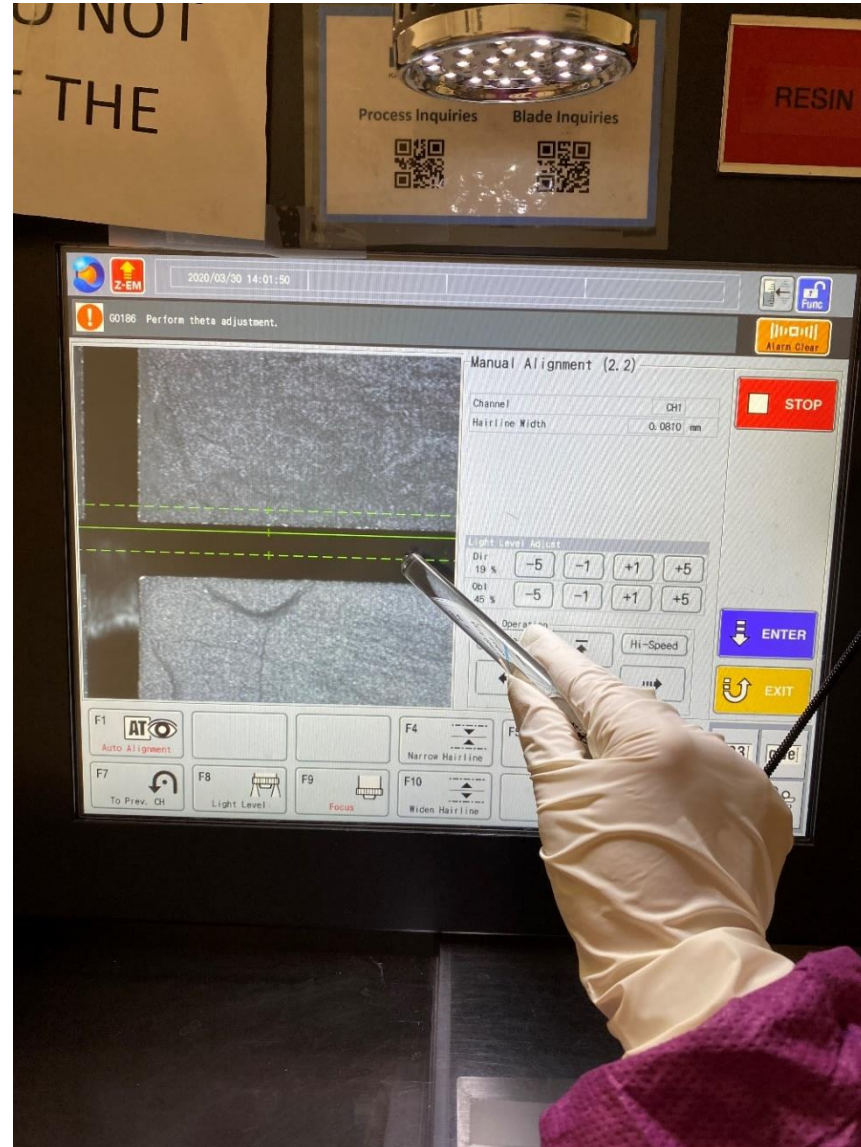
# 58. Toggle between Semi Auto and Auto Cut mode, depending on your need



# 59. In Auto Cut mode, do Manual Alignment



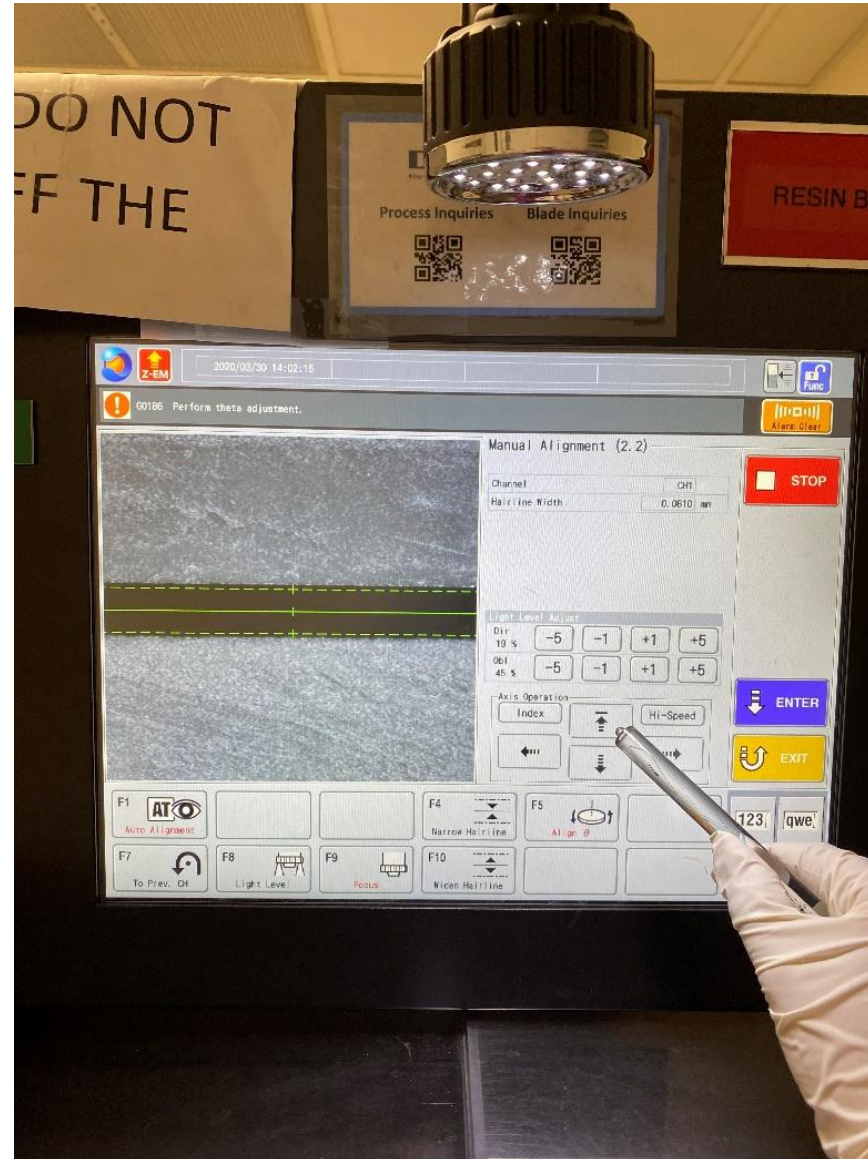
# 60. Align the green hairline with the alignment mark (center and width)



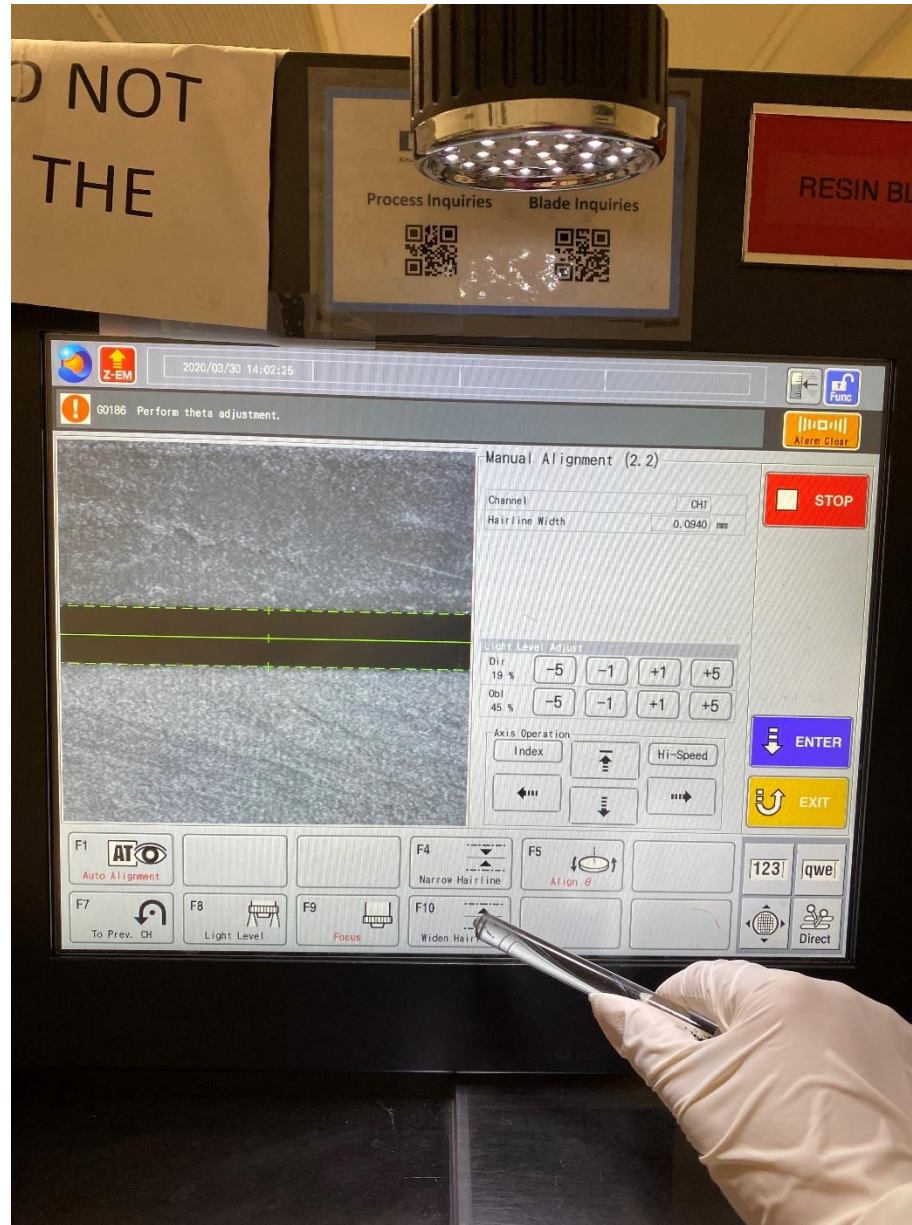
Here we use an existing cut as alignment mark, just to demonstrate how the alignment works. You should have your own alignment marks or street lines on your real sample



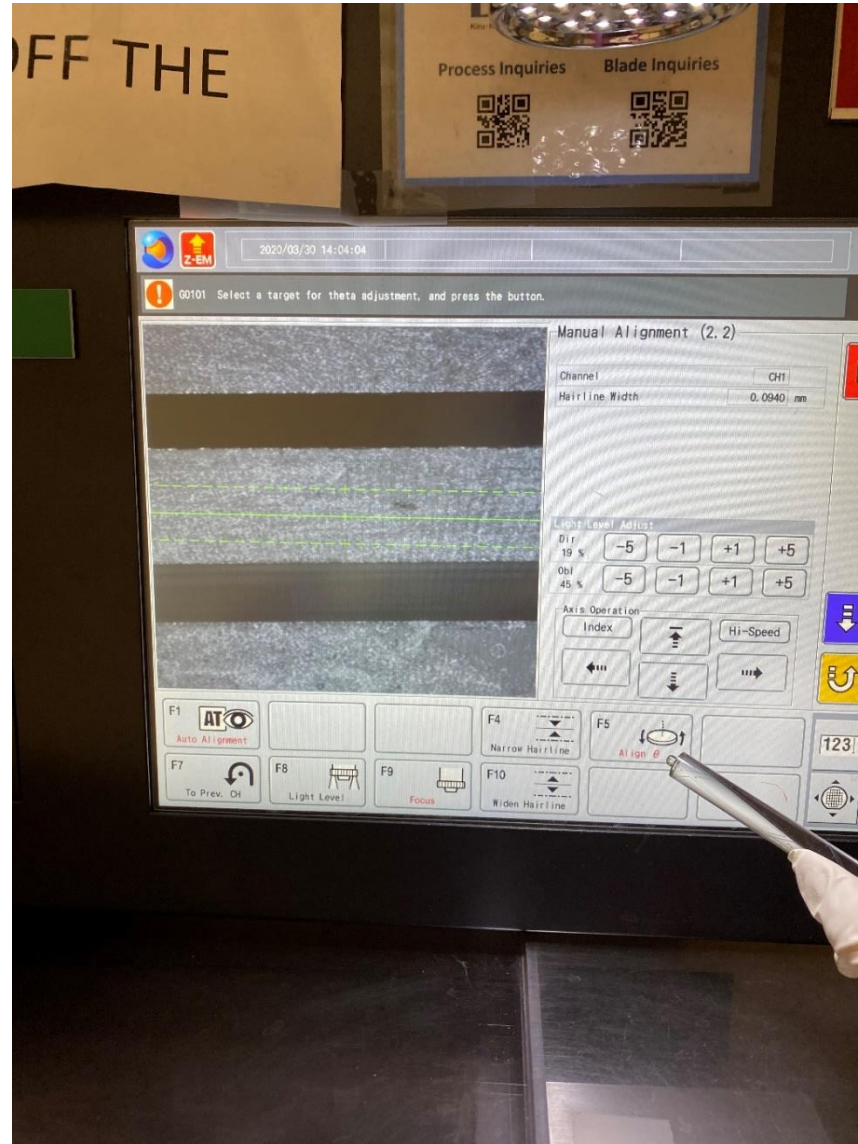
# 61. Fine tune the hairline location



# 62. Fine tune the hairline width



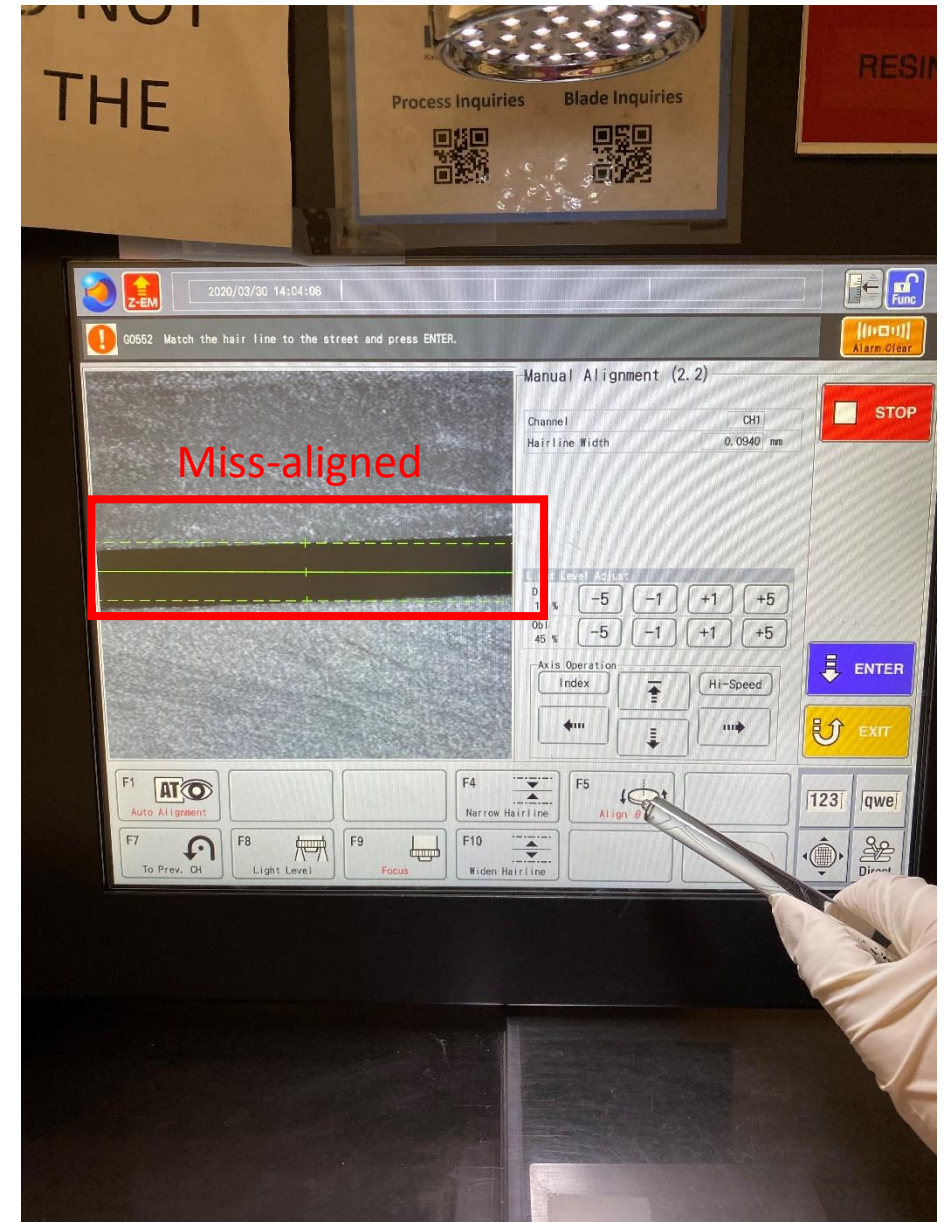
63. Go to the right side of the sample to find another alignment mark by clicking Align  $\theta$



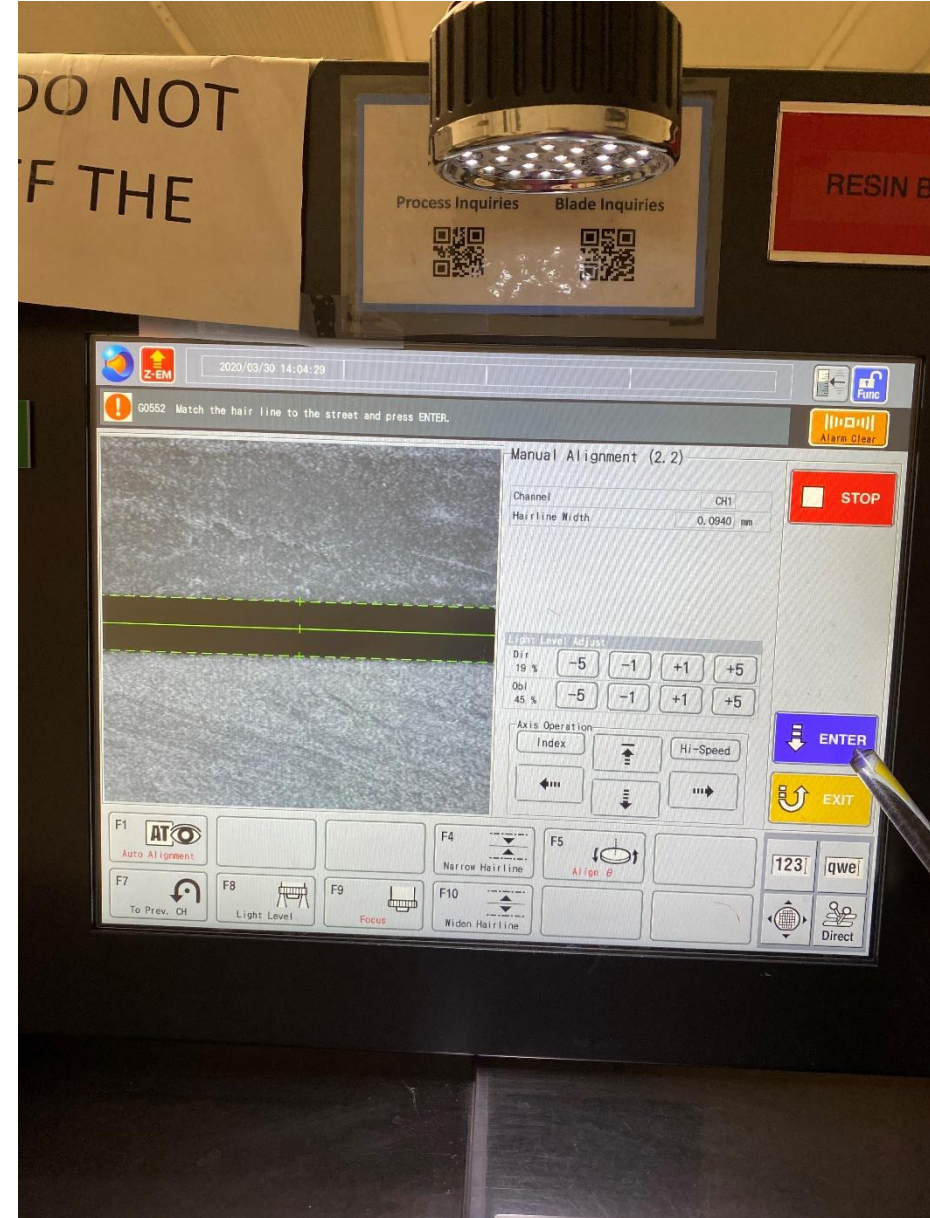


64. Move to the right side alignment mark using the pen tapping, and then click Align  $\theta$  again to go back to the left side alignment mark

If the green hairline and the alignment mark are miss aligned, click Align  $\theta$  again to go to the right side, and find another alignment mark. You can click Align  $\theta$  2X times to tune the locations, but will always go back to the left side when done

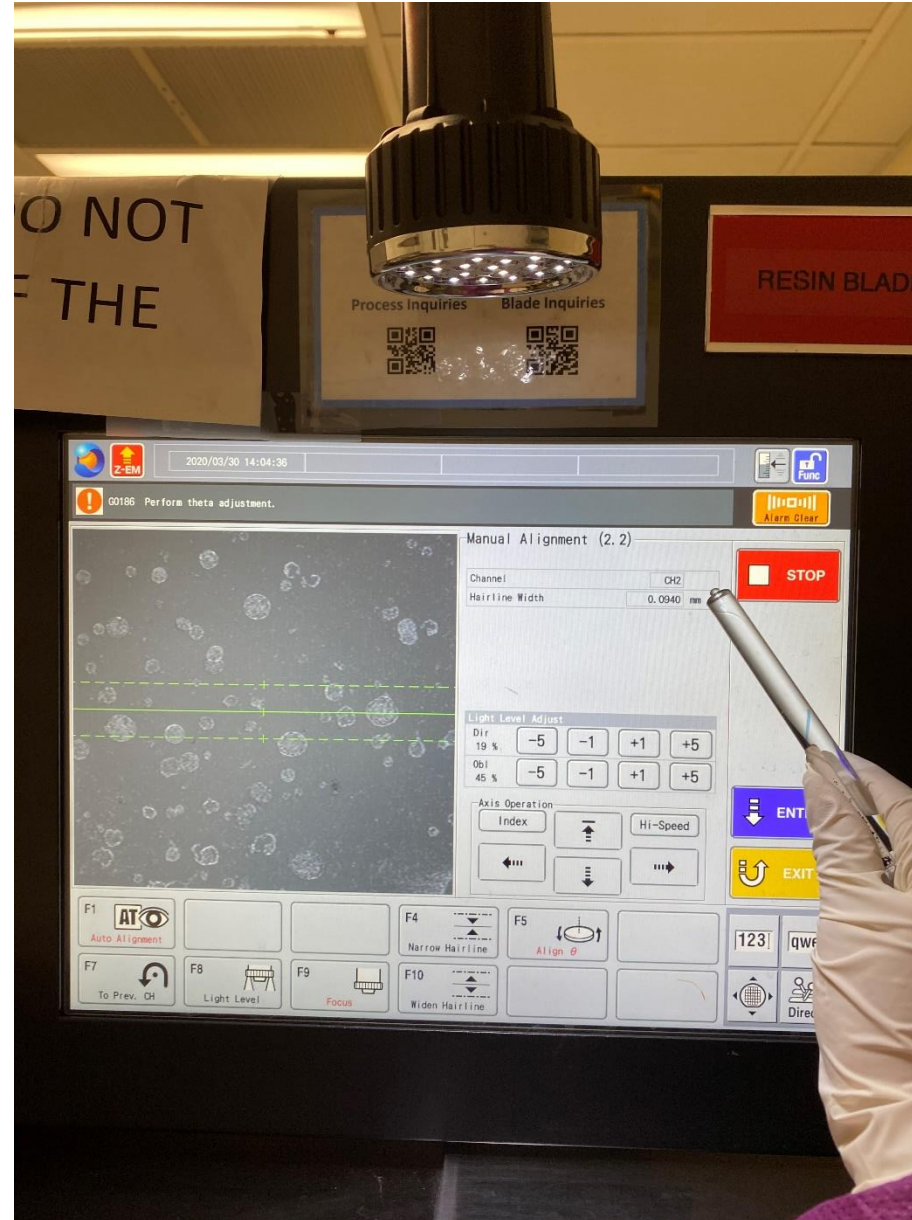


65. When left and right side marks are aligned (and back at the left side), click Enter



# 66. The chuck will automatically rotate to CH2 in Manual Alignment

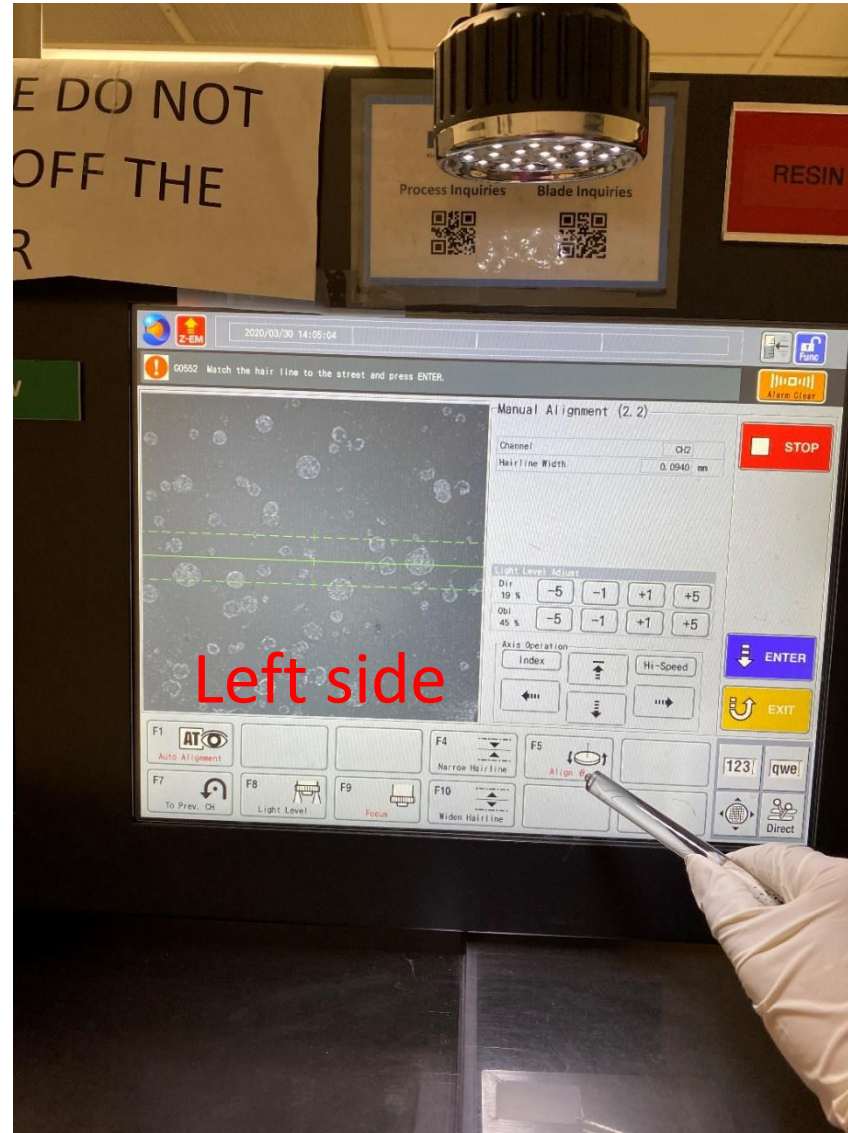
In manual alignment, the default is two direction. Starting with CH1, then automatically rotate to CH2 after clicking Enter





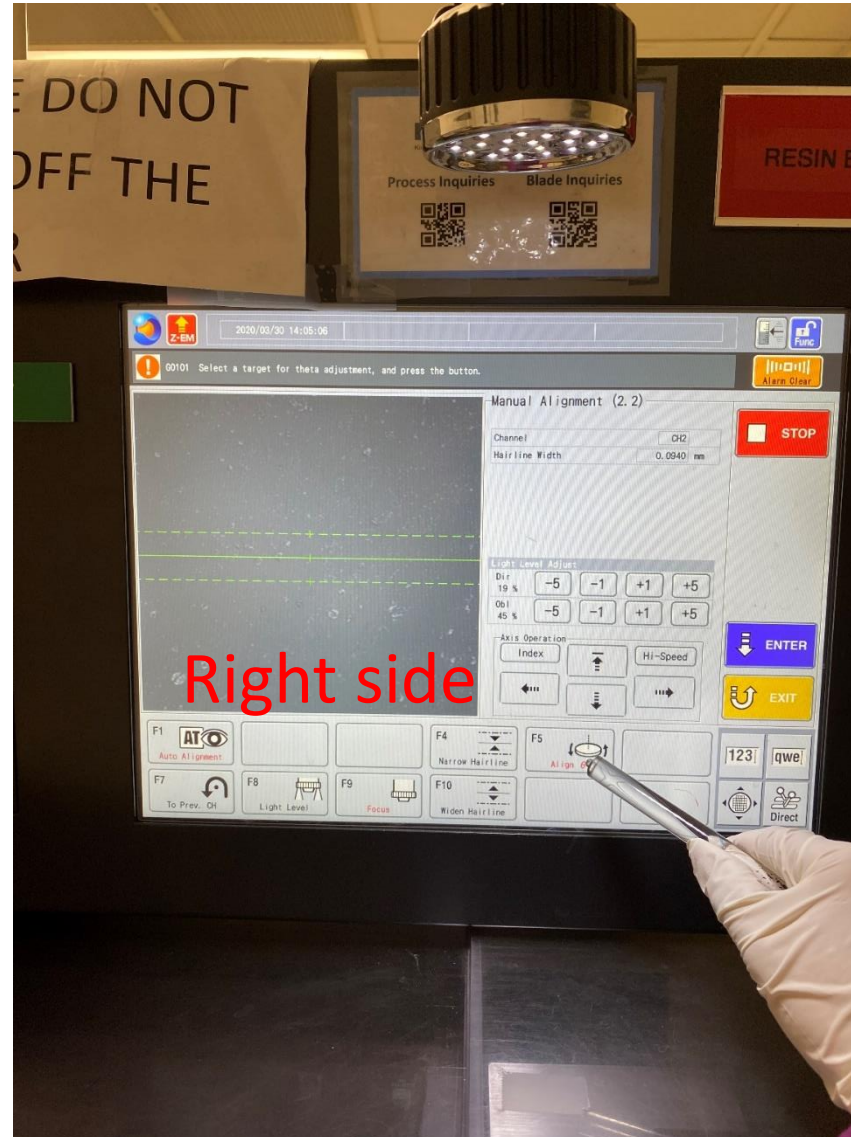
67. In CH2, click Align  $\theta$  2X times without changing the alignment, if you are going to cut CH1

Otherwise click Align  $\theta$  2X times in CH1 without changing the alignment, if you are going to cut CH2

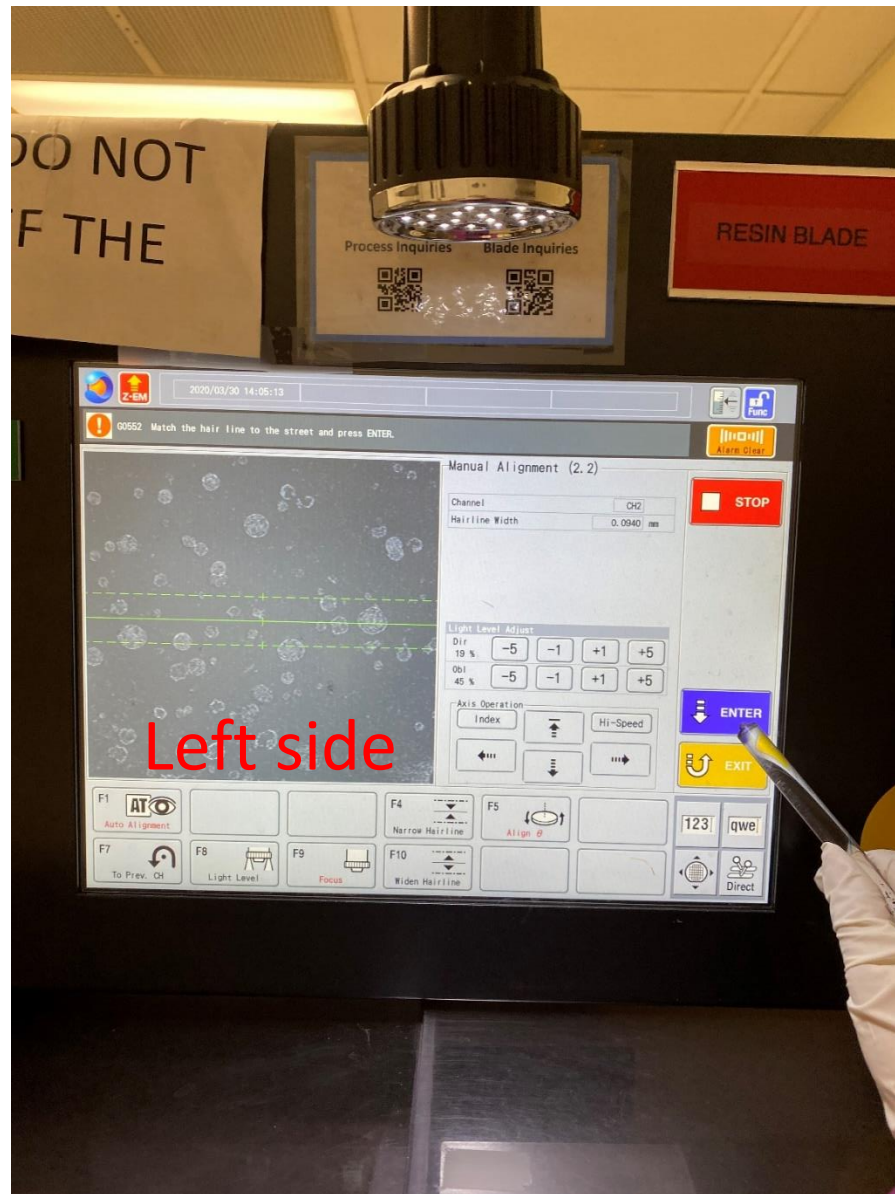


68. In CH2, click Align  $\theta$  2X times without changing the alignment, if you are going to cut CH1

Otherwise click Align  $\theta$  2X times in CH1 without changing the alignment, if you are going to cut CH2

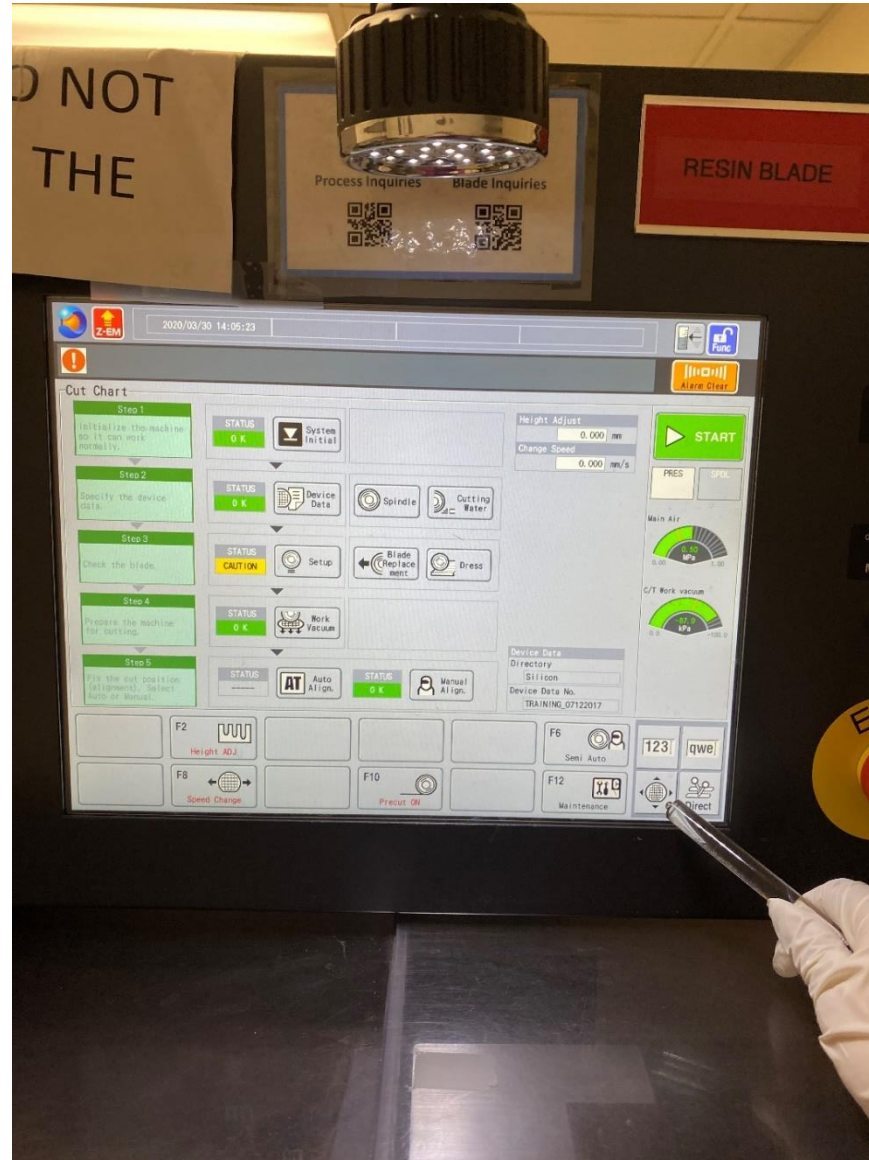


# 69. When at the left side, click Enter



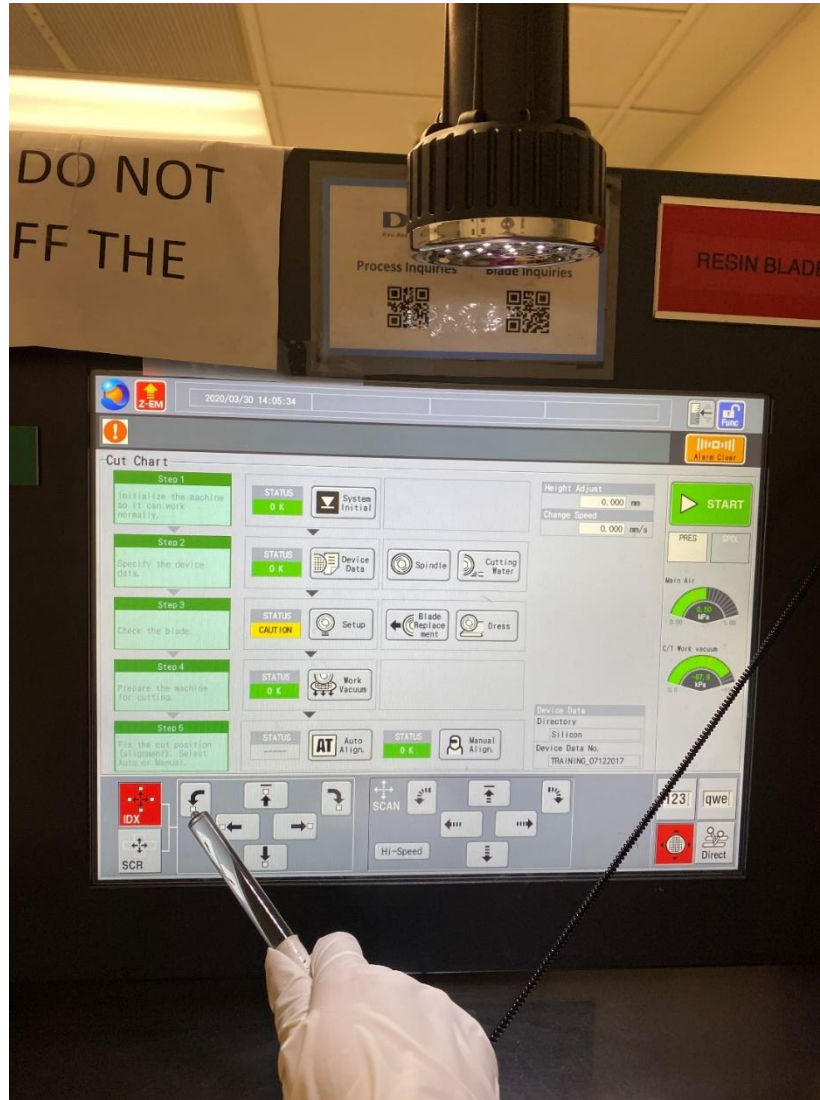


# 70. Click the arrows session

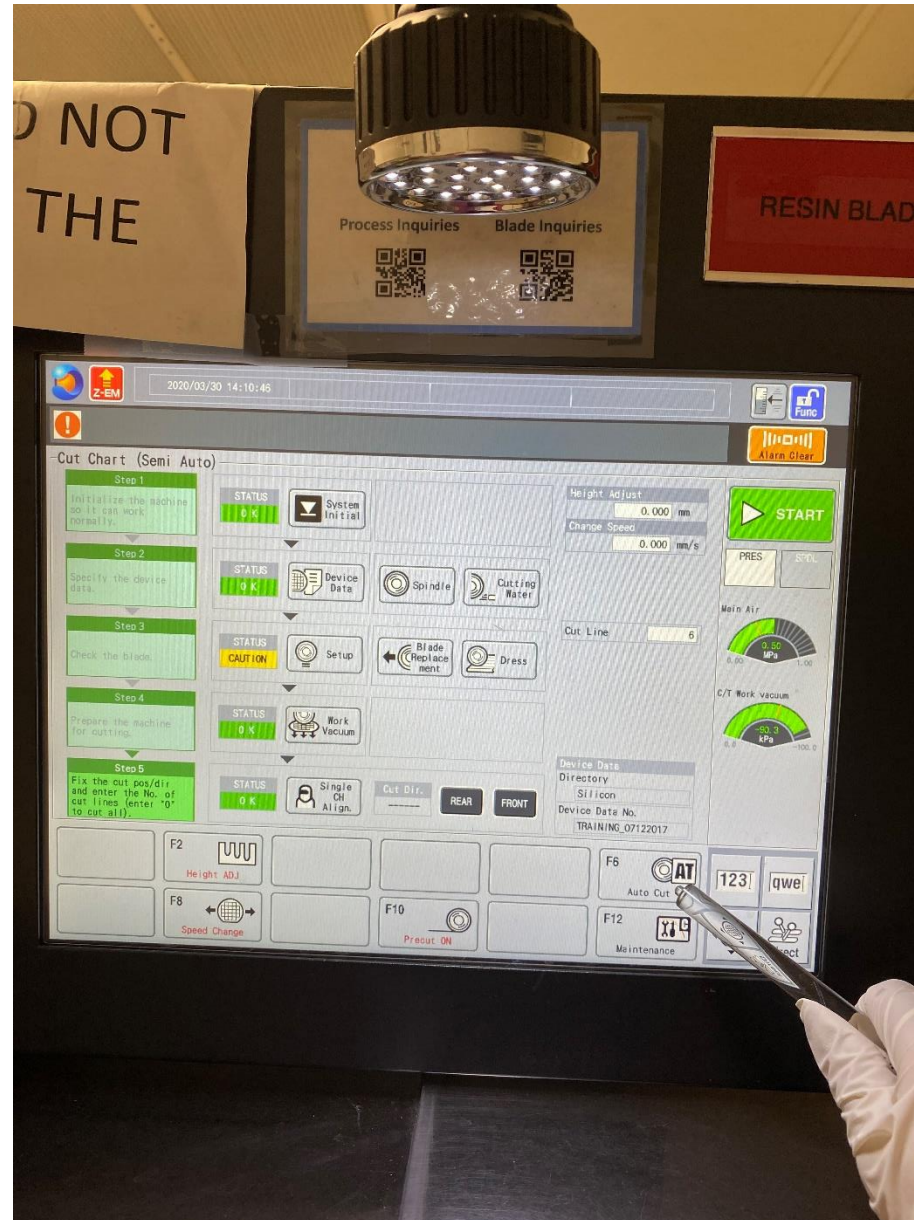


After the Manual Alignment, the chuck stays at CH2. If you are going to cut CH2, then you can skip this step; If you are Going to cut CH1, then you need to Rotate back to CH1

71. Turn counter clockwise for 90degree to rotate back to CH1, if you are going to cut CH1

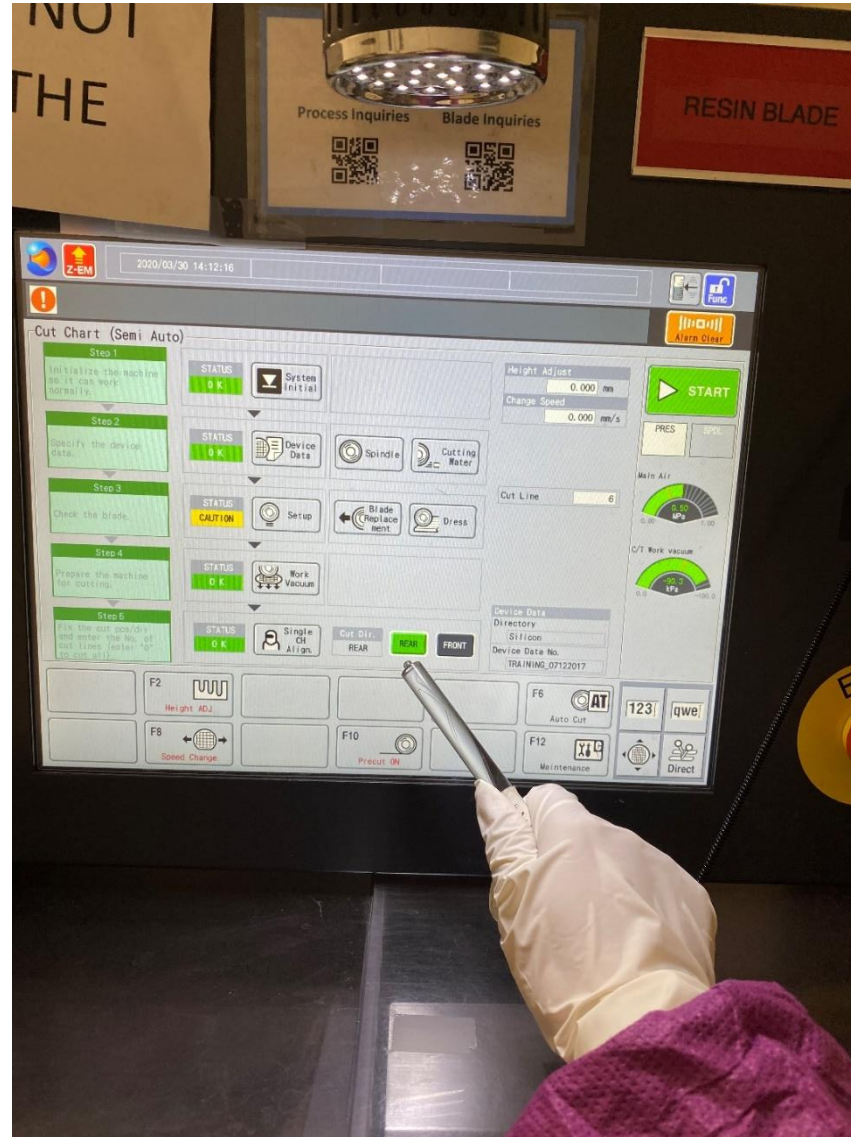


# 72. Choose either Auto Cut or Semi Auto mode





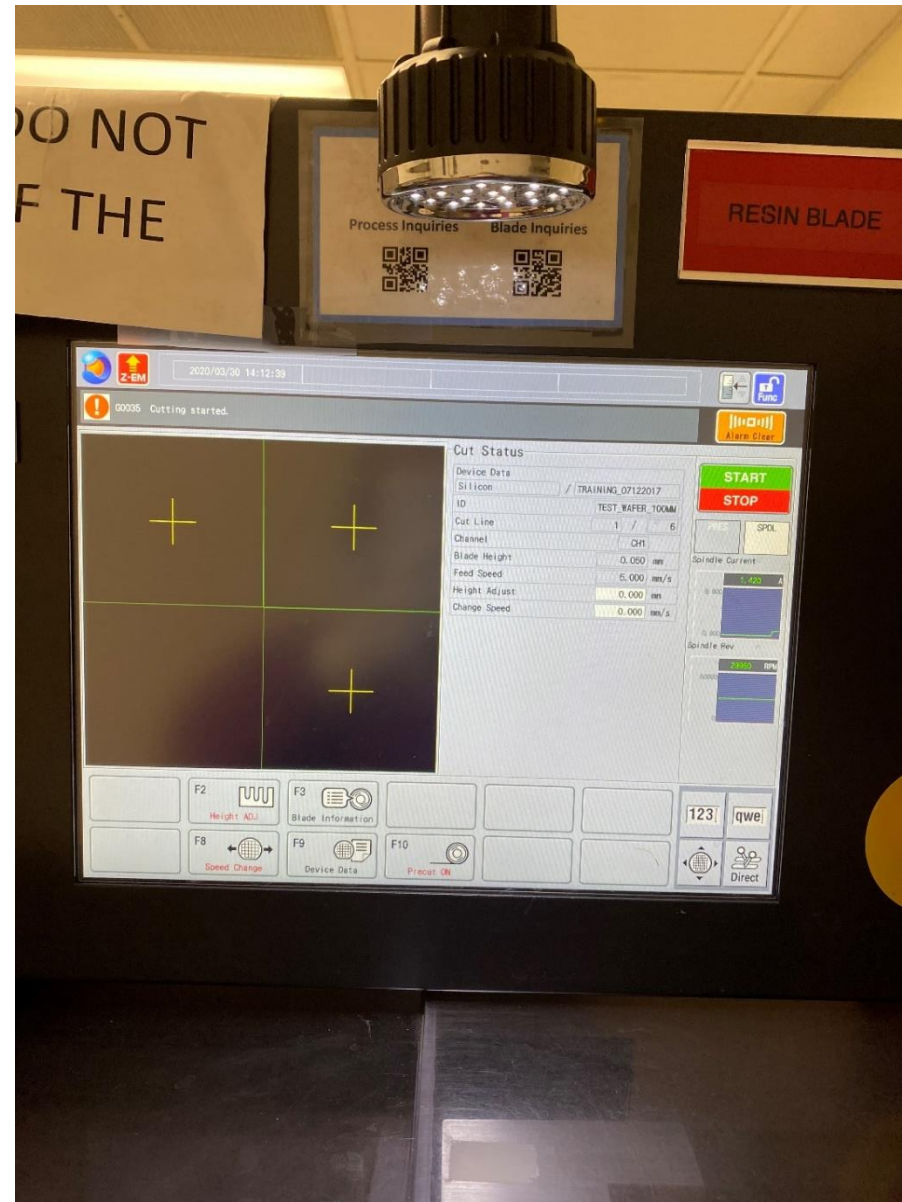
73. If choose Semi Auto mode, choose cut direction



# 74. Start the cut



# 75. Cutting ongoing



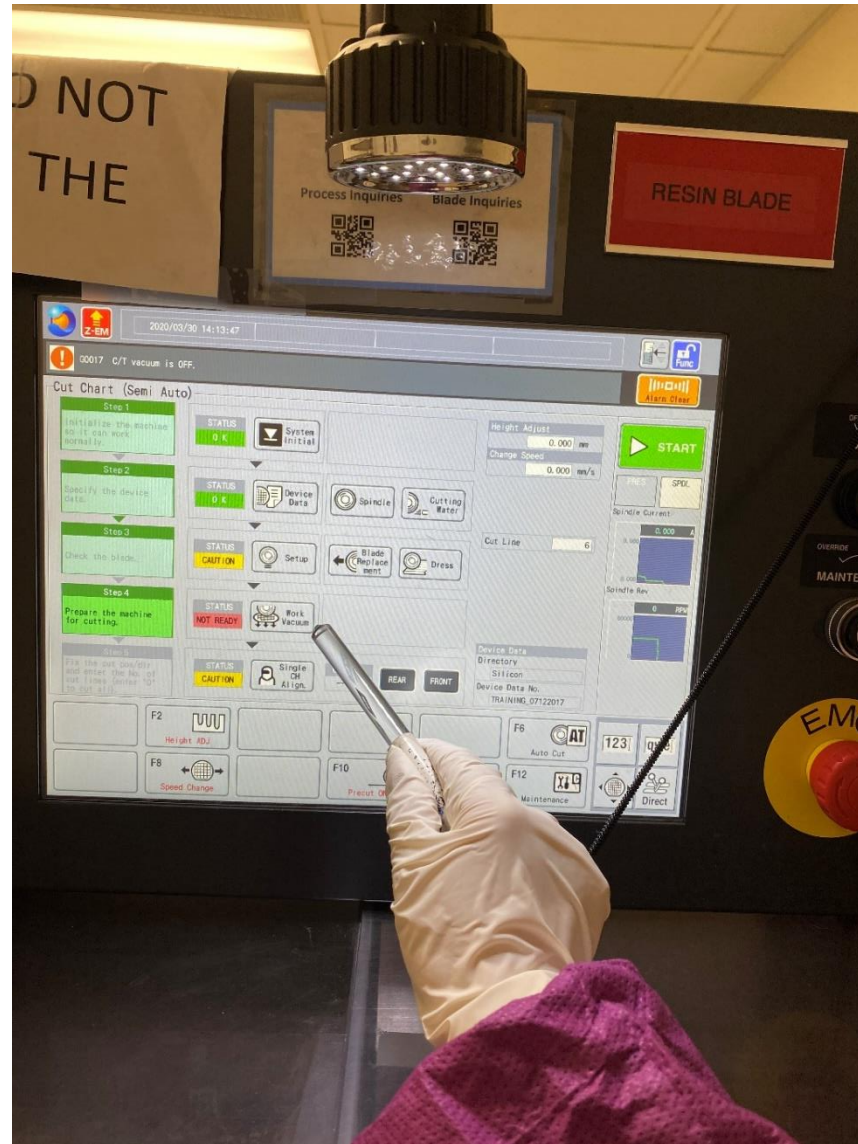


# 76. System Initialize after the cut



Repeat slides#4-29

# 77. Turn off Work Vacuum

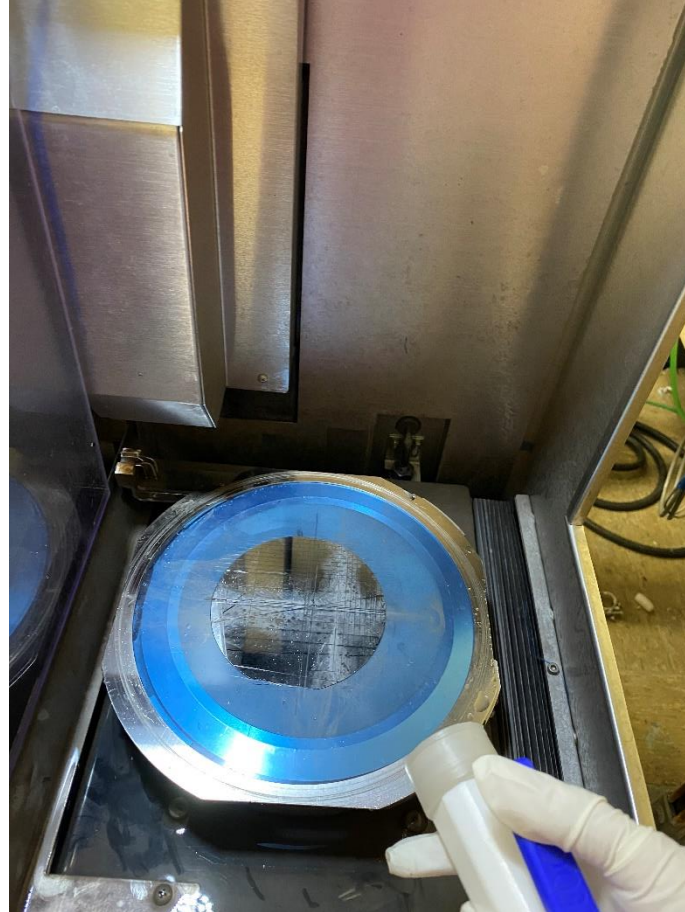


78. Use the N<sub>2</sub> gun to blow off the water





78. Use the N<sub>2</sub> gun to blow off the water



79. Remove your device wafer, then put the ring back to the Ring Rack



Then repeat slides#4-29 to replace your blade with a test blade, Test\_Hub or Test\_Resin

# 80. Leave the tool at POWER ON

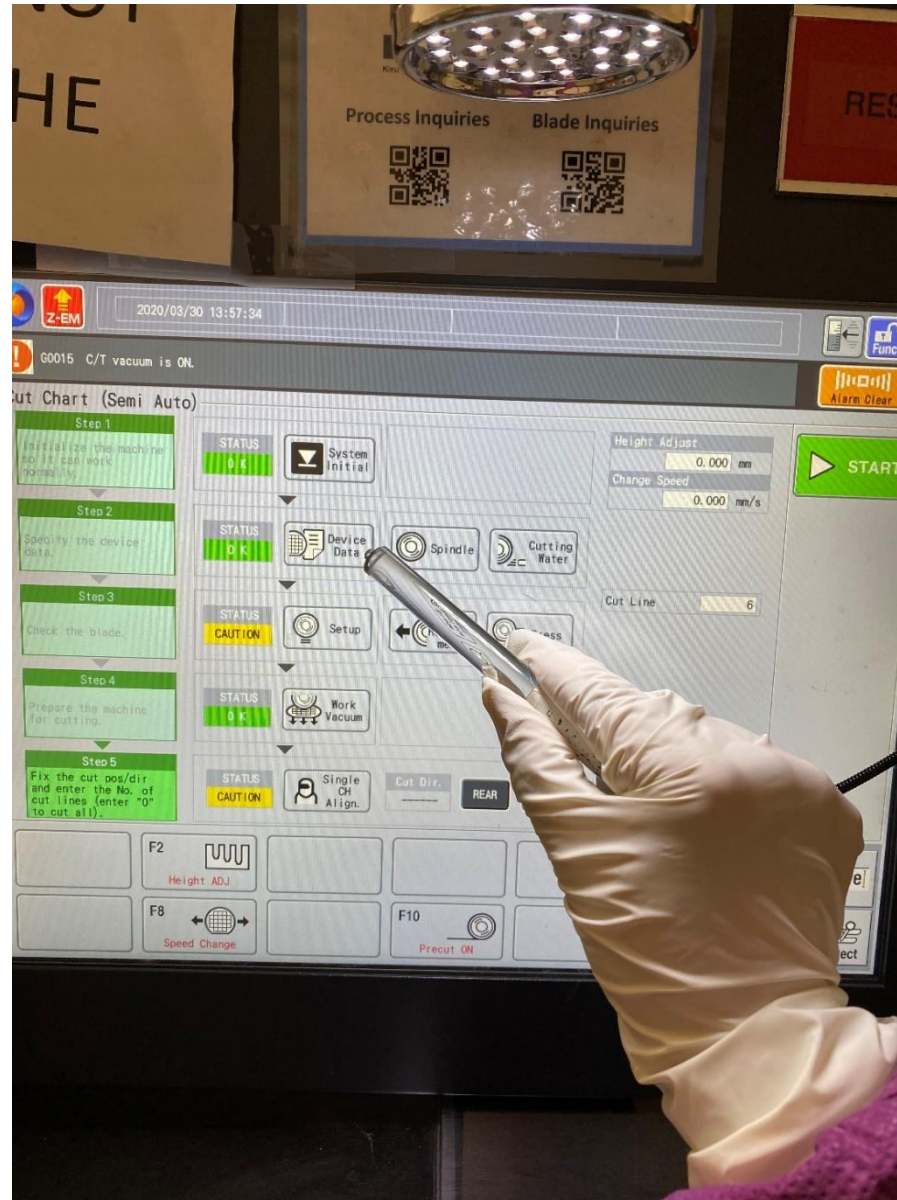


You may flip the side of this label to show which type of test blade set is installed, as a courtesy for next user



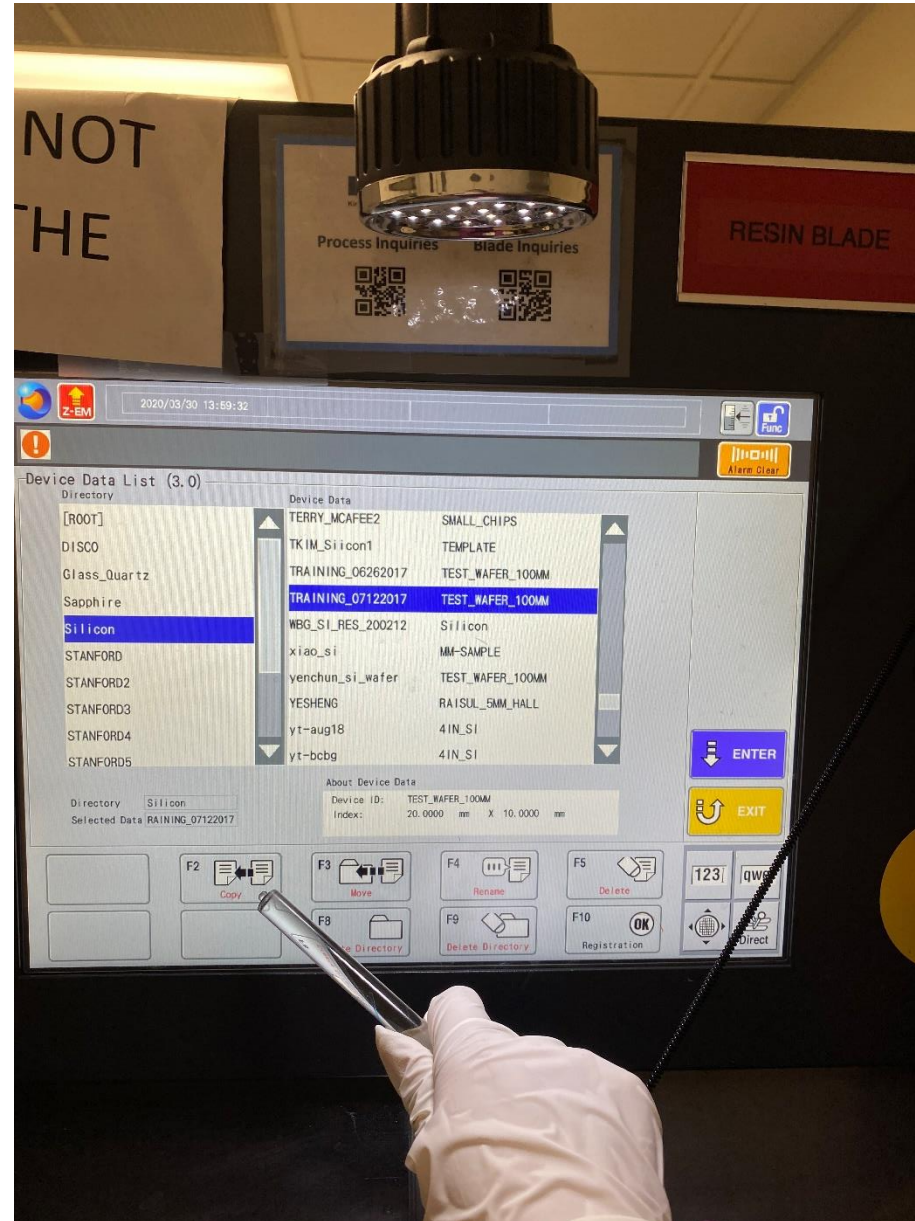
# How to copy Device Data?

*Follow the pen step by step*



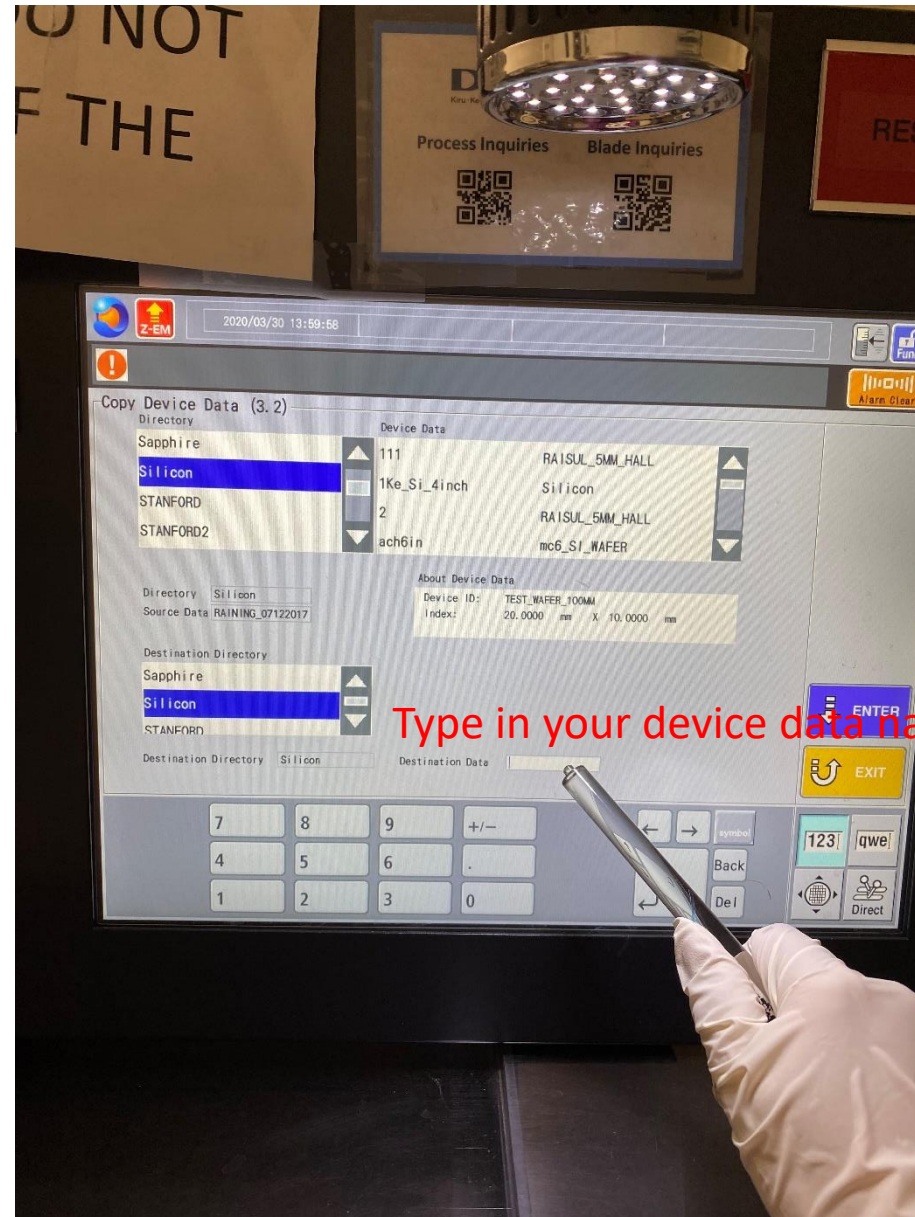
# How to copy Device Data?

*Follow the pen step by step*



# How to copy Device Data?

*Follow the pen step by step*



Type in your device data name