S tandard O perating P rocedures

New User Interface Upgrade

Advanced Dicing Technologies

7100 Dicing Saw

Location: NRF 122

Contents:

General Information:

The ADT dicing saw is an advanced, fully programmable microprocessor controlled saw intended to be used for cutting wafer thin materials into smaller component pieces. Typically silicon wafers are diced but any thin material can be cut with the correct configuration and blade type. The maximum thickness is limited by the blades designated exposure and the depth of cut cannot be more than 2mm due to spindle clearances.

The NRF stocks blades that are intended for use on silicon wafer die separation, users may consult with staff for direction on how to purchase blades for other materials.

Safety Issues:

The Saw is protected by many different safety interlocks that are intended to protect the saw from being damaged or the user from being injured. Circumventing any of the interlocks will result in an operator losing all access to the machine. During a dicing routine there is the production of very fine particulate that will adhere to anything that it touches, be aware of the toxicity of the material that is being cut, if poisonous materials are being diced then specific permission must be acquired well in advance. During any dicing process a relatively high level of noise is present around the machine; operators are required to acquire their own well fitting hearing protection wear it while the saw is in operation.

The machine uses a high volume of water to cool the blade and the material being cut and so the material must be able to withstand being wetted with significant force. High frequency vibrations can be generated by the actions of the saw which can destroy small fragile structures that are left unprotected. All materials must be able to withstand being taped or glued to a substrate. Since dicing is a very dirty process the devices must be able to withstand cleaning afterwards.

Operational Restrictions:

When using RSC supplied nickel hubbed blades no dicing chuck travel speed greater than 2 mm per second or lower will be used. Privately owned blades may use the speed recommended by the manufacturer of the blade for the composition and thickness of the material or at the user's discretion. All cuts will be 30 mm greater than the actual width of the sample so that a lead of 15 mm pre and post blade contact with the sample. This conserves the blade and reduces the amount of programming that is necessary. Use new tape for every

mounting, used tape will not hold the sample securely and break the blade and could cause damage to the tool. Operators may only alter recipes, alignments and blade property libraries. No other parameters used in calibration, directing safe motion of the parts, or any other adjustment not directly related to the efficient execution and running of a recipe or blade change routine is allowed by an operator.

Pre process considerations:

Blades:

Before a job can be planned the substrate must be known; we stock blades that are specifically designed to cut average silicon wafers. Any other materials will require a consultation with staff for blade availability and sources; users will have to purchase their own blades for unusual materials. The thickness (Kerf) of the blade needs to be considered if the intention is to stay within the width of a street between dies. The exposure of the blade needs to be greater than the thickness of the device. The standard blade will cut streets greater than 35 µm and dies as thick as 750 µm.

Mounting methods

We stock a variety of materials to provide several different mounting methods. For tape mounting there are three common standard tapes with three levels of tackiness (how sticky they are)

- The Low tack tape is intended for large substrates that are being cut into large pieces of not less than 2 cm at the narrowest.
- The medium tack tape (blue and clear) is intended for smaller dies that are no less than 1 cm at the narrowest.
- The high tack UV Release tape is intended for smaller dies that are no less than .5 mm at the narrowest. This tape is used in combination with the medium tack tape.
- Hot melt glue (QuickStick™ 135) is intended for very small dies, less than 1 mm at the narrowest, for mounting to a larger carrier substrate for maximum stability.

Machine Start-up:

NOTE: Operators are required to log on to and start the machine before sample preparation!!!

1 Log on to the TUMI system; you will hear the vacuum pump start. Power to the Monitor will also be enabled

2 To the right rear of the saw; turn on the valve labeled with the green “Clean Dry Air” label. On is when the valve handle is aligned with the tubing. The hissing of air can be heard

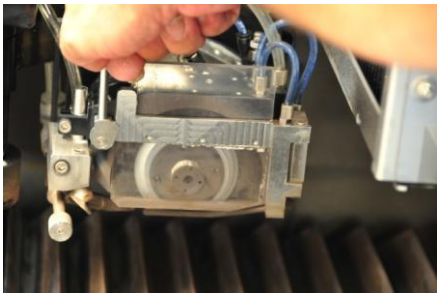
3 To the left rear of the machine down near the floor; turn on the water valve. On is when the valve handle is aligned with the tubing. The water can be heard as it runs through the dicer

4 Press the “ON” button and allow the machine to boot up.

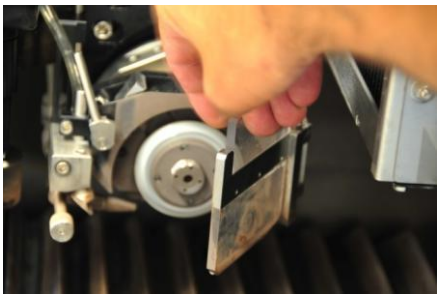
5 During software start up the use the key on the top of the tool to open the blade enclosure safety lock to inspect the integrity of the blade before proceeding any farther.

6 Open the blade enclosure cover.

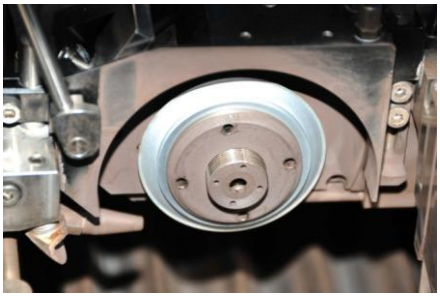
7 Slide the spindle cover latch to the left and…



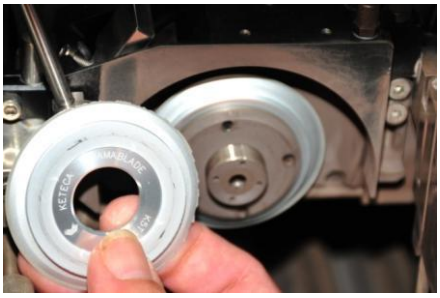
8 open the window so that the blade can be inspected.



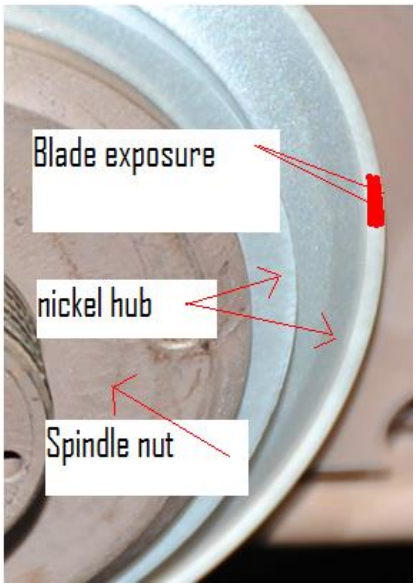
9 This is what a new “standard” blade looks like.



if the blade were broken, it would have the jagged appearance of this example below or the exposure may be completely missing. **If the blade is broken then continue with the start-up routine through login and initialization then go to the blade change section of this SOP.**

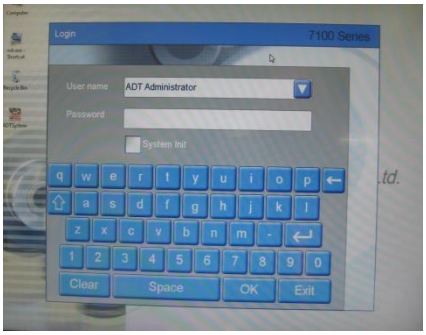


This is the anatomy of the parts of the blade.

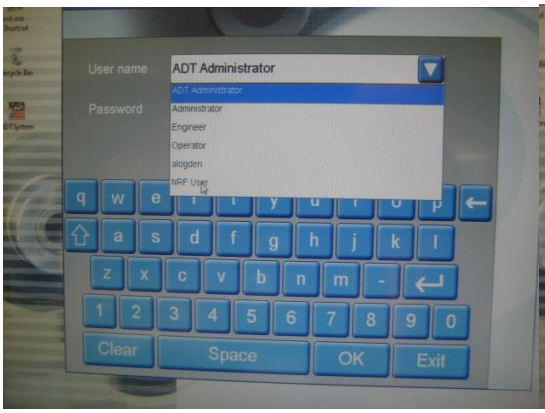


now is a good time to clean the spindle cover and rinse it off; After that close the spindle cover and blade enclosure cover with a firm snap of the locking mechanism.

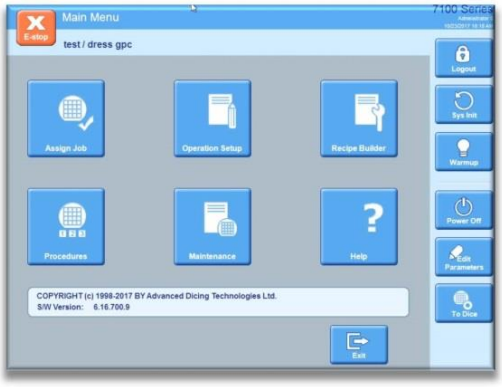
Log in to the operators computer; the keyboard may be hidden under the console.

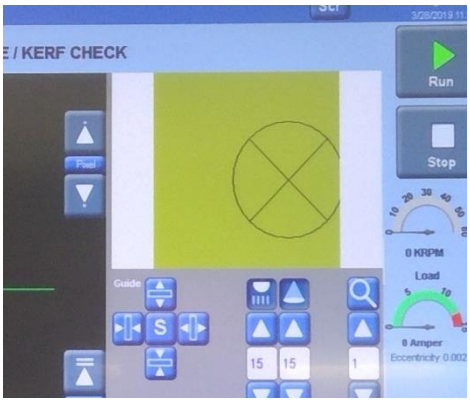


All operators log in as NRF Users and the password is nrf.



Make sure that the System Init box is checked. Any time the software asks “Do you want to create backup?” the answer will always be yes. The system will proceed through the initialization process, by moving to start position in x,y,z and t. The Main menu should appear.

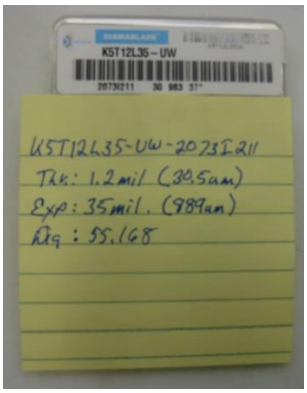




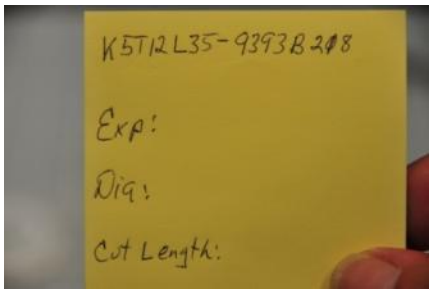
At the main menu, click on the “To Dice” button, which allows confirmation of proper initialization. Any time a yellow warning area appears on the work screen Press system init on the main menu screen.

Blade change Routine;

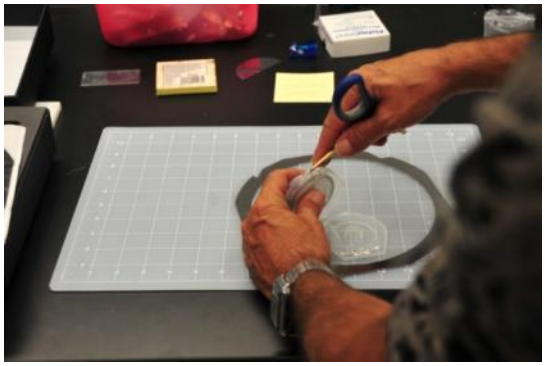
If the blade is broken, has too little exposure for the sample or is not the correct blade for the material that is being cut then it will have to be changed using the following routine. The steps included are creating the new blade in the system if needed, and finally installing the blade. All operators will completely re-install the standard 1235 (like our current vendor’s K5T12L35) blade after completion of their specialized run including Y offset. The blade case and post-it label for the blade that is currently installed is under the computer monitor.



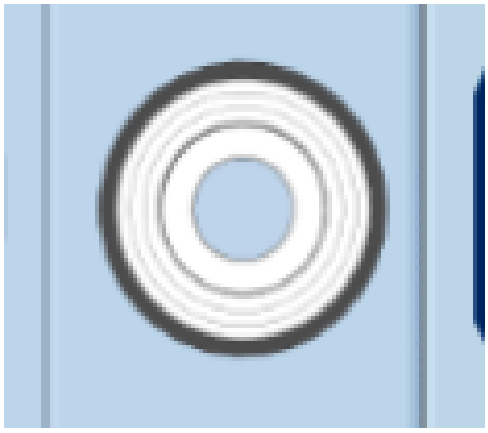
Acquire a new blade from the blade storage drawer and make a post-it label for it using the information printed on the blade. If the blade is a re-load then an “R” would be added to the end of the blade name after the serial number on the existing label.



Using a sharp tool score, the security tape on the blade case and carefully open the case

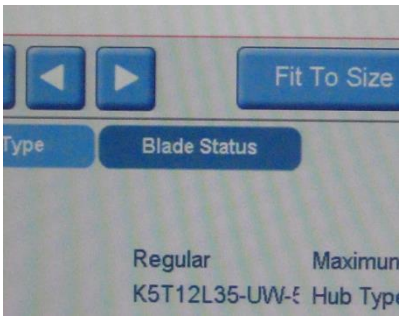



If this blade is not broken and is in good condition for re-installation later then change the cut length information as follows. From the main menu click on “To Dice” > “Blade Icon” > Spindle menu item “Blade Info”, check that the blade has the same name as the box, > “Blade Status” and record the “Cut Length (m) on the post-it; cross out the old and record the new.



Click on the “Blade Info” button then confirm that the blade the info in the software and the label match.

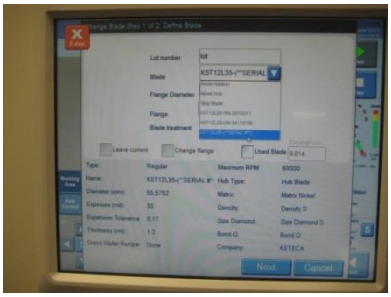
Click on the “blade status” tab and record the cut length on the label.



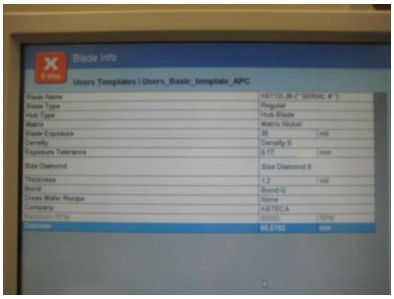
<u>Measuring the new Blade and entering it in the library</u>

From the Main Menu, Click on the Recipe Builder button, then click on the blades section.

A list of blades in the library will appear. Some will be general Templates for types of blades. Select a blade that matches the major part number or a general template and click on the Copy button to the right.

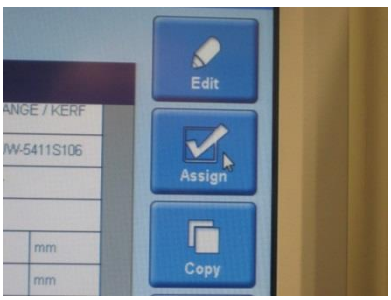



Rename the blade using part number and serial number and change the Blade parameters as needed.

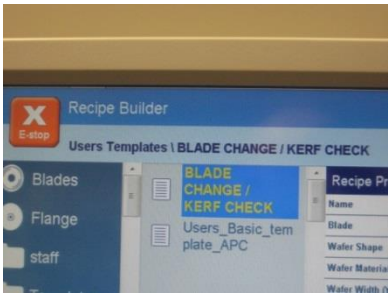



Your new blade should appear on the list and the blade parameters should match what you entered. Click on the assign button and the highlighted blade will be designated in the machine.

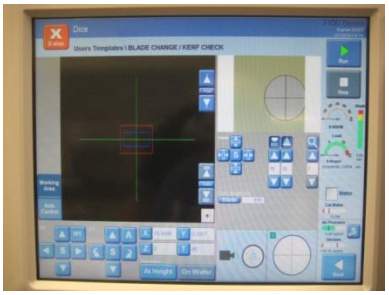
Next click on the “User Templates” menu item and select Blade Change / Kerf Check, then modify the recipe to indicate the assigned blade. Click on the assign button, this will load the Calibration recipe in the machine.

The loaded recipe will be indicated at the top of the screen

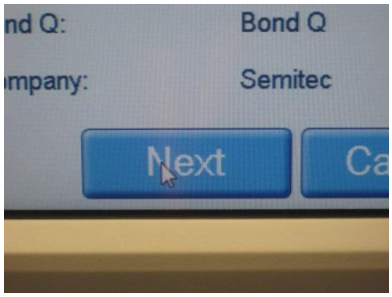


Click on the “To Dice” button to bring up the Dicing screen



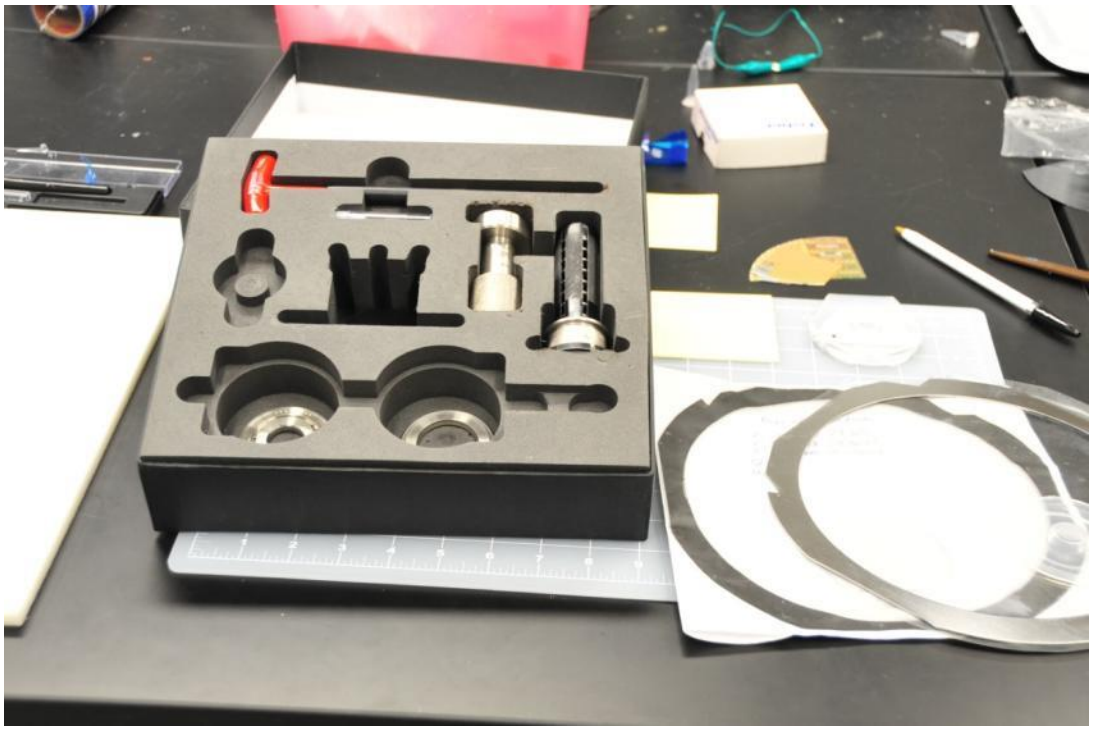
Click on the dicing blade icon at the bottom of the screen then click on the blade change menu item.

A display of the blade information will appear, click on Blade drop down menu and select the blade that you wish to change to.



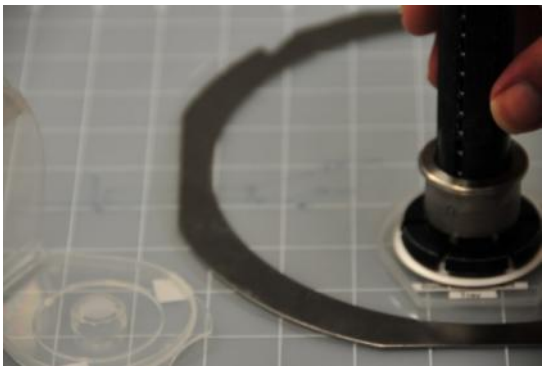
The spindle will move to the blade change position and the blade cover will unlock. Open the blade / spindle cover as it will re lock and the process will have to restarted.

Acquire the blade change kit form the drawer and use the tools to change the blade with the following sequence.

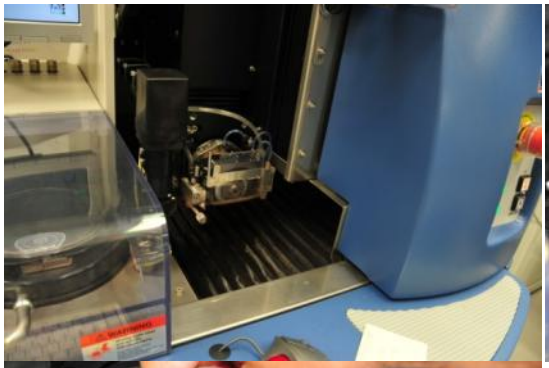
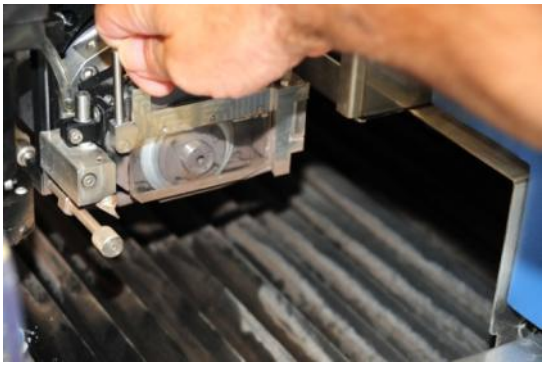


Remove the blade handling tool from the box to transfer the blade from its case.

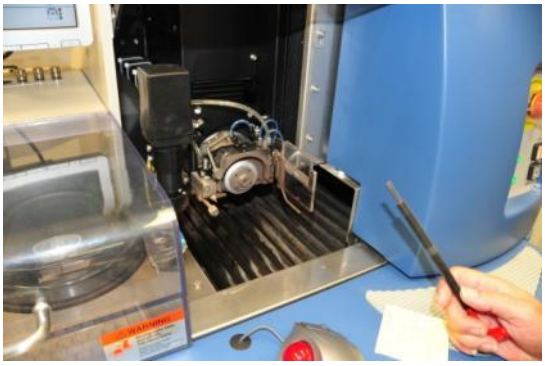
Pull back on the ring to spread the blade flange clamps and gently place the handler on the blade hub flange then release.



To change the blade open the spindle cover


Using the T-handled hex key and the knurled wrench remove the blade retaining nut and place it securely on the black box so that it can't roll away.

1 
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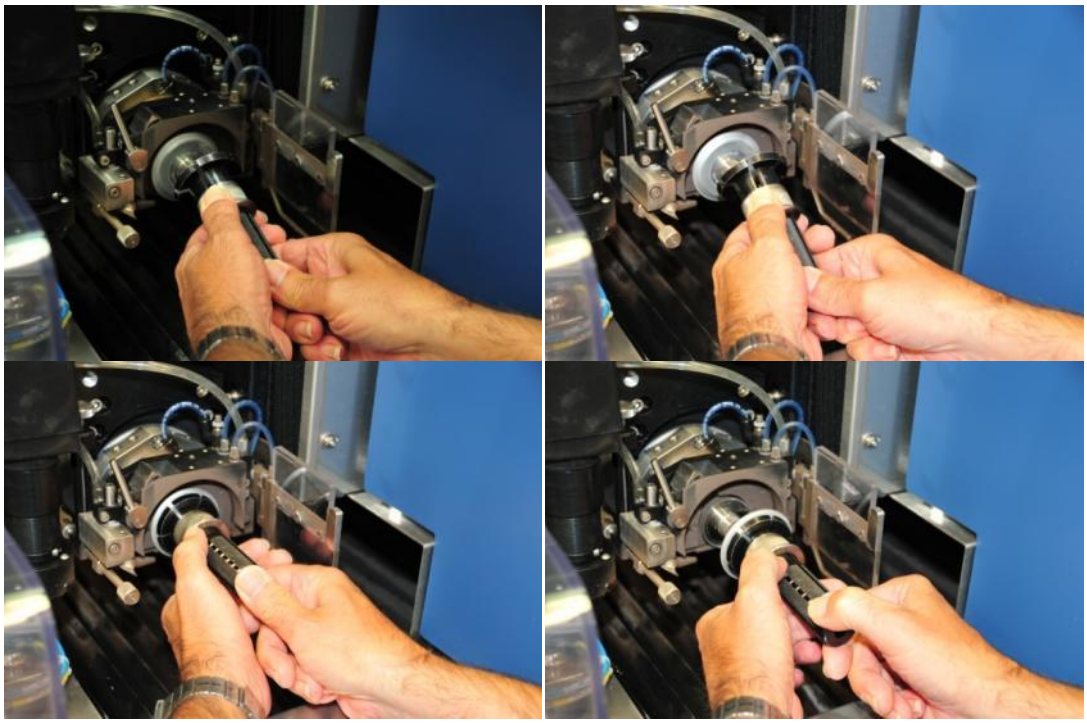
Using the blade handler remove the old blade; if it a good blade and to reloaded later place it in its original container and store it and its label in the blade storage drawer, broken blades and their containers are discarded.

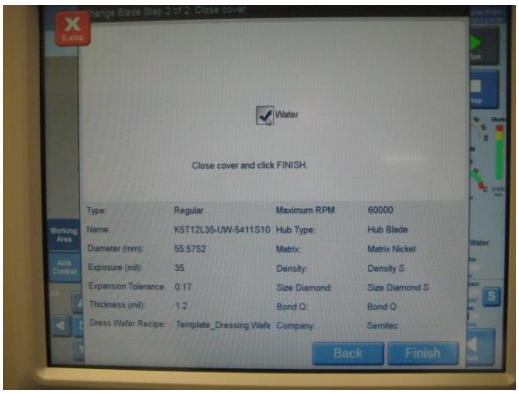


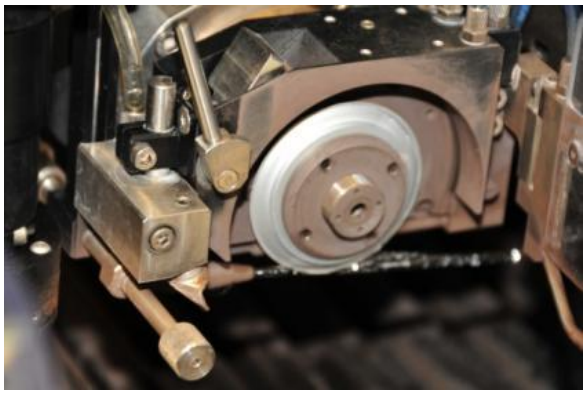
Using the blade handler place the new blade on the spindle, keep the handler aligned with the spindle and it should slip on easily, it is not necessary to force it all the way back, the retaining nut will allign and seat the blade.



Replace the blade nut and tighten it firmly but not too tight (you might have to change it next time).

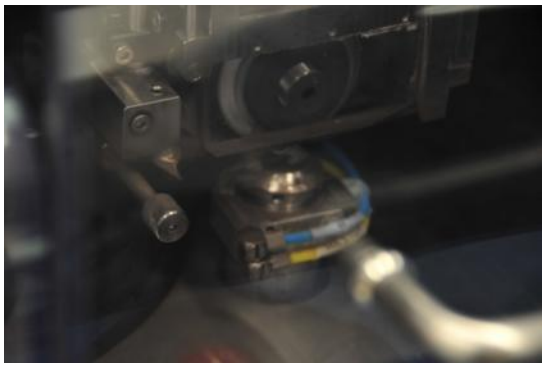

Press the water adjust button and check to see of the jet is aimed at the center of the blade bottom.





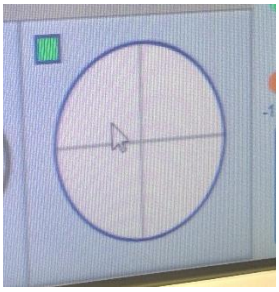
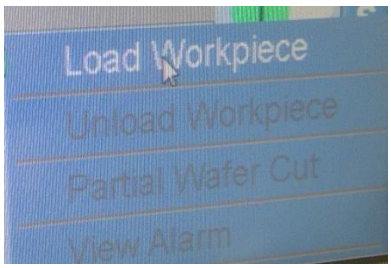
Clean the window and close the door and the spindle enclosure until the lock clicks.


Click the “OK” button then click the finish button; the machine will automatically check and set the blades dimensions using the off the chuck height column. It may warn that the measurements entered are in error, the machine is always right so accept the machines measurements.

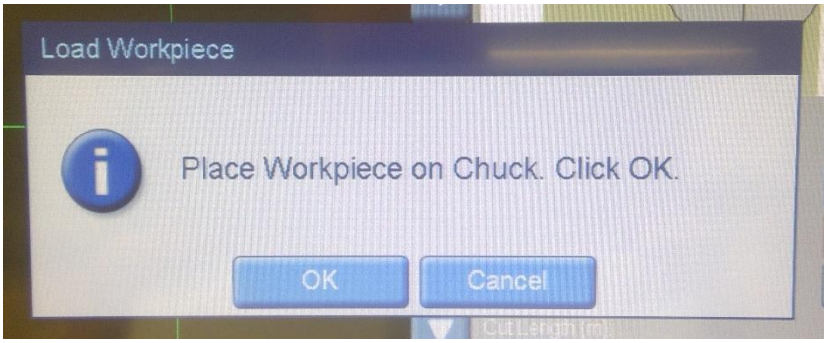


The next step is to check and adjust any Y offset due to variation from one blade to another. The machine requires that there be an alignment and cut defined; since there is nothing to align or cut just go through the motions.

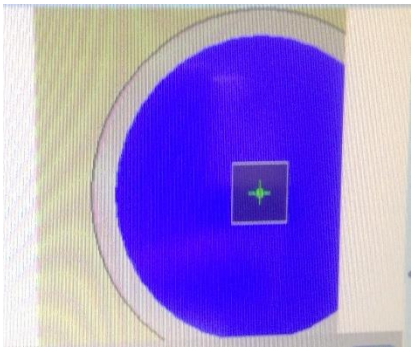
Click on the chuck icon and then the load workpiece item

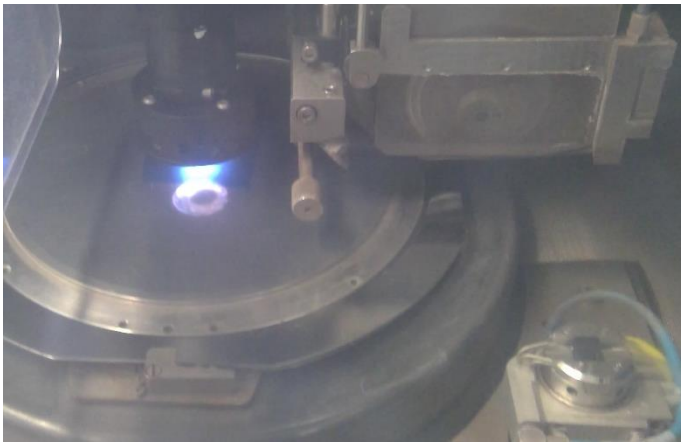



The chuck will move to the load / unlaod position.



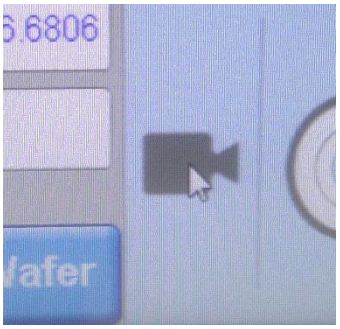
Place the blade testing frame on the chuck and clamp it in then click OK. The chuck and frame will move to the defined area indicated in the blade change kerf check recipe.

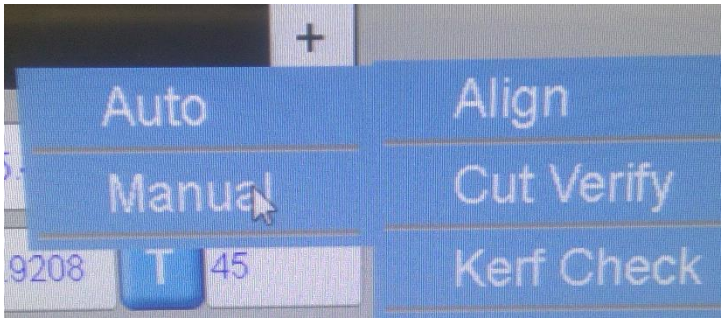




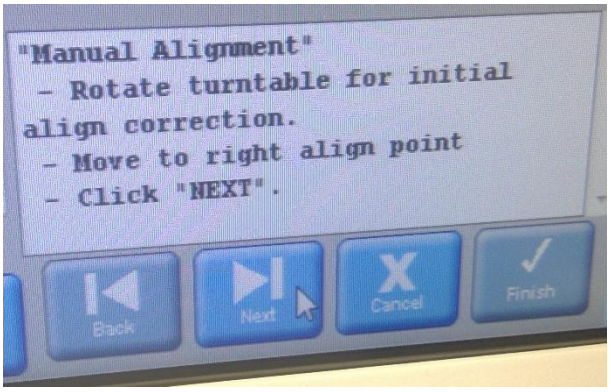
You must align and define a cut to be able to do a “Y” offset adjustment, itisiunimportant on the test frame where these are done so just go through the motions.

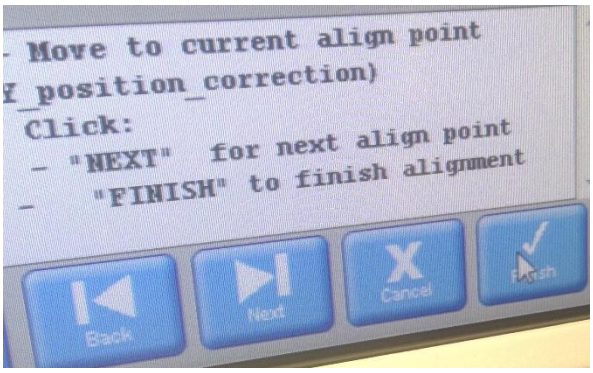
Click on the camera icon the select align >manual from the menu.



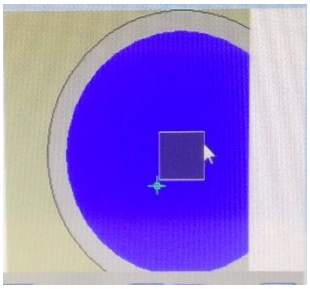


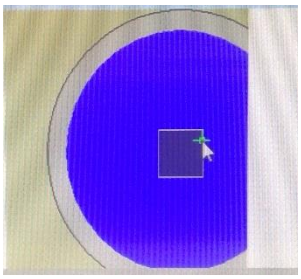
The chuck will move to a “right align point”, click next three times then finish.

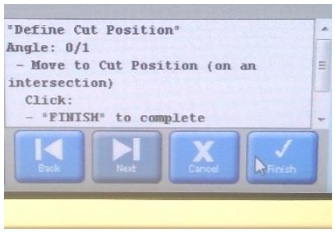


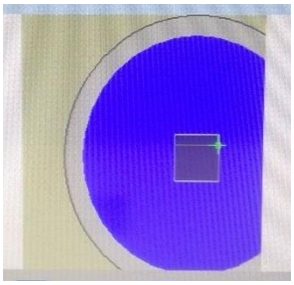


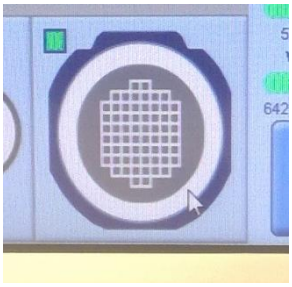
It will ask to define a cut position, double click in the upper right portion of the defined area on the chuck window, the camera will move to that position. Now click finish and a “cut line” will be defined and the chuck icin at the bottom will change to indicate that a pattern pattern alignment and definition has been defined.





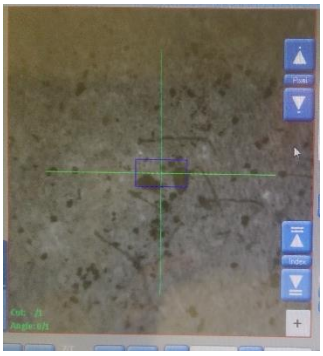
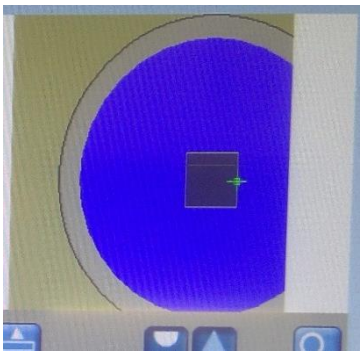
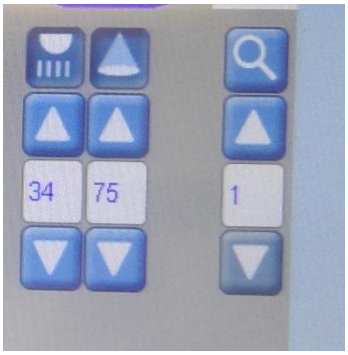




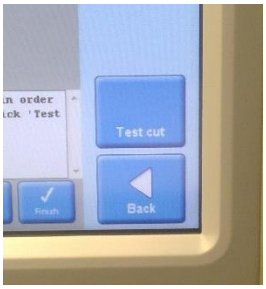


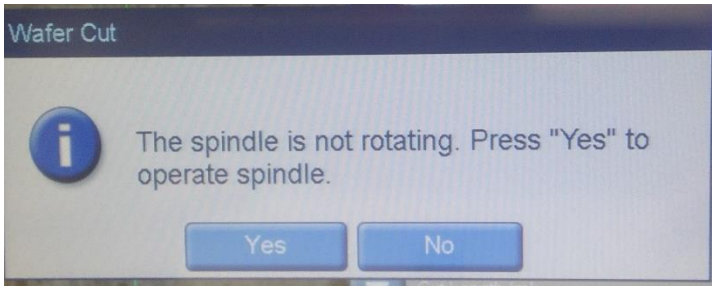
Now click on the Blade icon then the Y offset menu item

It will ask to be moved to a position to preform a test cut. The location that one uses to do a test cut should not have anyother cuts in the video window when the camera is zoomed out completely.

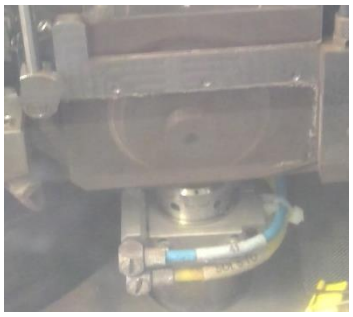
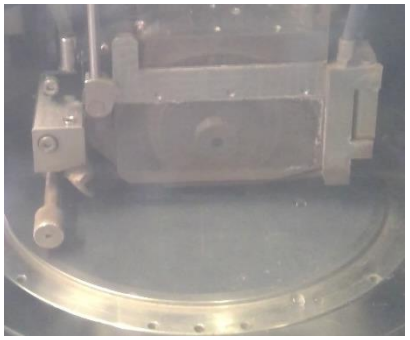
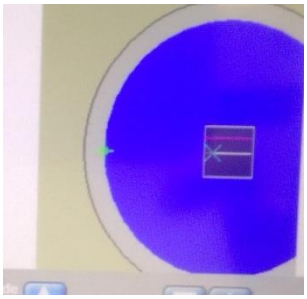




When this is all true click the Test cut button.

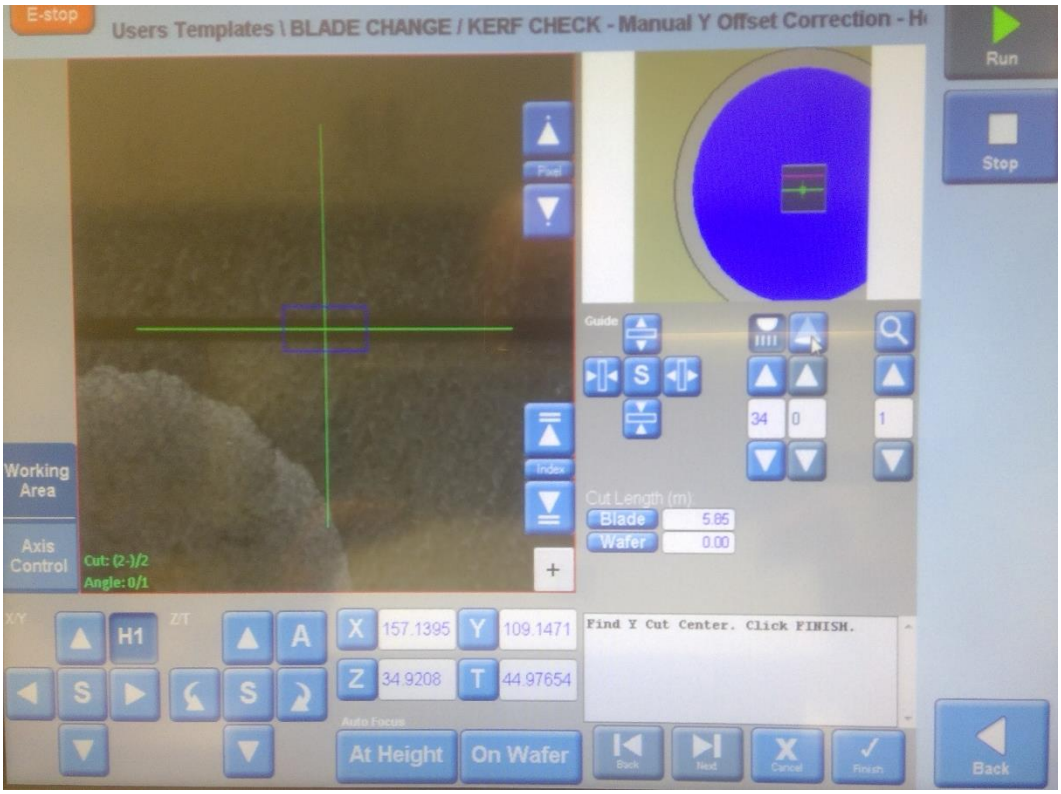




If you get the above error message click yes; the blade will spin up, the height will be checked and a cut will be made in the tape. When vomplete the camera will move to the center of the test cut indicating any errors in the blades y alignment to the defined cut line.

If the alignment is off as above, click in the cent er is the indicated cut on the video display and the cross heirs will move to the center of the line. Use the zoom feature and the Pixel buttons to move to the exact center of the line. Once this is done click finish and the calibration will be complete.

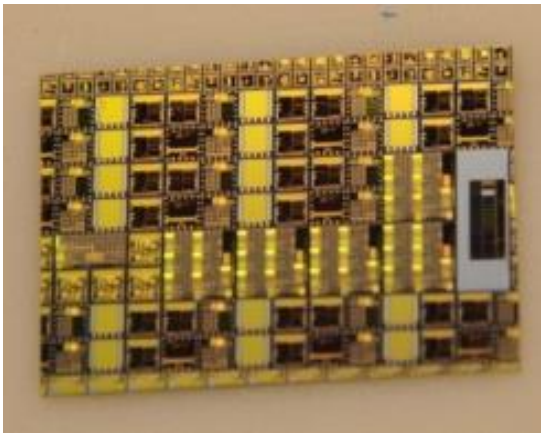


This completes the entire blade change kerf check proceedure.

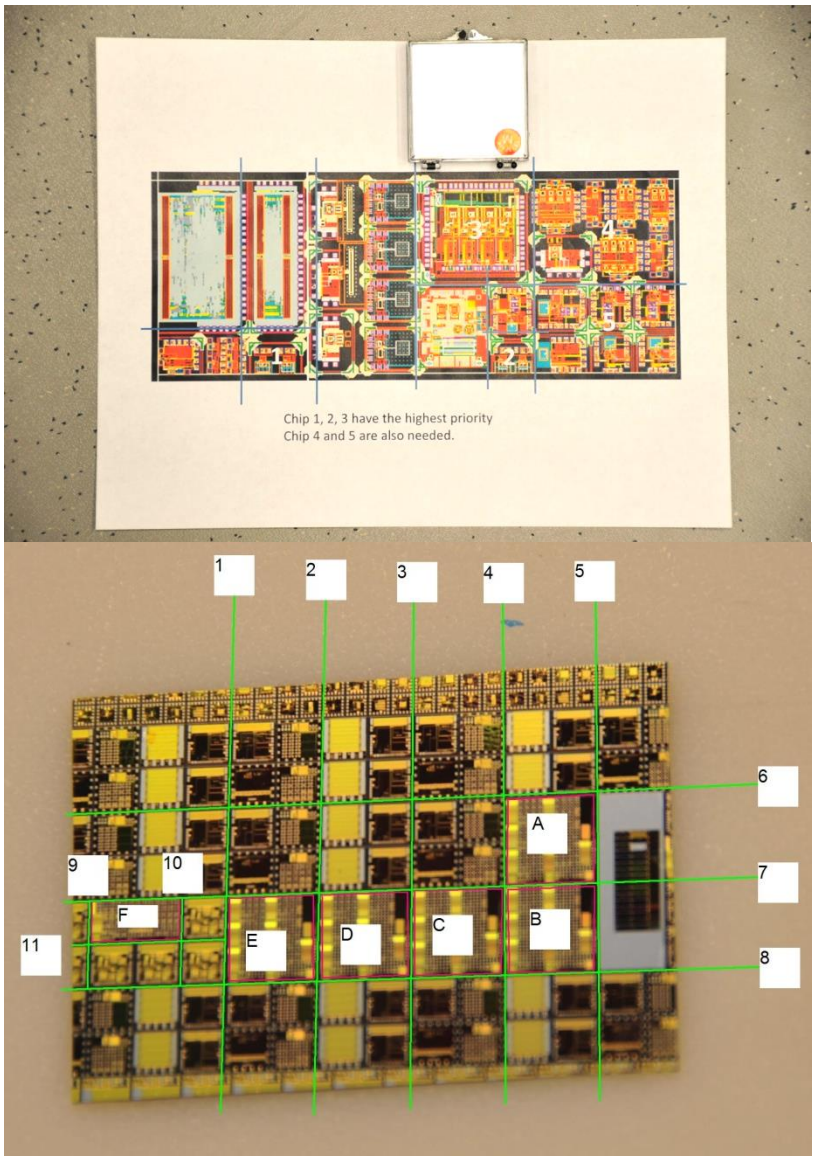
Put everything back in the black box and put it in the storage drawer.

Sample Preparation:

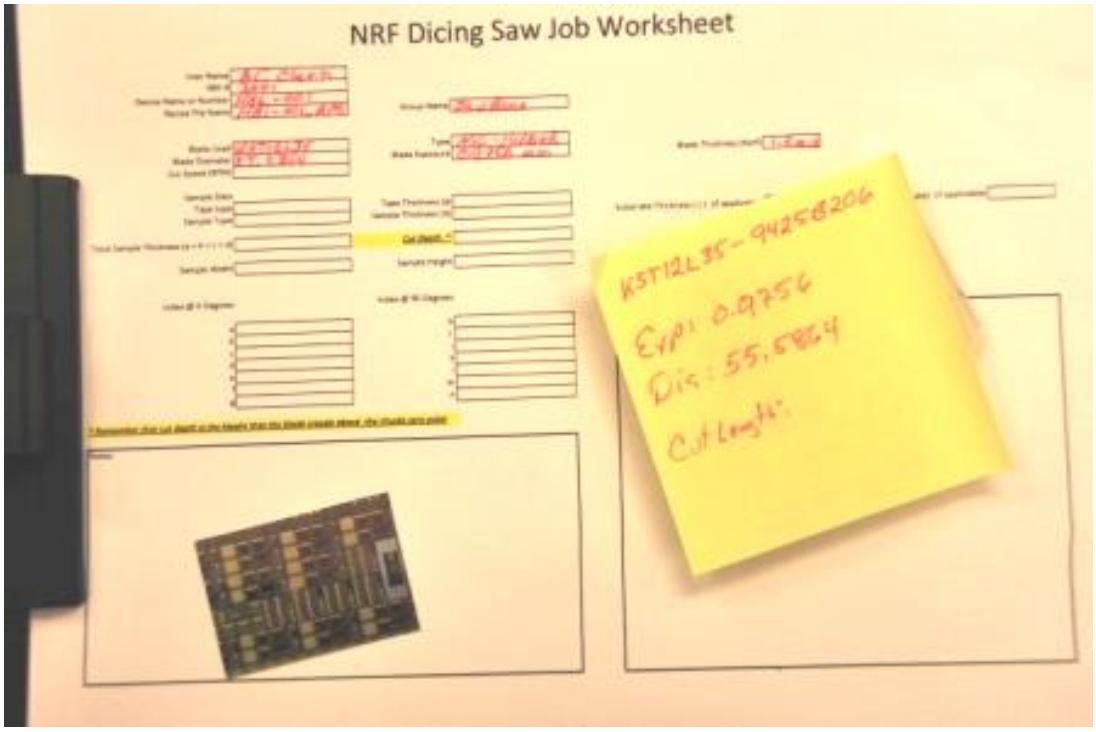
Measure the sample thickness, length and width using the micrometer and calipers that are in the wooden case in the drawer. If these devices are missing then dicing cannot continue.



This example is a somewhat complex one that has multiple dies of differing sizes and alignments. It is critical that the cuts be preplanned so that needed dies are not inadvertently destroyed.



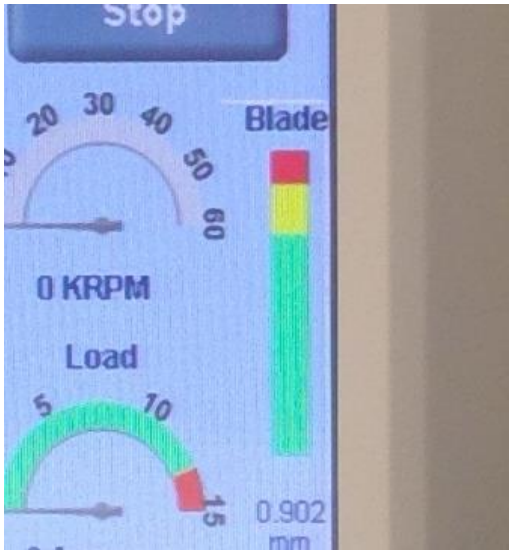
In this case there are six dies to be separated and the cutting order; note that portion of the piece that have die “F” and cuts 9, 10 and 11 will have to be removed and remounted and a separate recipe written for it. **All users will produce a cut map similar to this one and have it available while programming the dicer for a routine.** The Nikon microscope in the clean room is a valuable resource that can be used to capture these images and do critical measurements to help plan a dicing routine. Another resource that is available is the dicing job work sheet.



If all of the blocks are filled out then all the information needed to program the dicer will be available to the user.

Measuring the die:

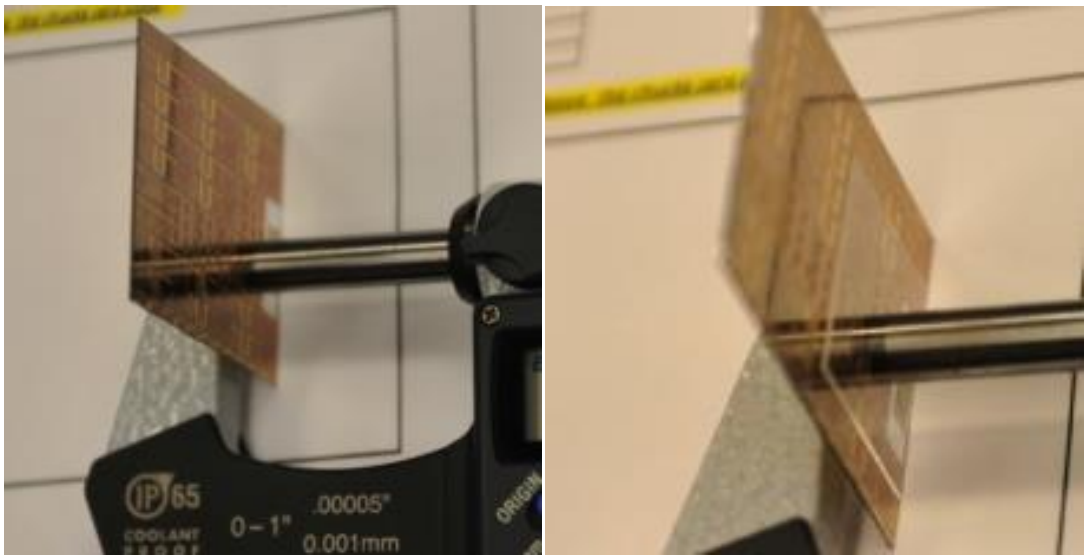
First note how much blade exposure is left on the blade that is currently mounted on the machine. If there isn't enough to cut through the device then the blade will have to be changed. Typically, device thickness plus 40 um depth in tape plus 150 um safety margin should be less than the remaining blade to dice.



With the above indications it would be advised not to start cutting wafers above 712 um thick as normal blade wear may quickly exceed tolerances.

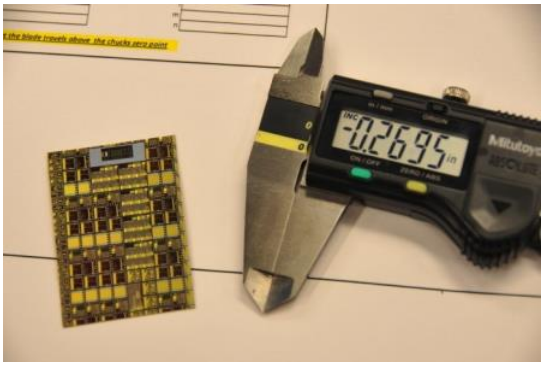
Remove the Micrometer from the box; it will turn on when the dial is adjusted, and zero it out. It doesn't matter what units are selected as the saw will convert if set up properly.

Open the jaws of the micrometer (turn the knurled knob CCW) and place the sample between the post and the rod so that the rod will make contact with the sample in a place that will not damage the devices, close the jaws by turning the knurled knob until it slips.

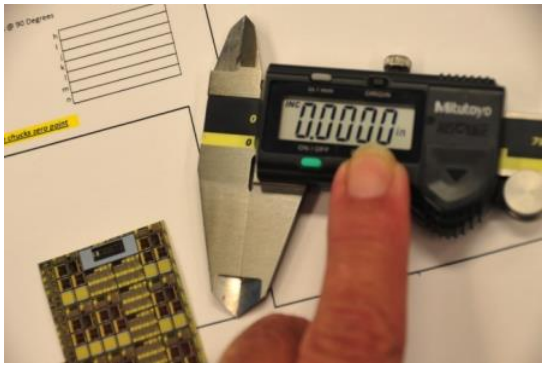


If the devices are fragile then cover slips can be used to protect the surface. Place the protective covers on both sides of the sample and close the jaws, zero the micrometer, loosen the jaws and remove the sample then close the jaws on the covers. This subtractive measurement will be the thickness of the sample.

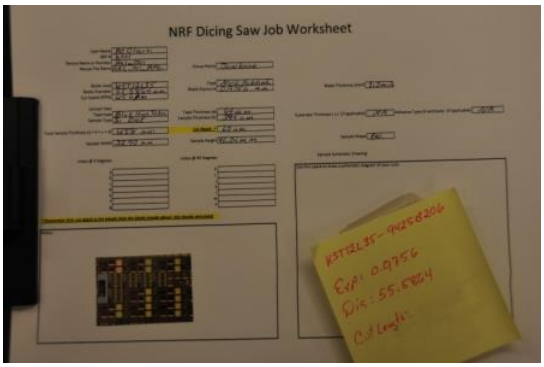
Next, using the calipers (which must be turned on and off manually, by the way) measure the height and width of the sample and record it on the worksheet.



Close the jaws, zero the caliper and select the desired units



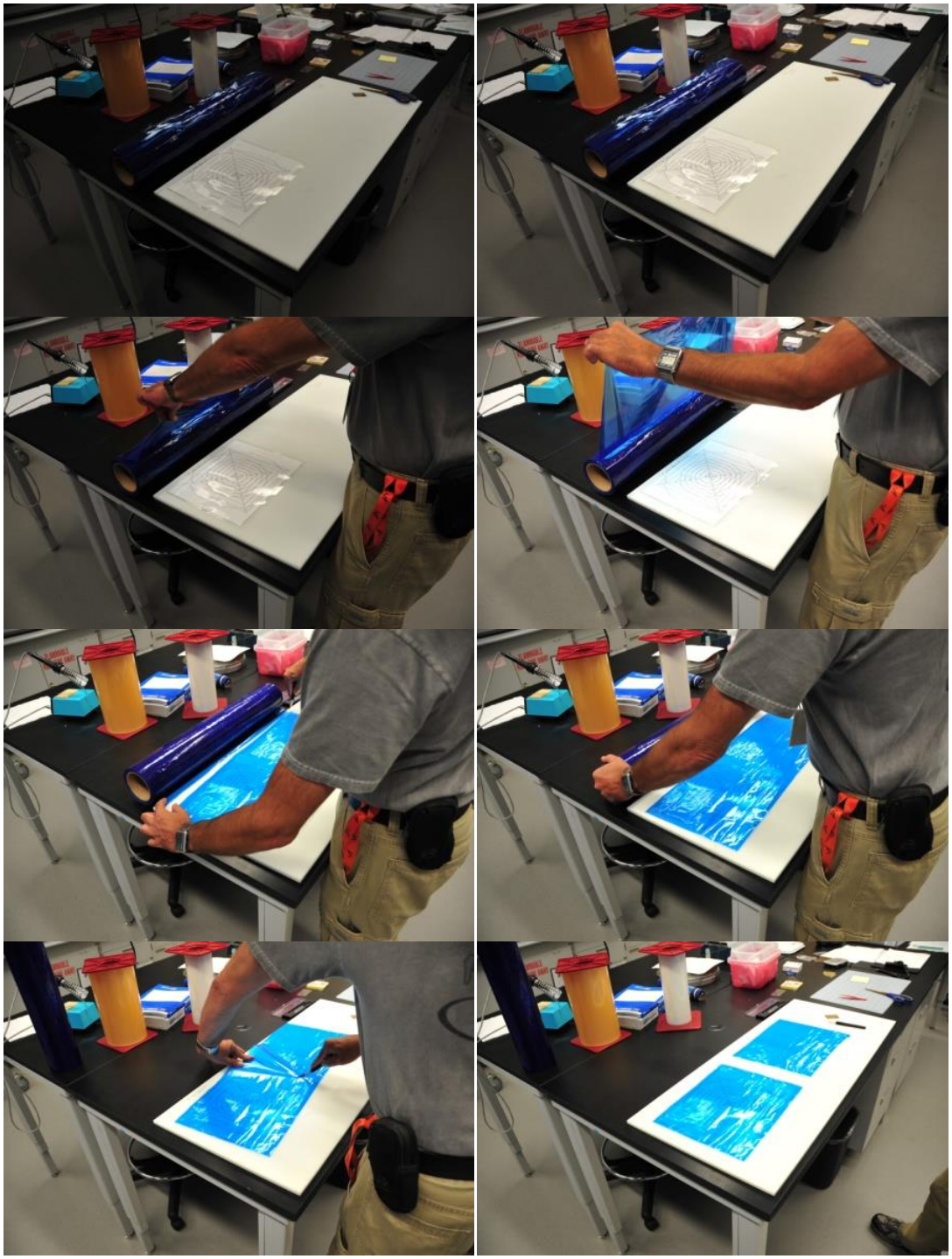
Measure the height and width and record them on the worksheet. One can also at this time “eyeball” measure the dimensions of the individual dies street distances in x and y and record them temporarily. These imprecise measurements can be programmed into the recipe and modified to the precise distances in a later step.



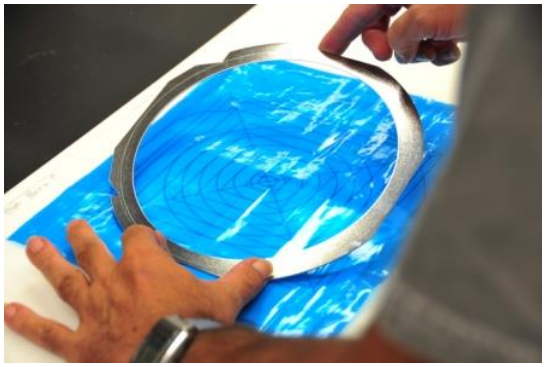
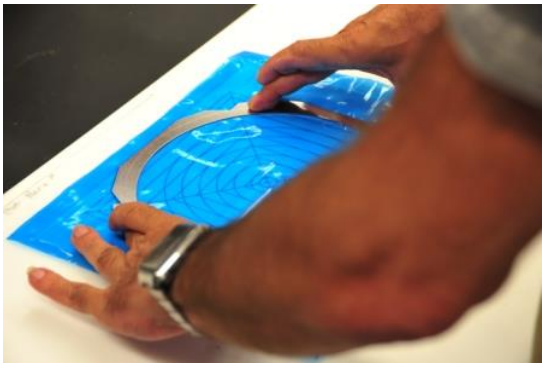
Mounting the sample:

It is recommended that, since the process of dicing is a very dirty process, the sample should be protected with some type of easy to remove coating. This make lifting off the silicon and blade dust and serves a secondary function of stabilizing and protecting fragile structures.

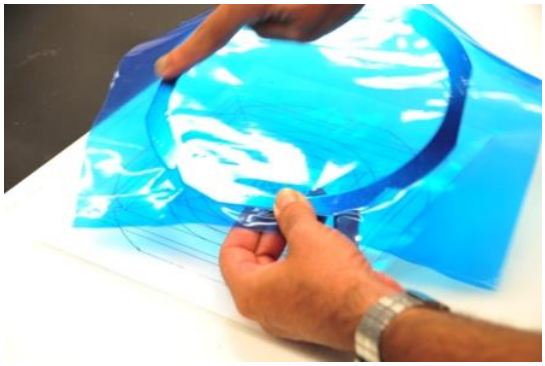
Select the appropriate Tape for the overall size of the final dies to be cut; in the case of very small dies that are hot glued to a substrate carrier then select the appropriate tape for the size of the carrier. Cut a length of tape that will cover the entire tape mounting ring. The laminated alignment guide is a good guide for the correct size to cut.



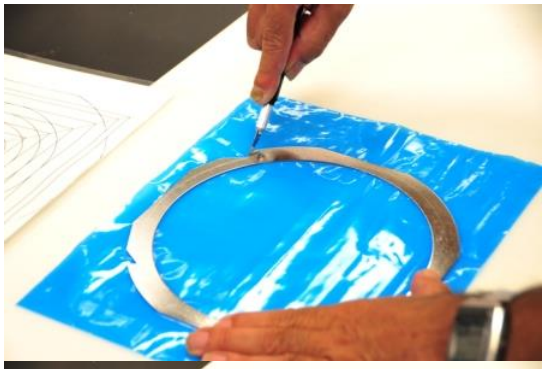
Place the alignment guide under the tape (tape should be sticky side up) then align the straight edge of the tape ring with the ring pattern on the guide and drop the ring on top to the tape.

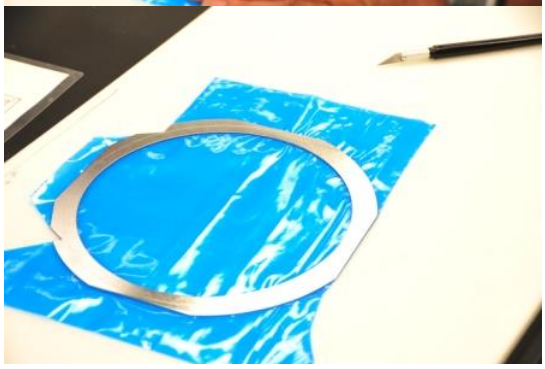



Turn the ring and tape over and squeeze out any big bubbles.

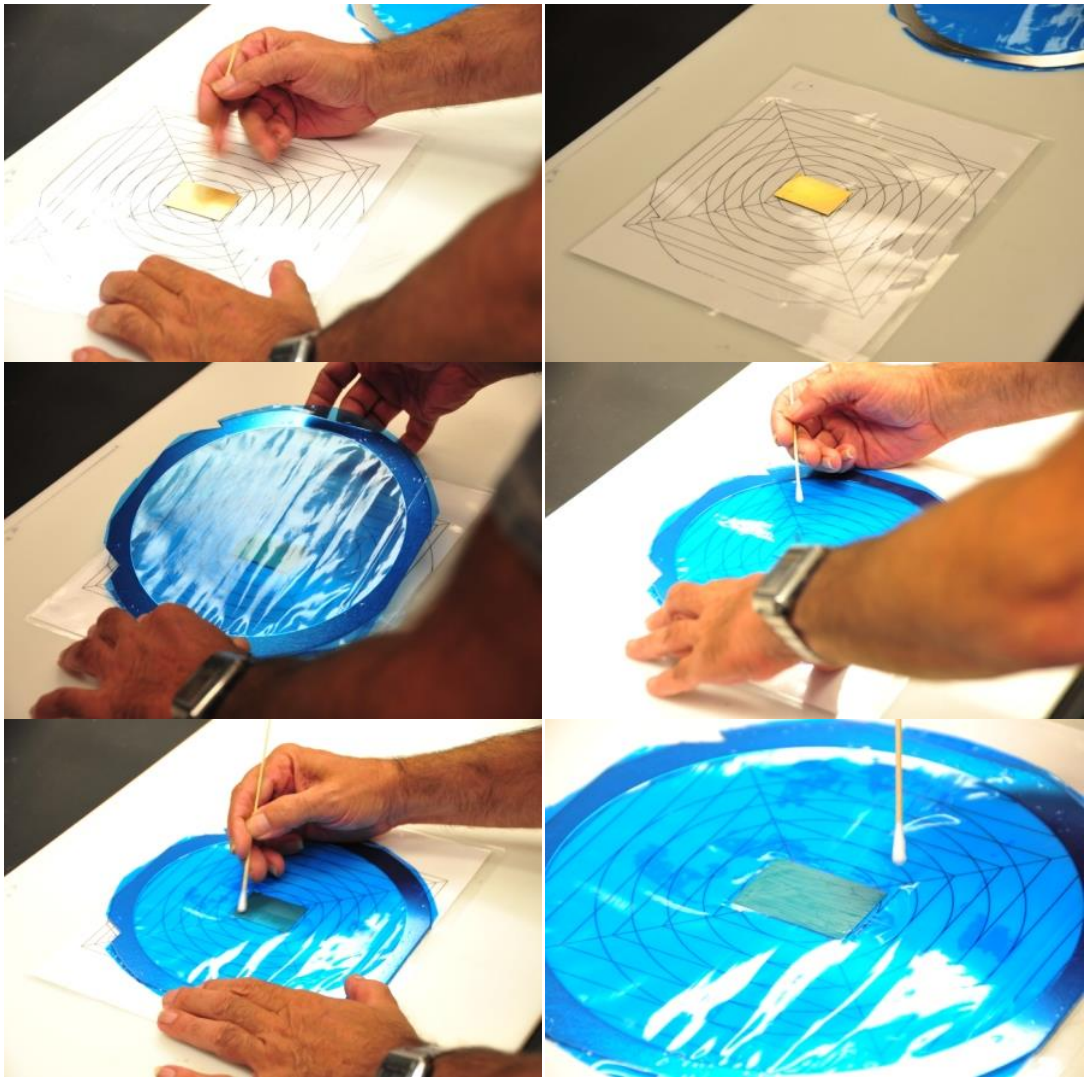


Trim the excess tape from the outside of the ring; make sure that the notches at the top and the flat at the bottom are trimmed flush with the ring.

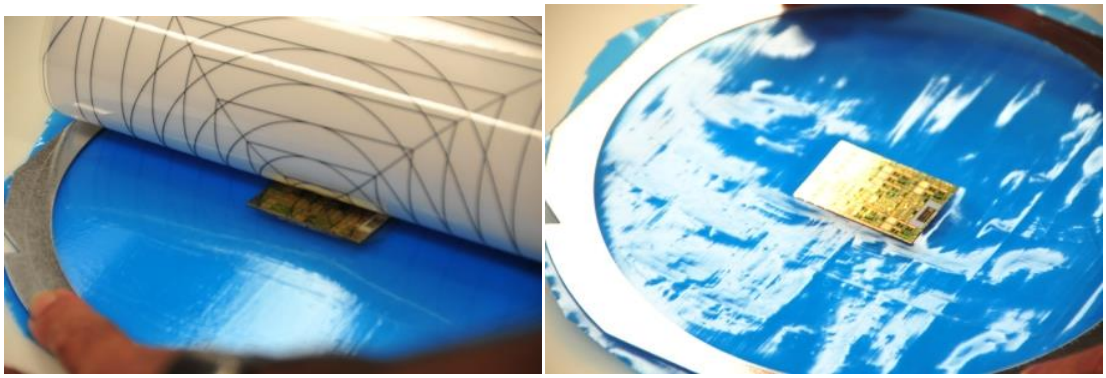





Align the sample centered, top down on the alignment guide then drop the tape ring / tape sticky side down and use a swab to remove the bubbles from between the tape and the sample.



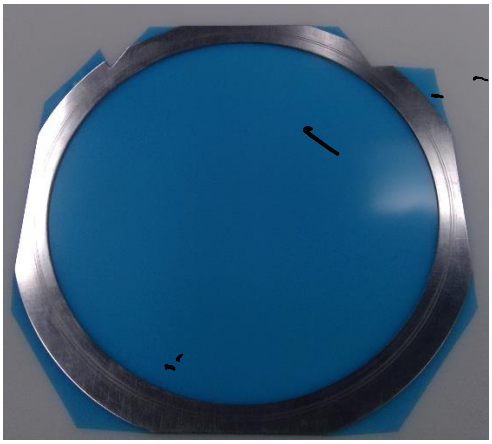
Turn everything right side up and peel off the guide. The sample is ready to cut.



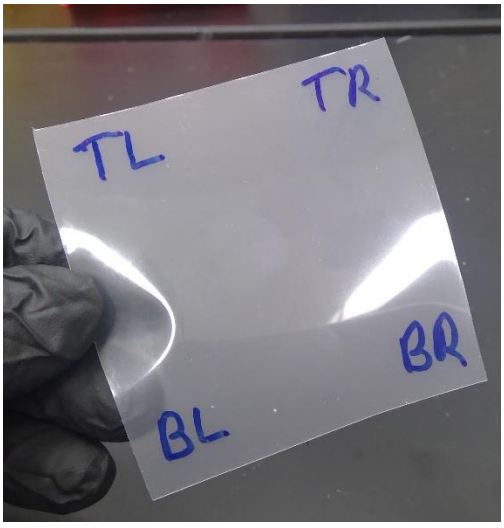
UV Release Tape

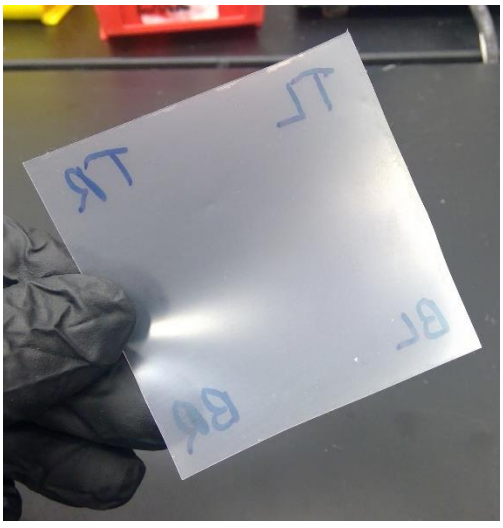
When using a layer of UV release tape always remember to label the top side of the protective cover from the non-sticky underside and place non-sticky side up on the alignment grid with your samples, mounting surface up, on the cover. This will prevent the UV release tape sticking strongly to the alignment grid.

Prepare a tape frame with blue medium tac tape. Save the trimmings for use later as UV tape edge protection.

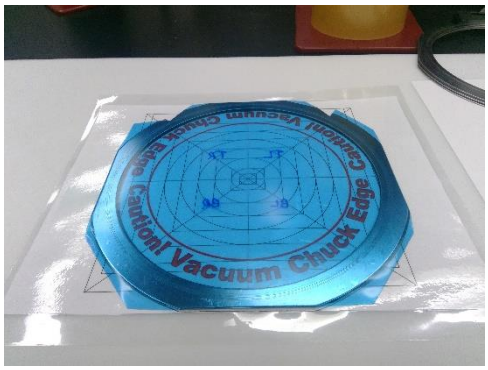


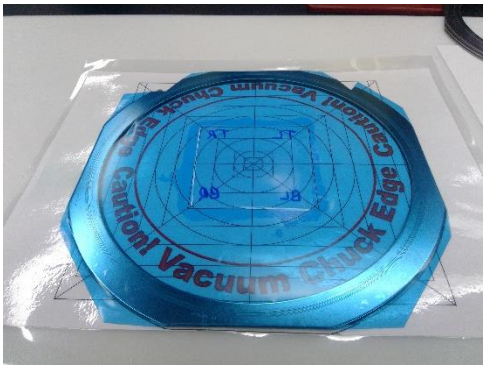
Cut a piece of UV release tape approximately 1 inch larger than the sample that is to be mounted. Label the cover so that the top can be distinguished after it is removed. Note that the top cover sheet is reflective and that the bottom side is dull (with a larger surface area).



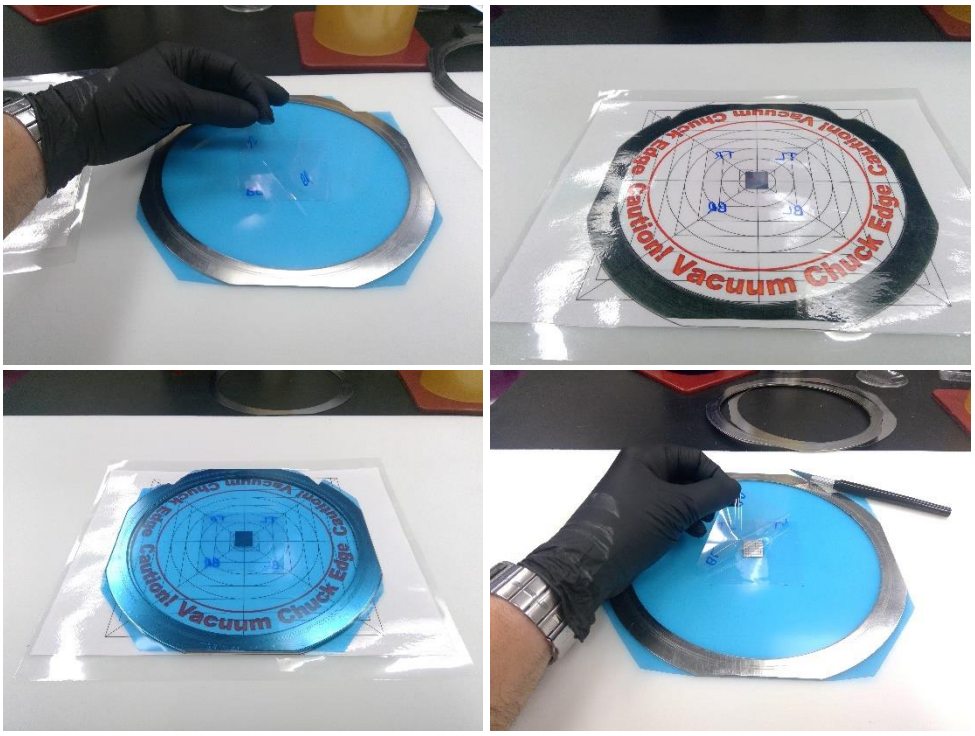


Place the UV tape top side down on the alignment sheet, then align the tape frame ovet it and starting from the center work out all of the air bubbles.

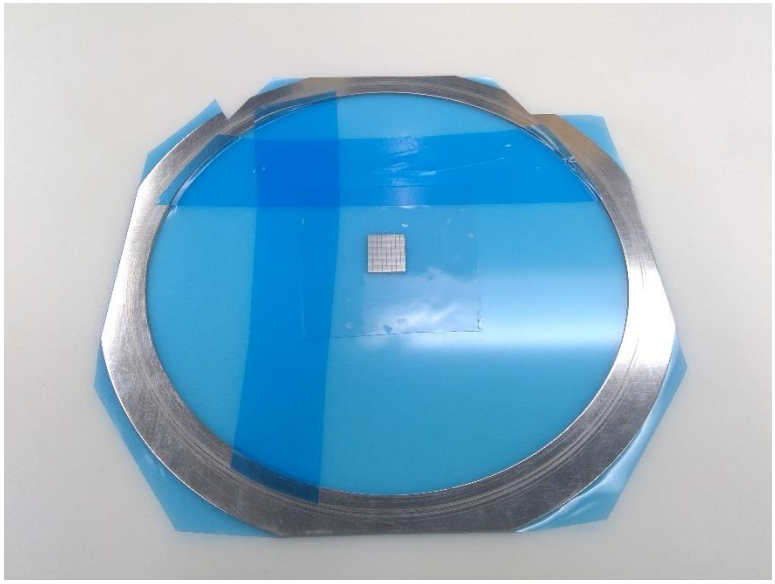




With the exacto knife separate the protective sheet from the tape and place it top side down back on the alignment sheet, center the samples to be cut tops side down on the cover sheet. It is advisable to use a few empty tape frames as spacers so that the UV tape does not come in contact with the sample too early, once contact is made it will not release unless exposed to UV light. Press into the center of the of the sample and work to the outside ensuring that there are no bubbles. Flip the whole frame over and remove the cover sheet, save this it will be needed at the UV exposure station.



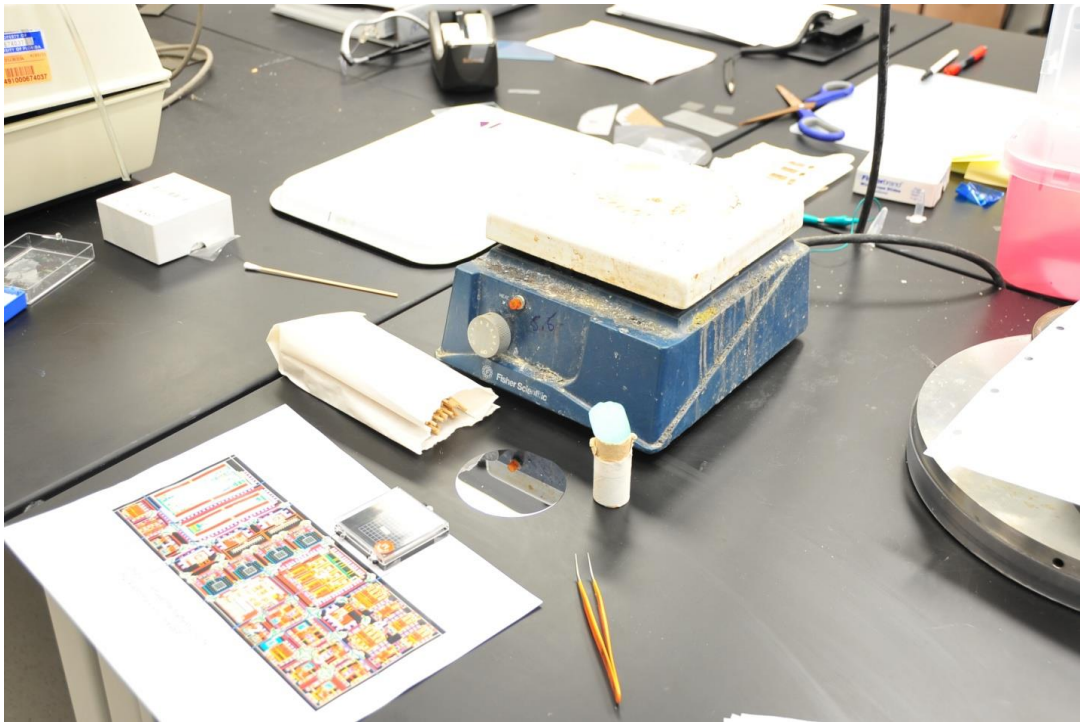
Finally, using the the trimmings that were saved fron the base tape, tape the edged of the UV tape down so that the wash water cannot infiltrate between the base tape ad the UV tape. It is only necessary to tape the top and left side.



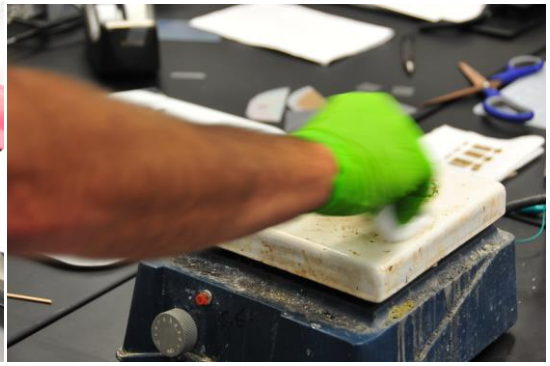
Store the mounted sample in the dark drawer until ready for loading into the dicer

Preparing a Hot melt sample:

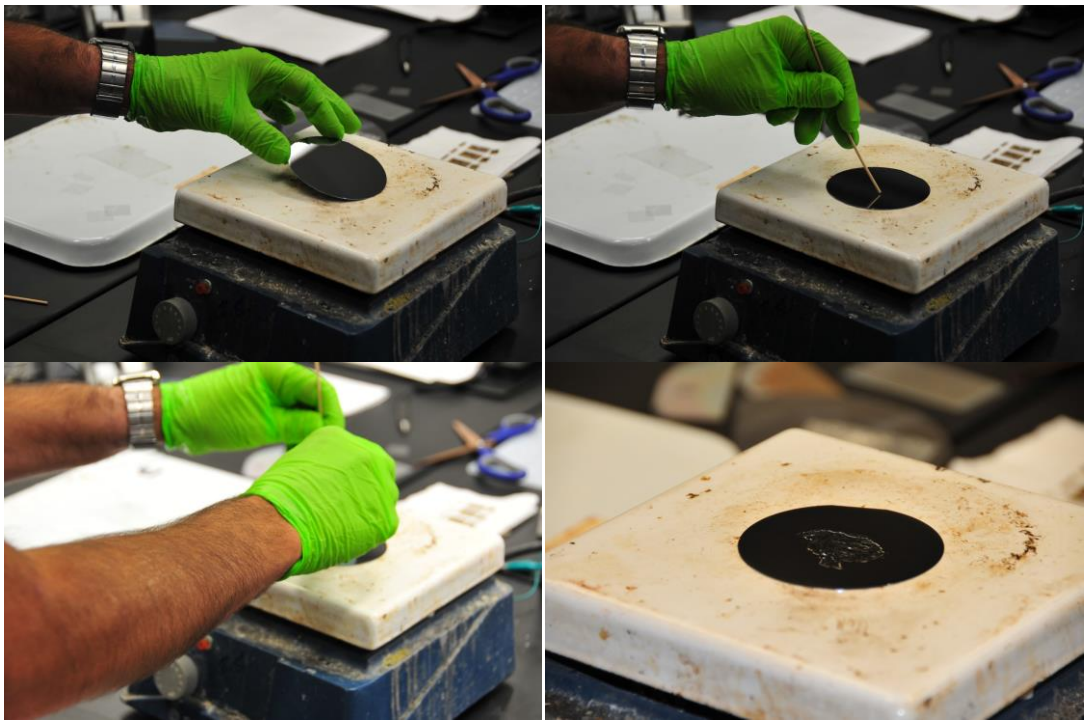
Materials needed are; hot plate, swabs, glue stick, carrier substrate, forceps and the cutting guide.



Turn the hot plate dial to 7.0 and allow the hot plate to warm up. Select an appropriate substrate material (a 3 inch wafer in this case); any uniform and stable material will do as long as it is compatible with the blade that is being used remember the carrier material is going to cut into by many microns. Clean off any residual glue off the hot plate (glue on the bottom of the substrate will have to be cleaned off with acetone before mounting to the tape).

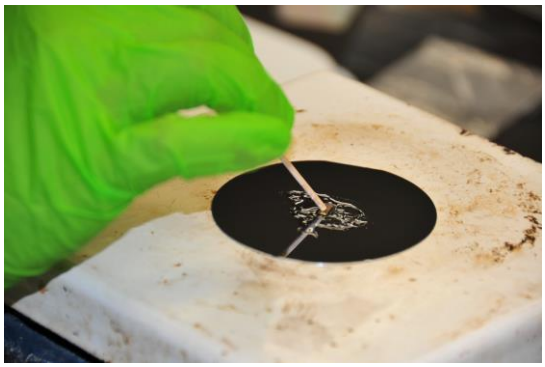


Place the substrate on the hotplate and hold it in place with the wooden end of the swab. Apply the glue stick to the hot substrate until there is a generous pool of melted glue.

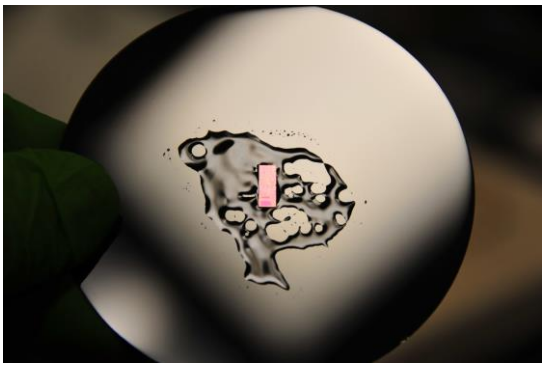


Place the sample very close to the glue pool without toughing it, and drop the sample into the pool face up.

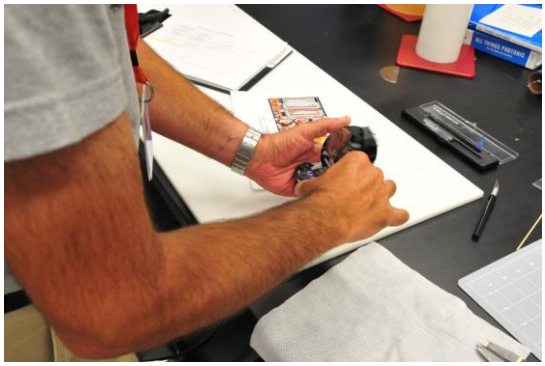
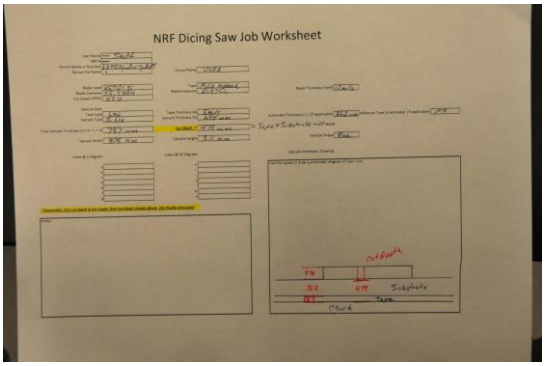
Using a clean swab wooden end gentily press the sample into the pool with a slight circuler motion untill the glue underneath is as thin as possible and the surface of the sample is parallel with the surface of the substrate.




Remove the substrate and allow it to cool, the sample is mounted.

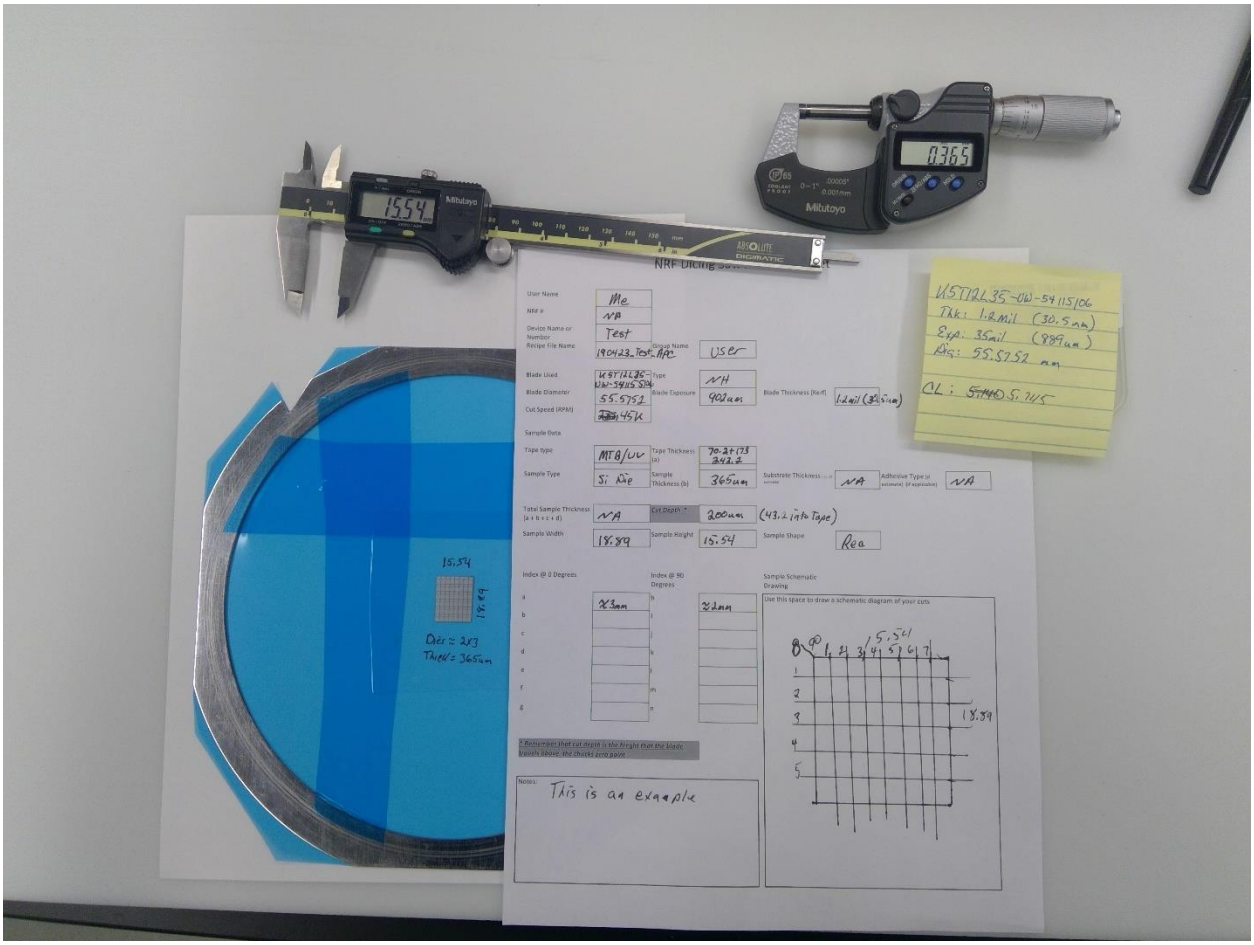
Clean any residual glue off the back with acetone. Measure and record the substrate thickness and mount on the ring with tape as outlined above.

Writing and running a Recipe:

What follows the step by step process of creating a recipe and running it. The cut routine is purposely kept to a simple grid, more advanced cutting like multiple dies and or samples with variable index lengths between cuts are beyond the scope of this document and will be covered one on one with staff.

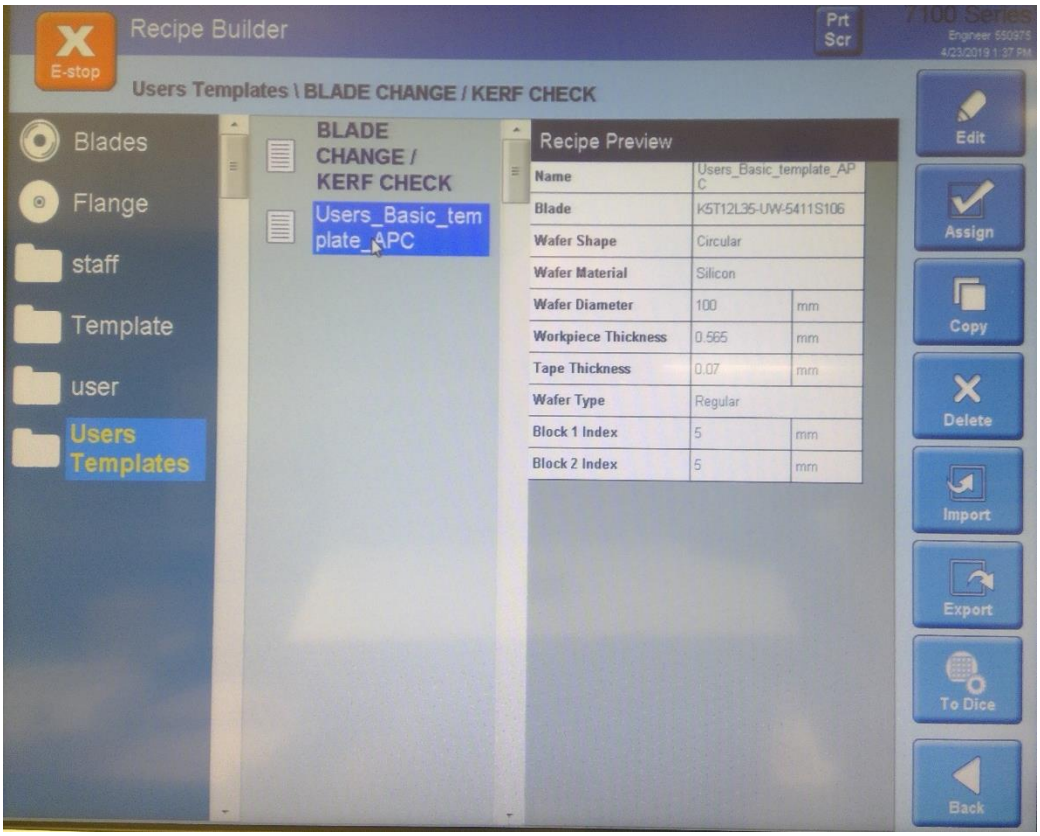
This is a sample and the individual die array that must be diced out following that is a rough hand drawn diagram of the cut placement and order.



Using the measurement tools available, the blade case and the configuration of the die itself fill out the work sheet. If all the fields are completed, all the information needed to write a recipe will be available.

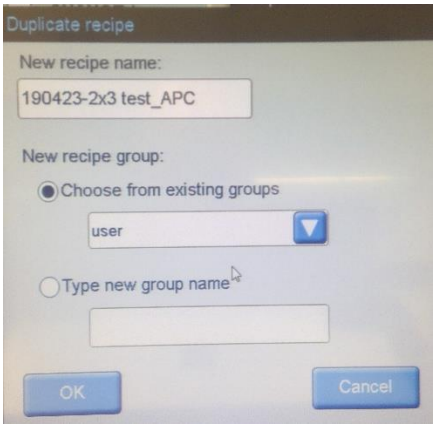
At the main menu screen select Recipe Builder.

the recipe builders page has many items on it, and allows access to and the ability to copy and modify process recipes, templates, flanges and blades.

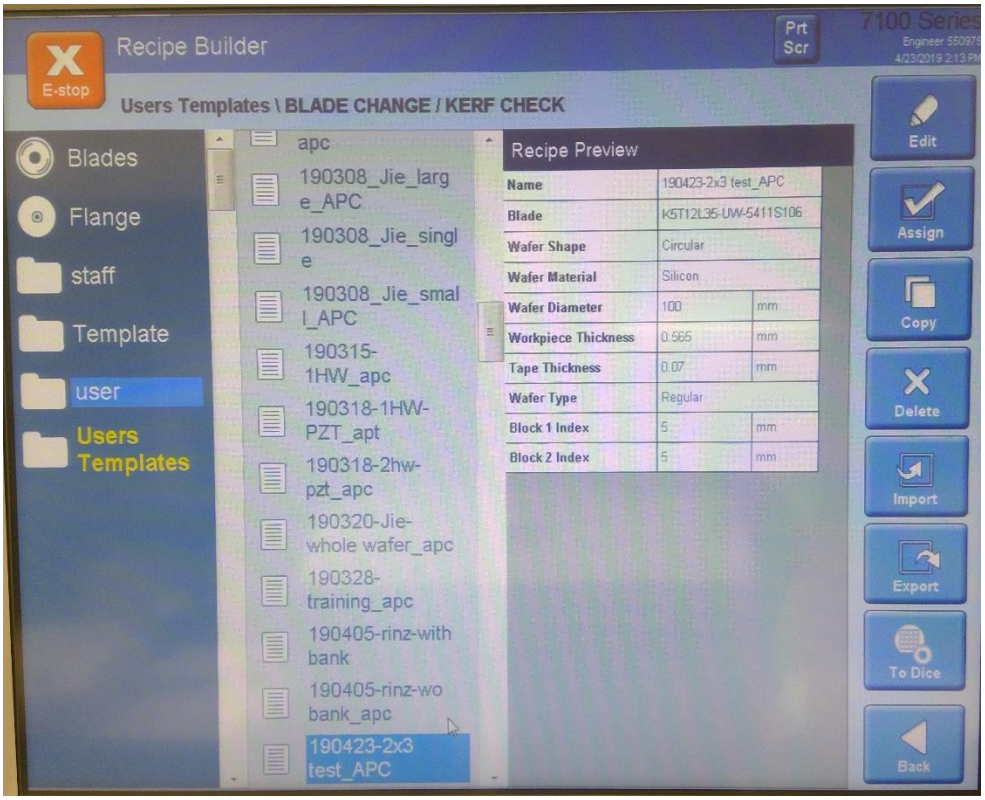


The templates and users templates have most of the basic configurations required already completed. The users templates have been configured more completely to meet our needs; these are the ones users will use.

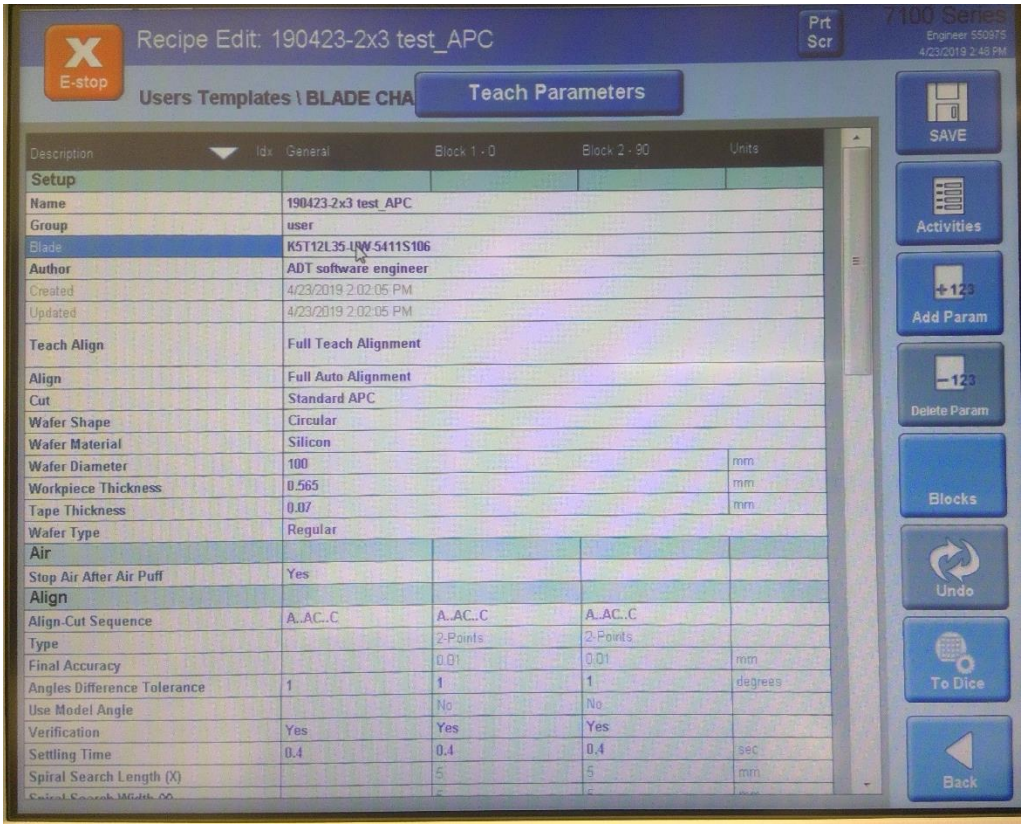
To start a new recipe, select “Users_Basic_Template_APC”, then click on the copy button.



I recommend a recipe name that includes a date code plus pertinent information. This name is for a recipe created on April 23, 2019 that has 2 x 3 dies. Always store user recipes in the user folder. When OK is clicked the user folder will appear with you new recipe highlighted. By the way if a user wants to select copy and modify an existing recipe that is certainly allowed. Don't worry about what the "Recipe Preview" indicates, it is going to be edited in the next step. Click on the edit button

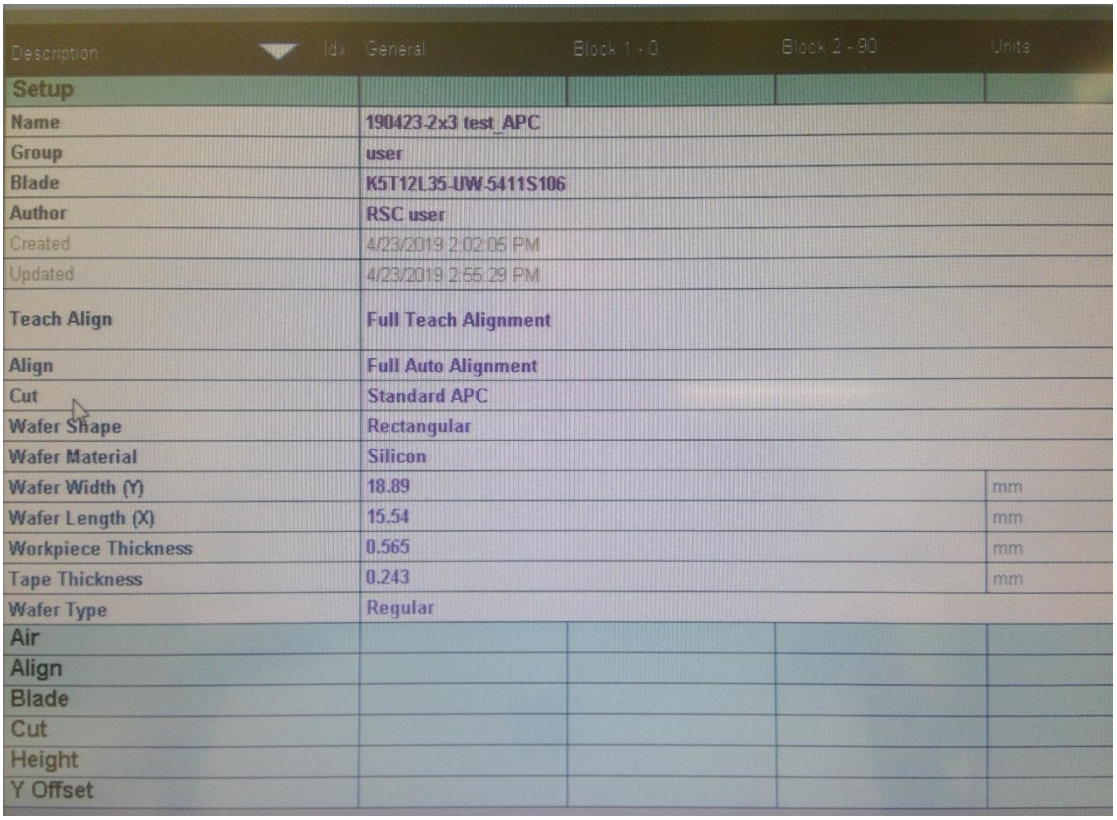


This will bring up the recipe editing window;



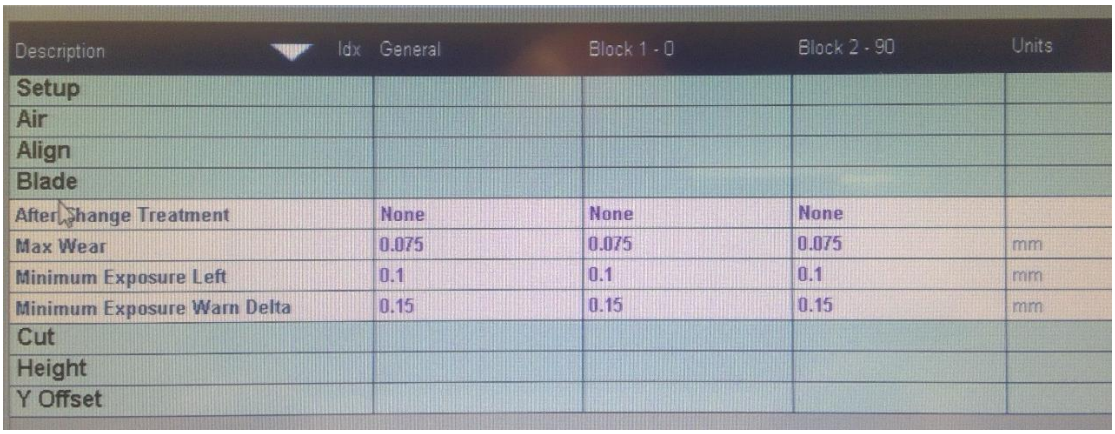
The editing window is divided into sections separated by blue bars that can be minimized once all of the editing is done for that section; it is recommended the the recipe be saved after completion of each section

In the Set up section, check that the correct blade is designated if no click in the field and select the correct blade from the library. Using the worksheet correct each of the other fields.



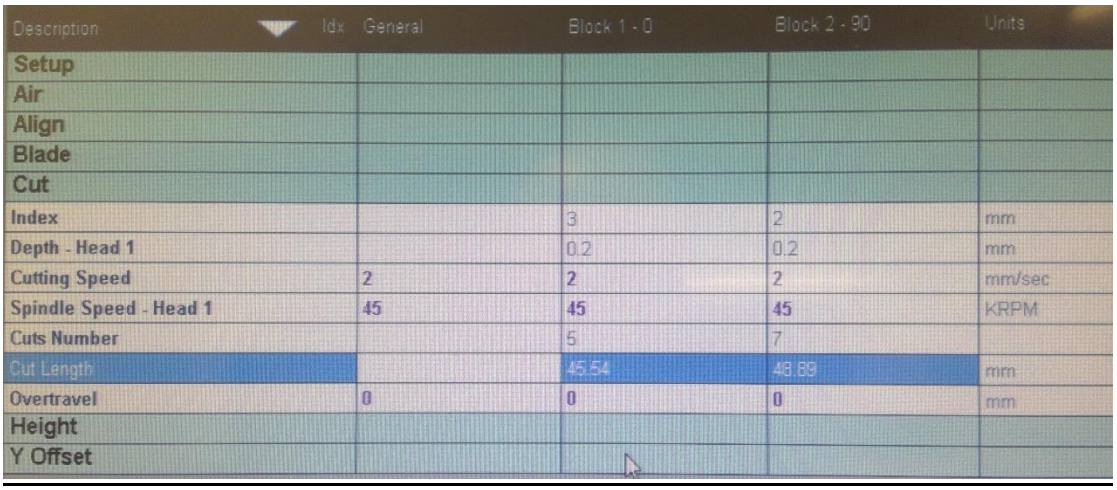
Description	Idx	General	Block 1 - 0	Block 2 - 90	Units
Setup					
Name		190423-2x3 test_APC			
Group		user			
Blade		K5T12L35-UW-5411S106			
Author		RSC user			
Created		4/23/2019 2:02:05 PM			
Updated		4/23/2019 2:55:29 PM			
Teach Align		Full Teach Alignment			
Align		Full Auto Alignment			
Cut		Standard APC			
Wafer Shape		Rectangular			
Wafer Material		Silicon			
Wafer Width (Y)		18.89			mm
Wafer Length (X)		15.54			mm
Workpiece Thickness		0.565			mm
Tape Thickness		0.243			mm
Wafer Type		Regular			
Air					
Align					
Blade					
Cut					
Height					
Y Offset					

Click save and go on to the Blade section, the air and align sections have nothing that needs to be changed.



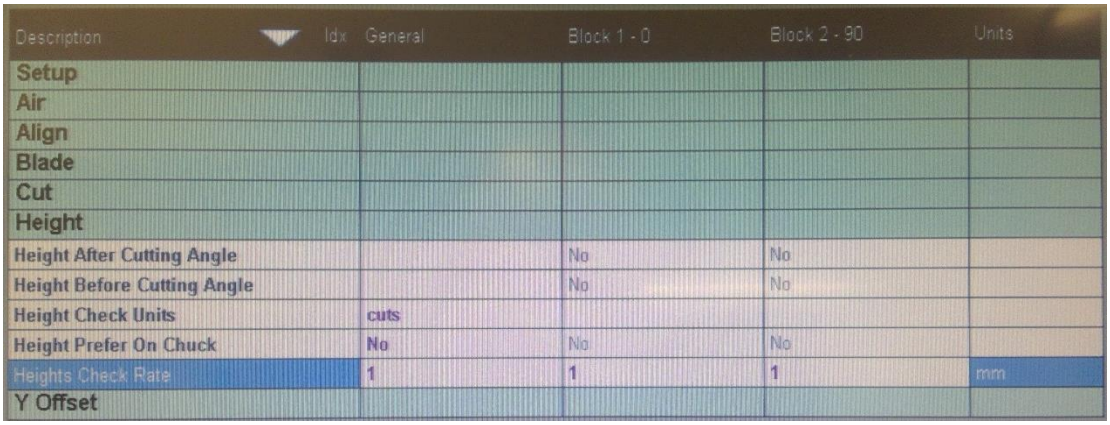
Description	Idx	General	Block 1 - 0	Block 2 - 90	Units
Setup					
Air					
Align					
Blade					
After Change Treatment		None	None	None	
Max Wear		0.075	0.075	0.075	mm
Minimum Exposure Left		0.1	0.1	0.1	mm
Minimum Exposure Warn Delta		0.15	0.15	0.15	mm
Cut					
Height					
Y Offset					

In the blade section the parameter are good for the standard Nickel hubbed blade but may need to be different for fast wearing res1niod blades. the exposure left and warn parameters are a safety margin keeping the hub away from the top of the sample. The max wear rate field may have to be changed if it turns out that the sample is so hard that a resinoid blade wears more than 75um per meter.



Description	Idx	General	Block 1 - 0	Block 2 - 90	Units
Setup					
Air					
Align					
Blade					
Cut					
Index			3	2	mm
Depth - Head 1			0.2	0.2	mm
Cutting Speed		2	2	2	mm/sec
Spindle Speed - Head 1		45	45	45	KRPM
Cuts Number			5	7	
Cut Length			45.54	48.89	mm
Overtravel		0	0	0	mm
Height					
Y Offset					

In the Cut section the actual cut parameters are entered. Notice the columns are designated General, Block 1 angle 0, Block 2 angle 90. More blocks may be added using the right menu if there are more than one sample loaded together. Remember the approximation of 3mm x 2mm for the streets (this can be modified in real time after the sample is loaded and measured). It was determined that a head depth of 200 um was sufficient. The Mediun tack blue tape was 70.2 um thick and the UV release tape was 173um for a total of 243.2 um and we want to cut sufficiently deep into the tape to prevent chipping on the bottom side of the sample. 200um will make a cut 43.2um into the tape. Remember that this figure represents the height that the blade travels above the chucks surface and not how deep into the sample that it cuts. The cuts number is self explanatory. The cut length is determined by adding 30um to the length and width of the sample. Later on the point at which the cut starts will be designated as 15mm beyond the edge of the sample automatically making it end 15mm beyond the opposite side.



Description	Idx	General	Block 1 - 0	Block 2 - 90	Units
Setup					
Air					
Align					
Blade					
Cut					
Height					
Height After Cutting Angle			No	No	
Height Before Cutting Angle			No	No	
Height Check Units		cuts			
Height Prefer On Chuck		No	No	No	
Heights Check Rate		1	1	1	mm
Y Offset					

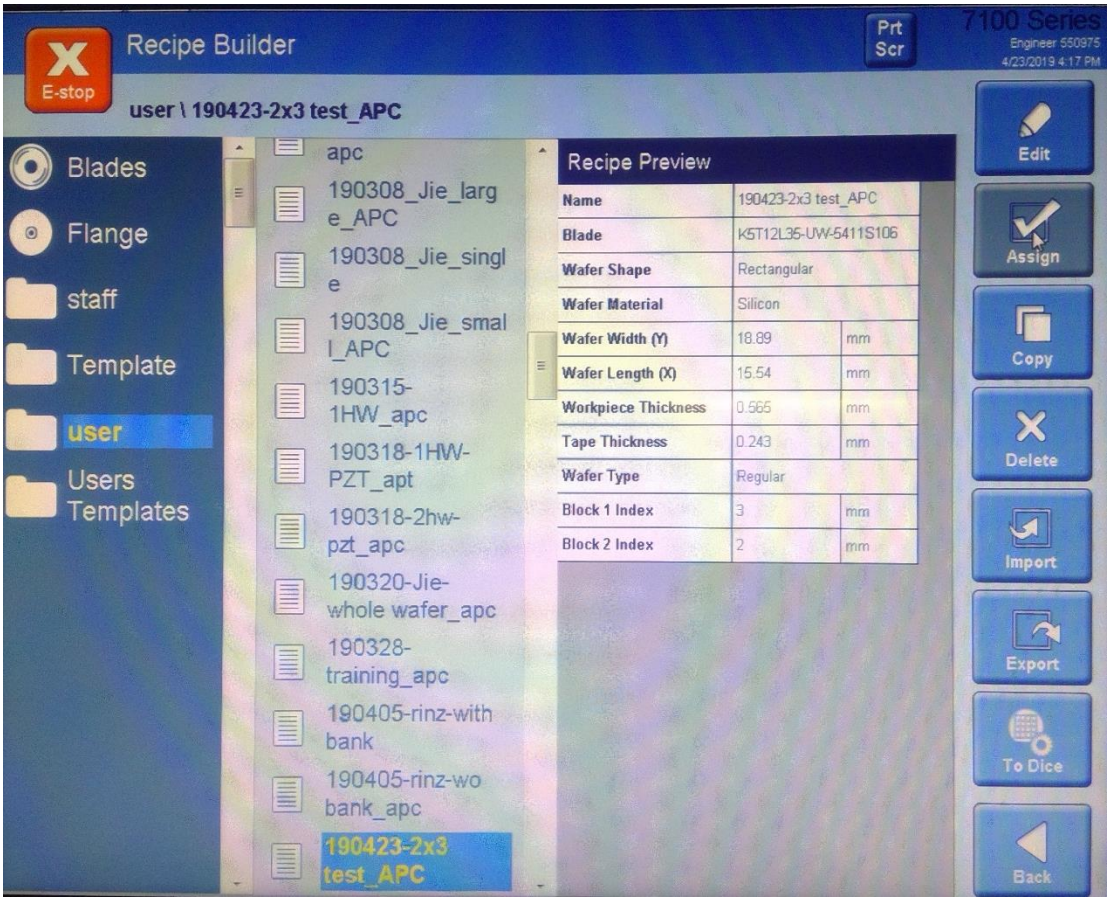
Under the Height section the number of cuts between height checks and zeroing are set. Setting it to 1 means that it will check and reset after every cut, this will increase you total dicing time by 15 to 20 seconds per check and can vastly influence the total cutting time if there are many cuts. The proper way to figure out what this figure should be is to determine how many cuts it will take to wear the blade to the point that it is not safely cutting into the tape beneath the sample and set the parameter accordingly.

There is no parameter in the Y offset section that needs to be modified, click the save button one last time for good measure.

The other items of interest in the editing section are the ability to add more blocks and add additional parameters. Or instance if there are multiple samples loaded at the same time there would have to be a set of blocks for each sample. If there are major and minor streets of varying distances then there would have to have more than just two index distances. A very thick and hard material may require multiple

passes of progressively deeper cuts along an indexed line to safely make the cut without damaging the blade or substrate.

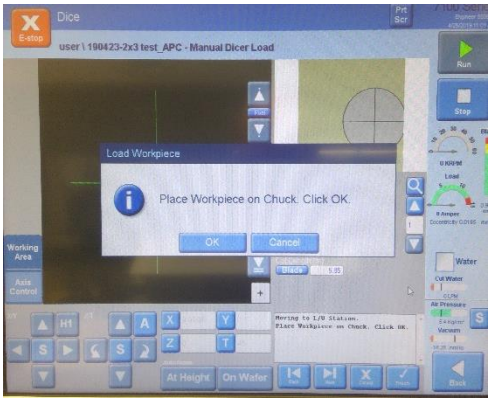
Once the editing is complete and saved click the back button to return to the recipe selection window. Then click the Assign button and the new recipe will be loaded into the machine.

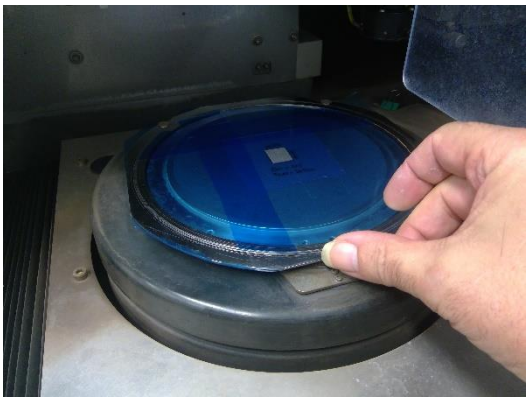


Note that the new recipe is indicated at the top of the screen.

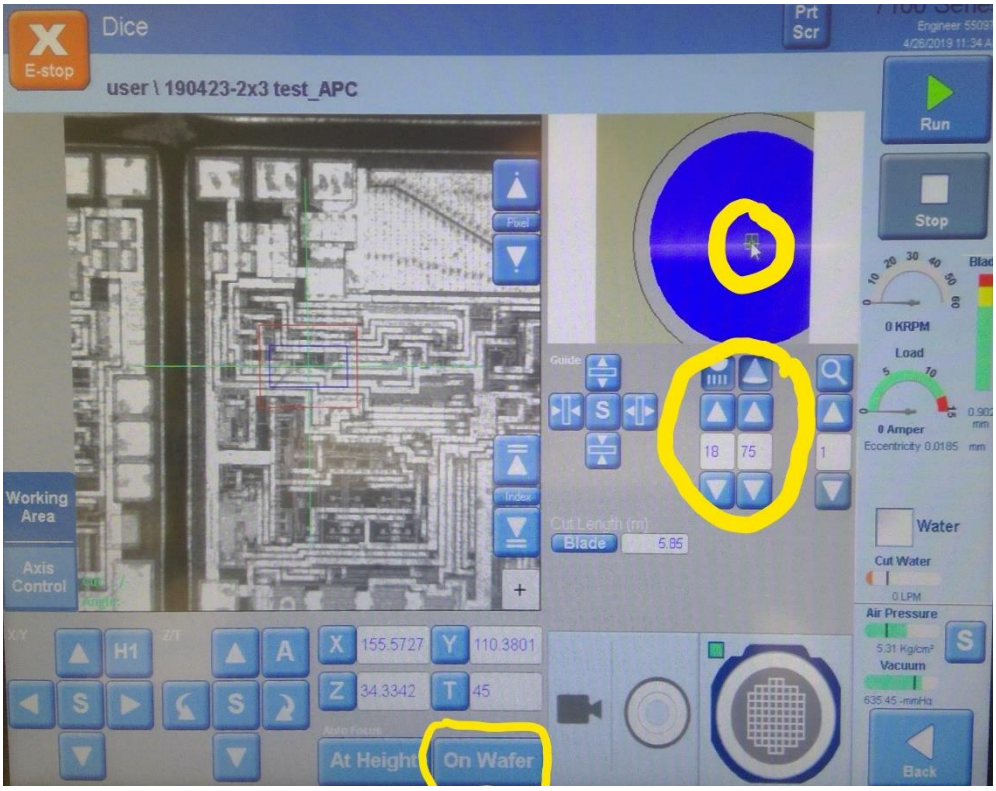
Click on the “To Dice” button to move to the processing screen.

Click on the Chuck Icon to bring up the workpiece handling menu and click on “Load Workpiece” and wait for the message.





Then click OK, the sample will be loaded and the workpiece icon will change.

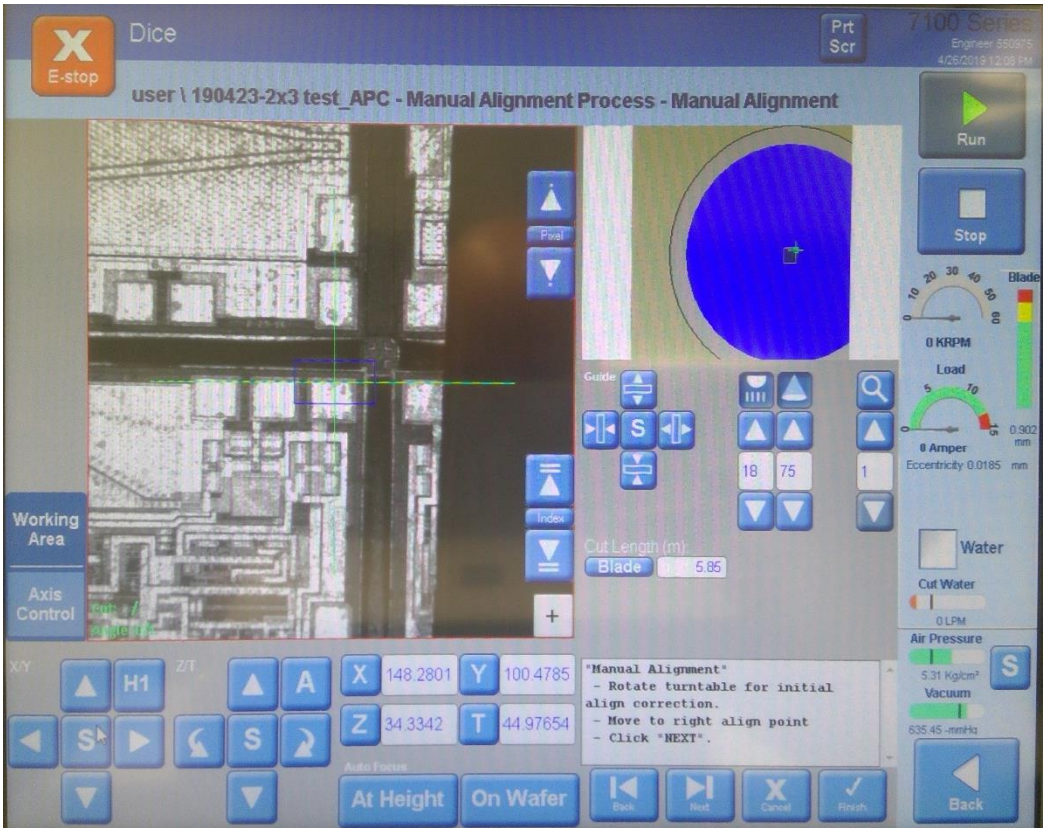


Notice that in the center of the chuck window is an area defined that matches the sample size and shape as designated in the recipe. Double click in the center and the camera will move to the center of the sample. Click the autofocus On Wafer and adjust the illumination control to give a clear video of the sample. The surface of the sample should be in focus, if not there is probably some error in the thickness measurement of the sample stack.

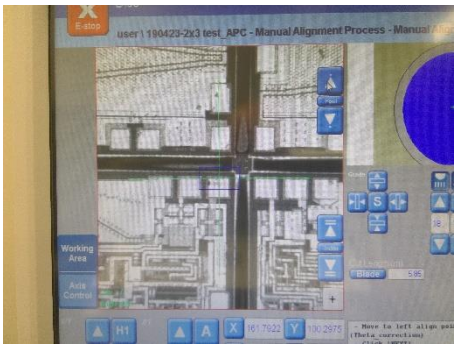
Click on the camera icon then select Align>Manual from the menu.

Using the X/Y, Z/T arrow buttons navigate to an area of the sample that has a reliable feature that is duplicated across the sample and set the

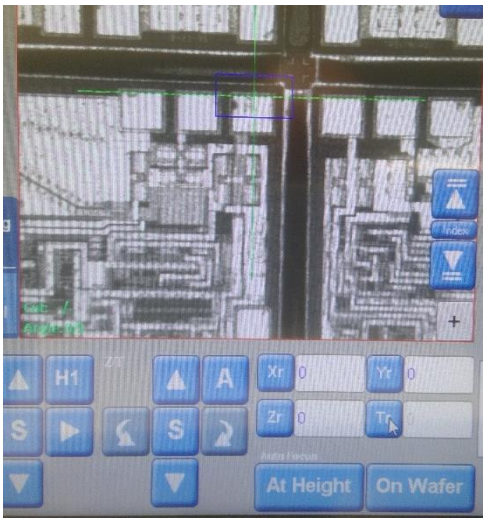
cross hairs on the edge. In this case I used the right most contact pad os the actual die as it is more reliable than features in the heavily processed street.



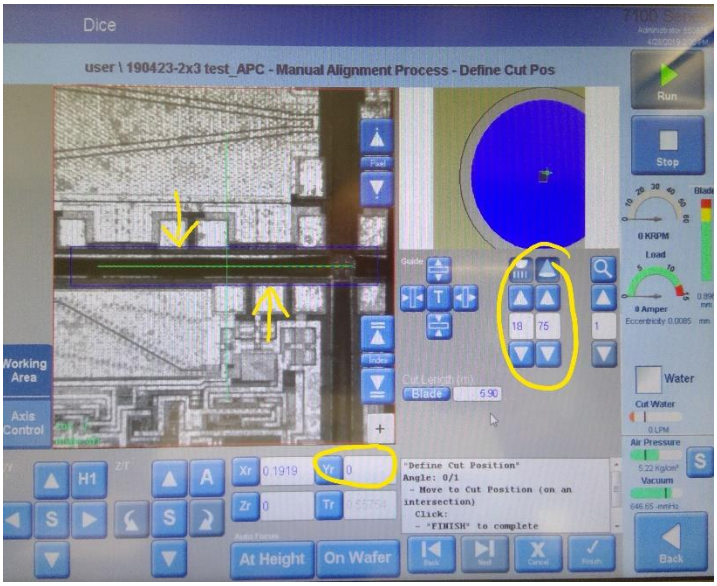
Click next and the will move to the other side of the sample, navigate and place the crosshairs on the identical feature on the left side of the sample.



When next is clicked the sample will be adjusted in Theta. Now clicking next repeatedly will move back and fourth between the alignment points the correct alignment, when satisfied move to the right most alignment point and zero out the location by clicking on the X,Y,Z an T buttons so that you can easily navigate back to this point. When finish is clicked the tool will drive to a “defined” position away from this point and so zeroing the position allows navigating back to this position with ease.



Click finish and then navigate back to the saved position. Center the crosshairs over the area that is to be cut, in this case the middle of the street above the alignment point. Note that the street has a lot of inconsistencies so we will center the cut between the bond pads using the blue box.



Adjust the position of the box and crosshairs in “Y” so that it is perfectly where the cut needs to be, then zero out the Y window. Next navigate to the far right edge of the sample using the “X” arrows, in this case, the right side of the sample. If the sample were circular then the point would be as far right as possible. Zero that point and then enter -15mm and enter, this effectively moves the crosshairs 15mm to the right of the samples rightmost point, zero this point. Next travel back to the Y zero position. Once the crosshairs are on the X,0 and Y,0 position click finish and cut lines will be generated and displayed on the animation window.

Navigate to a point above and near the center of the of the sample and click the index down button. The crosshairs should move to the first line that was used to define the cut and should be perfect. Index to each of the next positions (cut 2,3,4,5); notice that the error if any will be multiplied at each point. On the final cut position manually navigate in in y and divide that figure by the number of cut -1. Go back to the recipe and enter this number into the 0 block index parameter (in this case changed from 3 to 3.1291).

When finished and confident that all of the alignments and cut designations are correct, click on the “A” button and then the right most arrow button to move to the next angle block.

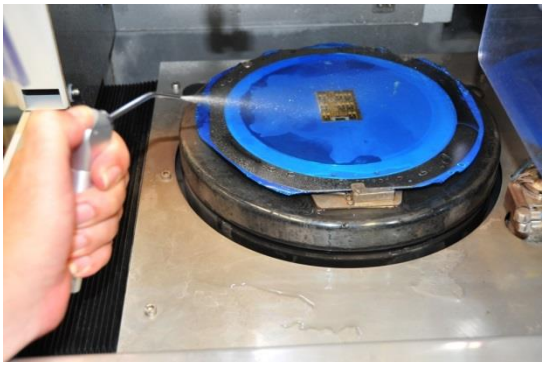
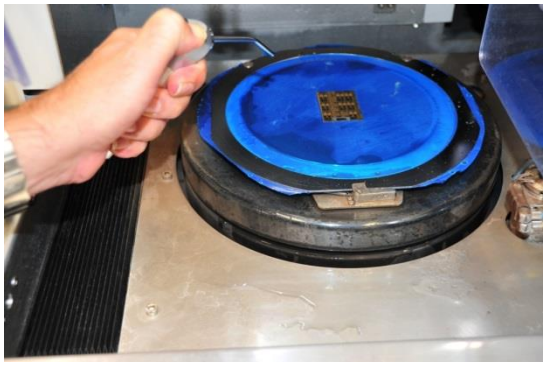
Preform all of the above procedures for each block that exists.

 Always verify that the actual cut matches the position of the crosshairs. Once alignment and cut definition is complete then a manual Y off-set test can be completed.

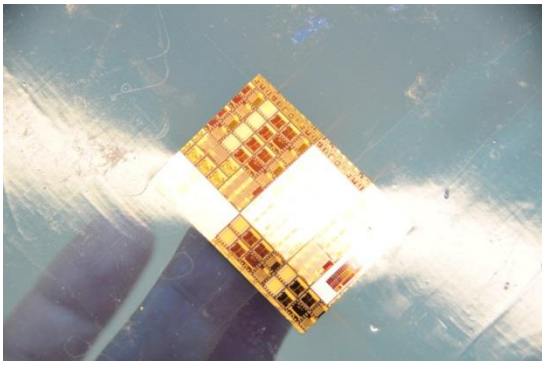
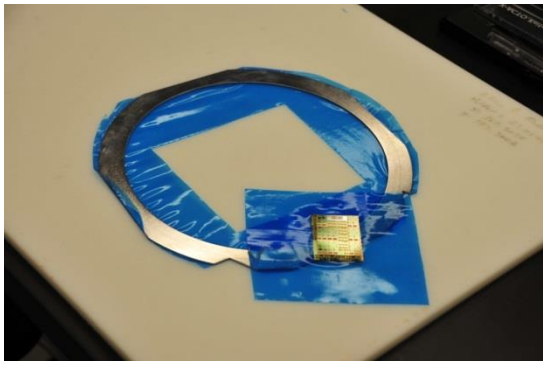
Select the Blade Icon then select “Y Offset” from the menu, tha tool will ask you to move the camera to a position where it will be safe to preform a test cut. This position can be in the tape just above the sample (less precise) but is best preformed on a safe portion of the sample surface.

When all of the blocks have been aligned and cuts defined and match the needs, and the cut position has been verified then click on the run button. The dicer will cut the sample as programmed then move to the Load/ unload position. When all of the cuts are finished, the dicer will return the chuck to the load/unload position.

Wash the sample and chuck area, then blow it dry

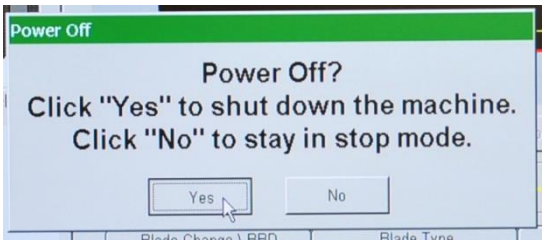
Click finish then remove the sample holder and inspect the cuts for completeness, the cut sample can be left on the tape for easy storage.

Dicer shutdown:

Press the “off” button and click yes on the screen. The dicer will go through an automated shutdown routine and will be finished when only the AC INPUT light is lit
After that turn off the water, clean dry air and log off on the TUMI.


INPUT
ON
STOP–OFF
24 VDC


Power Off
Power Off?
Click "Yes" to shut down the machine.
Click "No" to stay in stop mode.
Yes
No