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Date Modified: April 29, 2013

ADT 7100 Dicing Saw

Equipment Standard Operating Procedure

Steve Sostrom




1. **Purpose**
 - 1.1. The dicing saw is used to separate die from the wafer. A specified blade (dependant on substrate type) cuts or scribes lines in the x and y direction.
2. **Reference Documents**
 - 2.1. ADT 7100 Operations Manual
3. **Equipment**
 - 3.1. Tweezers
4. **Materials**
 - 4.1. Blue Tape
5. **Protective Equipment**
 - 5.1. Eye Protection: safety glasses must be worn at all times.
 - 5.2. Hand Protection: vinyl gloves are not necessary but recommended to minimize organics onto the wafer.
6. **Engineering and/or Administrative Controls**
 - 6.1. The dicing saw is located in room 1332.
 - 6.2. The tool owner is Steve Sostrom, srs@umich.edu.
 - 6.3. The check off and training person is Steve Sostrom, srs@umich.edu.
 - 6.4. Only authorized users may operate this piece of equipment.
 - 6.5. You must schedule the Dicing Saw and activate your reservation before using it.

7. Terminology

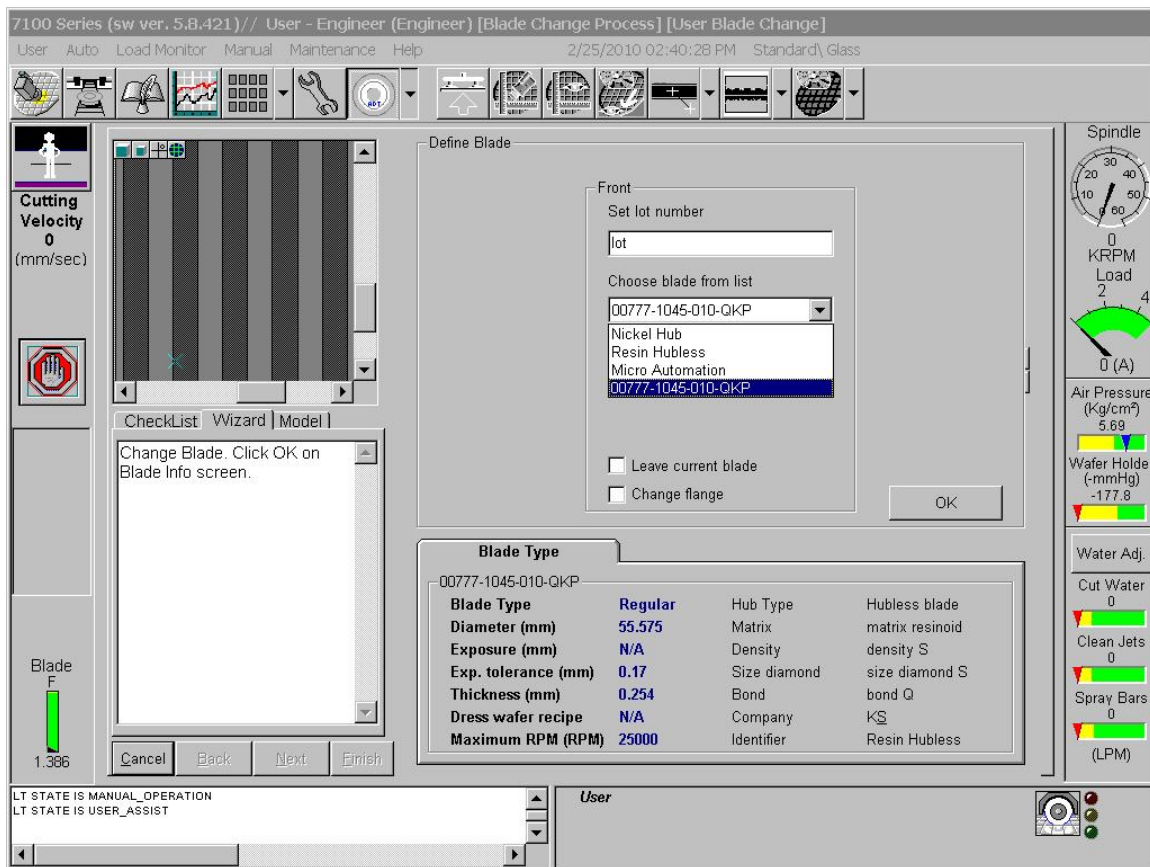
- 7.1. Wafer Diameter: diameter of wafer.
- 7.2. Wafer Thickness: The thickness of the workpiece.
- 7.3. General Tab: recipe parameters that affect all cuts.
- 7.4. Angle 0/1: recipe parameters that affect angle 0.
- 7.5. Angle 90/2: recipe parameters that affect angle 90.
- 7.6. FOV: Field of View
- 7.7. Cutting Speed: The speed of the Cutting Chuck (i.e. mm/sec) in the X direction during the cut.
- 7.8. Depth: how close to the chuck to cut or amount of material left after cut.
- 7.9. Street: usually the path in which to cut. Streets are physically predefined during Workpiece manufacture.
- 7.10. Index: street-to-street dimension or the distance along the Y-Axis between adjacent cuts in a workpiece for the angle specified.
- 7.11. Kerf width: width of saw cut.
- 7.12. Flange: Used to mount hubless blades so they can be placed on the spindle. Also referred to as a hub.
- 7.13. Blade Exposure: The amount of blade exposed outside of the flange or hub. This can be used to determine the maximum cut depth.
- 7.14. Cleavage Plane
 - 7.14.1. {100} wafers, natural cleavage planes exist perpendicular to the surface of the wafer in the directions parallel and perpendicular to the wafer flat.
 - 7.14.2. {111} wafers, a vertical cleavage plane runs parallel to the wafer flat.
- 7.15. Types of Blades
 - 7.15.1. The grit size of a blade is dependant on material to be cut.
 - 7.15.1.1. The thinner the blade, the narrower the kerf width.
 - 7.15.2. Blade 00777-1030-008 is used to cut glass and hard materials.
 - 7.15.2.1. The kerf width is typically 230 um (9.05 mils).
 - 7.15.2.2. Diamond grit size is 30 um, for less chipping, but will have a higher wear rate.
 - 7.15.3. Blade 00777-1045-008 is used to cut glass and hard materials.
 - 7.15.3.1. The kerf width is typically 230 um (9.05 mils).
 - 7.15.3.2. Diamond grit size is 45 um, for longer blade life.
 - 7.15.4. Blade S1230-Q5HH-000 is used only to cut silicon and softer materials.
 - 7.15.4.1. The kerf width is typically 50 um (2 mils).
 - 7.15.4.2. Diamond grit size is 4-6 um.
 - 7.15.5. Always ensure there is a blade on the flange.
 - 7.15.6. Edges of blades are very sharp and can easily cut through skin.
 - 7.15.7. Blades are very delicate and can break easily.
 - 7.15.7.1. Never touch the edge of a blade; this can cut you or damage the blade.
 - 7.15.7.2. **Do not use a broken blade on the saw** as it can cause the chuck to be cut and will not give a clean cut.

- 7.16. Types of flanges. The LNF has 4 different sizes.
- 7.16.1. 4B785-4200-000 flange
 - 7.16.1.1. Diameter is 2.00 inches or 50.800 mm.
 - 7.16.1.2. Blade exposure is 2.388 mm with the standard 2.188" OD blade.
 - 7.16.1.3. Best for cutting 2 mm thick substrates.
 - 7.16.2. 4B785-4204-000 flange
 - 7.16.2.1. Diameter is 2.04 inches or 51.816 mm.
 - 7.16.2.2. Blade exposure is 1.880 mm with the standard 2.188" OD blade.
 - 7.16.2.3. Best for cutting 1.5 mm thick substrates.
 - 7.16.3. 4B785-4208-000 flange
 - 7.16.3.1. Diameter is 2.08 inches or 52.832 mm.
 - 7.16.3.2. Blade exposure is 1.372 mm with the standard 2.188" OD blade.
 - 7.16.3.3. Best for cutting 1 mm thick substrates.
 - 7.16.4. 4B785-4212-000 flange
 - 7.16.4.1. Diameter is 2.12 inches or 53.848 mm.
 - 7.16.4.2. Blade exposure is 0.864 mm with the standard 2.188" OD blade.
 - 7.16.4.3. Best for cutting 500 um thick substrates.

8. Procedure

- 8.1. Know the layout of your wafer before cutting.
 - 8.1.1. Know width of streets (scribe lines).
 - 8.1.2. Thickness of the Workpiece.
 - 8.1.3. The diameter of the Workpiece.
 - 8.1.4. Location of alignment marks.
 - 8.1.5. The Index Value which is the distance between the streets on the Workpiece, such that moving between indexes in any angle should leave the cursor at the same relative point on the next street.
- 8.2. Powering Up the System
 - 8.2.1. Activate your reservation.
 - 8.2.2. Turn the nitrogen supply on using the valve located on the wall behind the saw.
 - 8.2.3. Ensure that the water level in the filtration system is filled to the bottom of the white platform. Do not fill past this point. Add water if necessary by using the black valve on the wall to the right of the filtration system.
 - 8.2.4. On the System Front Panel, press the ON  button. Wait for the system to initialize and the login screen to appear.
 - 8.2.5. Ensure that the water filtration system is running.
 - 8.2.6. Log in to the system by selecting your user name from the User menu and enter your password. You may check the Init system checkbox the first time you log in.
 - 8.2.7. Click OK. The Graphic User Interface Opening Screen is displayed.
 - 8.2.8. If the system has not yet been initialized, select System Init from the User menu.
- 8.3. Assign your recipe.
 - 8.3.1. From the Auto menu select Define Job.
 - 8.3.2. The name of the currently assigned recipe is displayed in the field in the upper left corner.
 - 8.3.3. Select a Recipe from the tree displayed.
 - 8.3.4. Click OK to assign the Recipe and close the dialog box.
- 8.4. Changing Blades
 - 8.4.1. New blades can be purchased from the LNF online store.
 - 8.4.2. The tool and House Nitrogen must be on.
 - 8.4.3. Blades are replaced on the Model 7100 for a variety of reasons, including:
 - 8.4.3.1. Worn Blades (not enough clearance)
 - 8.4.3.2. Blade type or size is not the same as the recipe
 - 8.4.3.3. Bad kerf (which may indicate a problem with a Blade)
 - 8.4.3.4. Broken Blades. **Do not use a broken blade** as this may cause the chuck to be cut and will not give a clean cut.
 - 8.4.4. Initiate the Blade Change procedure in one of the following ways
 - 8.4.4.1. Right-click the Blade Indicator and select Blade Change.
 - 8.4.4.2. From the Manual menu, select Services > Blade Change.

- 8.4.4.3. In the Blade Change tab of the Blade Information screen, click Change.
- 8.4.5. The Spindle stops rotating and moves automatically to the Blade Change station to enable easy access to the Blade. The GUI displays the Define Blade screen.
- 8.4.6. When the cutting chamber cover interlock disengages, open the cover to access the spindle.
- 8.4.7. Move the locking lever on the left side of the blade cover to the left.
- 8.4.8. Open the blade cover.
- 8.4.9. To remove the blade, place the Spanner Tool onto the red-handled Allen Wrench.
- 8.4.10. Place the Allen Wrench in the end of the spindle and the Spanner Tool on the Holding Nut. Never use the Torque Wrench to remove the blade as this may damage the Torque Wrench.
- 8.4.11. Remove the Holding Nut in the center of the Spindle by turning the silver Spanner Tool counter-clockwise. If you cannot remove the nut or blade, do not force it, call for help.
- 8.4.12. Remove dicing saw blade using the Blade Handling Tool.
- 8.4.13. If you are removing a S1230-Q5HH-000 (with built-in hub) blade and replacing it with a hubless blade such as 00777-1045-008, remove the thin silver spacer from the spindle.
- 8.4.14. Put blades with a built-in hub in the blade container or on a table and release from Blade Handling Tool.
- 8.4.15. Before putting a blade on, clean the spindle and cover using IPA and a clean wipe. Clean the back of the blade or flange, mounting hole and spacer to ensure accurate cutting.
- 8.4.16. Install the new Blade onto the Spindle using the Blade Handling Tool.
- 8.4.16.1. If you are installing a S1230-Q5HH-000 blade (with built-in hub), ensure that the thin silver spacer is on the spindle before the blade.
- 8.4.16.2. Writing on blade should face you.
- 8.4.16.3. Blade should be inserted all the way into the spindle. If you put it on straight, it will go on easily.
- 8.4.17. Release and remove the Blade Handling Tool.
- 8.4.18. Put the Spanner Tool on the Torque wrench.
- 8.4.19. Put the Holding Nut on the Spanner Tool with the writing facing you.
- 8.4.20. Place the Torque Wrench in the end of the spindle with the Holding Nut on the Spanner Tool.
- 8.4.21. Tighten the Holding Nut in the center of the Spindle by turning the Spanner Tool clockwise until the torque wrench clicks 2-3 times.
- 8.4.22. Close the blade cover.
- 8.4.23. Move the locking lever to the right to lock the cover in place.
- 8.4.24. Close the cutting chamber cover.



- 8.4.25. On the Define Blade screen, enter N/A in the Set Lot Number field.
- 8.4.26. Select the new blade type from the pull-down list. Failure to select the correct blade and flange could damage the machine and your wafer.
- 8.4.27. The Flange diameter field of the Define Blade screen becomes active when the blade type is defined as hubless.
- 8.4.28. If it is necessary to change the flange, Check Change Flange, change the Flange Diameter units to inches, and then select the desired flange.
- 8.4.29. Change the Flange Diameter units back to mm.
- 8.4.30. In the Define Blade screen, click OK.
- 8.4.31. Click Finish on the wizard screen.
- 8.4.32. The blade diameter is measured. The exposure is calculated and displayed in the Blade Indicator near the lower left part of the screen.

8.5. Wafer Mounting




- 8.5.1. Turn on the mounting unit using the switch located on the right front of tool.




- 8.5.2. Wait for plate to heat to 60°C, about fifteen (15) minutes.
 - 8.5.3. Lift the cover and place wafer face down on chuck (blue pad) with the flat aligned to the horizontal bars in chuck.
 - 8.5.4. Turn the vacuum valve on located on the right front of tool.
 - 8.5.5. Place saw frame around sample, aligning to the pins.
 - 8.5.6. Pull blue tape across frame and wafer. Stick it to the bar near the front of the tool. Be careful not to pull too much tape as this will get in the way.
 - 8.5.7. Press down firmly with your fingers at the four corners of the roller assembly. Slide it straight and evenly to the back and again to the front. It tends to bind if it is not moved evenly.
 - 8.5.8. Place the roller is back into the compartment in the front.
 - 8.5.9. Close the unit cover.
 - 8.5.10. Move the end cutter that is near the back of the cover to the center. Press down and move it to the left then all the way to the right.
 - 8.5.11. Press down on the circular blade button on the top and move it twice around the frame.
 - 8.5.12. Open the unit cover.
 - 8.5.13. Lift and discard the remaining tape.
 - 8.5.14. Turn the vacuum valve off located on the right front of tool.
 - 8.5.15. Remove the workpiece from the unit.
 - 8.5.16. It is recommended that you put the workpeice back on the chuck with the wafer facing up for 15-20 minutes to ensure good tape adhesion. Failure to do this may cause pieces to dislodge during cutting and will be lost in the machine.
 - 8.5.17. If there are bubbles between the tape and the workpiece, remove the tape from the frame and the workpiece, and then repeat the entire procedure. Completing the steps quickly can minimize bubbles.
 - 8.5.18. Turn off machine after mounting the last wafer.
 - 8.5.19. **Note: The tape is 3 mils thick.**
- 8.6. Dicing saw Programming
- 8.6.1. It is wise to have all parameters calculated prior to set up, this way you may check for errors. Length parameters can be specified in inches, millimeters or microns by selecting the units from the units pull-down menu. Note that some parameters cannot be changed. Items highlighted in green can be changed by the standard user.

| Recipe parameter | Description | Typical Value |
|-------------------|---|---------------|
| Wafer Diameter | The diameter of the workpiece | 4", 6" |
| Wafer Thickness | The thickness of the workpiece | 500 um, etc. |
| Tape Thickness | The thickness of the blue tape | 3 mil |
| Min Exposure Left | The minimum blade exposure permitted considering the wafer thickness, etc. | 2 mil |
| Cut Entry Speed | The speed of the Cutting Chuck in the X direction during the entry to the workpiece | 2.5 mm/sec |
| Cut Exit Speed | The speed of the Cutting Chuck in the X direction during the exit from the cut | 2.5 mm/sec |

| | | |
|--------------------------------|--|--------------------------|
| Cutting Speed | The speed of the Cutting Chuck in the X direction during the cut | 5 mm/sec |
| Overcut | The distance for which the entry and exit speed is maintained to ensure the Blade enters and exits the workpiece at the specified speed. | 8 mm |
| Overtravel | The distance along the X-Axis that is added to the cut to ensure that all cuts begin from beyond the edge of the Workpiece | 3 mm |
| Spindle Speed | The rotational speed of the Spindle | 24000 RPM |
| Height Check Units | The unit of measurement for blade height checks | Number of cuts |
| Height Check Rate | How often blade height (exposure) is checked | 10 |
| Coaxial Illumination After Cut | Defines the Coaxial illumination intensity for the inspection that is done after the cut. | 30 |
| Oblique Illumination After Cut | Defines the intensity of Oblique Illumination for the Manual Inspection after cut | 15 |
| Depth | How close to the chuck to cut or amount of material left after cut | 2 mil |
| Index | Street-to-street dimension or the distance along the Y-Axis between adjacent cuts in a workpiece. Can be taught or entered manually. Multiple Indices of various lengths can be defined for a Workpiece. | Equal to the size of die |

8.6.2. Displaying Recipe Parameters

- 8.6.2.1. Click  to display the Programming Workspace.
- 8.6.2.2. Expand the Recipe in the Programming tree on the left to display its parameter categories.
- 8.6.2.3. Select any parameter category in the Programming tree. The parameters for the Recipe are displayed in the Parameter Table in the upper right pane of the Programming Workspace.
- 8.6.3. Creating a New Recipe. **Please do not make unnecessary recipes as memory space is limited.** Only the technician user has permission to duplicate recipes.
 - 8.6.3.1. Select an existing Recipe from the Standard group in the Programming tree. There are standard recipes for most of the materials that we currently cut. Do not change any parameter in these recipes.
 - 8.6.3.2. Click the Duplicate Recipe button at the bottom of the Programming Workspace.
 - 8.6.3.3. Enter a name for the new recipe in the New recipe name field and select the **Users** group from the drop-down list. User recipes in the Standard group will be deleted.

- 8.6.3.4. Click OK. The new Recipe is created based on the Recipe selected.
- 8.6.4. It is recommended for better accuracy to operate the spindle for at least 10 minutes before you begin cutting. The spindle will be on after the blade is put on.
- 8.6.4.1. If necessary, after the blade has been installed, right-click on the spindle indicator and select operate.
- 8.6.5. Place a Workpiece on the Cutting Chuck
- 8.6.5.1. Click the Load/Unload Wafer button , or from the Manual menu, select Services > Place Workpiece.
- 8.6.5.2. Open the Load/Unload Cover and place your Workpiece, mounted on a frame, on the Cutting Chuck with the workpiece on top of the tape. Lifting only slightly, Place the notches of the frame under the pins to the rear of the chuck with the substrate facing up. Open the latch near the front of the chuck, make sure that the frame is below the latch and close it.
- 8.6.5.3. Close the Load/Unload Cover and click Finish in the Wizard.
- 8.6.6. Defining Recipe Properties
- 8.6.6.1. Users can modify the values of parameters in the Recipe that they have read-write access to.
- 8.6.6.2. Click  to display the Programming Workspace.
- 8.6.6.3. Select your Recipe from the Programming tree. The properties for the Recipe are displayed on the right.
- 8.6.6.4. Select the desired units from the Units drop-down list for the parameter being modified. The type of units vary with the parameter type.
- 8.6.6.5. In the Parameter Table, double-click the Value cell of the parameter to be modified. If the User can choose from among a list of preset values, a drop-down list appears in the cell. Otherwise, a blinking cursor appears.
- 8.6.6.6. Select a value from the drop-down list or enter the value directly. Only values within the min and max range are valid.
- 8.6.6.7. Click Save . The new Recipe is saved to the System. The System checks the required parameters in the Recipe.
- 8.6.6.8. If the Missing Parameters Report is displayed, click Close to add the missing parameters to the recipe using default values.
- 8.6.6.9. Assign the new recipe for use if you have not done this previously. See step 8.3.

7100 Series (sw ver. 5.8.421) // User - Engineer (Engineer) [Blade Change Process] [User Blade Change]

User Auto Load Monitor Manual Maintenance Help 2/24/2010 12:01:48 PM Standard\Si-Glass

Si-Glass

Cutting Velocity (mm/sec)

Blade F 1.372

Recipes

- APC
- Glass-Silicon
- Pico
- Silicon
- Standard
- AutoAlign-Glass
- Glass
- Si-Glass
- Air
- Align
- Align Pos
- Blade
- Camera
- Cut
- Height
- Manual Inspection
- Teach Center
- Y offset
- Silicon
- Template

| Name | Value | units | Ad | En | Te | Op |
|------------------|------------------------|----------|----|----|----|----|
| Name | Si-Glass | no units | | | | |
| Group | Standard | no units | | | | |
| Blade Group | 00777-1045-010-QKP | no units | | | | |
| Wafer Shape | circular | no units | | | | |
| Wafer Diameter | 4 | inch | | | | |
| Wafer Width (Y) | 0 | inch | | | | |
| Wafer Length (X) | 0 | inch | | | | |
| Wafer Thickness | 1 | mm | | | | |
| Tape Thickness | 3 | mil | | | | |
| Wafer Type | regular | no units | | | | |
| Author | Administrator | no units | | | | |
| Created | 11/20/2009 08:58:09 AM | no units | | | | |
| Updated | 2/24/2010 11:40:24 AM | no units | | | | |
| comment | | no units | | | | |
| cut | Standard GPC | no units | | | | |
| align | Full Auto Alignment | no units | | | | |
| Kerf Check | none | no units | | | | |
| PP Teach | Full Teach Alignment | no units | | | | |
| Kerf Teach | none | no units | | | | |

Spindle 3 289 KRPM Load 2.51 (A)

Air Pressure (Kg/cm²) 5.79

Wafer Holder (-mmHg) -3.8

Water Adj.

Cut Water 0

Clean Jets 0

Spray Bars 0 (LPM)

Import/Export

Duplicate recipe

Recipe Import

Recipe Export

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LT STATE IS MANUAL_OPERATION

User

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8.7. Teaching Alignment

8.7.1. Alignment uses the Vision System to precisely align a Workpiece parallel to the Blade to ensure accurate cutting down the middle of each Street. This SOP will describe Manual Alignment (performed by the User). Auto Alignment (performed automatically by the Pattern Recognition System) is available to advanced users.

8.7.2. Manual Alignment comprises the following steps:

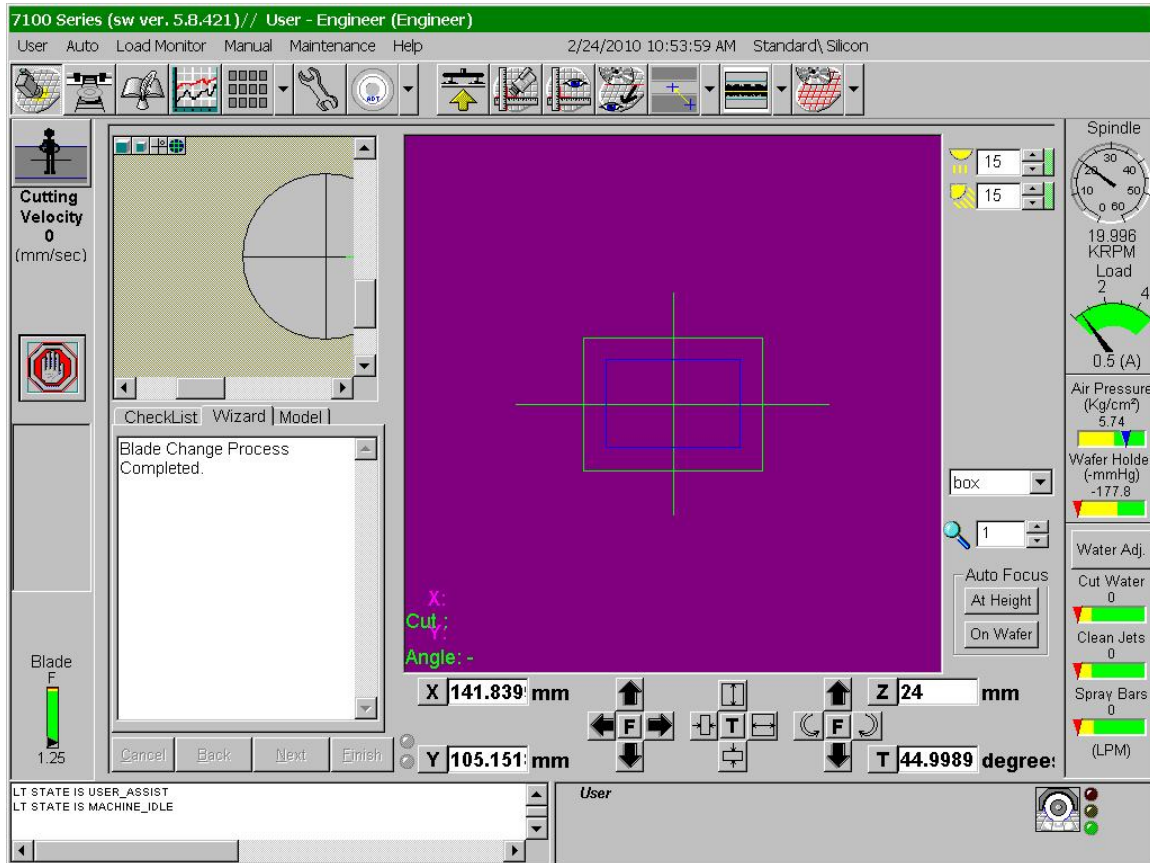
8.7.2.1. Aligning the Workpiece, to ensure the Streets are parallel to the Blade.

8.7.2.2. Defining the Cut Position.

8.7.3. From the Manual menu, select Vision > Manual Alignment, or click



in the toolbar. The display automatically switches to the Video Workspace and the first step to be performed by the User is displayed in the Wizard.



8.7.4. Follow the direction given in the Wizard.

8.7.4.1. Note: If a cut map for the wafer already exists, the system goes to the defined cut position. To repeat the alignment, manually click Back.

8.7.4.2. Adjust focus and illumination as needed.

8.7.5. At this time you may optionally rotate the chuck manually for a gross theta alignment. Position the green horizontal line (not the box) of the Reticule along the horizontal edge of a Street on the right side of the Workpiece using either the X/Y-Axis Controls or by double-clicking the location in the view windows.

8.7.6. Click Next. The Workpiece moves along the X-Axis until the left side of the Workpiece is beneath the microscope.



8.7.7. Position the Reticule on the edge of the same edge of the same street using the X/Y-Axis Controls.

8.7.8. Click Next. The theta correction is applied.

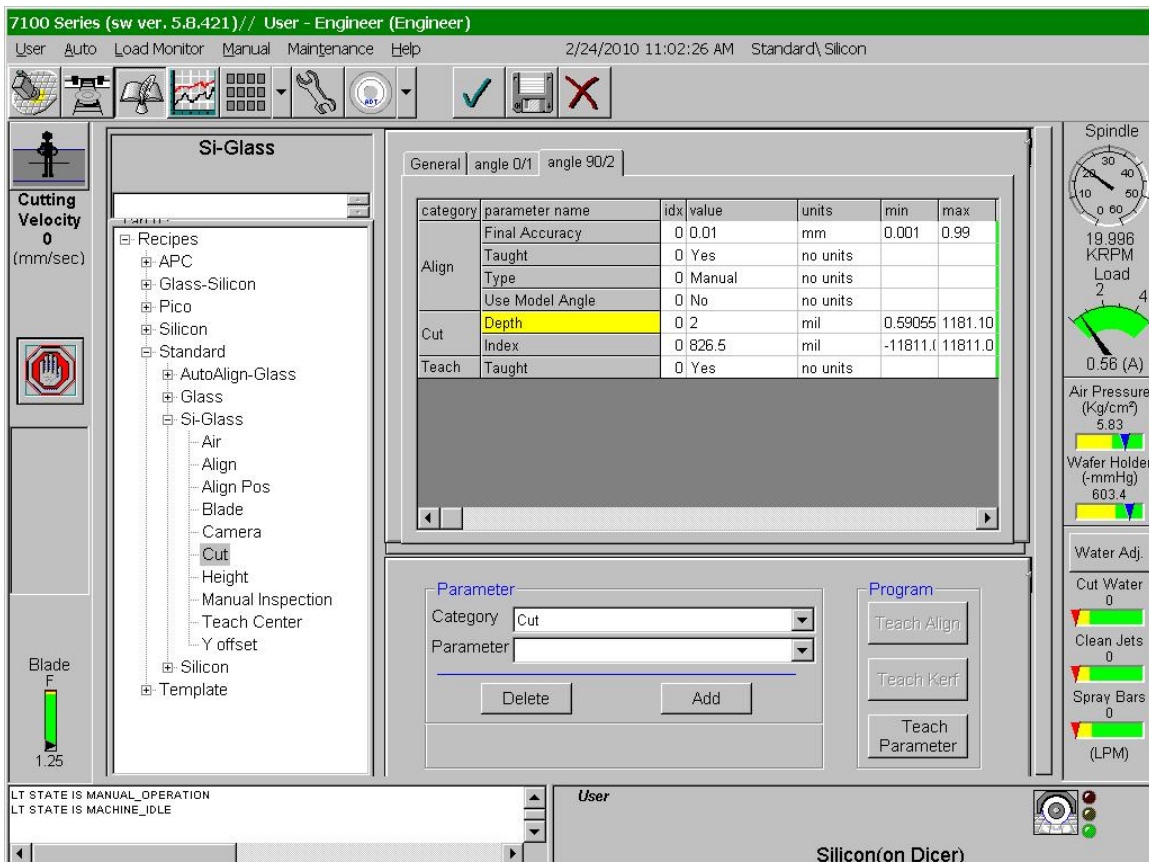
8.7.9. If you click Next, the Workpiece moves along the X-Axis until the right side of the Workpiece is beneath the microscope allowing additional correction. You may also click Finish to complete.

8.7.10. Repeat Steps 8.7.6 to 8.7.9 by clicking Next to move from one side of the Workpiece to the other and adjusting the position of the Reticule until the Reticule remains on the edge of the Street in both positions.

8.7.11. Click Finish to complete the first step in the Manual Alignment procedure.

- 8.7.12. The second step in Manual Alignment is defining a Cut Position, which is a reference point on the Workpiece. It is recommended to select a Cut Position at a well-defined point on the Workpiece, usually at the top of the wafer.
- 8.7.13. Use the X/Y-Axis Controls to move the green horizontal crosshair to the center of the wafer.
- 8.7.14. Click Finish. The System automatically calculates and displays the cut map for that angle in the Main Workspace Window in the Video Workspace, according to the recipe parameters.
- 8.7.14.1. Note: For GPC algorithm, the defined cut position is in the center of a wafer anywhere on the wafer. The cut map is displayed across the entire wafer.
- 8.7.15. Switch to the next angle by changing the Theta to the next angle using the Z/T Axis Controls (selecting **A** then ).
- 8.7.16. Repeat steps 8.7.4 to 8.7.14 to align the second angle.
- 8.8. Teach the Index (if you choose not to enter it into the recipe manually)
- 8.8.1. Click  to display the Programming Workspace.

8.8.1.1. Expand the Recipe assigned to the Workpiece in the Programming tree and select the Cut parameter category of that Recipe. The parameter table for the Recipe is displayed on the right.



7100 Series (sw ver. 5.8.421) // User - Engineer (Engineer)

User Auto Load Monitor Manual Maintenance Help 2/24/2010 11:02:26 AM Standard\Silicon

Si-Glass

General angle 0/1 angle 90/2

| category | parameter name | idx | value | units | min | max |
|----------|-----------------|-----|--------|----------|----------|---------|
| Align | Final Accuracy | 0 | 0.01 | mm | 0.001 | 0.99 |
| | Taught | 0 | Yes | no units | | |
| | Type | 0 | Manual | no units | | |
| | Use Model Angle | 0 | No | no units | | |
| Cut | Depth | 0 | 2 | mil | 0.59055 | 1181.10 |
| | Index | 0 | 826.5 | mil | -11811.1 | 11811.0 |
| Teach | Taught | 0 | Yes | no units | | |

Parameter Category: Cut Parameter:

Program Teach Align Teach Kerf Teach Parameter

Spindle 19.996 KRPM Load 2 0.56 (A)

Air Pressure (Kg/cm²) 5.83



Wafer Holder (-mmHg) 603.4

Water Adj. Cut Water 0 Clean Jets 0 Spray Bars 0 (LPM)

Blade F 1.25

LT STATE IS MANUAL_OPERATION
LT STATE IS MACHINE_IDLE

User Silicon(on Dicer)

- 8.8.1.2. In the parameter table, select the tab for the first defined angle.
- 8.8.1.3. Scroll to the Index parameter and click the cell containing the value defined for the Index parameter. The Teach Parameter button in the lower right corner becomes enabled.
- 8.8.1.4. Click Teach Parameter.
- 8.8.1.5. In the box that pops up, click Update to modify a previously taught Index, or New to teach the Index for the first time.
- 8.8.1.6. Perform Manual Alignment (8.7.3 to 8.7.11). At the end, click Finish.
- 8.8.1.7. Click Manual in the Teach Index Process dialog box.
- 8.8.1.8. Click Next. The Chuck moves to the top of the Workpiece.
- 8.8.1.9. Move to an align point the first Street where a cut is required, using the X/Y-Axis Controls.
- 8.8.1.10. Click Next to move to the next align point.
- 8.8.1.11. Move to the same align point on the next Street where a cut is required, using the X/Y-Axis Controls.
- 8.8.1.12. Repeat steps 8.8.1.9 and 8.8.1.10 for each additional align point, as required. At the last align point, click Finish. The System calculates the Index and the Index is defined and displayed on the screen. The Update Parameters dialog box is displayed.
- 8.8.1.13. Click Yes. The new values for the Index and Align Index parameters are saved to the Recipe.
- 8.9. Save the recipe, ensure that your recipe is loaded/assigned (assigned earlier)
- 8.10. Click the Run button  on the toolbar. From that point on, System operation is entirely automatic. The entire wafer will be cut as defined in the recipe. The User only needs to intervene when changing a Workpiece or replacing the Blade.
- 8.11. Y Offset must be performed after a Blade change or before cutting can begin.
 - 8.11.1.1. Y offset will automatically be initiated before cutting starts if the blade has been changed or you can manually initiate it by clicking Manual Y Offset  in the toolbar.
 - 8.11.1.2. Move to an area on the wafer where you can cut. Make sure the cut is not close to critical features.
 - 8.11.1.3. You may need to change the illumination if the wafer color is different from the cutting area.
 - 8.11.1.4. The User is prompted to either perform a single cut or to abort the Manual Y Offset procedure. Click Yes to continue.
 - 8.11.1.5. The cut is performed and the User is prompted to find the center of the cut.
 - 8.11.1.6. Use the up and down arrows of the X/Y-Axis Controls to move the reticule to the center of the cut.
 - 8.11.1.7. Click Finish. The System is automatically updated.


8.12. If you are in Auto mode and the machine has finished cutting the Workpiece, the wizard will prompt to remove the workpiece.

8.12.1. Follow the Wizard instructions.

8.12.2. Click Finish in the Wizard, when prompted to do so by the System.

8.12.3. Remove the Workpiece from the Cutting Chuck. Take care not to drip water on the chuck.

8.13. To remove a Workpiece in manual mode

8.13.1. Click the Load/Unload Wafer button , or from the Manual menu, select Services > Remove Workpiece, or press Ctrl+R.

8.13.2. Click Finish in the Wizard.

8.13.3. Open the Load/Unload Cover and remove the Workpiece from the Cutting Chuck. Take care not to drip water on the chuck.


8.13.4. Close the Load/Unload Cover.

8.14. Remove your blade. See section 8.4.4

8.15. Powering Down the System

8.15.1. Ensure that the system has stopped operation.

8.15.2. Press the Stop>OFF button . The system stops and a pop-up message appears on the screen.

8.15.3. Wait at two seconds and press the Stop>OFF button  again. **Do not click Yes on the screen** to power off.

8.15.4. The powering down process takes 1 to 1.5 minutes. Please wait until the tool has completely shut down before leaving the area.

8.15.5. Turn the nitrogen supply off using the valve located on the wall behind the saw.

8.15.6. Ensure that the water filtration system is not running.

8.15.7. Fill out the log book.

8.15.8. End your reservation.

8.15.9. Remove your wafer pieces from the blue tape. Discard the tape and return the frame to the magazine located near the mounting station.

9. Waste Products

9.1. Broken wafers are to be discarded in the glass trash located in Wet Chemistry.

- **Report all accidents (injuries, spills, fires) to the LNF On Call or other LNF staff. For emergencies during non-business hours, call the LNF Emergency Response Team at (734) 764-4127 or Department of Public Safety at (734) 763-1131.**