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Dicing Saw

Standard Operating Procedure

Revision: 1.0 — Last Updated: Apr. 15/2015, Revised by Mohamad Rezaei

Overview

This document will provide a detailed operation procedure of the Dicing Saw. Formal Training is required for all users prior to using the system.

Revision History

#	Revised by:	Date	Modification
1	Mohamad Rezaei	April 15, 2015	Initial release
2			
3			
4			
5			

Document No. -------

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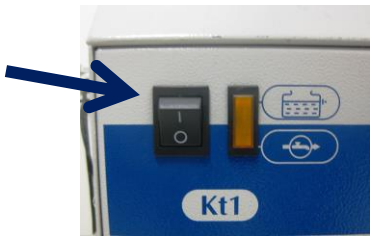
General Information

The Loadpoint MicroAce Series 3 is an ultra-high – precision, high speed cutting and scribing machine.

Operation

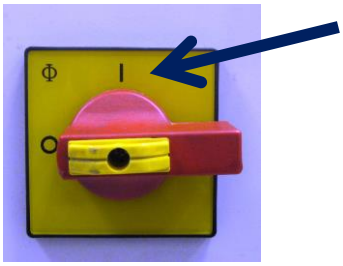
1. Start-up

- Turn on the chiller.



- Open the air valve at the backside of the machine.

- Turn on the main isolator switch on the front of the main unit.



- Press the white start button adjacent to the emergency stop.

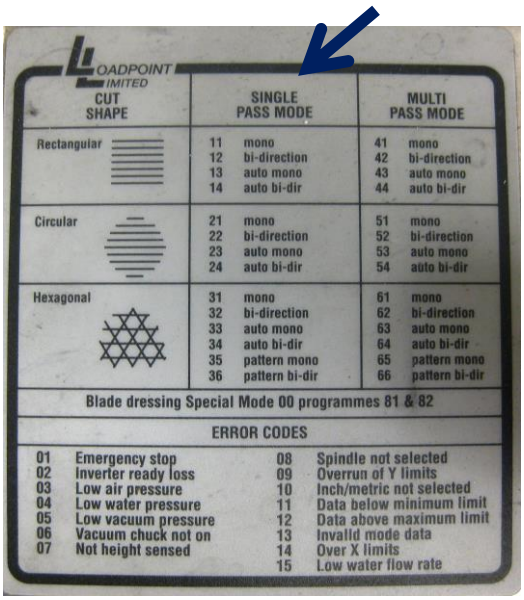
- Turn on two black switches on the wall

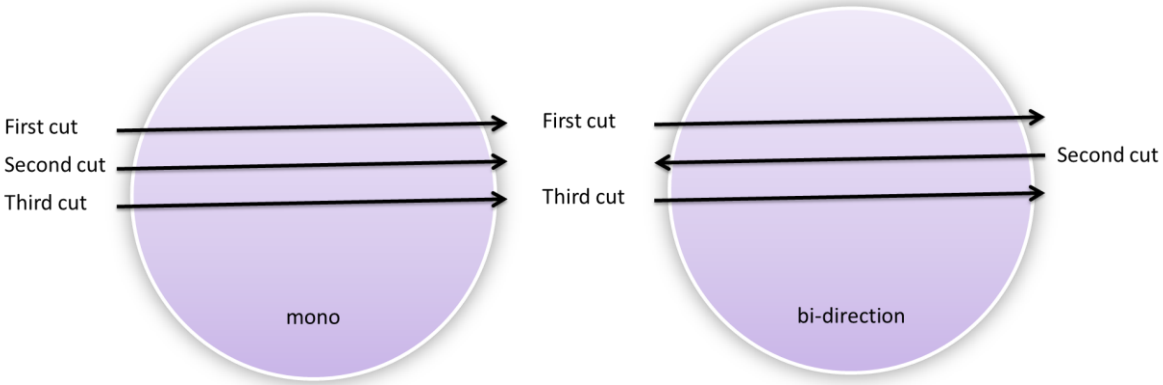
2. Programming

- Place the sample on the rotary porous chuck
- Press ***prog*** on the control panel**.** The red indicator light **"• programme no"** starts flashing.

- If you already have a saved program, select it, otherwise enter 32 by pressing ***3***, ***2*** and ***enter***.
- The next light on the Auto Prompt **"• inch [1]/ metric [2]"** then flashes. Select either ***1*** for inch or ***2*** for metric and press ***enter.***
- The **"• mode"** now flashes. Programme modes for wafer shape with single or multiple passes and with manual or automatic operation are available on the panel above the controller. Select a suitable mode based upon your dicing plan.

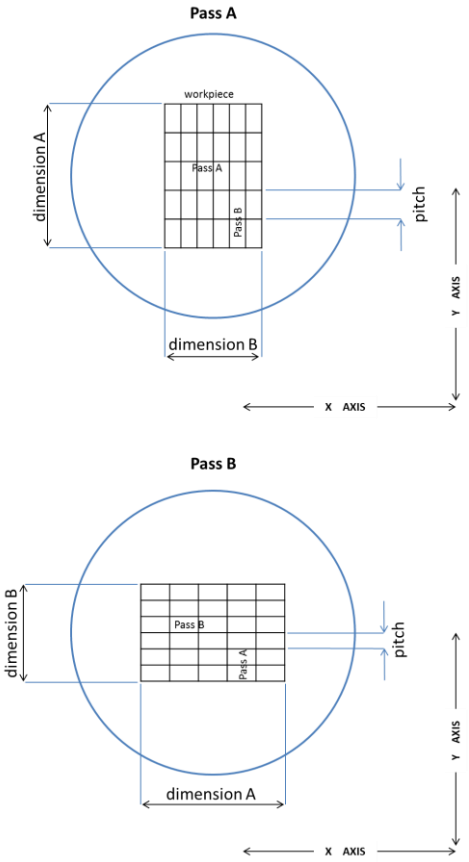
  NOTE: Please select a number from "SINGLE PASS MODE" column. For a dual axis cutting use an "auto cut" mode. In mono modes the blade cuts only in one direction while in bi-direction modes the blade cut in 2 directions.





- The **"• dimension A"** then flashes. **dimension A** displays the work piece dimension along the Y-axis when the chuck is in the 0 position ready for pass A. key in your dimension and press ***enter***.
- The **"• dimension B"** then flashes. **dimension B** displays the work piece dimension along the X-axis when the chuck is in the 0 position ready for pass A. key in your dimension and press ***enter***.

  Note: Whenever vacuum "vac" is turned on, the Data Panel will display the current pass.



- The **"• compt thickness"** then flashes. **compt thickness** displays the thickness entered for the component, which should include the thickness of the mounting film. Enter proper thickness and press **enter**.
- The **"• depth of cut"** then flashes. Enter the desired depth which always should be less than the thickness of the components.
- Enter the **"• pitch A"** value**. pitch A** displays the pitch, or index increment, on the Y-axis when the chuck is in pass A.
- Enter the **"• pitch B"** value. **pitch B** displays the pitch, or index increment, on the Y-axis when the chuck is in pass B.
- Enter the **"• no of cuts A"** value. It displays the number of cuts when the chuck is in the A pass.
- Enter the **"• no of cuts B"** value. It displays the number of cuts when the chuck is in the B pass.
- Enter the **"• feed rate-left"** value. It shows the carriage speed for a right to left cut.

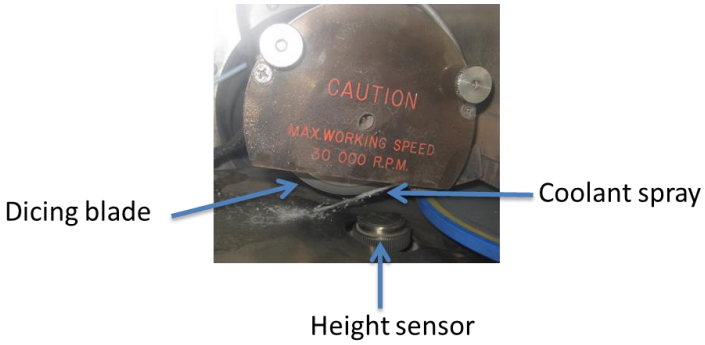
- Enter the **"• feed rate-right"** value. It shows the carriage speed for a left to right cut.
- Enter the **"• spindle speed (r.pm)"** value. Key in 40 for a spindle speed of 40,000 rpm and press ***enter***.
- Programming is now complete. To save data press ***save*** & the button with no label shown in the below image simultaneously.

3. Operation

After programming the machine

- Place the mounted work piece over the chuck
- Press ***vac*** and do the alignment procedure as described below
    - Use the jog keys to generally align the work piece
    - Using the microscope, jog the X, Y and Θ keys to precisely align the work piece
    - The first cut is now aligned to the blade
- Press ***spindle*** to start
- Press ***height sense.*** [HS] is displayed in the DATA panel. Wait till [HS] is cleared from the Data panel.
- Press ***cut auto.*** The cutting programme will now start.

Note: Check that operation is satisfactory and that blade coolant is spraying tangentially onto the point of contact of the blade.



- On the completion of the programme, [END] will show.

4. Dual Axis cutting

Dual axis cutting automatically cuts the second axis

- Select and enter a suitable programme with an **auto cut** mode.
- Start ***spindle*** and ***height sense.***
- Follow the general guide until the work piece is aligned on the first pass. Ensure work piece is in correct orientation for pass A or Pass B.
- Press ***cut auto***. The machine will now remember that position and rotate the chuck through 90°.
- Align the work piece on the second pass and press ***cut auto***.
- The machine will now start cutting the second pass. On completion, the chuck will rotate back through 90° and move to the memorized alignment position of the first pass and start cutting the first pass.

5. Shut-down

- If spindle is rotating press ***spindle*** to stop.
- Turn off the main isolator switch on the front of the main unit.
- Close the air valve at the backside of the machine.
- Turn off the chiller
- Wait for 5 minutes and then turn off two black switches on the wall

References and Files

MicroAce 3 operation and maintenance manual and training notes.

Contact Information

Questions or comments in regard to this document should be directed towards Mohamad Rezaei (rezaei@4dlabs.ca) in 4D LABS at Simon Fraser University, Burnaby, BC, Canada.