CORAL name: Diesaw-DAD3240

Location: Level 5 Packaging, Bay 5115.
Category: Packaging
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Introduction

The Diesaw-DAD3240 is a sawing tool used to cut wafers and other substrates into smaller pieces (dies). The tool is typically used at the end of a process. The substrate is attached to UV release tape and the saw can make a number of periodic cuts that can optionally be aligned to marks or patterns on the substrate. There are different blades available for different materials (silicon, glass, etc.); see appendix.



Safety

The system utilizes a high-speed cutting blade and has interlocked guarding to prevent user access to the blade while it is spinning. The system sprays water during the cutting process to cool the blade and substrate as well as to trap dust from the cutting process. Do not attempt to defeat interlocks.

The wastewater from this system is discharged into the drain and therefore substrates that contain materials that are prohibited from the wastewater stream must NOT be cut on this system. This includes arsenic-containing materials (GaAs, InGaAs, AlGaAs, etc.), selenium, copper, nickel, chromium, lead, and other heavy metals. Please discuss options with the staff if you need to cut a non-standard material.

Qualifications and Responsibilities

In person training is required. Because of the variety of options and settings that are available, users should bring a real sample for training.

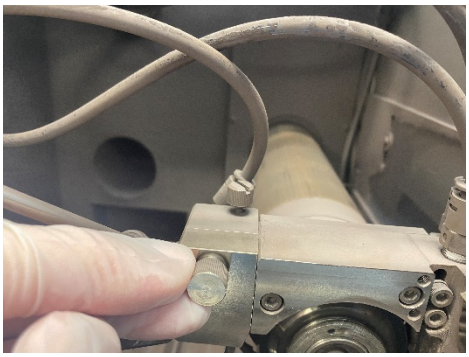
User responsibilities: check/change blade before each session or if blade breaks during use.

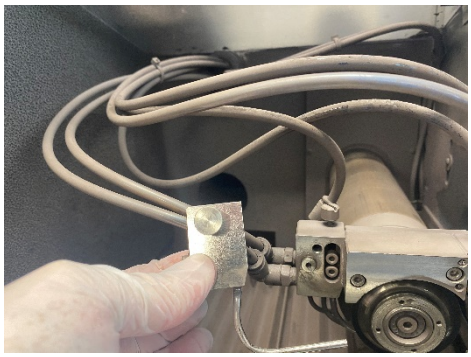
Operating Procedures

1. Engage tool in Coral (Diesaw-DAD3240)

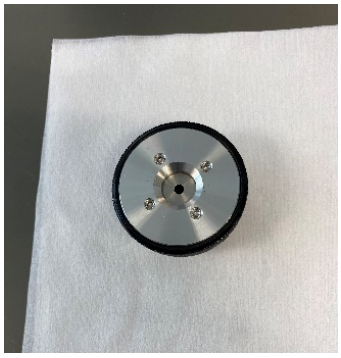


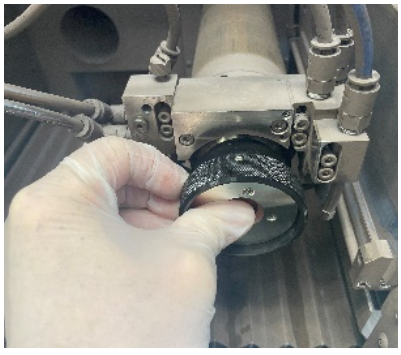
2. Turn on the labeled water valve to the left of the tool.
3. Turn key to "**Start**"; hold for 2-3 seconds and then release to the "**On**" position (similar to starting a car).
4. Initialize the system by selecting the "**System Initial**" tab.
5. Select the "**F4**" tab, **Blade Maintenance.**
6. Select the "**F1**" tab, **Blade Replacement.**
7. Open sash.
8. Remove thumb screw and place on top of the sash.

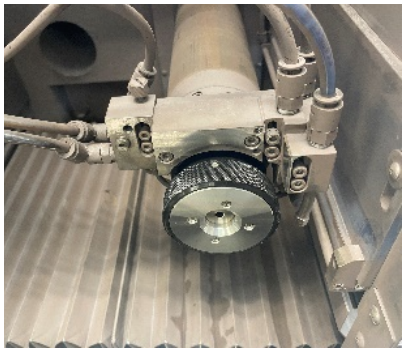




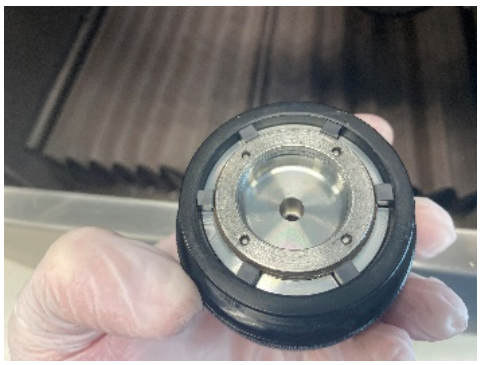
9. Blade changing tools are in the **blue bin** located on the bench in front of the tool.
10. Use the **Flange Nut Removal Tool** to remove flange nut. Attach tool to flange nut mounted on the spindle and turn clockwise until you feel the pins lock into place.



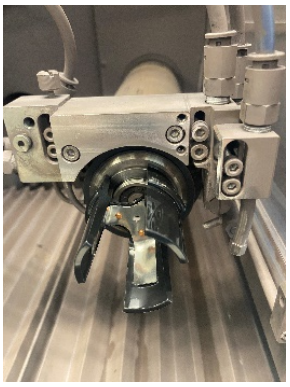




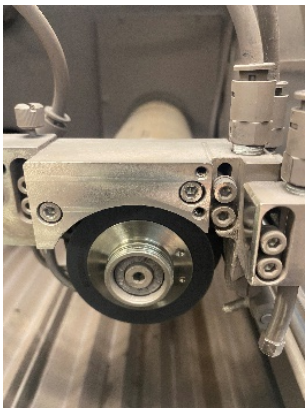
11. Once in place, turn tool counter-clockwise to remove nut from spindle and place on top of sash.



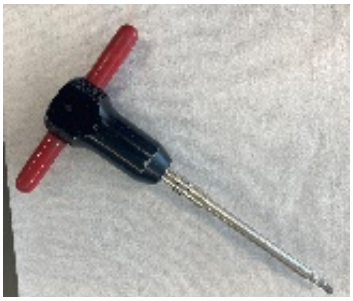
12. Use **Flange Removal Tool** to remove flange from spindle, place on top of the sash.

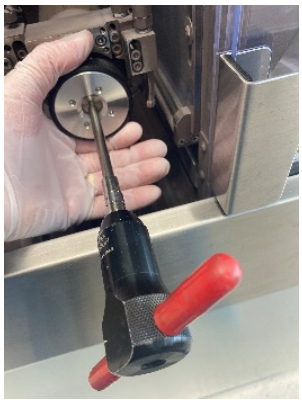


13. Carefully remove blade from the spindle. *Blades are very fragile and expensive!!

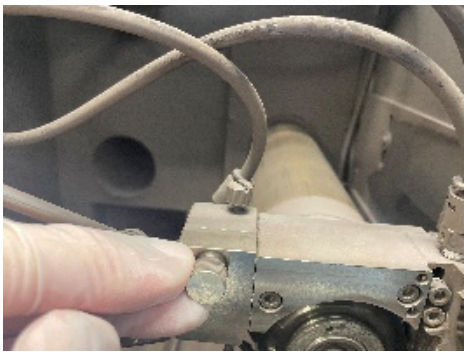


14. Place new blade on spindle.
15. Replace flange on spindle; there should be no gap between blade and flange.
16. Replace flange nut on spindle by threading clockwise until hand tight. **DO NOT CROSS THREAD!!**
17. Use the **Hex-head Torque Wrench** to tighten the flange nut**.** Insert torque wrench into the center hole of the Flange Nut Tool and turn until the Torque wrench clicks one time.



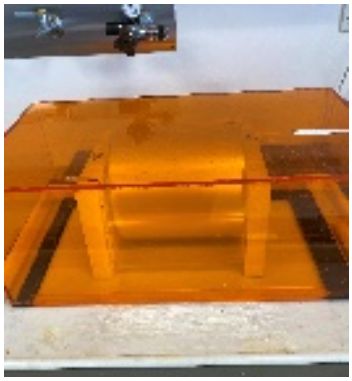


18. Remove Flange Nut Removal tool, place all tools back in blue bin.
19. Reinstall the thumb screw until finger tight.



20. On the touchscreen, enter blade information.
    - **Lot ID** is the model of the blade.
    - **Spec.** is the type of blade (Si or glass).
    - Select either New or Used.
    - Enter **Blade OD** located on blade case.
    - Enter **Blade Thick.** (Located on blade case.)
21. Press the blue **ENTER** button to save parameters.
22. Press the green **NEXT** button.
23. Perform a **Non-Contact Set-up** by pressing the green start button;
    Needs to be done after every blade change and after 15-20 cuts.
24. Exit to the **Main Screen.**
25. Select the **F3 Tab: Device Data.**
26. Select **Nano_User** in the left-hand column
27. Select **User** in the right-hand column
28. Select either **Round** or **Square**
29. Enter overall size of sample.
    - If **Round** is selected, **Ch.1/Ch.2** will not be used.
    - If **Square** is selected, **Ch.1** will be the X-dimension/ **CH.2** will be the Y-dimension.
30. Enter **Index,** the distance between cut for **CH.1 (X)** and **Ch.2 (Y).**

31. Enter **Feed Speed**, how fast sample is fed into the blade (Si 5-7; Glass/Quartz/Pyrex 3-5; Sapphire 0.5).
32. Standard **Spindle Rev.** is 30,000 RPM; Use 15,000 RPM for sapphire.
33. Enter **Sample Thickness.**
34. **Tape Thickness** is 0.3.
35. **Blade Height** should be 0.36.
36. **Precut Process No.** should always be 0.
37. Select **Enter** to save data.
38. Exit out to **Main Menu.**
39. Select **F2** tab **Manual Operation.**
40. Mount sample on a piece of UV tape located in amber box to the right of the tool.



41. Exit out to **Main Menu.**
42. Select **F2** tab **Manual Operation.**
43. Center and mount sample on wafer chuck; press C/T Vacuum.
44. Select **F4** Tab **Semi-Automatic Cutting.**
45. Select **F4 Manual Alignment.**
46. Make alignment using either alignment marks or flat of the wafer
47. To make alignment, place flat of wafer/alignment mark on the center line on screen and press **F5 Align,** place other side wafer flat/alignment mark on the center line; press **F5 Align** again.
48. Sample should be aligned; Press **blue** Enter.
49. Once aligned, move to where you want to make your first cut.
50. Enter the number of cuts to be made in **Cut Line.**
    - Note: If **Cut Line** is left at 0, it automatically calculates cuts by size of wafer. If not dicing full sample, be sure to enter correct number of cuts.
51. Select **F6 Rear** and press **Start.**
52. Tool will ask you to make Hairline Alignment, press **Start** to continue cut.
53. After first cut, saw will again ask for Hairline Alignment; At this time, you can line the center line on the screen to the center of your cut; Then widen or narrow dotted hairlines to fit your cut. Once aligned, select Hairline Adjusted.
54. Index to the next cut and press **Start** to continue with the rest of the cuts.
55. When done with first set of cuts, the sample needs to be manually rotated to perform second set of cuts.
56. Select the **Clockwise Arrow** to rotate.
57. Position Hairline where you want to start your cuts.
58. Select **F6 Rear** and press **Start.**
59. Once sample is finished cutting, press **C/T Vacuum** to release your sample.

60. Open sash, dry sample with N2 gun then remove sample from chuck.
61. Use N2 gun to blow remaining water off of chuck.
62. Exit to Main Menu, press **SPINDLE** Tab to shut off spindle.
63. Once spindle has stopped, turn Key to **OFF.**
64. Shut off water valve to the left of the tool.
65. Disengage from CORAL

Appendices

BLADES	SUBSTRATE	KERF
Z09-SD1700-Y1-60 Standard Si blade	Si	120um
NBC2050Z Thin Si blade	Si	30um
P1A851 Black blade	Glass, Quartz, Pyrex, Garnet, Sapphire…	200um

STANDARD 6" WAFER RECIPE:

Work Shape:	Round is selected 150mm
Index CH1:	chip size 
Index CH2:	chip size 
Feed Speed:	determined by material (see chart below)
Spindle Rev.:	30000/min
Tape Thickness:	0.300mm
Blade Height:	0.360mm
PreCut Process No.:	0

FEED SPEEDS:

Si: 5-7mm/s
Glass: 3-5mm/s
Quartz: 3-5mm/s
Pyrex: 3-5mm/s
Garnet: 1-3mm/s
Sapphire: 0.5mm/s