

DSA OPERATING STEPS:

1. Switch on vacuum.
2. Adjust general Nitrogen pressure to 6 bars.
3. Mains ON. (Power Switch)
4. Turn ON **MAIN SWITCH** of the mask aligner. (red yellow button)
5. Turn ON **power switch** of the lamp power supply.
Start lamp: press **START** key on the external lamp power supply
Enter the lamp reading and timing in the log book

Make entry in log book

6. Turn ON **KEY switch** for the electronics Power On.
8. If monitor displays that personal computer is ready then double click the icon “EVG620”. Press **Log IN** & enter **Username** and **Password**. When you LOGIN the aligner make an initialization of the system
During initialization move tray out when the command appears on the window.

9. Create Recipe: Double click the icon “recipe1.rcp” or create a new recipe (File-New). Set the Process Data parameters in the recipe.

General Parameters:

Parameters	Typical values
Maskholder size (inch)	Min. 3 – max. 5
Mask Thickness (mm)	Specific to the process
Substrate Size (inch)	Min. 2 – max. 4
Substrate Thickness (mm)	Specific to the process
Proximity (μm) (Distance between substrate and mask during expose step)	Specific to the process
Res. Thickness (μm)	Specific to the process
Separation (μm) (Distance between substrate and mask after Wedge Error Compensation)	Specific to the process
Mask ID	Specific to the process

TOP SIDE ALIGNMENT AND EXPOSURE

Process:

- Top Side

Process Mode:

- Transparent

Exposure Mode:

- Constant time
- Constant dose

Constant time- interval

Constant dose - interval

Contact Mode:

- Soft Contact
- Hard Contact
- Vacuum Cont
- Vac+Hard Contact
- Proximity

On pressing RUN process starts.

The user must wait until initialization has been completed before the system can be used.

<INIT PROCESS>

The aligner moves in the home positions.

Follow the instructions which are displayed in the window accordingly intended.

- 1) Insert chuck and connect vacuum and press <continue>

Insert the appropriate bottom-chuck for the process and Press “continue”

- 2) INSERT MASKHOLDER AND PRESS <CONTINUE>

Insert the appropriate Maskholder and bottom-chuck for the process and Press “continue”

- 3) Fix the maskholder and press <continue>

- 4) <INSERT MASK WITH LOADFRAME AND PRESS <CONTINUE>

Load the mask frame on the chuck and load the mask (structured surface to the bottom) pre -position it with the prealignment pins.

After loading the mask frame and the mask, press “*Continue*”

<MOVE TRAY IN>

<WEDGE COMPENSATION...>

Once the tray is moved in, the aligner will start with the **wedge-error compensation** (planarization) automatically.

wait for a few seconds before adjusting mask.

<PLEASE WAIT>

<ADJUST MASK>

Adjust Mask

Use the joystick for focusing and movement of optics

To change between the left and right microscope, press the “**L**” or the “**R**” button.

When the marks are adjusted, press “CONTINUE” and the top-chuck activates the chuck vacuum to hold the mask firmly in its setup position.

During the alignment procedure the mask is in separation to the top-chuck.

- <PLEASE WAIT>
- <MOVE TRAY OUT>
- <REMOVE LOAD FRAME AND PRESS <CONTINUE>>
- <INSERT SUBSTRATE AND PRESS <CONTINUE>>

Load Substrate

load the substrate without a load frame on to the bottom-chuck.

Preadjust the substrate with the help of the prealignment-pins on the chuck.

Press “CONTINUE” and fix the bottom-chuck to the vacuumed substrate.

- <MOVE TRAY IN>
- <WEDGE COMPENSATION...>

When the tray is in, the **wedge-error-compensation** (planarization) starts automatically.

- <PLEASE WAIT>
- <ADJUST WAFER>

Adjust Substrate

Press “**Scan Optic**” and turn the joystick clockwise or anticlockwise to focus the mask and the wafer.

Adjust the marks of the substrate to the marks of the mask.

During the adjustment the substrate and the mask are in separation.

To change between separation and contact press “**Sep/Cont**”

When you are ready with the alignment press “**Continue**”

- <PLEASE WAIT>

Exposure

- <EXPOSURE >

Now the exposure is ready to begin, and the exposure-time is announced.

When the exposure is ready, the top-optic moves backward to the end-position.

To stop the exposure in between press the button on the joystick for 2 secs

Unload Substrate

After the exposure wait until the system informs you to move the tray out:

- <PLEASE WAIT>
- <MOVE TRAY OUT>
- <REMOVE SUBSTRATE AND PRESS <CONTINUE> OR <EXIT>>

Choose whether to **load a new substrate** or **unload the mask**.

To load a new substrate press “**Continue**”.

<INSERT SUBSTRATE AND PRESS <CONTINUE>>

To unload the mask press **Exit**

Unload Mask

Following message is displayed:

<INSERT LOADFRAME AND MOVE TRAY IN>

Insert the load frame, move the tray in and wait for a few seconds.

<PLEASE WAIT>

<MOVE TRAY OUT - REMOVE MASK AND LOAD FRAME>

<**END OF PROCESS**>

With “**Continue**” one can start the same process again.

BOTTOM SIDE ALIGNMENT AND EXPOSURE

Set process data

Process:

- Bottom Side

Process Mode:

- Transparent
- Overlay
- Crosshair

Exposure Mode:

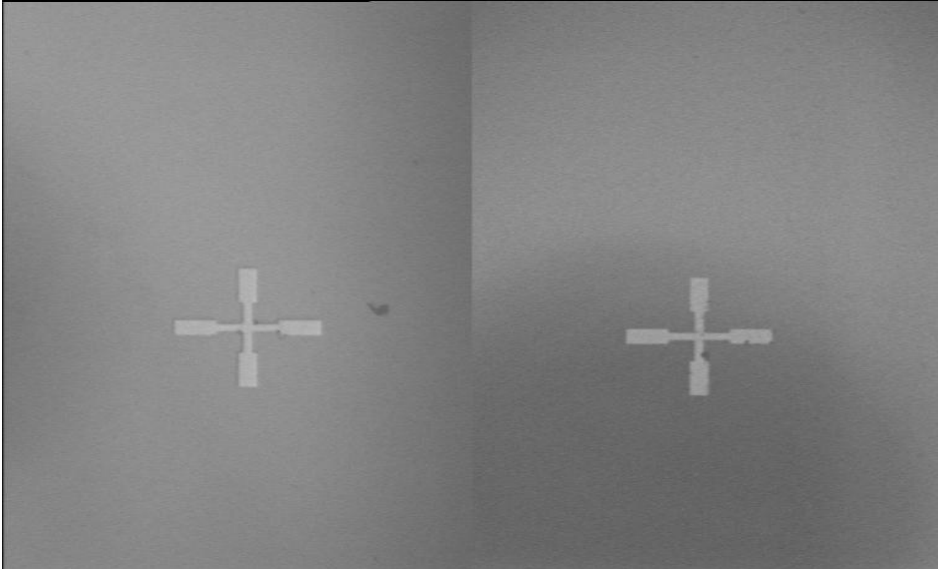
- Normal
- Interval

Contact Mode:

- Soft Contact
- Hard Contact
- Vacuum Cont
- Vac+Hard Contact
- Proximity

Start the process & load the mask as for top side alignment.

Adjust Mask



Adjust the mask and the marks of the mask with the help of the stage and the bottom-side microscope. To ensure that the mask is straight on the stage the actual y-positions of the microscopes should show the same value (when they show the same value, they are in a straight line) and one can see both marks on the screen. Otherwise one has to turn the mask with the stage.

Press “**continue**” and the top-chuck suck’s the mask with vacuum.

- <MOVE TRAY OUT>
- <REMOVE LOAD FRAME AND PRESS <CONTINUE>>

- <MOVE TRAY IN>

Move the tray in **without load frame** and **without substrate!**

When the tray is moved in, the aligner starts with the **wedge-error compensation** (planarization) automatically.

- <PLEASE WAIT>

Adjust crosshair / Adjust overlay

Before starting with crosshair/overlay-adjustment, a precise adjustment of the mask marks is carried out with the bottom-side microscope. One cannot adjust with the stage, because the mask is already fixed on the top chuck.

- <ADJUST MASK AND PRESS <CONTINUE>>

Now carry out the crosshair/overlay-adjustment

- <ADJUST CROSSHAIR / ADJUST OVERLAY AND PRESS <CONTINUE>>

Optic movement after crosshair adjustment causes misalignment!

A) Crosshair-Adjustment

Move the crosshair with the help of the *Trackball*.

In the control menu one can choose between the left and the right crosshair. Press the left button of the trackball and one can move with the crosshair. For the fine adjustments press the up/down left/right buttons in the control menu. In the controls menu one can also adjust the length, width and the color of the crosshairs. A fine adjustment of the crosshairs is possible with the **left, right, up, down**, buttons in the control menu. (pixel-steps) Lay the crosshairs exactly over the marks of the mask.

B) Overlay-Adjustment

With the overlay-adjustment mode (select it in the recipe before starting process. Store the image of the adjusted marks of the mask (adjust the marks and press “continue”) Later when one wants to adjust the substrate one can see the stored image of the mask marks on the screen (one can change the intensity with the overlay regulator) and adjust the substrate to the image of the mask.

Press “**Continue**”

- <PLEASE WAIT>
- <MOVE TRAY OUT>

Load Substrate

- <INSERT SUBSTRATE AND PRESS <CONTINUE>>

Preadjust the substrate with help of the prealignment-pins on the chuck.

Press “**Continue**” and the bottom chuck fix the substrate with vacuum

- <MOVE TRAY IN>

When the tray is in, the **wedge-error-compensation** (planarization) starts automatically.

- <PLEASE WAIT>
- <ADJUST SUBSTRATE>

Adjust Substrate

A) Transparent

Press **Scan Optic** and turn the joystick clockwise or anticlockwise to focus the mask and the wafer.

To adjust the substrate you press **Scan Stage** and you can move the stage with the joystick.

Adjust the marks of the substrate to the marks of the mask.

During the adjustment the substrate and the mask are in separation.

To change between separation and contact press “**Sep/Cont**”

When you are ready with the alignment press “**Continue**”

- <PLEASE WAIT>

B) Crosshair

Adjust the substrate with the stage. Don't move with the microscope or with the crosshair, because they are already adjusted to the marks of the mask!

Adjust the marks of the substrate exactly to the crosshair.

During the adjustment the substrate and the mask are in separation.

To change between separation and contact press “**Sep/Cont**”

When you are ready with the alignment press “**Continue**”

EXPOSURE, UNLOAD MASK, UNLOAD SUBSTRATE steps same as for top side alignment.

FLOOD EXPOSURE

Set process data

Process:

Flood

Process mode:

Transparent

Exposure mode:

Continuous

Contact mode:

No contact

MASK adjustment not required, remaining steps same as for Top side alignment.

PROXIMITY EXPOSURE

Set process data

Process:

Proximity Exposure

Process mode:

Transparent

Exposure mode:

Continuous

Contact mode:

Proximity

Load Substrate

After the initialization process load the substrate.

<LOAD SUBSTRATE>

Preadjust the substrate with help of the adjustment-pins on the chuck.

Press „Continue“ and the bottom-chuck fix the substrate with vacuum.

<MOVE TRAY IN>

<ADJUSTMENT>

Press *Continue*

1.4.3.3 Exposure

On pressing „continue“, the Exposure is beginning to start the process.

The exposure-time is displayed on the screen.

When the exposure is finished, the optic moves backward to the end position.

1.4.3.4 Unload substrate

<MOVE TRAY OUT>

- <REMOVE SUBSTRATE AND PRESS <CONTINUE>>
- <PRESS <CONTINUE> TO LOAD SUBSTRATE
OR <EXIT> TO LEAVE PROCESS>

SHUTDOWN THE SYSTEM

Exit EVG620 Program
Shutdown Windows
Turn OFF Electronic Key Switch
Turn OFF Lamp Power Supply
Entry in log book
Wait 10 Minutes
Turn OFF Main Switch (red button on dash board)
Power switch
Nitrogen press.
Vacuum pump

Please check **everything** once you are done with the shutdown

Changing lens:

1. Before downloading the recipe, we need to make sure about the lenses. We need to choose the lens according to the minimum feature size of your devices.
2. Before down loading the recipe. If you want to change the existing lenses, click(left) on **change objective** (which is on the top of the screen, right size).
3. <MOVE TRAY IN> (if the tray is out)
4. Then you can see message like <PLEASE WAIT>.
5. Then please wait for some time, then lens part will come towards you.
6. It will show you <CHANGE OBJECTIVE AND PRESS>.
6. Now, u can start the changing the lenses one by one. If we need to remove the existing lenses carefully and we need place these at proper place (lens box).
7. After removing the lenses, you can start to fix required lenses one by one. Here we need do your job very smoothly. We should not tight the lenses. It should be convenient for next user if he wants to change the lenses.
8. Once you fix lenses, we can press <COTINUE>
9. <MOVE TRAY OUT>
10. Now, you can down load your recipe.
11. Please be sure you don't damage the lens arms on which we mount the lenses.

Intensity measurement

Choose the option of Intensity Measurement on the screen

- 1) Move tray out

- 2) Remove mask holder
- 3) Insert intensity measurement chuck
- 4) Move tray IN
- 5) Move stage in center position
- 6) Use the intensity meter for the measurement. It should be used in Norm Mode
- 7) Select Calculate on screen for calculating the intensity automatically by the system.
- 8) Press Default to select the default Filter Type.
- 9) Place the meter in various positions as per shown in the diagram at screen and feed the value
- 10) After all the measurements are done press save and export. Save the copy of it in the file.
- 11) Press continue
- 12) Press Exit
- 13) Remove tray out.

Cleaning DSA

1. Use only IPA (no Acetone)
2. Using a lint free cloth cleaning the Tray, Dash board and other externally visible parts.
3. Clean any marks of PPR on the chuck and the machine, if present.

Instruction for DSA users

- 1) For 20 X lens separation between mask and wafer should not be more than 20um.
- 2) Enter the lamp usage hours ie the numbers of hours it was ON.
- 3) **DO NOT** turn the micrometer screw gauge beyond 10mm. If you are not able to align samples remove and repeat the step. Extra force changes the center position of the stage.
- 4) Stage center is 5mm now so use 5mm as center position.
- 5) **DO NOT TOUCH** the lamp house controller settings.
- 6) If the message for Symantec back up is shown on the screen please allow the system to take back up.
- 7) While changing the lens be very careful. **DO NOT** tighten the lens with the assembly. Extra force can tilt the lens in the assembly itself.
- 8) **DO NOT USE** two adaptors for any type of lens. All lens work on single adaptor.
- 9) Any problem during the system initialization report immediately to the system owner.
- 10) Any doubt in usage of the system call authorized user/ system owner for guidance. **DO NOT** assume things.
- 11) Substrate should be clean while the alignment