ABM's High Resolution Mask Aligner is a very versatile instrument with interchangeable light filters which allow Near-UV (405-365 nm) as well as Mid- and Deep-UV (254 nm, 220 nm) exposure in proximity (non-contact) or contact (soft & hard) mode. The exposure can cover an area over 200mm in diameter. The bottom-mount mask system accommodates masks up to 9 inches square, and substrates from small chips to wafers as large as 200mm. The alignment tooling system also features an air-bearing substrate-to-mask planarization system for wedge-error compensation. The printing resolution is <0.8 µm for Near-UV and <0.4 µm for Mid-UV and Deep-UV in vacuum contact mode.

Features:

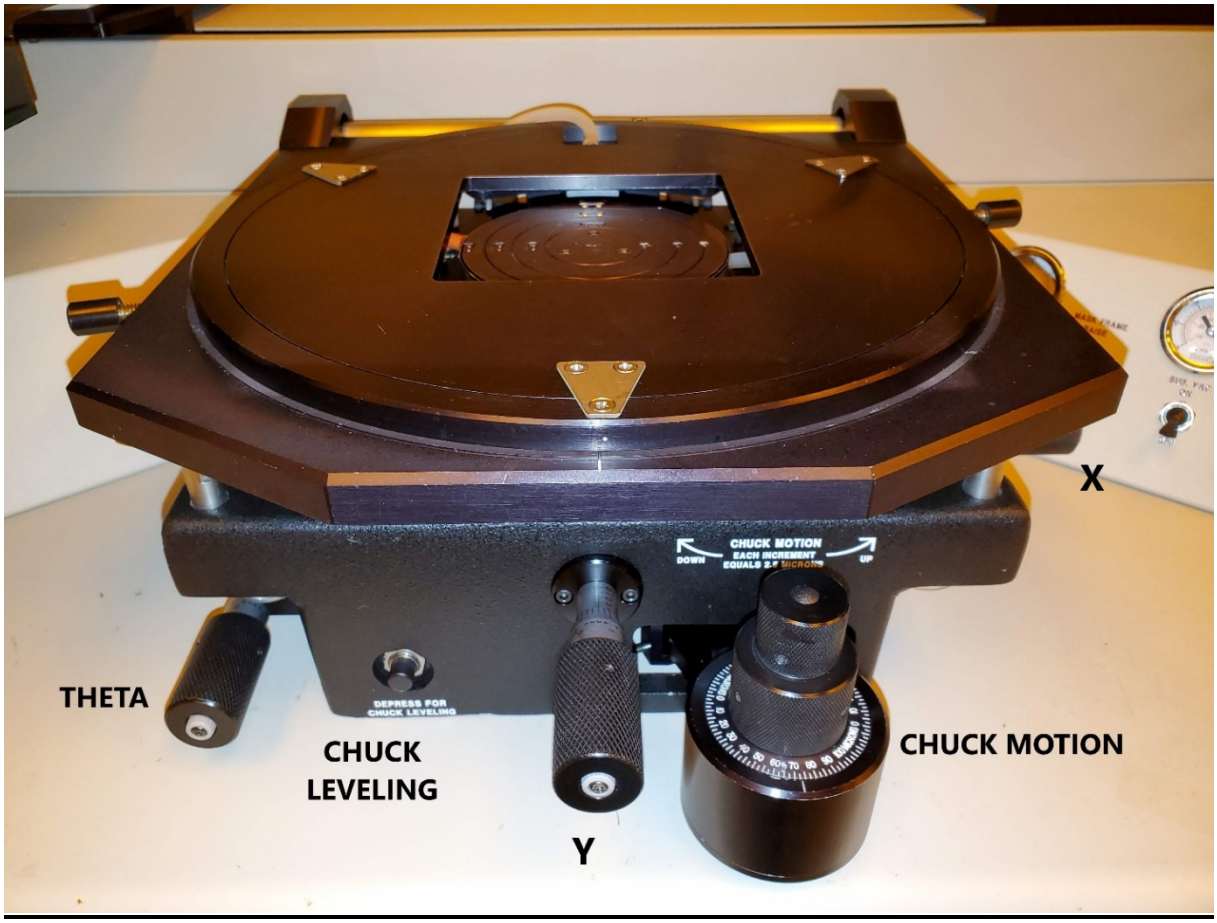
Proximity, soft contact, and vacuum contact modes
Substrates of any size or shape up to 200mm diameter and 0.250 inch thick
UV, Mid-UV, and DUV exposure modes
Dual CCD Zoom Microscope alignment system, 90X to 600X
Bottom-mounting mask holders

Operation of the ABM is performed manually using the front panel switches. In general, mechanical operations are controlled by vacuum toggle switches, and electrical operations are controlled by push button switches. Controls are interlocked to prevent unsafe operational modes.

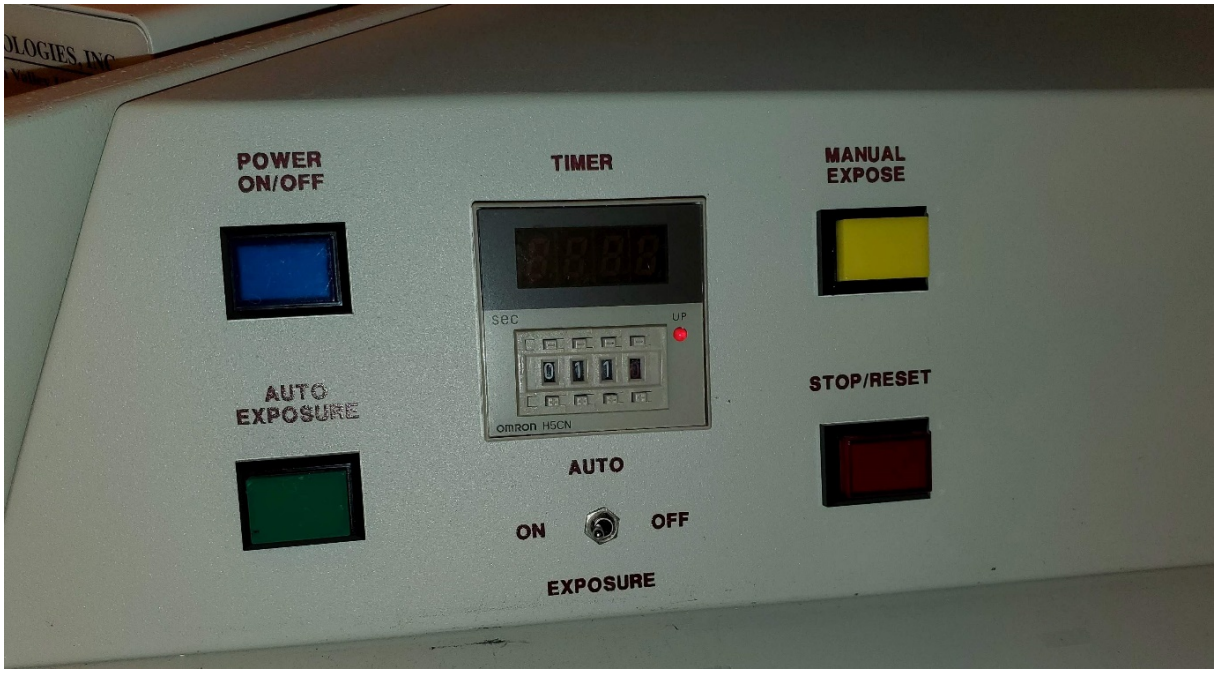
SUBSTRATE CHUCK CONFIGURATION:

1. Note separate vacuum rings for various diameter substrates.
2. Insert plugs to block vacuum rings as shown. Leave all open for 100mm wafers.
3. Center your substrate on chuck.
4. Remove all plugs before logging out of tool.

OPERATION:



1. Turn ON red Power Switch (lower right front of tool)
2. **ONLY** if using **Vacuum Contact** mode **with gasket installed**: turn ON Nitrogen Flow switch, adjust flow to no more than 4–5 SCFH
3. Turn ON Raise Mask Frame switch to raise Mask Holder
4. Mount mask to bottom of Mask Holder and press Mask Vacuum switch ON
5. Mount wafer onto Substrate Chuck and turn ON Substrate Vacuum switch
6. Make sure Substrate Chuck is down, then turn OFF Raise Mask Frame switch to lower Mask Holder
7. Press and hold Chuck Leveling button ON while turning Chuck Motion knob CCW using **ONLY** the **TOP** part of the knob (smaller part)
8. When knob begins slipping, stop turning and release Chuck Leveling button
9. For alignment, turn Chuck Motion knob CW at least one full turn
10. Move Alignment System switch to ALIGN
11. Perform alignment using X, Y, and THETA knobs
12. Turn Chuck Motion knob CCW until back in contact (do not use Chuck Leveling)
13. For **Vacuum Contact** mode **ONLY:** if using Vacuum Contact mode **with gasket installed,** turn OFF Substrate Vacuum switch, turn ON Contact Vacuum switch
14. Move Alignment System switch to HOME



15. Set Exposure Timer
16. Move Light Source switch to EXPOSE
17. After exposure is completed, move Light Source switch to HOME
18. **ONLY** if using **Vacuum Contact** mode **with gasket installed:** turn OFF Contact Vacuum switch, turn ON Substrate Vacuum switch
19. Turn Chuck Motion knob CW until there is a gap between mask and substrate
20. Turn ON Raise Mask Frame switch
21. Turn OFF Substrate Vacuum switch and remove wafer
22. After final exposure, with one hand under mask pull Mask Vacuum switch OFF and remove mask
23. Turn OFF Raise Mask Frame switch
23. Turn OFF Power switch (and Nitrogen Flow switch if using **Vacuum Contact**)

ALIGNMENT SYSTEM:

The alignment system utilizes two microscopic zoom lenses with magnification from 90X to 600X. CCD cameras with electronic apertures are used for imaging and are viewed on video monitors. The microscopes are independently adjustable for position, zoom level, focus, and illumination.

DO NOT adjust the illumination lamp power supply or the video monitors. Use the aperture controls on the CCD cameras to change image brightness.

The microscope assembly can be made to move along one axis at a time using the vacuum release buttons on the handle: either X, Y, or both at once.

The left and right objectives can be individually adjusted for X-axis position using large knobs on each side of the assembly. Minimum separation of the microscopes is approximately 50mm, or 2 inches. For smaller substrates, scan back and forth in X or Y using a single microscope.

Each side has an adjustable zoom lens. As magnification is increased, you will need to open the aperture further to keep the image bright. Lower numbers allow more light to reach the CCD camera.

CHANGING EXPOSURE WAVELENGTH MIRROR:

The ABM exposure housing has interchangeable turning mirrors for various exposure wavelengths. The standard mirror allows 405-365 nm light to be used. Other available mirrors allow 254 nm or 220 nm light to be used.

NOTE: You MUST be trained to perform this procedure!

To change the exposure mirror:

1. Remove the thumbscrews from the top panel of the front exposure housing
2. Remove the panel from the housing and set it aside
3. Turn the retaining knob 180° while pulling away from mirror
4. Using the mirror tool, carefully slide the mirror towards you until the far edge clears the retaining clip
5. Tilt the mirror away from the holder and lift it out
6. Remove the mirror and place it in the mirror box
7. Select a mirror from the box and reverse the steps

Make sure that the mirror is installed with the **label** facing **AWAY** from the light source. The mirrors are **front surface** mirrors and will not work properly if reversed. Be careful not to touch the mirror surface. If you see smudges on the mirror **DO NOT** attempt to clean it. Notify Staff and wait for them to assess the mirror condition.

USING WAVELENGTH FILTER:

There is a wavelength filter available for use with thick SU-8 films. It should be in a storage box found in a drawer in the cabinet on the left side of the tool.

To use the filter:

1. Remove the thumbscrews from the bottom panel of the front exposure housing
2. Remove the panel from the housing and set it aside
3. Place the filter on top of the final lens assembly, NOT into the guide rails
4. Replace the panel and thumbscrews
5. After final exposure, reverse the steps above
6. Place filter back in storage box and return to cabinet drawer

DO NOT leave filter in tool!!