MJB3 MASK ALIGNER

SART-UP

Start the machine 30 minutes before use.

- Turn on the green pump in the service corridor Turn on the switches for air pressure and nitrogen on the mask aligner. Check that the manometers are giving the correct pressures.
- 2. Turn on H2 (H1 should already be on).
- Light up the mercury lamp by turning the switch on the Hg-lamp power supply to its "on" position. Wait until "rdy" is shown on the display and then press "start". Blue light should be leaking out from the lamp house. Make sure Cl2 is selected.
- 4. Press the power button on the mask panel control.
- 5. Turn on the lamp for the microscope.

MASK LOADING

- Loosen the screws of the mask holder and place the mask over the opening with the chromium facing you. Align the mask properly, so that the part to be exposed is in the center of the hole. Press "vacuum mask" to fasten the mask in the holder.
- Put the mask holder back and fasten the screws again.

SAMPLE LOADING, ALIGNMENT AND EXPOSURE

- 1. Place the sample on the center of the chuck, on the open hole, and load the chuck into the alignment stage.
- Adjust the height knob to your sample thickness, and lock the knob (the lock is the small black square lever that is attached to the z-stage knob). (IF YOU HAVE A NEW SAMPLE THICKNESS, SEE LATER)
- 3. Bring the substrate into contact with the mask by turning the contact ARM counterclockwise. DO IT GENTLY: The lamp of the contact

indicator on the front panel will be ON. This operation also accomplishes wedge error (parallelity) compensation.

- 4. By pulling the separation lever towards the front of the machine, the lamp of the CONTACT turns OFF and the separation light is ON. The substrate can now be aligned to the mask using the X; Y; and ⊙ micrometer screws. Adjust only using the thin end of the screws. NEVER ADJUST WHEN CONTACT LIGTH IS ON: CAUTION: IF YOU MOVE THE SCREWS AND NOTHING MOVE, SOMETHING IS WRONG. Check that you are not in contact. If not, the screws are on their limit move them back. Unload the sample and re-center it.
- 5. YOU can scan the microscope over the substrate in either X or Y direction or both simultaneously.
- 6. When satisfactory alignment has been achieved, move the substrate back into contact with the mask by driving the separation lever all the way to its rear most position until SEPARATION light goes out and the CONTACT re-illuminates.
- Chose your exposure mode:, SOFT CONTACT; HARD CONTACT; HIGH PRESISION CONTACT. (see exposure modes)
- 8. Chose the correct exposure time and check that the exposure switch is set to timer. When the exposure button has been pressed, the microscope will elevate slightly, and the mirror house will move forward over the mask. When the mirror house moves reaches its foremost position, the shutter opens and exposure takes place for the specified amount of time. After exposure is complete, the shutter closes, the mirror house retracts and the microscope moves back down to its original position.
- The substrate may now be unloaded. Rotate the contact arm fully towards the front of the machine, realizing the substrate from the mask.
 Pull the transport slide to the right and carefully remove the substrate from the chuck.

TURN OFF THE MASK ALIGNER

- Unload the mask: Loosen the screws of the mask holder and place the mask on the table facing you. Press "vacuum mask" to unfasten the mask in the holder. PUT THE MASK HOLDER back to its place.
- Turn off the microscope lamp
- Turn off the mask power
- Turn off the Hg-lamp power supply.
- Switch off H2
- LET THE N2 FLOW FOR 15-20 MIN
- Switch off the air and nitrogen pressure switches.
- Turn off the green pump on the maintenance corridor.

EXPOSURE MODES

Vacuum Contact (HP mode)- In the hp program a vacuum is drawn between the mask and the wafer prior exposure. This mode allows the highest resolution since the gap between the mask and wafer is minimized.

How to use it:

- Make sure soft contact button is OFF
- HP button should be on
- Press Vacuum chamber
- Press exposure

Standard (ST) Hard contact mode: During exposure, the vacuum holding the substrate to the chuck is switched off and positive nitrogen pressure is used to press the substrate against the mask.

How to use it:

- Make sure soft contact button is OFF
- ST button should be on
- Press exposure

Soft Contact mode When the ST and soft cont buttons are illuminated simultaneously, the soft contact mode is selected and the substrate is held to the mask just by mechanical pressure of chuck throughout the exposure. The vacuum holding the substrate to the chuck remains on.

How to use it:

- The soft contact button should be ON
- Press exposure

Proximity contact Exposures are made with a small gap between the mask and substrate. The gap is determined by the height adjustment.

How to use it:

- Prior sample alignment, the height should properly adjust.
- The soft contact button should be ON

Height Adjustment

It should be done when a new mask or sample thickness is going to be used. Do it without resist on your sample.

NEVER ADJUST THE THICKNESS WHEN CONTACT IS ON.

- 1. Press soft contact mode.
- GO TO CONTACT, check if the sample is in contact (You will see like if it "twists" when you move the contact arm slowly up)
- 3. If not, go back to full separation
- 4. Move the z-knob ½ turn
- 5. Repeat 1, 2 and 3 until you get contact.
- 6. Go to half contact position and turn the knob 1.5 revolutions.