Usage Policies Notebook for Quintel 2001 Mask Aligner

Revision date

September 2014

INRF UCIrvine

Emergency Plan for Quintel 2001 Mask Aligner

Standard Operating Procedures for Emergencies

Contact information

Person	Phone number
Lab Manager	Jake Hes, 949-824-8239 (day), 562-522-8328 (alternate)
Director	G.P. Li: 949-824-4194 (day), 949-824-2047 (alternate)
Staff	Mo Kebaili: 949-824-8239 (day), 949-494-5892 (alternate)
Super User	Carlos Ruiz (818) 527-6349 (Anytime, voicemail or text only)

Hazardous chemicals, gases, and conditions

Hazard name	Description of hazard
N_2 (nitrogen) gas	Asphyxiant
High temperature	Burn or ignition source
Electrical Hazards	Electrical shock, ignition source
Lamp Explosion	Mercury Vapors
Fingers could be jammed	DO NOT Take any action during Operation
Radiation Hazards	High energy of UV light from exposure lamp

Emergency shutdown plan #1

In the event of an emergency, when there is very little time, *press the large red emergency shut-off button at the front of the Tool*. This action will shutdown the system, and will stop and turn off the exposure lamp. Leave the facility at once, and contact the lab manager or the staff.

Emergency shutdown plan #2

In the event of an emergency, when there are a few minutes available, place the tool in the stand-by mode. Leave the facility at once, and then contact the staff and the lab manager

Usage Policies for Quintel 2001 Mask Aligner

Standard policies for usage

The Quintel 2001 Mask Aligner uses 4 inch mask to expose photoresist on 3 inch or smaller size substrates.

Contact information

The INRF staff or the lab manager may be reached at 824-8239 or 824-9831.

Authorized users

Only INRF registered users who have completed the training and passed the certification may use this equipment. Users may only use the portion of the system for which they have been trained.

Training

Users must have received direct training from the staff in order to use this equipment. Users are expected to understand the nature of the system. Training varies slightly, depending on the process to be performed. Contact the staff for details and to arrange for a training session.

Usage logs

Users are required to log all activity in the log sheets provided. All users must log in when they used the Quintel 2001 Mask Aligner (date and time), which substrate and photoresist they used, and when they completed their process in the user log sheets. If users notice anything unusual, they should record it in the user log sheets, and add details in the maintenance log sheets. Any maintenance to the system must be logged in the maintenance log sheets (maintenance staff only).

Safety equipment

There is no specific safety equipment for use on this tool, however cleanroom gloves and tweezers should be used when handling and placing substrates on the chuck, care should be taken.

Standard equipment and materials

The laboratory provides the following: N_2 blow off gun and isopropanol solvent.

User maintenance

Users are requested to clean and wipe off the chuck after use. Spray the isopropanol into a lint-free cloth and wipe the chuck clean. Dispose of the cloth in a waste container marked for flammable solid waste.

Pollution Control

Dispose of the alcohol soaked wipes in a waste container marked for flammable solid waste.

Scheduling

Reservations can be done online, also, the system can be used on a first come, first served usage if no reservation was made.

Other issues

Users should remain physically present in the cleanroom facility during the entire use of the Quintel 2001 Mask Aligner.

At no time should a user adjust a pressure regulator on a gas line. Gas control should be “on” or “off” only, using only the valves appropriate. For most gases, this is usually the valve at the cylinder head.

Non-standard use

Users may not modify any hardware on this equipment. For use of non-standard processes, gases or materials, contact the staff or the lab manager.

Usage Notes for Quintel 2001 Mask Aligner

Guide for using the Quintel 2001 Mask Aligner correctly

Alignment and Exposure using Quintel 2001 Mask Aligner

The aligner uses 4 inch mask to expose photoresist on 3 inch or smaller size substrates.

Preparation:

1. The UV light source should be on. Check the following settings: Lamp Current (~3 Amps) and Lamp Power (~185 watts), and record them in the log sheets.

2. Make a visual inspection on and around the aligner before using the system. Report anything unusual to the staff.

Procedure:

1. Log into the Log-in computer.

2. Push the VISUAL ALIGN button to raise the optical head.

3. Push MASK LOAD button to release the mask holder plate from the mask vacuum chuck.

4. Raise the mask holder plate until it rests against the stop switch, which turns off the vacuum that holds the mask against the mask holder. Before loading the mask, make sure the Mask Holder Plate is centered to allow for maximum rotation in either direction. Adjust the position of the Mask Holder Plate by turning the Mask Rotate Knob located to the right of the Mask Holder Plate.

5. Load wafer onto the wafer chuck. Make sure that the wafer size is big enough to cover all the vacuum openings on the wafer chuck. Turn on the wafer vacuum, and verified that the wafer is secured on the wafer chuck.

6. Load the mask onto the mask holder plate. The emulsion side of the mask should be facing you. Carefully lower the Mask Holder plate; the vacuum should engage and your mask should be held in place.

7. Press MASK LOAD button to secure the mask holder plate onto the mask vacuum chuck.

8. Press VISUAL ALIGN button to lower the optical head.

9. Press LOAD MANUAL button. The wafer chuck piston will raise and the wafer will make contact with the mask, then the separation button should light, indicating that there is separation between the wafer and the mask.

10. If no alignment is needed, rotate the optical turret to the EXPOSE position, set the exposure time using the thumbwheel switches on the Aligner, push the CONTACT button and then push the MANUAL EXPOSE button. After exposure, the wafer chuck lowers automatically.

11. To remove the wafer, push the VISUAL ALIGN button to raise the optical head and Push MASK LOAD button to release the mask holder plate from the mask vacuum chuck.

12. Raise the mask holder plate and remove the mask.

13. Turn off the wafer vacuum, raise the mask holder plate and remove the wafer.

14. Lower the mask holder plate.

15. Push the mask load button.

16. Push the visual align button.

17. Log usage and data into Aligner logbook.

18. Clean up area and log out.

Alignment:

1. Make sure the wafer is in the separation mode. Rotate the Optics Turret to the ROW AND COLUMN position or the SPLITFIELD HIGH POWER position. ROW AND COLUMN should be used first and then SPLITFIELD for better alignment. Adjust the Eyepiece Spacing for comfortable viewing. Adjust the Illumination. Adjust the focus of the mask and wafer using the large silver Focusing Knob located on the left side of the Optics Assembly. Adjust the horizontal positions of the 2 objectives (only for SPLITFIELD) by using the black and silver knob located at the front of the turret. The objectives should be positioned so that appropriate alignment marks are visible in the split view. Then align the wafer to the mask by using the following controls. The Left Chessman is used to move both the mask and wafer with respect to the Optics Assembly so that one can scan around the wafer. You need to press the small button on the Left Chessman to activate it. The Right Chessman is used to move only the wafer with respect to the mask during alignment. The Right Chessman and the Wafer Rotate Knob are used to perform the actual alignment. Once you are satisfied with your alignment, proceed to the following step.

2. Press the contact button. The wafer should come into contact with the mask.

3. Recheck your alignment. If you are not satisfied with your alignment, then press SEPARATION and realign.

4. Set your exposure time using the thumbwheel switches on the Aligner.

5. Rotate turret to the EXPOSURE position.

6. Press MANUAL EXPOSE. The shutter should then open and expose the wafer for the desired amount of time. During the exposure, the meter on the UV Source should read 300 watts or 5.4 mW/cm2 (depending on the setting).

7. After the exposure, the wafer chuck lowers automatically.

8. To remove wafer and mask, push the VISUAL ALIGN button to raise the optical head and Push MASK LOAD button to release the mask holder plate from the mask vacuum chuck.

9. Raise the mask holder plate and remove the mask.

10. Turn off the wafer vacuum, and remove the wafer.

11. Lower the mask holder plate.

12. Push the mask load button.

13. Push the visual align button.

14. Log usage and data into Aligner logbook.

15. Clean up area and log out.

Summary:

1. Inspect on and around aligner for anything unusual.

2. Log into the log-in computer.

3. Press VISUAL ALIGN button.

5. Press MASK LOAD button.

6. Raise the mask holder plate.

7. Load wafer onto the wafer chuck.

8. Turn on the wafer vacuum.

9. Load mask and lower the mask holder plate.

10. Press MASK LOAD button.

11. Press VISUAL ALIGN button.

12. Press WAFER LOAD button.

13. Align wafer and mask using ROW & COLUMN position of turret.

14. Align wafer and mask using SPLITFIELD HIGH POWER position of turret.

15. When satisfied with alignment, press CONTACT button to bring wafer and mask into contact.

16. If you are not satisfied with your alignment at this time, press SEPARATION button to separate the mask and wafer, and realign.

17. Press the contact button.

18. Set timer.

19. Rotate turret to EXPOSURE position.

20. Press MANUAL EXPOSE to expose wafer.

21. Press VISUAL ALIGN button.

22. Press MASK LOAD button.

23. Raise the mask holder plate and remove the mask.

24. Turn off the wafer vacuum, and remove the wafer.

25. Lower the mask holder plate.

26. Push the mask load button.

27. Push the visual align button.

28. Log usage and data into Aligner logbook.

29. Clean up area and log out.

Do's and Don'ts:

a. Do not make any equipment hardware changes with screwdriver or any other tools.

b. Do not turn off the aligner lamp power supply.

c. Do not operate the aligner if you are not qualified to use the system.

d. Do not share computer log-in and password with other users.

e. Do report anything unusual with the aligner to the staff.