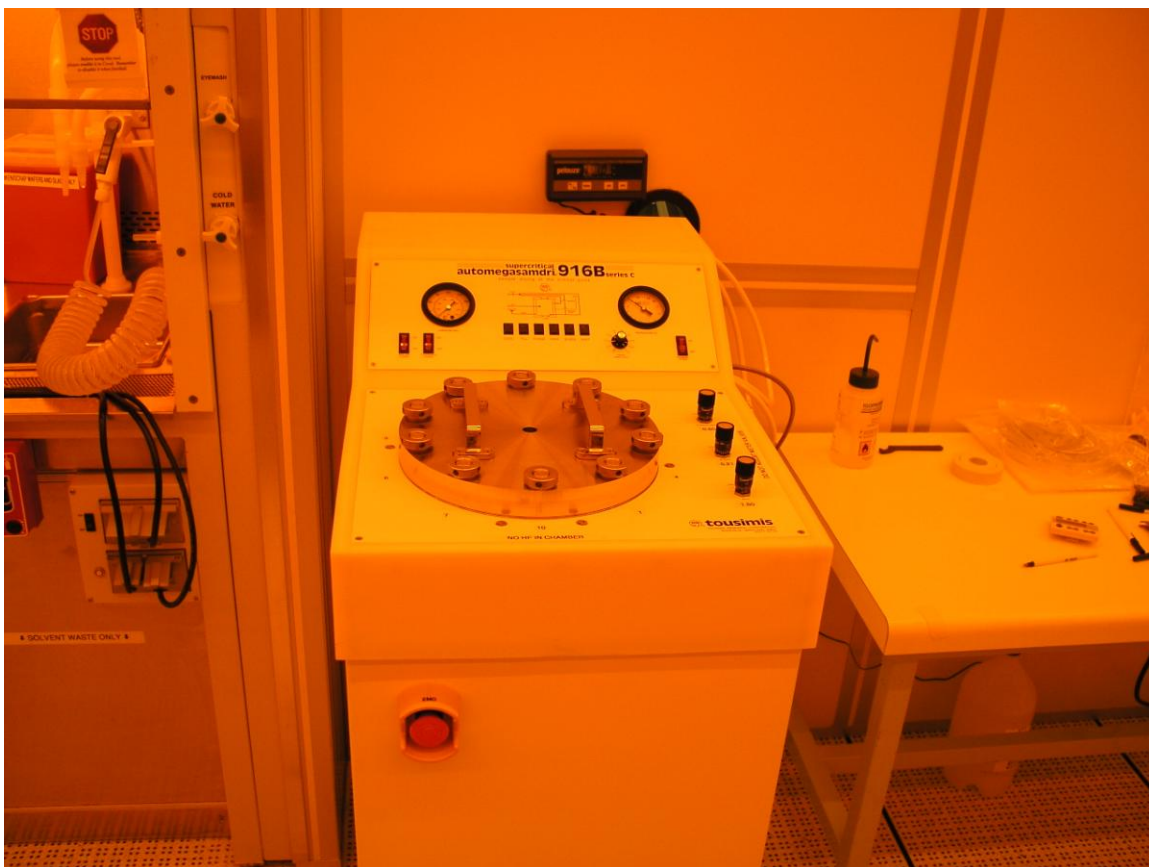


Tousimis 916B Series C Critical Point Dryer Users Manual



Coral name: Critical Point Dryer
Model: Tousimis Automegasamdri – 916B, Series C
Location: Nanofab, Building 215
Contact: nanofab_postprocess@nist.gov
Version: 1.0

OVERVIEW:

- This system utilizes LCO₂ to dry fragile suspended and floating structures
- Substrate sizes from 10mm die to 8" wafers
- Can dry up to 5 substrates in a single process

RESTRICTIONS:

- Only use ultrapure alcohol – IPA
- Do not introduce HF to the chamber

SAFETY PRECAUTIONS

- Please be careful when removing lid – it is very heavy
- Place lid on flat surface and replace when finished
- Turn CO₂ on before starting and turn off when run is complete

CONTAMINATION CONTROL PROCEDURES

- Use only ultrapure alcohol – 99.5% purity
- Do not use HF
- Use inserts to minimize amount of alcohol needed

OPERATING PROCEDURES

1. Turn chiller power ON and wait at **least 30 minutes** prior moving on to the next step – this allows the coolant fluid to chill properly
2. Go to the LCO₂ bottle and turn on gas
3. Turn ON condenser power
4. Turn ON chamber power – the green LED on the VENT button will illuminate
5. Wait 5 minutes for the internal components to warm up
6. Pressure gauge should read 0 psi – remove the chamber lid
7. Press the VENT button – the VENT LED will begin to blink
8. Put in proper inserts for wafer size
9. Fill up chamber with enough ultrapure alcohol (IPA) to cover your wafers
10. Carefully and quickly transfer your wafers into the chamber minimizing the exposure time to air
11. Place the lid back on to the chamber and use your fingers to tighten each of the 10 knurled nuts around the circumference of the chamber lid. Follow the numbered sequence uniformly tighten each nut using the spanning wrench.

12. Once the lid is secure it is time to set the purge timer. $\frac{1}{4}$ chamber full of alcohol = 15 minute purge time, $\frac{1}{2}$ full of alcohol = 20 minutes of purge time
13. Press the COOL Button. The COOL LED will go on and VENT LED will go off. The chamber temperature will begin to slowly drop. The temperature will take about 10 minutes to reach 8°C.
14. Once the chamber temperature reaches 8 °C, press the FILL button. The chamber will begin to fill with LCO₂ for 8 minutes and from this point forward the CPD will automatically cycle through all the drying sequences modes until the process has completed

The following steps will be completed automatically by the Critical Point Dryer.

15. After the 8 minute FILL the system automatically advances to the PURGE mode. The system will remain in purge for the duration selected in step 12.
16. The system then goes into the POST-PURGE-FILL mode. During this step the chamber is filled with LCO₂ for an additional 4 minutes to ensure the chamber is full of LCO₂.
17. Next the system goes into HEAT mode. The pressure and temperature will steadily rise. As the temperature reaches 31°C the HEAT LED will begin to blink for 4 minutes indicating the system is in “tousimis equilibrium”.
18. The system progresses into the BLEED mode. The chamber pressure will drop steadily.
19. At 360 psi the system will advance to the VENT mode.
20. After about 4 minutes the system will reach 0 psi and the process has completed

After the system reaches 0 psi the process has been completed

21. Use the spanning wrench to loosen all the knurl nuts in reverse order.
22. Remove chamber lid
23. Remove dried substrates
24. Replace lid back on to the chamber.
25. Turn CHILLER power off
26. Turn CONDENSER power off
27. Turn CHAMBER power off
28. Turn off LCO₂ gas bottle