

**VACUUM CHAMBER PM TECHNIQUE**

**LAM 2300 EXELAN FLEX OXIDE ETCH CHAMBER**

**OBJECTIVE:**

TO EFFECTIVELY PM THE LAM 2300 EXELAN FLEX OXIDE ETCH CHAMBER IN A TIMELY MANNER, WHILE IMPROVING TOOL RECOVERY AND PARTICLE PERFORMANCE

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**Vacuum Chamber:** LAM 2300 EXELAN FLEX OXIDE ETCH

**Vacuum Chamber Process Residue:** PROCESS INDUCED RESIDUE

**Vacuum Chamber Components:** CHAMBER, CHAMBER LINERS AND ASSOCIATED PARTS

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**Old Procedure:**

2+ hours using silicon carbide scrubbing pads with ethanol (or equivalent final wipe solvent) 100+ wipes  
**Tool recovery:** 6 to 8 hours conditioning wafers

**New Procedure:**

1 hour using 800D ScrubPAD, DI water & ethanol (or equivalent final wipe solvent)  
**Tool recovery:** <4 Hours conditioning wafers

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**Vacuum Chamber Products:**

LAM2300 EXELAN OXIDE ETCH PM KIT  
PM Kit P/N: HT4500-LAM23-OX1

- (1) **HT4754** UltraSOLV® Sponge
- (2) **HT4580D**-10-1 800 Grit Diamond ScrubPAD
- (4) **HT1511FC**-5 MiraSWABS® (20pc)
- (1) **HT5790S**-25 MiraWIPES® (25pc)
LAM 2300 Exelan Flex Oxide ETCH PM Procedure:


**Step 1:** Using proper procedures and **safety guidelines**, shutdown and prepare LAM 2300 Exelan Flex Chamber for wet clean

**Step 2:** Properly stage a container of DI water next to the chamber and place a Foamtec International [HT4580D](http://www.foamtecintlwcc.com/flash/) ScrubPAD and [HT4754](http://www.foamtecintlwcc.com/flash/) UltraSOLV® Sponge into the container (See Fig 1)

![Fig 1: ScrubPAD and UltraSOLV® Sponge in container of DI water](image1)

**NOTE:** MAY SUBSTITUTE A SMALL AMOUNT OF DI WATER TO MOISTEN UltraSOLV® SPONGE AND ScrubPAD AS NECESSARY (See Fig 2 & 3)

![Fig 2: UltraSOLV® Sponge, ScrubPAD and small amount of DI water](image2)

![Fig 3: Dampening UltraSOLV® Sponge with DI water](image3)

**Step 3:** Use the **lightly dampened** UltraSOLV® Sponge and wipe Oxide ETCH Chamber liners (See Fig 4)

![Fig 4: Dampened UltraSOLV® Sponge wiping chamber liners](image4)
LAM 2300 Exelan Flex Oxide ETCH PM Procedure (cont’d):

**Step 4:** Use a **lightly dampened** 800 Grit Diamond ScrubPAD and scrub off deposition from Oxide ETCH Chamber liner. It is important to keep area a little moist with DI water (See Fig 5 & 6)

![Fig 5 & 6: Lightly dampened 800 Grit Diamond ScrubPAD scrubbing chamber liner; keep slightly moist with DI water](image)

**Step 5:** Before oxide deposition has a chance to dry back onto the chamber liner, use lightly dampened UltraSOLV® Sponge and wipe deposition from chamber liner (See Fig 7 & 8)

![Fig 7: Lightly dampened UltraSOLV® Sponge preparing to wipe chamber liner](image)

![Fig 8: Clean chamber liner after UltraSOLV® Sponge](image)
**LAM 2300 Exelan Flex Oxide ETCH PM Procedure (cont’d):**

**Step 6:** As Diamond ScrubPAD appears to load up with deposition, pull ScrubPAD across damp UltraSOLV® Sponge. This will help keep ScrubPAD effectively removing oxide deposition from chamber liner (See Fig 9, 10 & 11)

**Fig 9:** ScrubPAD loaded with deposition  
**Fig 10:** Pull ScrubPAD across UltraSOLV® Sponge  
**Fig 11:** Unloaded ScrubPAD

**Step 7:** Continue to rinse UltraSOLV® Sponge in container of DI water as necessary to keep UltraSOLV® Sponge slightly moist and free of deposition (See Fig 12 & 13)

**Fig 12:** Loaded-up UltraSOLV® Sponge  
**Fig 13:** UltraSOLV® Sponge AFTER rinse
Step 8: Continue to repeat this **SCRUB – WIPE – RINSE** procedure outlined in steps 4 thru 7 for the remainder of the LAM 2300 Oxide ETCH parts (See Fig 14, 15 & 16)

**Fig 14, 15 & 16:** Continuing SCRUB – WIPE – RINSE procedure on remaining Oxide ETCH Chamber parts

Step 9: Using same technique described above, take 800 Grit Diamond ScrubPAD and gently remove dark build-up on heater coils (See Fig 17)

**Fig 17:** 800 Grit Diamond ScrubPAD removing build-up on heater coils

**IMPORTANT NOTE**

**IN ORDER TO HELP WITH AN EFFECTIVE TOOL RECOVERY, FOAMTEC INTERNATIONAL WIPE DOWN PROCEDURE MUST BE FOLLOWED WITH ALL HT5790S MiraWi PES® AND HT1511FC MiraSWABS®. THE MICRO-FI BER CHARACTERISTICS OF THESE PRODUCTS HELP REMOVE MORE DEPOSITION FROM THE PARTS THAN ANY OTHER STANDARD FAB WI PER**
LAM 2300 Exelan Flex Oxide ETCH PM Procedure (CONT'D):

**NOTE:** Figure below shows how much more deposition the Foamtec International MiraWIPE® can remove from a critical surface compared to the standard fab wiper, making the MiraWIPE® FINAL WIPE PROCEDURE the most CRITICAL STEP of the PM procedure (See Fig 18a & 18b)

**Step 10:** After scrubbing heater coils use the HT1511FC MiraSWAB® dampened with alcohol and clear out all openings on heater plate (See Fig 19 & 20)
LAM 2300 Exelan Flex OXIDE ETCH PM PROCEDURE (CONT’D):

**Step 11:** While using the HT1511FC MiraSWABS® to clear out all the openings within the heater coils, also use the HT5790S MiraWIPES® dampened with alcohol and proceed to wipe the entire heater plate, concentrating on the tight corners throughout the heater plate (See Fig 21 & 22)

![Fig 21: Wiping heater plate with HT5790S MiraWipe® and alcohol](image1)

![Fig 22: Clean heater plate coils after gentle scrub and wipe](image2)
LAM 2300 Exelan Flex Oxide ETCH PM Procedure (cont’d):

**Step 12:** Following the same procedure with the HT1511FC MiraSWABS® and HT5790S MiraWIPES® with alcohol, perform an entire wipe of the remaining Oxide ETCH parts prior to placing back into the Oxide ETCH Chamber (See Fig 23)

**NOTE:** THE FOLLOWING SHOWS HOW MUCH MORE DEPOSITION THE MIRAWIPE® WAS ABLE TO REMOVE FROM A SMALL SECTION OF THE SILICONE RING AFTER A COMPLETE WIPE DOWN WITH THE STANDARD FAB WIPER (See Fig 24 & 25)

*Fig 23: HT5790S MiraWIPE® performing final wipe on all chamber parts*

*Fig 24 & 25: THE IMPORTANCE OF USING THE HT5790S*
LAM 2300 Exelan Flex Oxide Etch PM Procedure (cont’d):

CHAMBER CLEAN:

Step 13: Take the additional 800 Grit Diamond ScrubPAD and using the same technique described above proceed to perform a chamber scrub on the LAM 2300 Exelan Flex Oxide Chamber

NOTE: Ensure to concentrate on the heavy deposition areas that are not covered by the chamber liners, such as the sides of the e-chuck (See Fig 26)

Fig 26: 800 Grit Diamond ScrubPAD gently scrubbing edge of e-chuck

Step 14: When entire chamber scrub is complete, use the same technique described above and use remaining HT1511FC MiraSWABS® and HT5790S MiraWIPES® with alcohol and perform a complete chamber wipe down (See Fig 27 & 28)

Fig 27: Applying alcohol to HT5790S MiraWIPE®

Fig 28: Performing final wipe of LAM Oxide Chamber

TOOL RECOVERY:

Step 15: Follow proper tool recovery guidelines as outlined by LAM Research Corporation