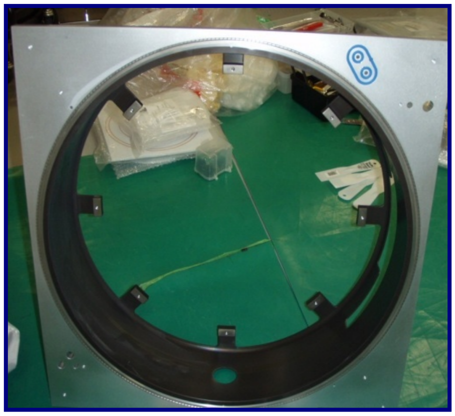
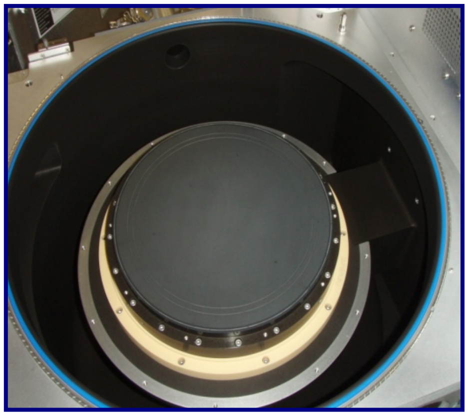


CHAMBER LINER

Foamtec International
Wilshire Contamination Control Division
cleaning critical surfaces



CHAMBER

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

Vacuum Chamber: LAM 2300 EXELAN FLEX OXIDE ETCH
Vacuum Chamber Process Residue: PROCESS INDUCED RESIDUE
Vacuum Chamber Components: CHAMBER, CHAMBER LINERS AND ASSOCIATED PARTS

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

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:

View “How to” instructional videos on http://www.foamtecintlwcc.com/flash/

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 ScrubPAD and HT4754 UltraSOLV® Sponge into the container (See Fig 1)

Fig 1: ScrubPAD and UltraSOLV® Sponge in container of DI water

NOTE: MAY SUBSTITUE 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

Fig 3: Dampening UltraSOLV® Sponge with DI water

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

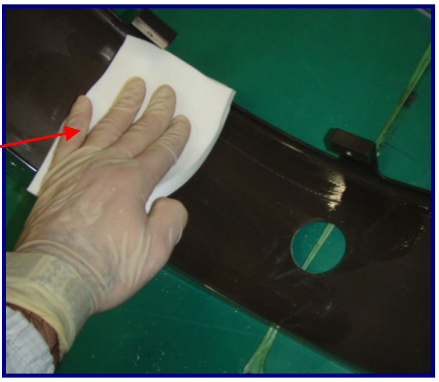


Fig 4: Dampened UltraSOLV® Sponge wiping chamber liners

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)

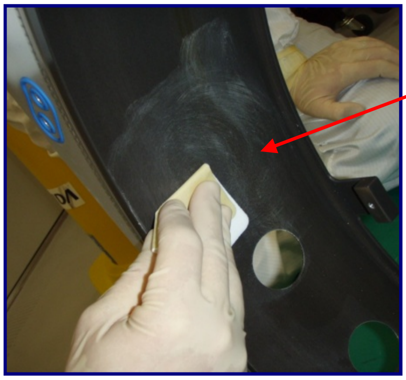


Fig 5 & 6: Lightly dampened 800 Grit Diamond ScrubPAD scrubbing chamber liner; keep slightly moist with DI water

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)

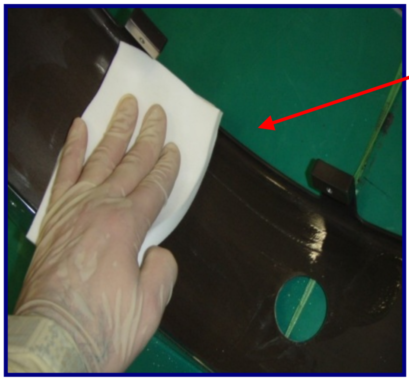
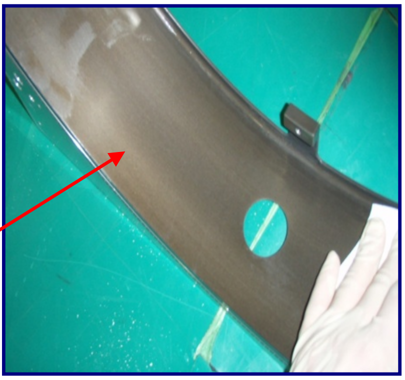


Fig 7: Lightly dampened UltraSOLV® Sponge preparing to wipe chamber liner

Fig 8: Clean chamber liner after UltraSOLV® Sponge



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

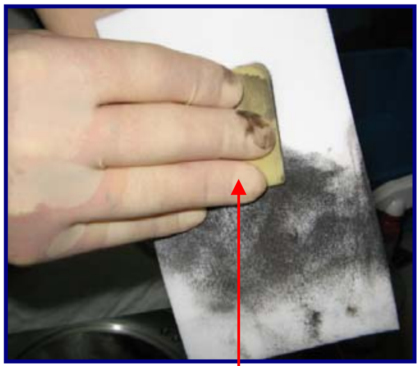


Fig 10: Pull ScrubPAD across UltraSOLV® Sponge

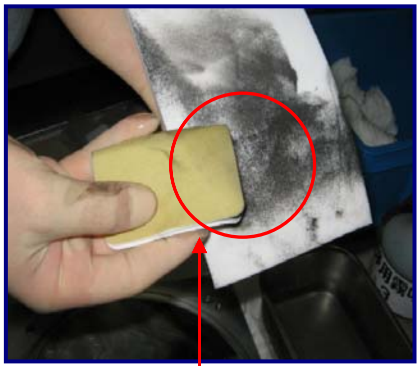


Fig 11: Unloaded ScrubPAD

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

LAM 2300 EXELAN FLEX OXIDE ETCH PM PROCEDURE (CONT'D):

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)

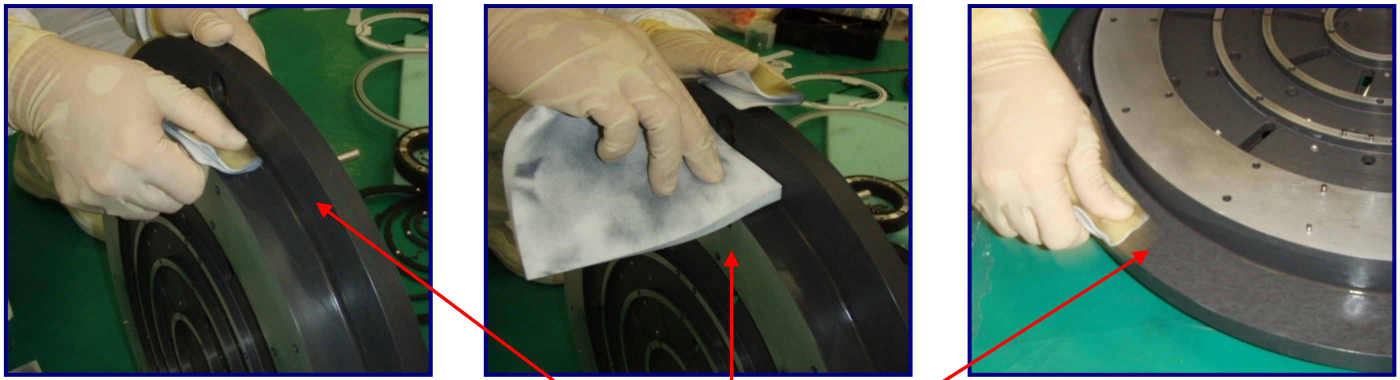


Fig 14, 15 & 16: Continuing SCRUB – WIPE – RINSE procedure on remaining Oxide ETCH Chamber parts

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

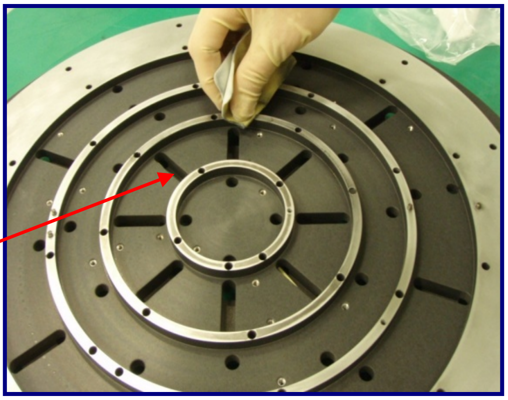


Fig 17: 800 Grit Diamond ScrubPAD removing build-up on heater coils

IMPORTANT NOTE

IN ORDER TO HELP WITH AN EFFECTIVE TOOL RECOVERY, FOAMTEC INTERNATIONAL WIPE DOWN PROCEDURE MUST BE FOLLOWED WITH ALL HT5790S MiraWIPES® AND HT1511FC MiraSWABS®. THE MICRO-FIBER CHARACTERISTICS OF THESE PRODUCTS HELP REMOVE MORE DEPOSITION FROM THE PARTS THAN ANY OTHER STANDARD FAB WIPER

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)

Fig 18a: Current fab wiper after completely wiping LAM 2300

Fig 18b: Particles picked up using HT5790S MiraWIPES® after completely wiping with current fab wiper

MiraWIPES® are the KEY STEP for DEFECT REDUCTION and IMPROVED TOOL RECOVERY

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)

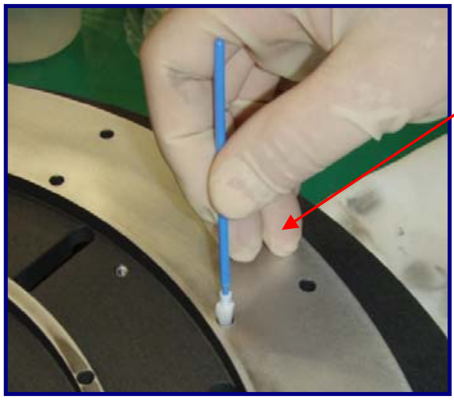
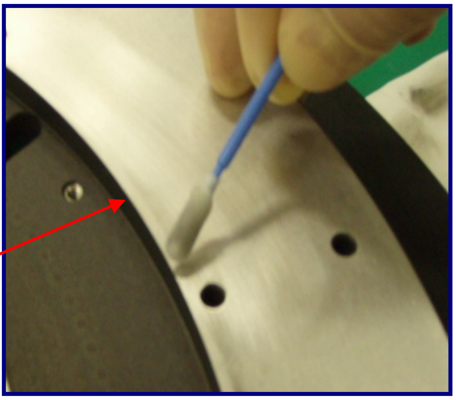


Fig 19: HT1511FC MiraSWAB® clearing out openings on heater plate

Fig 20: Additional deposition MiraSWAB® was able to remove from openings



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)

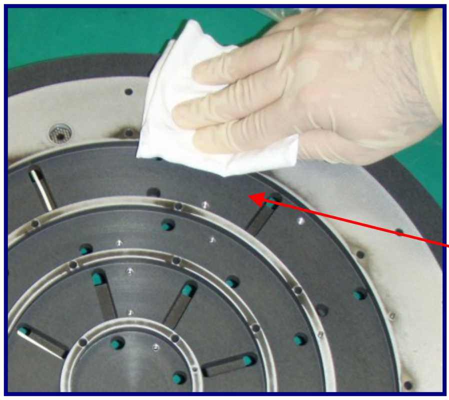


Fig 21: Wiping heater plate with HT5790S MiraWIPE® and alcohol

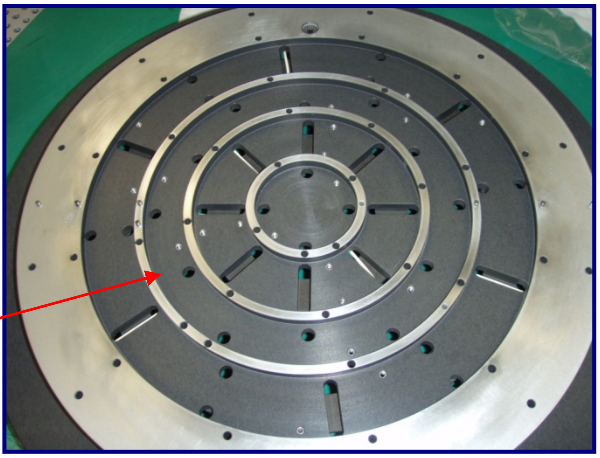


Fig 22: Clean heater plate coils after gentle scrub and wipe

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)

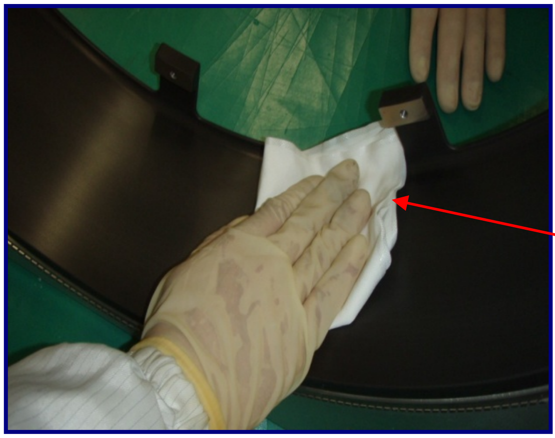
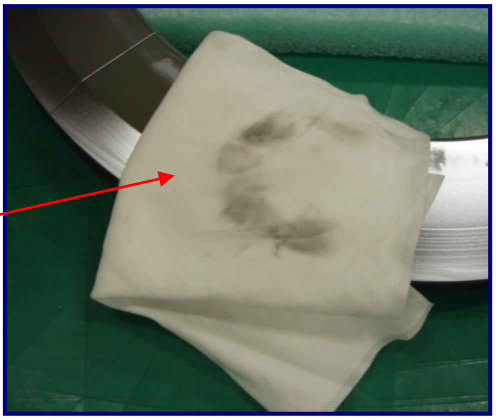


Fig 23: HT5790S MiraWIPE® performing final wipe on **all** chamber parts

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 WIPED DOWN WITH THE STANDARD FAB WIPER (See Fig 24 & 25)**

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)

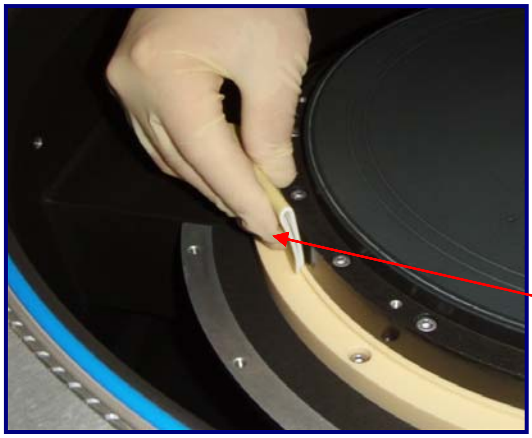


Fig 26: 800 Grit Diamond ScrubPAD gently scrubbing edge of e-chuck

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)

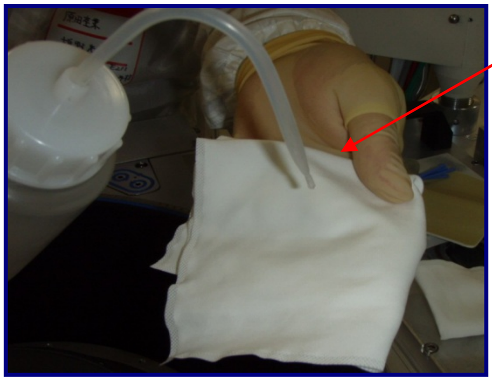


Fig 27: Applying alcohol to HT5790S MiraWIPE®

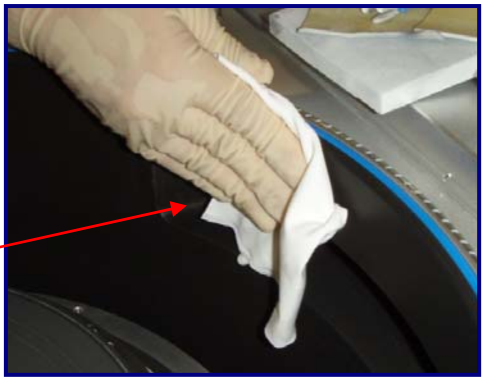


Fig 28: Performing final wipe of LAM Oxide Chamber

TOOL RECOVERY:

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