

VACUUM CHAMBER PM TECHNIQUE AMAT XGEN 300 - CVD POLYCHAMBER WET SCRUB PM

OBJECTIVE:

TO EFFECTIVELY PM THE APPLIED MATERIALS XGEN CVD POLY CHAMBER IN A TIMELY MANNER WHILE MAINTAINING THE WAFER THINNESS, THE WAFER RS NON-UNIFORMITIES WITHIN SPECIFICATIONS AND IMPROVING TOOL PERFORMANCE

Vacuum Chamber:

APPLIED MATERIALS XGEN 300 CVD POLY

Vacuum Chamber Process Residue:

PROCESS INDUCED RESIDUE

Vacuum Chamber Components:

CHAMBER BODY

Old Procedure:

Wipe chamber body using standard fab wipers & IPA

Recovery time: 24 hours + conditioning

New Procedure:

AMAT & Foamtec International designed cleaning technique

Recovery time: <24 hours, no conditioning (Pass particles 1st run)

Vacuum Chamber Products:

PM Kit P/N: HT4500 – XGEN3

- (2) [HT4580D](#)-10-1 800 Grit Diamond ScrubPAD
- (1) [HT4518D](#)-10-1 180 Grit Diamond ScrubPAD
- (1) [HT179080D](#)-1 800 Grit Diamond ScrubTIP®
- (1) [HT179018D](#)-1 180 Grit Diamond ScrubTIP®
- (1) [HT174913PD](#)-1 1350 Grit Diamond ScrubTIP®
- (1) [HT4754](#) UltraSOLV® Sponge
- (1) [HT1713](#)-5 UltraSOLV® Dual Tip Swab (5pc)
- (3) [HT5790S](#)-5 MiraWIPE® (15pc)
- (1) [HT4375B](#)-1 FirmWIPE™ Disk Foam Plate
- (1) HT6635B-1 Foam Plug
- (1) FT1301 Plastic Sealed Container



AMAT XGEN 300 CVD POLY CHAMBER PM PROCEDURE:

View "How to" instructional videos on <http://www.foamtecintlwcc.com/video/>

ENSURE TO REVIEW APPLIED MATERIALS CHAMBER WET SCRUCLEAN DOCUMENT PRIOR TO PERFORMING CHAMBER PM

Step 1: Using proper procedures and safety guidelines prepare AMAT XGEN 300 Poly Chamber for wet scrub (See Fig 1)

- Remove pumping plate
- Lift pin
- Heater assembly
- Manometer assembly



Fig 1: XGEN Chamber prepped for wet scrub PM

Step 2: Place [HT4375B-1 FirmWIPE™ Disk Foam Plate](#) in the bottom of the chamber to protect excess water from entering heater channel (See Fig 2 & 3)

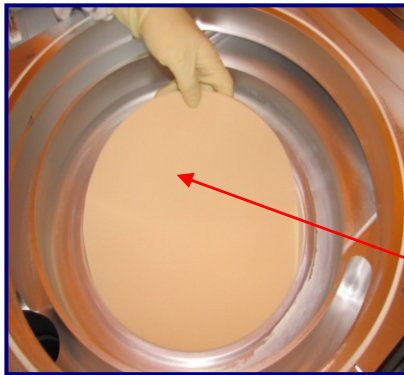


Fig 2 & 3: Placing [HT4375B-1](#) Foam Plate in bottom of chamber

Step 3: Place [HT6635B-1 Foam Plug](#) in pressure gauge channel for protection (See Fig 4 & 5)

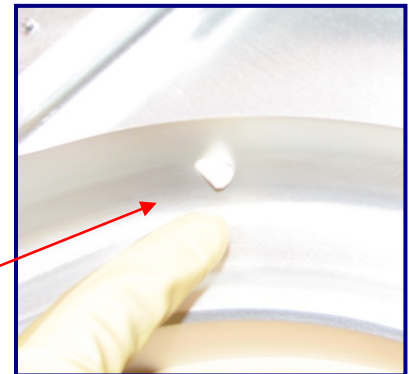


Fig 4 & 5: Placing [HT6635B-1](#) Foam Plug in channel

AMAT XGEN 300 CVD POLY CHAMBER PM PROCEDURE (CONT'D):

Step 4: Fill FT1301 Plastic Sealed Container with approximately 3" to 4" of DI water

Step 5: Place [HT4754](#) UltraSOLV® Sponge and [HT4580D](#)-1 800 Grit Diamond ScrubPAD in container of DI water to moisten (See Fig 6)



Fig 6: UltraSOLV® Sponge and ScrubPAD in DI water

Step 6: Use damp UltraSOLV® Sponge to wipe a small area within the XGEN Chamber that is to be scrubbed. Keep area moist with DI water during scrub

NOTE: **MAY WANT TO REDUCE CHAMBER BODY TEMPERATURE TO HELP KEEP DI WATER FROM EVAPORATING QUICKLY** (See Fig 7)

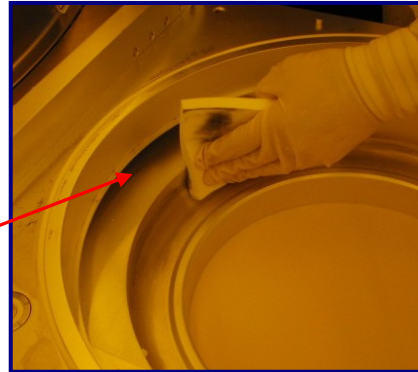


Fig 7: Wiping a small area within XGEN Chamber

Step 7: Use [HT4580D](#) ScrubPAD lightly dampened with DI water to SCRUB the moistened area within XGEN Chamber to remove deposition buildup (See Fig 8)



Fig 8: Scrubbing a small area within XGEN Chamber

AMAT XGEN 300 CVD POLY CHAMBER PM PROCEDURE (CONT'D):

Step 8: WIPE with the UltraSOLV[®] Sponge while scrubbing to keep area moist and to remove deposition buildup from chamber body

Step 9: Return UltraSOLV[®] Sponge and Diamond ScrubPAD to container of DI water periodically to help keep products moist

NOTE: ENSURE NOT TO PUT EXCESSIVE DI WATER ON CHAMBER BODY, JUST ENOUGH TO KEEP SCRUBBED AREA MOIST

Step 10: As Diamond ScrubPAD begins to load up with deposition, pull across UltraSOLV[®] Sponge to unload ScrubPAD (See Fig 9, 10 & 11)



Fig 9: ScrubPAD Loaded with Deposition



Fig 10: Pull ScrubPAD across UltraSOLV[®] Sponge

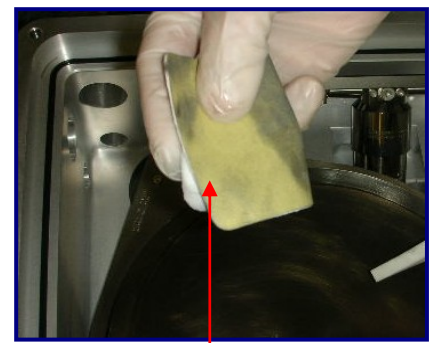


Fig 11: Unloaded ScrubPAD

Step 11: Rinse UltraSOLV[®] Sponge in DI water to remove as much deposition as possible from sponge (See Fig 12 & 13)



Fig 12: Loaded UltraSOLV[®] Sponge

Fig 13: UltraSOLV[®] Sponge after rinse



Step 12: Using the same technique described above, use the [HT179080D-1](#) ScrubTIP[®] to scrub the deposition off of all the hard to reach areas and tight corners

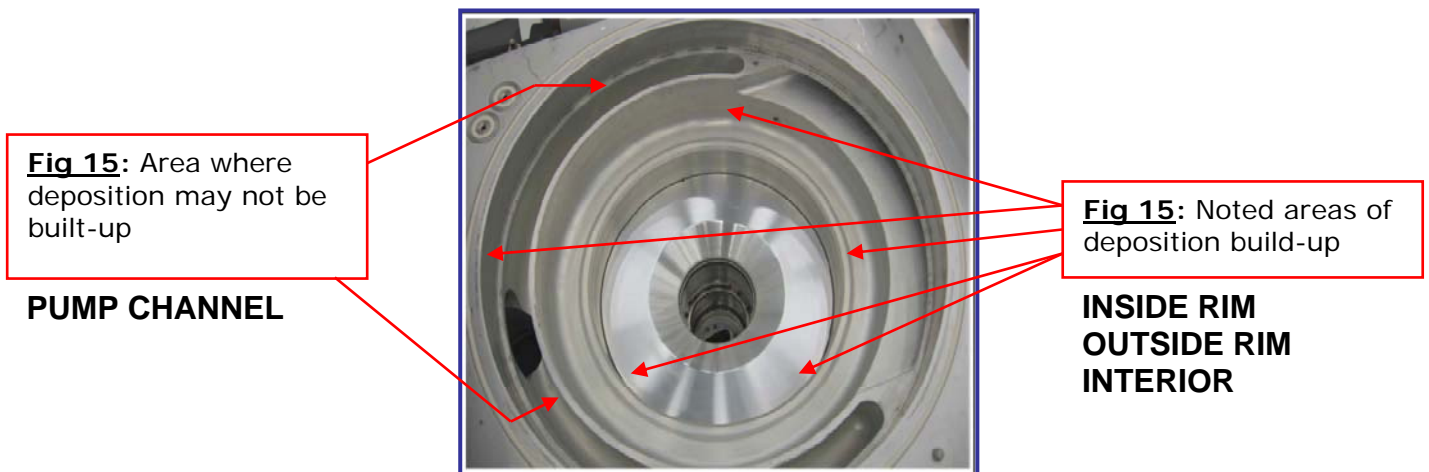
AMAT XGEN 300 CVD POLY CHAMBER PM PROCEDURE (CONT'D):

Step 13: Use the [HT174913PD](#)-1 ScrubTIP® 1350 Grit Diamond to polish out any scratches in the o-ring groove and to remove deposition from other hard to reach areas (See Fig 14)



Step 14: Repeat steps 6 – 13, scrubbing the remaining areas of the XGEN Poly Chamber, rinsing UltraSOLV® Sponge and unloading 800 Grit Diamond ScrubPAD as necessary

Step 15: Concentrate on the areas where there is deposition buildup, may not be necessary to scrub all areas of chamber, such as pump channel (See Fig 15)



Step 16: When [HT4580D](#) 800 Grit Diamond ScrubPAD appears worn, replace with second HT4580D ScrubPAD and continue chamber scrub

AMAT XGEN 300 CVD POLY CHAMBER PM PROCEDURE (CONT'D):

- Step 17:** XGEN Chamber scrub portion of PM should take 30 to 45 minutes to complete
- Step 18:** When scrub portion of PM is complete, replace DI water with fresh DI water and rinse-out UltraSOLV[®] Sponge in fresh DI water
- Step 19:** Take UltraSOLV[®] Sponge and perform an entire XGEN Chamber wipe in preparation to perform **FINAL SCRUB** with [HT4518D](#)-1 180 Grit Diamond ScrubPAD

IMPORTANT NOTE

FINAL SCRUB PORTION OF PROCEDURE IS A VERY CRITICAL STEP AND MUST BE PERFORMED ACCORDINGLY. USING THE 180 GRIT DIAMOND SCRUBPAD GIVES THE XGEN POLY CHAMBER THE REQUIRED RA (ROUGHNESS AVERAGE) WHICH CORRELATES TO THE SPECIFIED EMISSIVITY NEEDED FOR PROPER TOOL PERFORMANCE

- Step 20:** Using the same technique as described above in steps 6 – 13, take the [HT4518D](#) ScrubPAD and [HT179018D](#)-1 180 Diamond Grit ScrubTIP[®], and roughen all of the chamber surface areas that were scrubbed earlier with the 800 Grit Diamond ScrubPAD & ScrubTIPS[®]
- Step 21:** When roughing up XGEN Chamber is complete, take UltraSOLV[®] Sponge and perform an entire XGEN Chamber wipe in preparation to perform **FINAL WIPE**

AMAT XGEN 300 CVD POLY CHAMBER FINAL WIPE:

IMPORTANT NOTE

IN ORDER TO ACHIEVE AN EFFICIENT TOOL RECOVERY, THE FINAL WIPE PORTION OF THIS PROCEDURE MUST BE FOLLOWED USING THE FOAMTEC INTERNATIONAL [HT5790S](#) MiraWIPES®. THE CHARACTERISTICS OF THE MICROFIBER MiraWIPE® WILL REMOVE MORE DEPOSITION THAN ANY STANDARD FAB WIPER, HELPING TO REDUCE PARTICLE LEVELS DURING RECOVERY

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 16a & 16b)



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

- Step 22:** Remove foam plug from pressure gauge channel and foam plate from bottom of XGEN Chamber
- Step 23:** Fold the [HT5790S](#) MiraWIPES® into quarters and apply IPA to the MiraWIPES®, then wipe entire XGEN 300 Poly Chamber – **Continue wiping using 5 to 7 MiraWIPES®. The final MiraWIPE® should show no more deposition left throughout chamber**

AMAT XGEN 300 CVD POLY CHAMBER FINAL WIPE (CONT'D):

Step 24: In addition to using the MiraWIPES[®] apply IPA to the [HT1713-5](#) UltraSOLV[®] Foam Swab and wipe all of the hard to reach areas, o-ring grooves and pressure gauge channel (See Fig 17)

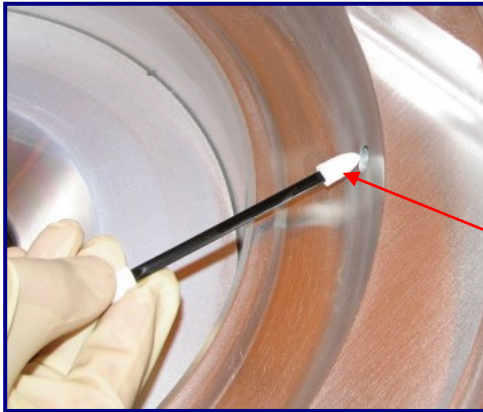
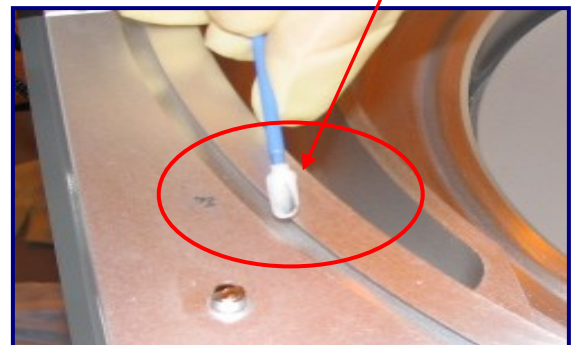
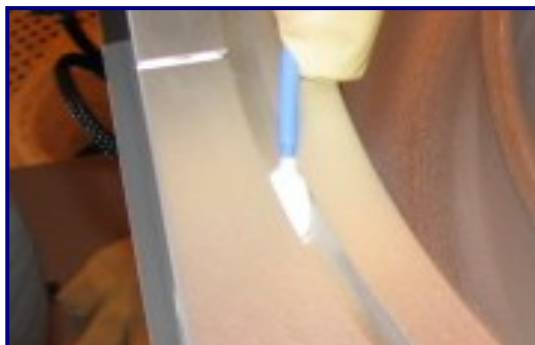


Fig 17: UltraSOLV[®] Foam Swab reaching into pressure gauge channel to clean

Step 25: Shown below is the [HT1511FC](#) MiraSWAB[®] (**MiraSWABS[®] must be ordered separately**) which gives the opportunity to reach into the tight corners and hard to reach areas, but is laminated with the MiraWIPE[®] so provides the micro fiber characteristics of the MiraWIPE[®] **REMOVING MORE DEPOSITION FROM THESE AREAS!**



PARTICLES!!



Step 26: Use additional MiraWIPES[®] to **WIPE DOWN ALL PARTS** being placed back into XGEN Chamber. Using applied materials safety guidelines and procedures bring XGEN 300 Poly Chamber back up to production