**VACUUM CHAMBER PM TECHNIQUE**

**APPLIED MATERIALS XR80**

**IMPLANT CHAMBER CLEAN**

**OBJECTIVE:**

TO EFFECTIVELY PM THE VERTICAL DIFFUSION FURNACE DOOR ASSEMBLY IN A TIMELY MANNER, WHILE IMPROVING TOOL RECOVERY AND PARTICLE PERFORMANCE

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**Vacuum Chamber:** XR80 CHAMBER

**Vacuum Chamber Residue:** BF3, P, SB, IN, ASH3 BEAM RESIDUE

**Vacuum Chamber Components:** IMPLANT CHAMBER

**Old Procedure:** ScotchBrite®, hydrogen peroxide (H₂O₂), 40 grit sand paper, wire mesh

**Solvent:** DI water, IPA (only)

**NOTE:** May not clean Implant Chamber due to current method is very dirty and not very effective

**DANGER:**

USE OF HYDROGEN PEROXIDE (H₂O₂) CAUSES A VARIETY OF ENVIRONMENTAL, HEALTH, AND SAFETY CONCERNS. CAN CAUSE PROLONGED PUMP DOWN TIMES AND HIGH VOLTAGE ARCING. BREATHING APPARATUS AND FULL ACID PPE IS RECOMMENDED WHILE SCRUBBING WITH H₂O₂. SCRUBBING PHOSPHORUS WHILE USING H₂O₂ INCREASES THE RISK OF FIRES AND/OR THE RELEASE OF HAZARDOUS CHEMICAL FUMES, POTENTIALLY RESULTING IN PERSONAL INJURY AND PROPERTY DAMAGE

**Vacuum Chamber Products:**

- (1) **HT4754** UltraSOLV® Sponge
- (2) **HT4528D**-10 280 Grit Diamond ScrubPAD
- (1) **HT4580D**-10 800 Grit Diamond ScrubPAD
- (2) **HT4536DC3**-1 360 Grit Diamond ScrubDISK®
- (1) **FT901** Soft Handle w/Loop ErgoSCRUB®
- (5) **HT179036D** 360 ScrubTIP®
- (25) **HT5790S** MiraWIPE® Wipers
**XR80 Implant Chamber Clean PM Procedure:**


**Step 1:** Remove all necessary parts from Implant Chamber (faradays, graphite, shields, etc...)

**Step 2:** Vacuum inside of the chamber using an approved arsenic vacuum system

**Step 3:** Wipe-down inside of the chamber using a DI water dampened UltraSOLV® HT4754 Sponge

**Step 4:** Using a DI water dampened HT4536DC-1 ScrubDISK®, attached to the FT901 ErgoSCRUB®, scrub an 8“x8“ area within the Implant Chamber

**Step 5:** Wipe-down the effected chamber area using the DI water dampened UltraSOLV® HT4754 Sponge

**Step 6:** Unload the ScrubDISK® of deposition by wiping the UltraSOLV® HT4754 Sponge with the ScrubDISK® in one direction (See Fig 1, 2, & 3)

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**Fig 1:** ScrubDISK® loaded with deposition

**Fig 2:** Pull & twist ScrubDISK® across UltraSOLV® Sponge

**Fig 3:** Unloaded ScrubDISK®
XR80 Implant Chamber Clean PM Procedure (cont’d):

Step 7: Unload the UltraSOLV® HT4754 Sponge by moistening with DI water and ringing out into a HazMat container (See Fig 4 & 5)

![UltraSOLV® Sponge loaded with deposition](image1)

![UltraSOLV® Sponge free of deposition after rinse in DI water](image2)

Step 8: Repeat steps 4 – 7, using the HT4528D ScrubPAD and the HT179036D ScrubTIP® where necessary, until all deposition is removed

Step 9: OPTIONAL – After effectively cleaning the Implant Chamber, technician may want to use the HT4580D ScrubPAD and the HT4754 UltraSOLV® Sponge within certain areas of the Implant Chamber (decel bushings, view ports....) to lightly scrub the fine scratches that may be left behind from using the 280 Grit Diamond ScrubPAD

FINAL WIPE PROCEDURE:

IMPORTANT NOTE

THE USE OF HT5790S MiraWIPE® DURING FINAL WIPE PORTION OF PROCEDURE IS A CRITICAL STEP TO EFFECTIVELY REMOVING PARTICLE DEFECTS
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 IPA Wipe the most CRITICAL STEP of the PM procedure (See Fig 6a & 6b)

Fig 6a: Current fab wiper after completely wiping the chamber

Fig 6b: 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: Repeatedly wipe the inside of the Implant Chamber using an IPA dampened HT5790S MiraWIPE®. Ensure to wipe entire chamber effectively until all areas are removed of deposition
XR80 Implant Chamber Clean PM Procedure (cont’d):

Implant Chamber - PreClean

Arsenic, Boron, Phosphorus...
Implant Chamber – PostClean

PM COMPLETED USING ONLY DI WATER AND IPA FOR FINAL WIPE-DOWN

NO $H_2O_2$ (HYDROGEN PEROXIDE)

ENTIRE AMOUNT OF WASTE GENERATED UPON COMPLETION OF THIS CHAMBER PM.