



**BEFORE**



**AFTER**

## VACUUM CHAMBER PM TECHNIQUE MULTIPLEX ICP STS-RIE CHAMBER WALL CLEAN

### **OBJECTIVE:**

TO EFFECTIVELY PM THE ETCH STS-RIE CHAMBER IN A TIMELY MANNER,  
WHILE IMPROVING TOOL RECOVERY AND PARTICLE PERFORMANCE

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<b><u>Vacuum Chamber:</u></b>	STS-RIE / ETCH CAVITY
<b><u>Vacuum Chamber Process Residue:</u></b>	PROCESS INDUCED RESIDUE
<b><u>Vacuum Chamber Components:</u></b>	CHAMBER WALL

**Old Procedure:** 5 to 6 days  
**Tool Recovery:** Extended recovery time, outgassing and particle issues

**New Procedure:** DI water, Foamtec Products, 1 hour, 1 technician  
**Tool Recovery:** Reduced recovery time and no particle issues

### **Vacuum Chamber Products:**

- (3) HT4536D-1 360 Grit Diamond ScrubPAD
- (1) FTPEN-1 ScrubWRIGHT™ Pen
- (1) HT4536DW-5 360 Grit Diamond ScrubBELT®
- (2) HT4754 UltraSOLV® Sponge
- (1) HT5790S-25 MiraWIPES® (25 wipes)
- (1) HT4794 UltraSOLV® foam wiper
- (1) HT1502-10 MiraSWAB® 3" Rigid Tip
- (1) HT1511-10 MiraSWAB® 4" Flexible Oval Head Tip

**MULTIPLEX ICP STS-RIE CHAMBER PM PROCEDURE:**

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

- Step 1:** Using proper procedures and **safety guidelines** properly prepare STS-RIE for chamber scrub
- Step 2:** Using DI water, moisten an UltraSOLV<sup>®</sup> Sponge and a Diamond ScrubPAD. Ring-out sponge to ensure foam is moist throughout the sponge. Keep the sponge slightly damp with DI water (See Fig 1)

**Fig 1:** Dampen UltraSOLV<sup>®</sup> Sponge and Diamond ScrubPAD with DI water



- Step 3:** Using a dampened UltraSOLV<sup>®</sup> Sponge, wipe chamber plate and wall removing the surface particles and avoiding the powder fly around the chamber (See Fig 2)
- Step 4:** Using a dampened 360 Grit Diamond ScrubPad, scrub chamber wall and outlet side of turbo pump. Keep the Diamond ScrubPAD slightly moist with DI water (See Fig 2 & 3)



**Fig 2:** UltraSOLV<sup>®</sup> Sponge wiping chamber wall



**Fig 3:** 360 Grit Diamond ScrubPad scrubbing entire chamber and chamber wall

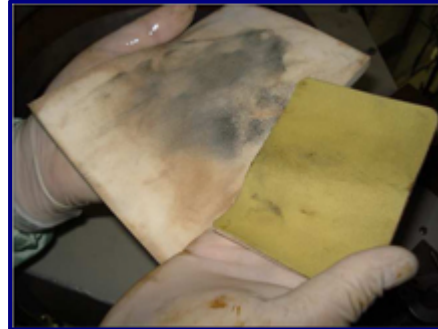
**MULTIPLEX ICP STS-RIE CHAMBER PM PROCEDURE (CONT'D):**

**Step 5:** As loosened deposition begins to build up on chamber wall, take UltraSOLV<sup>®</sup> Sponge and wipe the area free of deposition

**Step 6:** When ScrubPAD loads up with deposition, pull across UltraSOLV<sup>®</sup> Sponge to unload ScrubPAD. This ensures the function and efficiency of the sponge (See Fig 4 & 5)



**Fig 4:** Pull ScrubPAD across UltraSOLV<sup>®</sup> Sponge



**Fig 5:** Unloaded ScrubPAD

**Step 7:** Rinse sponge as necessary by rinsing with DI water to free UltraSOLV<sup>®</sup> Sponge of excess deposition (See Fig 6 & 7)



**Fig 6:** Loaded-up UltraSOLV<sup>®</sup> Sponge

**Fig 7:** UltraSOLV<sup>®</sup> Sponge AFTER rinse



**MULTIPLEX ICP STS-RIE CHAMBER PM PROCEDURE (CONT'D):**

- Step 8:** Repeat steps 3 – 7, scrubbing the remaining areas of the chamber plate & wall assembly. Rinse UltraSOLV<sup>®</sup> Sponge and unload 360 Grit Diamond ScrubPAD as necessary
- Step 9:** When deposition has been sufficiently removed throughout the entire chamber assembly, remove gloves and replace with a new set in preparation for Final Wipe Procedure

**FINAL WIPE PROCEDURE:**

**IMPORTANT NOTE:**

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**THE USE OF HT5790S MiraWIPES<sup>®</sup> DURING THE FINAL WIPE PROCEDURE IS A CRITICAL STEP TO EFFECTIVELY REMOVE PARTICLE DEFECTS FROM CHAMBER**

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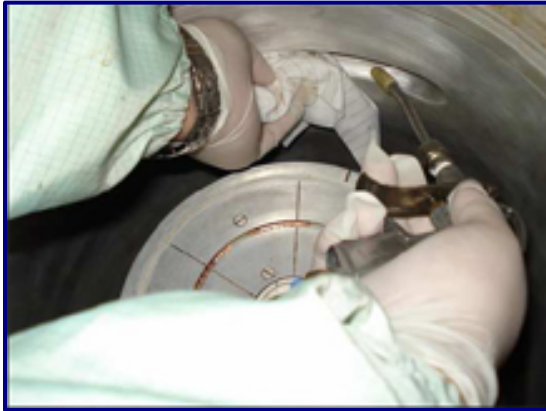
**NOTE:** Figure below shows how much more deposition the Foamtec International MiraWIPE<sup>®</sup> can remove from a critical surface compared to the standard fab wiper, making the MiraWIPE<sup>®</sup> FINAL WIPE PROCEDURE the most **CRITICAL STEP** of the PM procedure (See Fig 8a & 8b)



**MiraWIPES<sup>®</sup> are the KEY STEP for DEFECT REDUCTION and IMPROVED TOOL RECOVERY**

**MULTIPLEX ICP STS-RIE CHAMBER PM PROCEDURE (CONT'D):**

**Step 10:** Use a MiraWIPE® dampened with IPA and wipe up all of the moisture and/or loosened deposition that surfaces from N<sub>2</sub> gun blowing N<sub>2</sub>, or CDA into the sealing areas and screw holes (See Fig 9)



**Fig 9:** Use N<sub>2</sub> gun to blow out the moisture and loosened deposition inside sealing, screw holes and corners

**Step 11:** Use a HT5790S MiraWIPE®, apply IPA and proceed to wipe entire RIE-PC chamber wall assembly

**Step 12:** Prior to closing chamber, use a clean MiraWIPE® dampen with IPA and perform a final complete chamber wipe-down



**FIG 10: COMPLETED STS-RIE CHAMBER WALL ASSEMBLY SCRUB**



**MULTIPLY ICP STS-RIE CHAMBER PM PROCEDURE (CONT'D):**

**PARTS CLEANING**

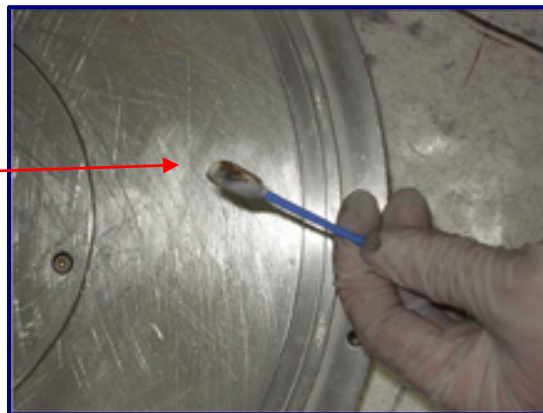
**Step 13:** Use the FTPEN, combined with the Diamond ScrubBELT® (HT4536DW-5), scrub inside the chamber cover to remove film. Keep slightly dampened with DI water, and remove the deposition by wiping with UltraSOLV® Sponge (See Fig 11)

**Fig 11:** FTPEN and 360 Grit Diamond ScrubBELT® scrubbing inside chamber cover



**Step 14:** Use MiraSWABS® (HT1502 MiraSWAB® 3" Rigid Tip & HT1511 MiraSWAB® 4" Flexible Oval Head Tip) dampened with IPA to clean the parts screw holes and o-ring trench (See Fig 12)

**Fig 12:** MiraSWAB® cleaning the screw holes and o-ring trench



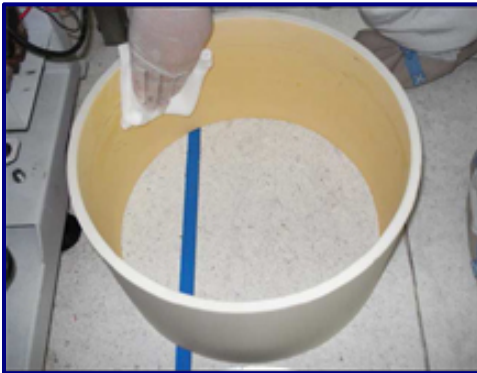
**Step 15:** Use a HT5790S MiraWIPE®, apply IPA and proceed to wipe entire STS-RIE chamber cover (See Fig 13)



**Fig 13:** Apply IPA to MiraWIPE®, and proceed to wipe chamber cover

**MULTIPLEX ICP STS-RIE CHAMBER PM PROCEDURE (CONT'D):**

**Step 16:** Use the UltraSOLV<sup>®</sup> foam wiper dampened with IPA to clean the ceramic & bead blasted parts (See Fig 14 & 15)



**Fig 14 & 15:** Use UltraSOLV<sup>®</sup> foam wiper dampened with IPA to clean the ceramic and bead blasted parts