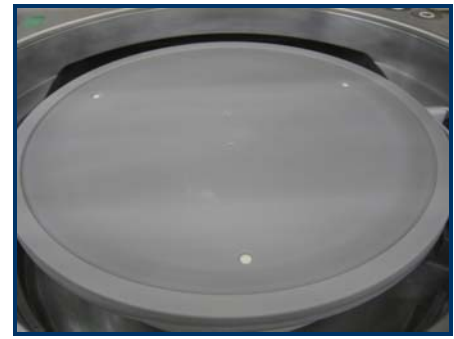


**AMAT HEATER
BEFORE PM**



**AMAT HEATER
AFTER PM**

APPLICATION NOTE AMAT PRODUCER® HARP™ HEATER ASSEMBLY PM

OBJECTIVE:

TO EFFECTIVELY REMOVE THE DEPOSITION ON THE EDGE OF THE APPLIED MATERIALS PRODUCER® HEATER ASSEMBLY IN A TIMELY MANNER IMPROVING WAFER UNIFORMITY

| | |
|----------------------------------|--|
| <u>Surface Build-up:</u> | Aluminum Fluoride |
| <u>Tool:</u> | Applied Materials Producer® HARP™ |
| <u>Tool Parts:</u> | Heater Assembly |
| <u>Old Procedure:</u> | None Developed – Some Customers Cleaning With ScotchBrite |
| <u>Recovery Time:</u> | N/A |
| <u>Interval:</u> | N/A |
| <u>New Procedure:</u> | 1 Hour Using Diamond ScrubPAD, ScrubWRIGHT™ Pen, MiraWIPE® and MiraSWABS® |
| <u>Recovery Time:</u> | N/A |
| <u>Interval:</u> | PM Heater Every 20,000 Wafers Depending On Film Thickness |

Products:

PM Kit P/N: HT4500-HARP1

AMAT Producer® Heater PM Kit

- (1) [HT4536D](#)-10-1 Diamond ScrubPAD, 360 Grit
- (2) [HT4536DW](#)-1 Diamond ScrubBELT™, 360 Grit
- (1) [FTPEN](#)-1 ScrubWRIGHT™ PEN
- (1) [HT4754](#) UltraSOLV® Sponge
- (3) [HT5790S](#)-5 MiraWIPES® (15 MiraWIPES®)
- (1) AN-HARP1 Documentation Application Note



AMAT PRODUCER® HEATER PM:

Step 1: Using proper procedures and SAFETY guidelines prepare AMAT Producer® Chamber for Heater clean.

Step 2: Using proper procedures and SAFETY guidelines remove Process Kit from the Chambers. (See Fig. 1)

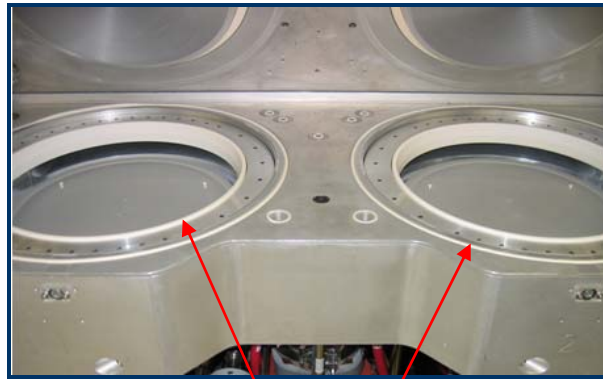
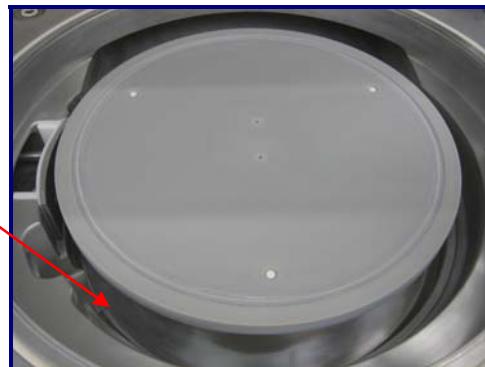


Fig 1: Remove Process Kits from Chambers

Step 3: Follow AMAT procedure to move heaters to 300 mil spacing. (See Fig. 2)

Fig 2: Heater raised to 300 mils



AMAT PRODUCER® HEATER PM (CONT.):

NOTE: This procedure is intended to remove process buildup on the edge of the Heater to reduce wafer uniformity.

ONLY scrub the outer ring of the Heater where the wafer's edge would be.

DO NOT scrub the interior of the Heater or the raised outer lip. (See Fig 3, 4, and 5)

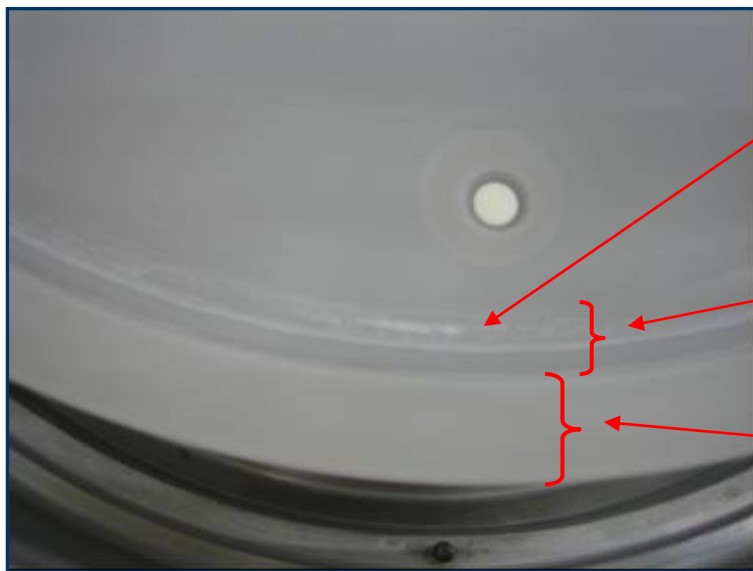


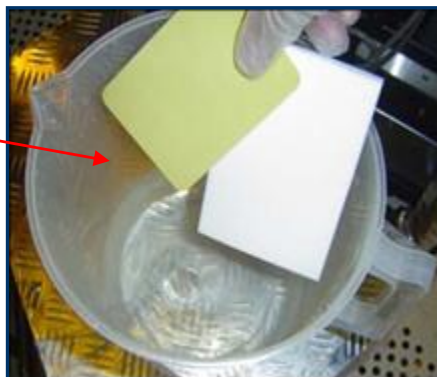
Fig 3: Process buildup on edge of Heater

Fig 4: **ONLY** scrub this portion of the Heater

Fig 5: **DO NOT SCRUB** raised outer lip

Step 4: Place [HT4754](#) UltraSOLV® Sponge and [HT4536D](#) 360 Diamond Grit ScrubPAD in a container of DI water. (See Fig. 6)

Fig 6: UltraSOLV® Sponge and ScrubPAD into container of DI water



AMAT PRODUCER® HEATER PM (CONT.):

Step 5: Apply a small amount of DI water from a squirt bottle onto the Heater's edge. Start scrubbing with the 360 Diamond Grit ScrubPAD. Work on a small area so the surface doesn't have time to dry out. (See Fig. 7)



Fig 7: Fold Diamond ScrubPAD over and scrub a small area

NOTE: Be sure to keep the area moist. The water will evaporate quickly and leave behind Aluminum Fluoride residue due to the temperature of the Heater.

Step 6: When the area feels smooth as compared to when the scrubbing started, stop scrubbing that area and wipe with the dampened UltraSOLV® Sponge. (See Fig. 8)



Fig 8: Wiping the scrubbed area with a damp UltraSOLV® sponge to remove loosened residue

AMAT PRODUCER[®] HEATER PM (CONT.):

Step 7: As ScrubPAD begins to load up with deposition, pull across dampened UltraSOLV[®] Sponge to unload ScrubPAD. (See Fig 9, 10 & 11)



Fig 9: ScrubPAD loaded with deposition



Fig 10: Pull ScrubPAD across UltraSOLV[®] Sponge

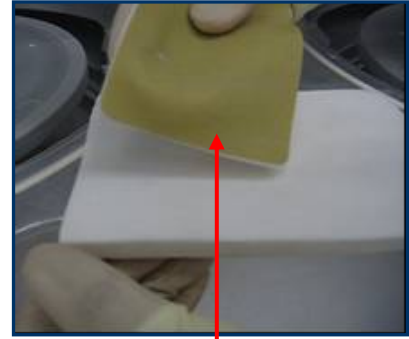


Fig 11: Unloaded ScrubPAD

Step 8: Rinse the UltraSOLV[®] Sponge with DI Water as sponge begins to load up with deposition.

Step 9: Continue to perform steps 5 thru 8 until the outer ring of the Heater has been completely scrubbed ensuring to rinse UltraSOLV[®] Sponge and unload 360 Diamond Grit ScrubPAD as necessary.

Step 10: Put [HT4536DW](#)-1 360 Diamond Grit ScrubBELT[™] onto the [FTPEN](#)-1 ScrubWRIGHT[™] Pen and, using the same technique as Diamond ScrubPAD, scrub the edge of the Heater. (See Fig. 12)

NOTE: Be sure to keep the area moist. The water will evaporate quickly and cause the ScrubBELT[™] to wear.



Fig 12: Using the ScrubWRIGHT[™] Pen to scrub the edge of the Heater

AMAT PRODUCER® HEATER PM (CONT.):

Step 11: Unload the ScrubWRIGHT™ Pen on the UltraSOLV® Sponge in the same manner as the Diamond ScrubPAD. (See Fig. 13)

NOTE: ENSURE TO ROTATE THE 360 GRIT ScrubBELT™ AROUND THE ScrubWRIGHT™ PEN AS YOU SCRUB TO PREVENT STRAINING A SINGLE AREA ON THE ScrubBELT™ CAUSING IT TO WEAR AND BREAK.

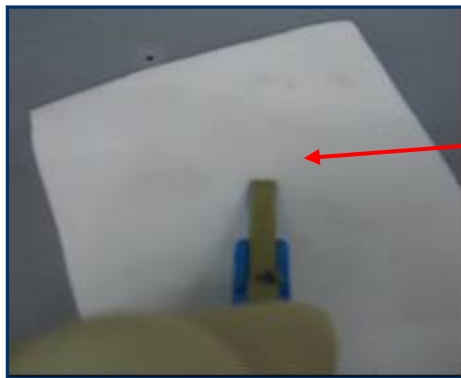


Fig 13: Unloading the ScrubWRIGHT™ Pen

Step 12: Continue scrubbing the edge of the Heater. Be sure to follow the same procedure as the ScrubPAD, WET - SCRUB – WIPE.

NOTE: ONCE SCRUBBING IS COMPLETE AND HEATER HAS DRIED INSPECT SURFACE FOR ANY RESIDUAL WHITE RESIDUE, IF FOUND CONTINUE TO CLEAN AREA. KEEP CLEANING HEATER UNTIL ALL RESIDUE HAS BEEN REMOVED.

Step 13: Now perform steps 5 thru 12 on the other Chamber Heater.

Step 14: Perform a Final wipe of the complete Heater Assembly top surface with the HT5790S MiraWIPES® saturated with DI water.

AMAT PRODUCER[®] HEATER PM (CONT.):

IMPORTANT NOTE

THE USE OF HT5790S MiraWIPES[®] DURING THE FINAL WIPE PORTION OF THE PROCEDURE IS A CRITICAL STEP TO EFFECTIVELY REMOVE PARTICLE DEFECTS FROM HEATER ASSEMBLY

NOTE: BELOW IS AN EXAMPLE OF THE PARTICLES LEFT BEHIND IN A CHAMBER AFTER THE FINAL WIPE PORTION OF THE PM WAS PERFORMED USING THE CURRENT FAB WIPER (SEE FIG 14a & 14b)



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

- Step 15:** Replace MiraWIPE[®] with a fresh MiraWIPE[®] as necessary, and continue wiping Heater Assembly until MiraWIPE[®] no longer is able to remove process film from Chamber.
- Step 16:** Close Process Chambers and bring tool back to production using AMAT's recommended recovery procedure.