



## VACUUM CHAMBER PM TECHNIQUE Novellus INOVA Vat Valve

### **OBJECTIVE:**

TO EFFECTIVELY PM THE NOVELLUS INOVA VAT VALVE IN A TIMELY MANNER,  
WHILE IMPROVING TOOL RECOVERY AND PARTICLE PERFORMANCE

#### **Vacuum Chamber:**

NOVELLUS INOVA PLATFORM

#### **Vacuum Chamber Process Residue:**

PROCESS INDUCED RESIDUE

#### **Vacuum Chamber Components:**

ISOLATION VAT VALVE

#### **Old Procedure:**

No method documented

**Tool recovery:** No recovery documented

#### **New Procedure:**

1 hour using ScrubTIPS<sup>®</sup>, MiraSWABS<sup>®</sup> & MiraWIPES<sup>®</sup>  
with DI water and IPA

**Tool recovery:** TBD

#### **Vacuum Chamber Products:**

##### **Novellus INOVA Vat Valve PM Kit**

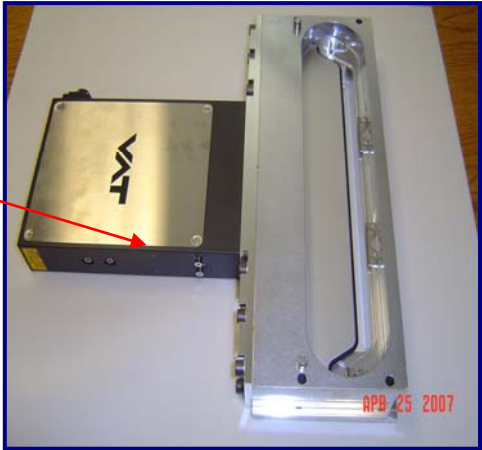
- (2) [HT9423](#) CushionPAD 24" X 24"
- (2) [HT174913PD-1](#) 1350 Grit Diamond ScrubTIP<sup>®</sup>
- (2) [HT1501FC-5](#) MiraSWABS<sup>®</sup> (10 MiraSWABS<sup>®</sup>)
- (1) [HT1585FC-5](#) MiraSWABS<sup>®</sup> (5 MiraSWABS<sup>®</sup>)
- (2) [HT5790S-5](#) MiraWIPES<sup>®</sup> (10 MiraWIPES<sup>®</sup>)



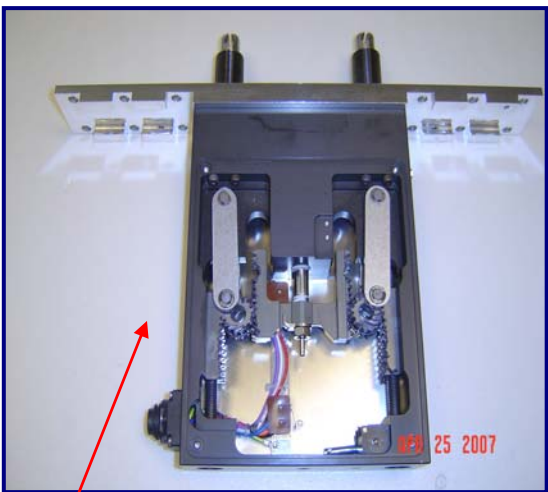
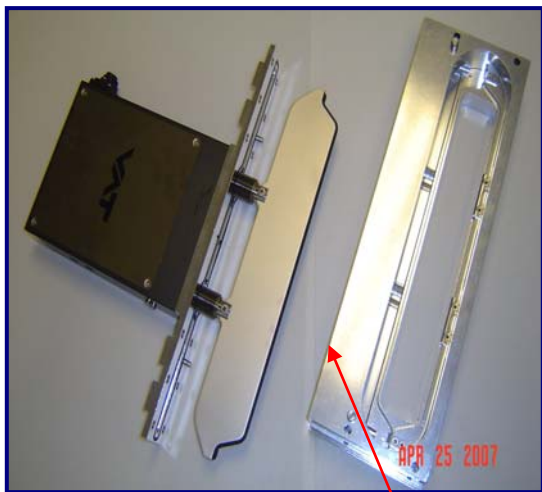
**NOVELLUS INOVA VAT VALVE PM PROCEDURE:**

- Step 1:** Using proper procedures and **safety guidelines**, remove isolation VAT valve from INOVA platform
- Step 2:** Place two [HT9423](#) CushionPADS on workstation next to each other and place VAT valve onto CushionPADS (See Fig 1)

**Fig 1:** VAT valve placed onto [HT9423](#) CushionPADS



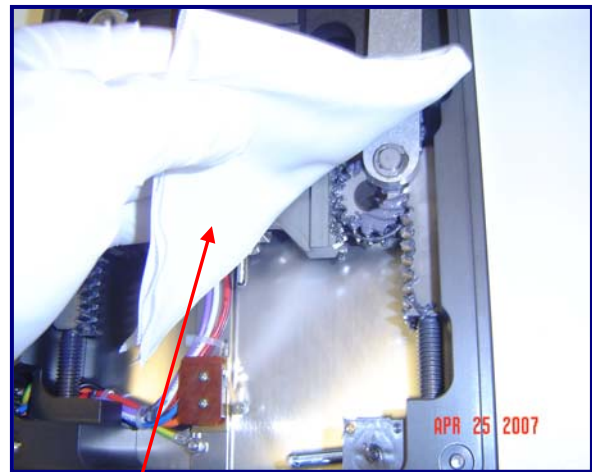
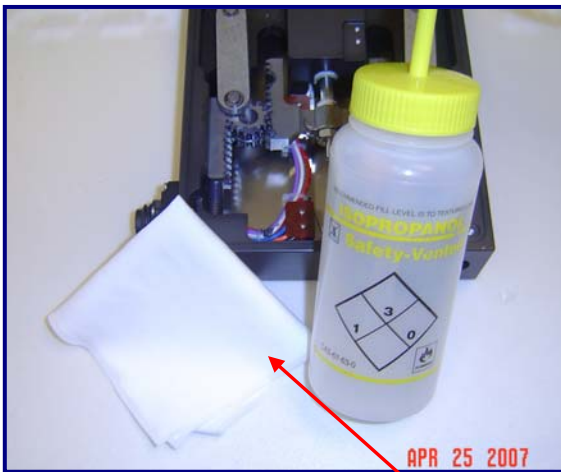
- Step 3:** Using proper procedures and safety guidelines disassemble VAT valve (See Fig 2 & 3)



**Fig 2 & 3:** VAT valve disassembled for cleaning

**NOVELLUS INOVA VAT VALVE PM PROCEDURE (CONT'D):**

- Step 4:** While VAT valve is disassembled, inspect the internals while cycling the valve manually. Monitor the proper operation and note any areas that may be rubbing or have broken wafer-chips grinding
- Step 5:** Vacuum out the internals of VAT valve using a certified fab vacuum
- Step 6:** Dampen [HT5790S](#) MiraWIPE® with IPA and gently wipe out internals of VAT valve (See Fig 4 & 5)

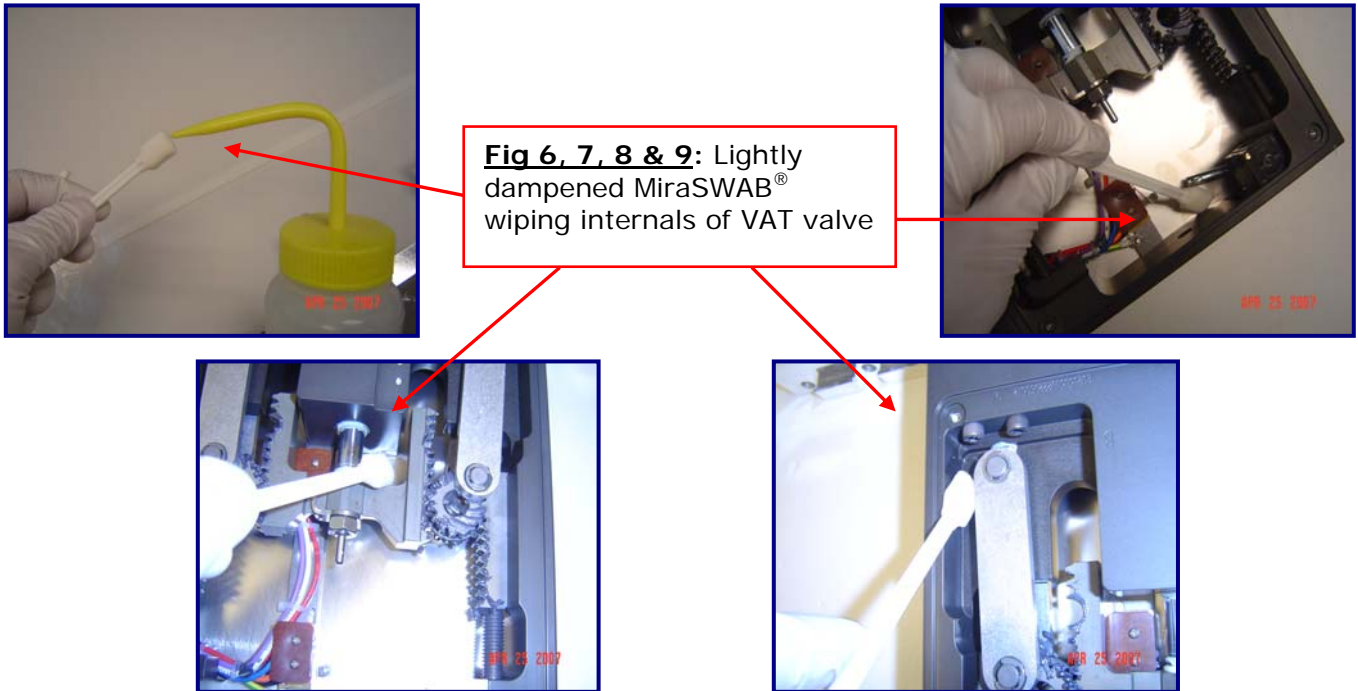


**Fig 4 & 5:** Dampened MiraWIPE® wiping out internals of VAT valve

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

**NOVELLUS INOVA VAT VALVE PM PROCEDURE (CONT'D):**

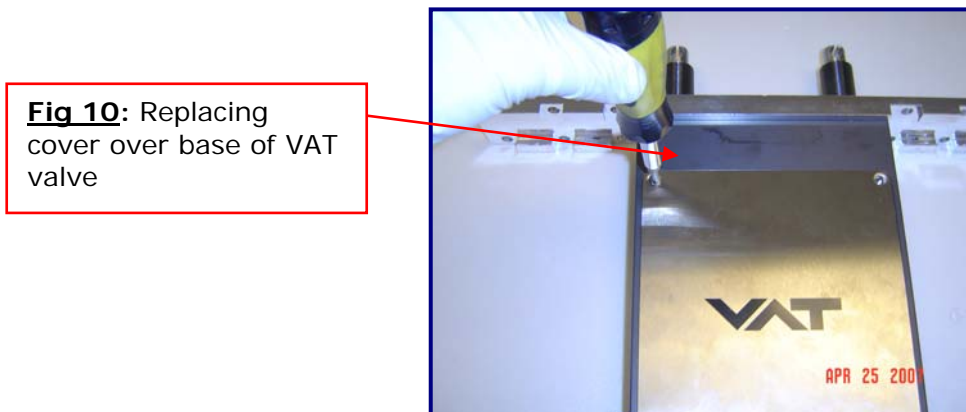
**Step 7:** Take [HT1501FC](#) and [HT1585FC](#) MiraSWABS<sup>®</sup>, dampen with IPA and wipe out all areas within VAT valve. Continue to cycle valve manually to help wipe out all areas within valve (See Fig 6, 7, 8 & 9)



**Step 8:** Continue to operate VAT valve manually and, if necessary, breakdown valve further to clean gears and operating piston using the same technique described above

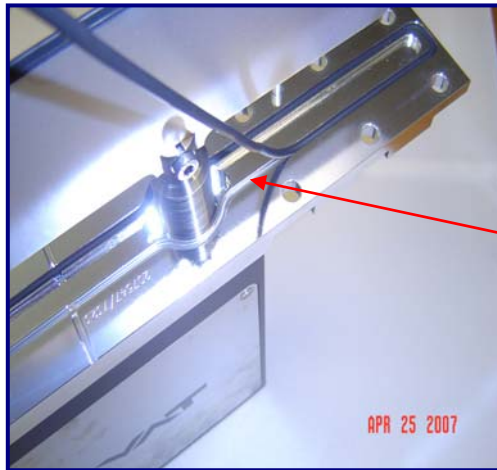
**Step 9:** Repeat steps 6 - 8 using freshly dampened MiraWIPES<sup>®</sup> and MiraSWABS<sup>®</sup> until internals of VAT valve have been cleaned and wiped out thoroughly

**Step 10:** Properly reassemble internals of VAT valve and replace cover (See Fig 10)



**NOVELLUS INOVA VAT VALVE PM PROCEDURE (CONT'D):**

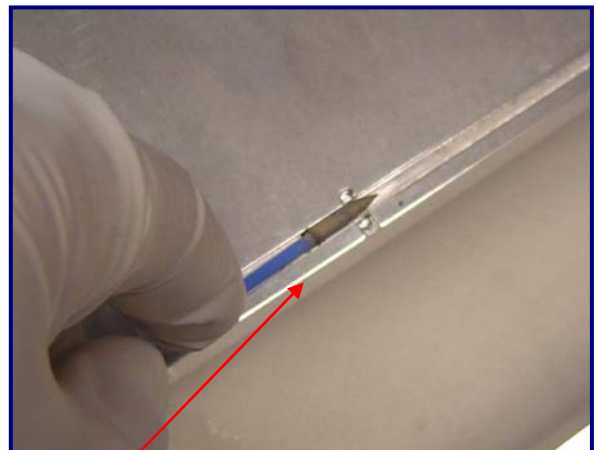
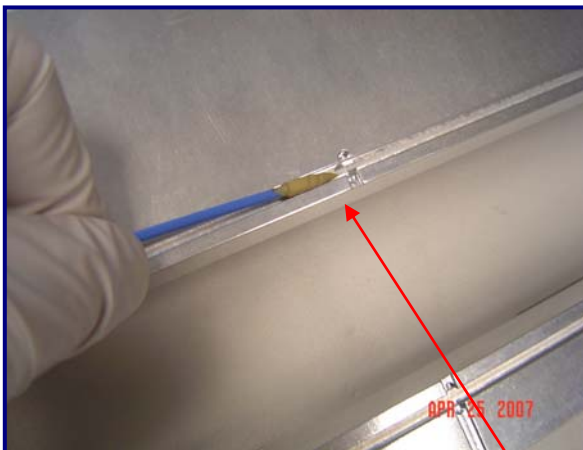
**Step 11:** Remove o-ring from base plate of VAT valve (See Fig 11)



**Fig 11:** Removing o-ring from base plate of valve

**NOTE:** DO NOT REMOVE O-RING WITH METAL TOOLS SUCH AS SCREW DRIVERS OR HEX TOOLS

**Step 12:** Inspect o-ring groove on valve base plate and if scratches are apparent then dampen [HT174913PD-1](#) ScrubTIP<sup>®</sup> and polish scratches out of o-ring groove (See Fig 12 & 13)

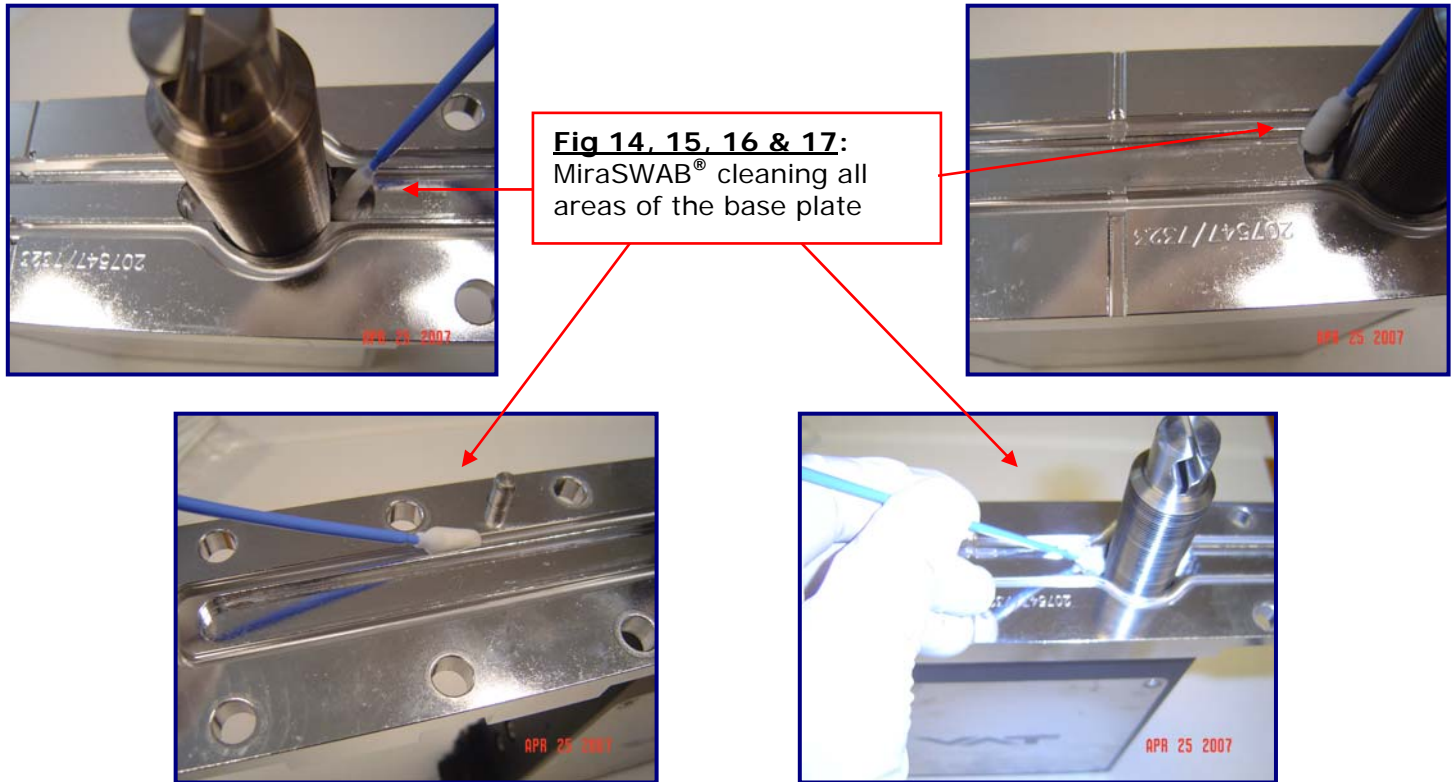


**Fig 12 & 13:** 1350 Grit Diamond ScrubTIP<sup>®</sup> polishing scratch out of o-ring groove



**NOVELLUS INOVA VAT VALVE PM PROCEDURE (CONT'D):**

**Step 13:** When o-ring groove is free of scratches, use the same technique described above, lightly dampen MiraWIPE® and MiraSWABS® with IPA and thoroughly wipe out all areas of VAT valve base plate (See Fig 14, 15, 16 & 17)



**Step 14:** Inspect the o-ring for cracks or cuts and replace with new o-ring if necessary

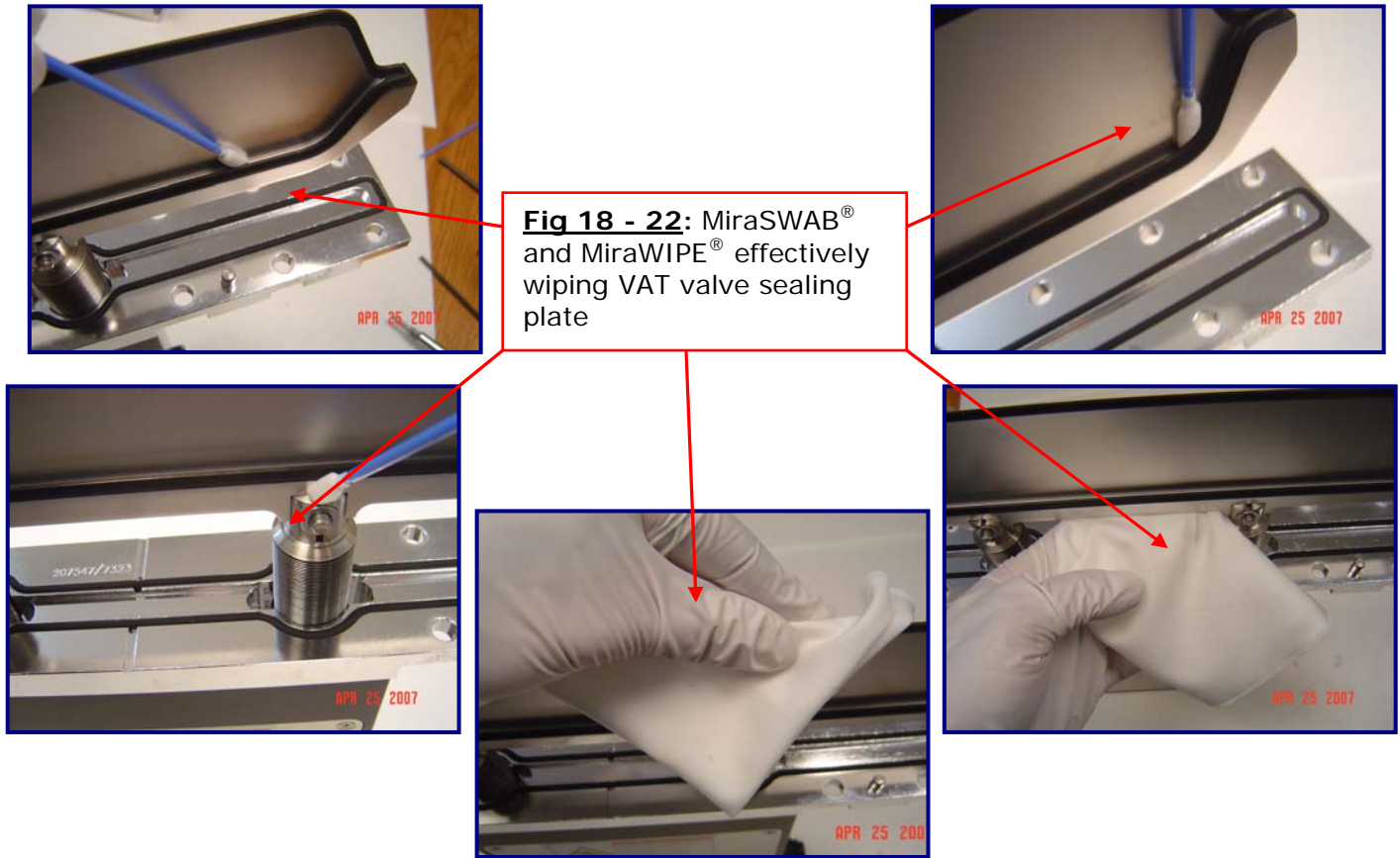
**Step 15:** Prior to placing o-ring back into the o-groove, wipe the new or reused o-ring, using the following procedure:

1. Saturate center of MiraWIPE®
2. Fold MiraWIPE® three times diagonally to keep sealed edges away from o-ring
3. Tightly fold center of MiraWIPE® around o-ring
4. Pull the entire o-ring through the folded area two times
5. Brush off any collected residue

**Step 16:** Carefully replace wiped o-ring back into o-ring groove

**NOVELLUS INOVA VAT VALVE PM PROCEDURE (CONT'D):**

**Step 17:** Using the same technique as described above, dampen the MiraWIPES® and MiraSWABS® and effectively wipe the VAT valve sealing plate (See Fig 18, 19, 20, 21 & 22)

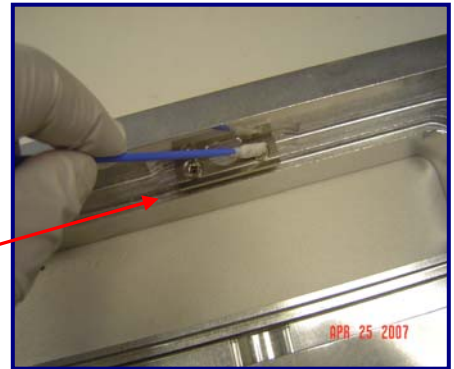


**Step 18:** Inspect the sealing surface of the VAT valve sealing plate to ensure there are no cuts or scratches along the sealing surface. Replace VAT valve sealing plate if necessary

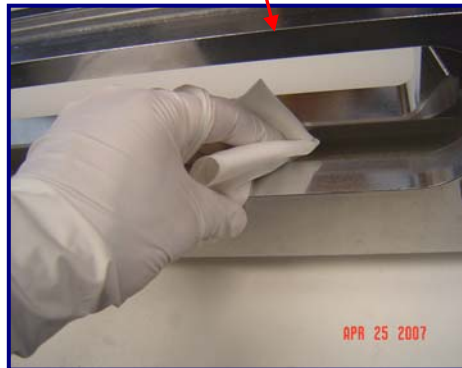
**Step 19:** Using the same technique as described above, remove o-ring from the cover of VAT valve sealing plate. Inspect o-ring groove and polish groove with [HT174913PD-1 ScrubTIP®](#) if necessary

**NOVELLUS INOVA VAT VALVE PM PROCEDURE (CONT'D):**

**Step 20:** Using the same technique as described above, dampen the MiraWIPES® and MiraSWABS® and effectively wipe the cover of the valve sealing plate (See Fig 23, 24, 25, 26 & 27)



**Fig 23 - 27:** MiraSWAB® and MiraWIPE® effectively wiping cover of VAT valve sealing plate



**Step 21:** Inspect the o-ring for cracks or cuts and replace with new o-ring if necessary

**Step 22:** Prior to placing o-ring back into the o-groove, wipe the new or reused o-ring, using the following procedure:

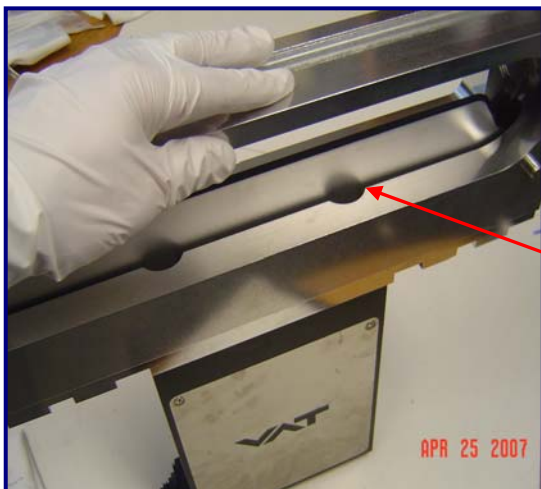
1. Saturate center of MiraWIPE®
2. Fold MiraWIPE® three times diagonally to keep sealed edges away from o-ring
3. Tightly fold center of MiraWIPE® around o-ring
4. Pull the entire o-ring through the folded area two times
5. Brush off any collected residue

**Step 23:** Carefully replace wiped o-ring back into o-ring groove



**NOVELLUS INOVA VAT VALVE PM PROCEDURE (CONT'D):**

**Step 24:** Replace sealing plate cover back onto the VAT valve base (See Fig 28)



**Fig 28:** Placing sealing plate cover back onto base of VAT valve

**Step 25:** Cycle the VAT valve by applying external N<sub>2</sub> and monitor for proper operation

**Step 26:** Using proper procedures and safety guidelines, replace VAT valve onto INOVA platform