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**SPECIFICATION NAME:** IR-PP80SP

**CREATED BY:** Douglas Hicks

**DATE CREATED:** 04/28/2020

**REVISED BY:** Luke Merryweather

**REVISED DATE:** 02/28/2024

**ECN:** 24059016

**Revision:** 005

**MODULE :** Implant

**DESCRIPTION :** AMAT/Varian VIISta 80HP Even Months Short PM Procedure

## 1.0 Purpose

- Provide specific instructions/procedures for the execution of scheduled, preventive maintenance of the equipment listed in section 2 on an as required basis

## 2.0 Scope

- Applicable to all AMAT/Varian VIISta 80HP ion implanters listed in [\\$ IM-EQ-HC-8 \\$](#)

## 3.0 Index

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**Procedures need to be broken down into sub-tasks to enable BKM navigation via hyperlink. Once identified, sub tasks are to be renamed in the Index and the slide sections**

## 4.0 References

### 4.1

[\\$ IR-PC-HC-8 \\$ Pm Checklists](#)

[\\$ IR-PS-HC-8 \\$ Pm Schedules](#)

[\\$ IR-SS-HC-8 \\$ Machine Start-Up/Shut-Down](#)

[\\$ IR-SF-HC-8 \\$ Equipment Safety](#)

[\\$ IR-CO-HC-8 \\$ Configuration Specification](#)

### 4.2

1. Viista 80 reference manual volume 1.

[https://sps16.itg.ti.com/sites/cmpimpee/Vista%2080HP/Manuals/80HP/80HP%20Rev%20D\\_Vol1.pdf](https://sps16.itg.ti.com/sites/cmpimpee/Vista%2080HP/Manuals/80HP/80HP%20Rev%20D_Vol1.pdf)

2. Viista 80 reference manual volume 2.

[https://sps16.itg.ti.com/sites/cmpimpee/Vista%2080HP/Manuals/80HP/80HP%20Rev%20D\\_Vol2.pdf](https://sps16.itg.ti.com/sites/cmpimpee/Vista%2080HP/Manuals/80HP/80HP%20Rev%20D_Vol2.pdf)

# 5.0 Definitions

AMU	ATOMIC MASS UNIT
AsH3	Arsine
BF3	BORON TRIFLOURIDE
CDA	COMPRESSED DRY AIR
DI	DEIONIZED
EMO	Emergency Machine Off
HCIG	HOT CATHODE IONIZATION GAUGE
IAN	INFORMATION APPLICATION NETWORKING
IPA	Isopropyl Alcohol
MSDS	MATERIAL SAFETY DATA SHEETS
NCS	NEW COMPUTER SYSTEM
P.D.	POWER DISTRIBUTION
PCB	PRINTED CIRCUIT BOARDS
PFG	Plasma Flood Gun
PH3	Phosphine
PSI	POUNDS PER SQUARE INCH
RAID	REDUNDANT ARRAY INEXPENSIVE DISKS
SCSI	SMALL COMPUTER SYSTEM INTERFACE
TC	THERMOCOUPLE
VAP	SHORT FOR VAPORIZER
VCS	VARIAN CONTROL SYSTEM

# Supplies



Arsenic Vacuum Cleaner



IPA



Clean Room Wipes



DI Water

At any time if the tool has a fault or you have a question **STOP** and get a Technician

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# 6.0 Procedures

6.1 [Safety/Preparations](#)

6.2 [Monthly PM Procedure](#)

6.3 [Procedures for finishing PM](#)

At any time if the tool has a fault or you have a question **STOP** and get a Technician

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# 6.1 Safety/Preparation

6.1 Before enabling control power, ensure there are no personnel working on machine and all doors are closed.

6.2 Observe all warning signs on power supplies, and use grounding bar before entering and touching the terminal or source areas.

6.3 Note the location of the emergency shut off buttons, control power disable, the nearest telephone, emergency phone number, locations of SCOTT air packs, the nearest fire extinguisher, and exits from the area.

6.4 For any questions concerning chemicals used in process, consult MSDS on the web page below.

<http://msds.ti.com/>

6.5 DM5 SAFETY

<https://sps09.itg.ti.com/sites/wwfusfab/dmos5/esh/Pages/default.aspx>

6.6 TI Safety Standards

<https://sps01.itg.ti.com/sites/wwf/esh/standards/default.aspx>

6.8 OSHA CFR 29 - 1910.147 Control of Hazardous Energy

<https://www.osha.gov/SLTC/controlhazardousenergy/>

6.9 TI DM5 Hot Work Permit

<http://dmos6.sc.ti.com/hotwork/index.html>



## 6.1 Safety/Preparation

- Ensure the tool is properly locked out and tagged out.
- Ensure nobody is inside the load lock area of the tool before moving the robot arm.
- Be sure to alert your team members to what you are doing.
- All preventive maintenance is to be performed by Implant equipment engineering, AMAT-Varian customer service personnel.
- Before turning on any power supplies, make sure there are no personnel working on machine and all doors are closed.
- Observe all warning signs on power supplies, and use grounding bar before entering and touching the terminal or source areas.
- Note the location of the emergency shut off (EMO) buttons, high voltage disable, the nearest telephone, TI emergency phone number (214-429-2222), locations of Scott air packs, the nearest fire extinguisher, and exits from the area.
- For any questions concerning chemicals used in process, consult MSDS; use web MSDS: <http://msds.ti.com/servlet/ssmain> ; enter the name of the chemical you wish to review.
- Periodically update yourself on chemicals used in your area. hazardous materials used in any Viista ion implanter include phosphine, arsine, argon, boron-trifluoride, xenon, and nitrogen.
- Before performing maintenance on the Viista 80HP implanter, you must read the safety specification: AMAT-Varian Viista 80HP LOTO & Safety Procedures [§ IR-SF-HC-8 § Equipment Safety](#)

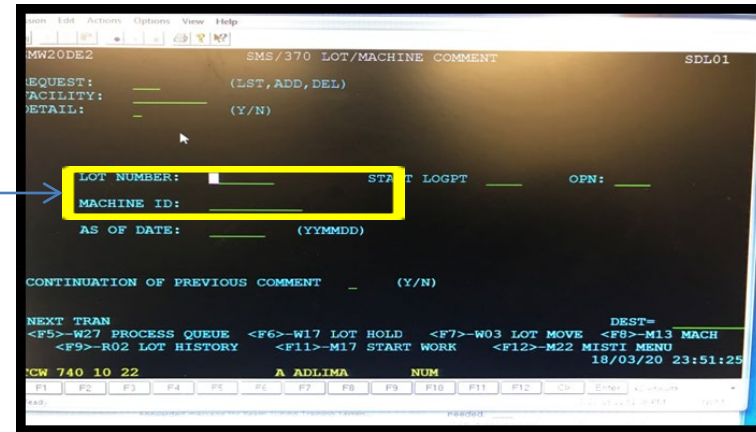
## 6.1 Safety/Preparation

- Inventory assemblies (see specific PM procedures to determine the parts needed); make sure all parts have been inspected and staged at the Implanter before the PM begins. Collect all supplies and materials required for the procedure.
- Notify the MFG supervisor the machine is going down for scheduled maintenance.
- Check SMS for XID'd; notify the tool owner if help is needed with an XID.
- Make sure the tool is in the proper PM state (SMM) in SMS.
- Pull up the electronic PM checksheet and fill it out as the procedure is performed.
- Make sure LOTO Procedure IR-LO-HC-8 is implemented.
- Do not perform work until the tool has been de-energized.

## 6.2 Monthly PM Procedure

6.2.1 Check XID of tool for any thing that needs addressed during the PM and complete those items. The XID is the tool Misti ID preceded by an "X" for example the XID for IM401 is XIM401. If the XID cannot be completed document what is needed.

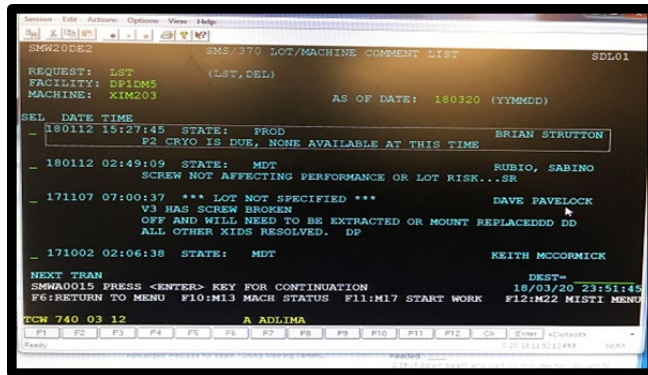
- Use SMW20DE2 to view comments
- X in front of tool performing PM on (xim203)
- Check Dates and Comments for anything needed.



Tool ID: IM203

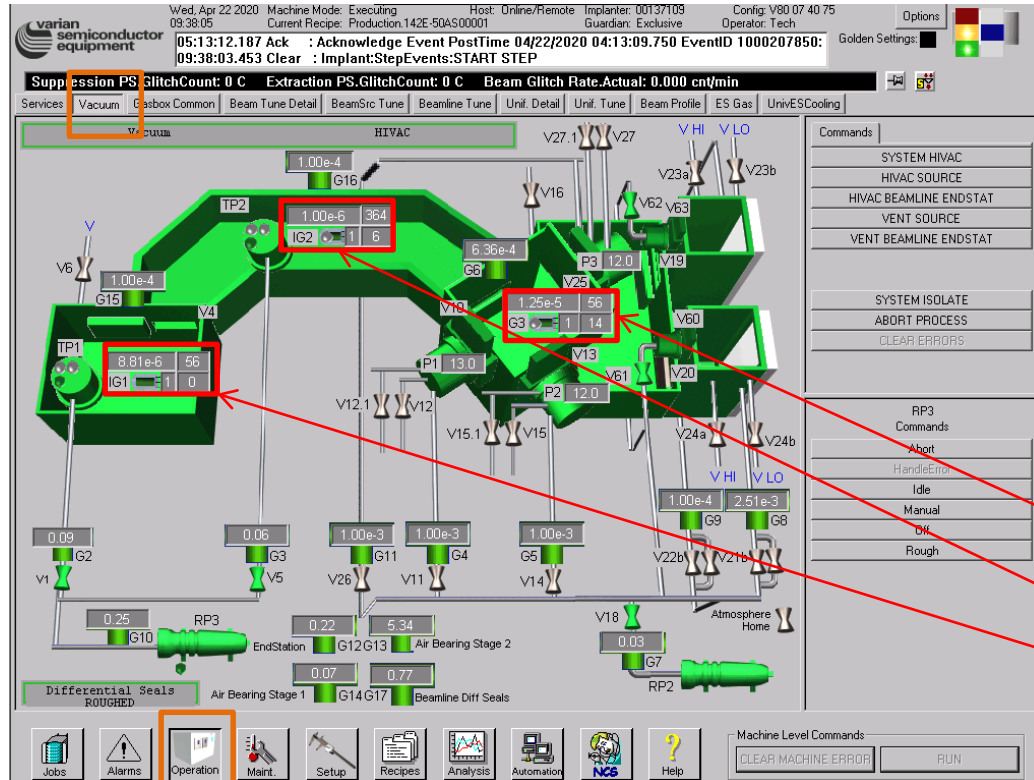
XID: XIM203

P2 Cryo due on next PM



At any time if the tool has a fault or you have a question **STOP** and get a Technician

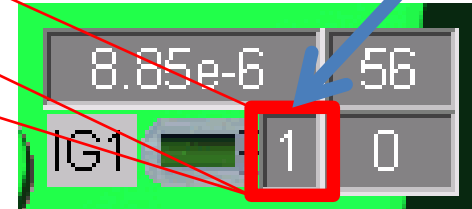
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Shut down beam and wait 30 minutes for vacuum to base record Pre-PM Vacuum. IG1 \_\_\_\_\_ IG2 \_\_\_\_\_ IG3 \_\_\_\_\_

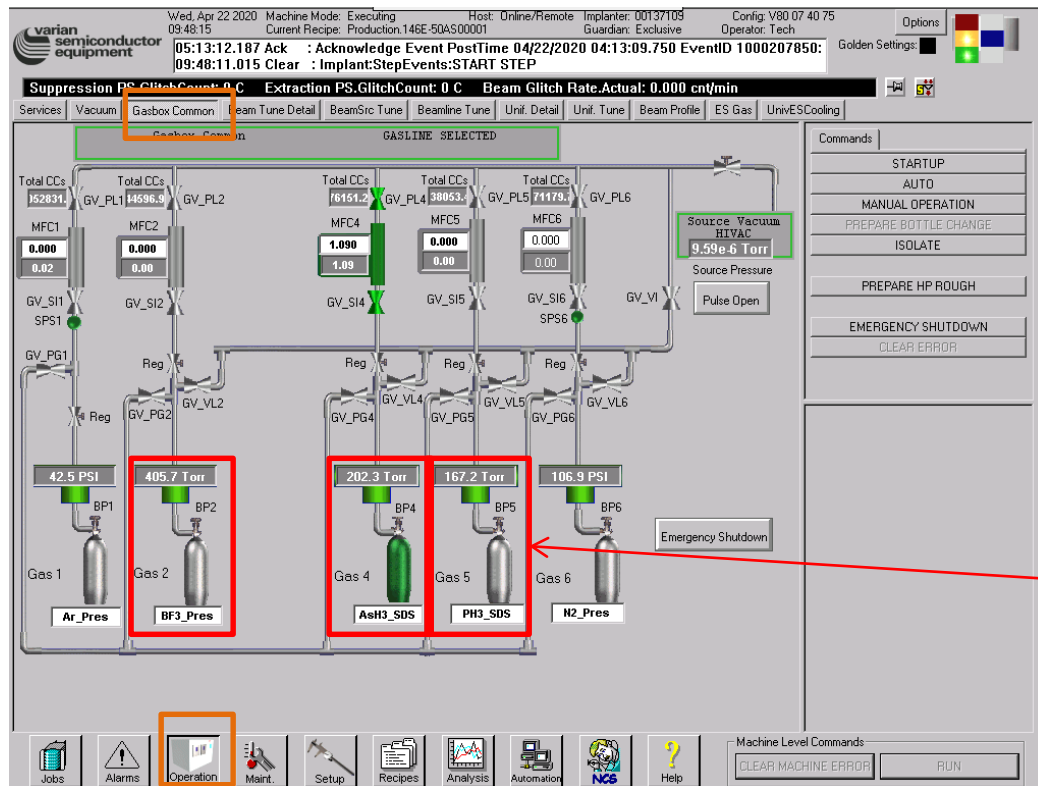
Check IG1, IG2 and IG3 for bad filaments and replace after the tool is vented if any are bad. The gauges have 2 filaments each.  
4617823-0001 – Original now obsolete  
4743691-0001 – New version

From the **Operation** button, **Vacuum** detail the IG's can be viewed and display the **filament #** as shown.



At any time if the tool has a fault or you have a question **STOP** and get a Technician

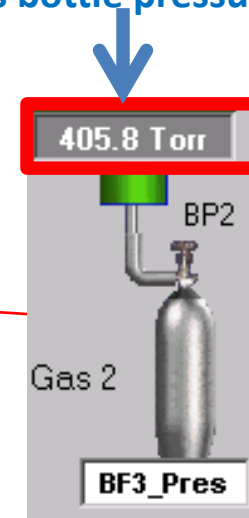
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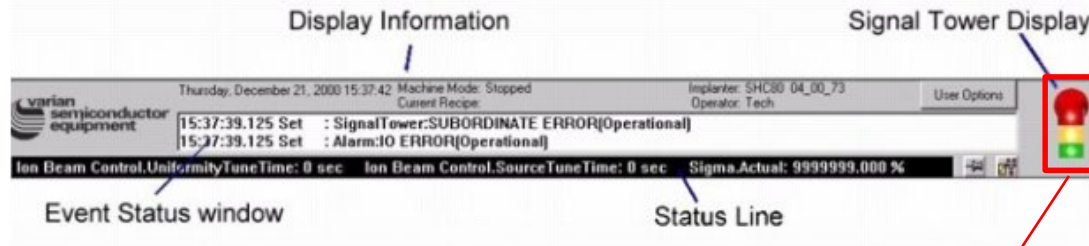
Record Bottle Pressures

BF3 \_\_\_\_\_ ASH3 \_\_\_\_\_ PH3 \_\_\_\_\_

From the **Operation** button, **Gasbox Vacuum** detail the IG's can be viewed and display the **gas bottle pressure** as shown.

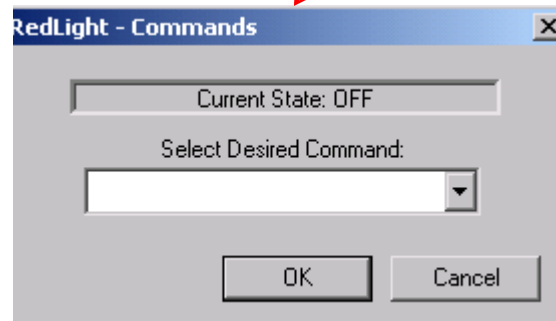
At any time if the tool has a fault or you have a question **STOP** and get a Technician\*\*\*Printed copies are **NOT** controlled documents\*\*\*

## 6.3 PM Items are to be performed after the Monthly PM



Check the signal light tower lights are working.

Click on the signal tower display at the top of the control screen and a pop-up will display where the light can be commanded on to test the light is working.

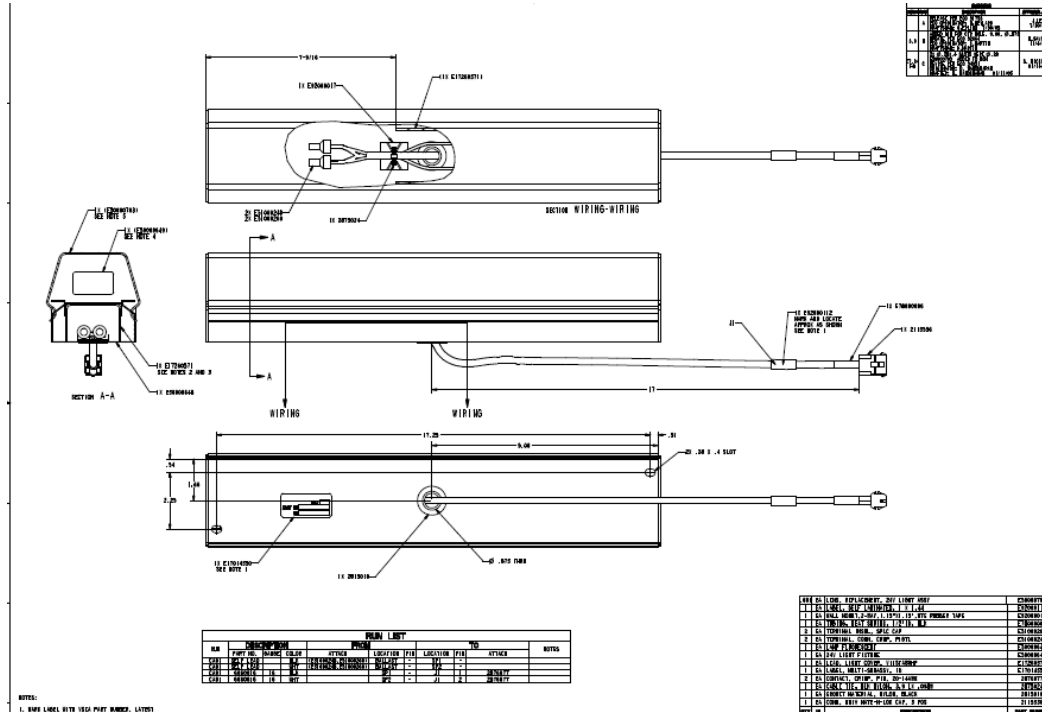


At any time if the tool has a fault or you have a question **STOP** and get a Technician

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## Enclosure Lights



Check all lights inside the tool, the HV enable/disable.

Lamp, fluorescent light bulb, Designation F39BX, Base Type 4-Pin (2G11), Lamp Shape T5, GE model F39BX/SPX35/RS

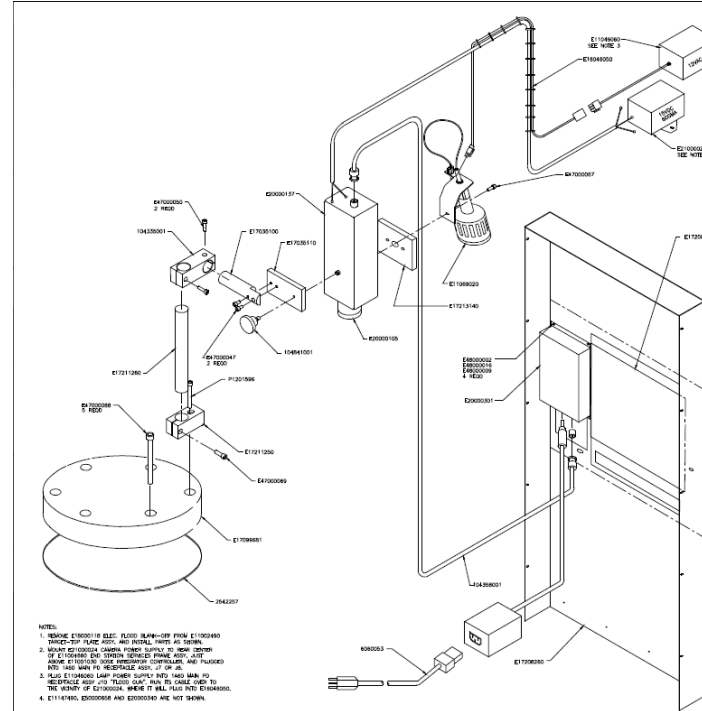


At any time if the tool has a fault or you have a question **STOP** and get a Technician

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Verify wafer camera is operating properly.

process chamber top window  
4716719-0001

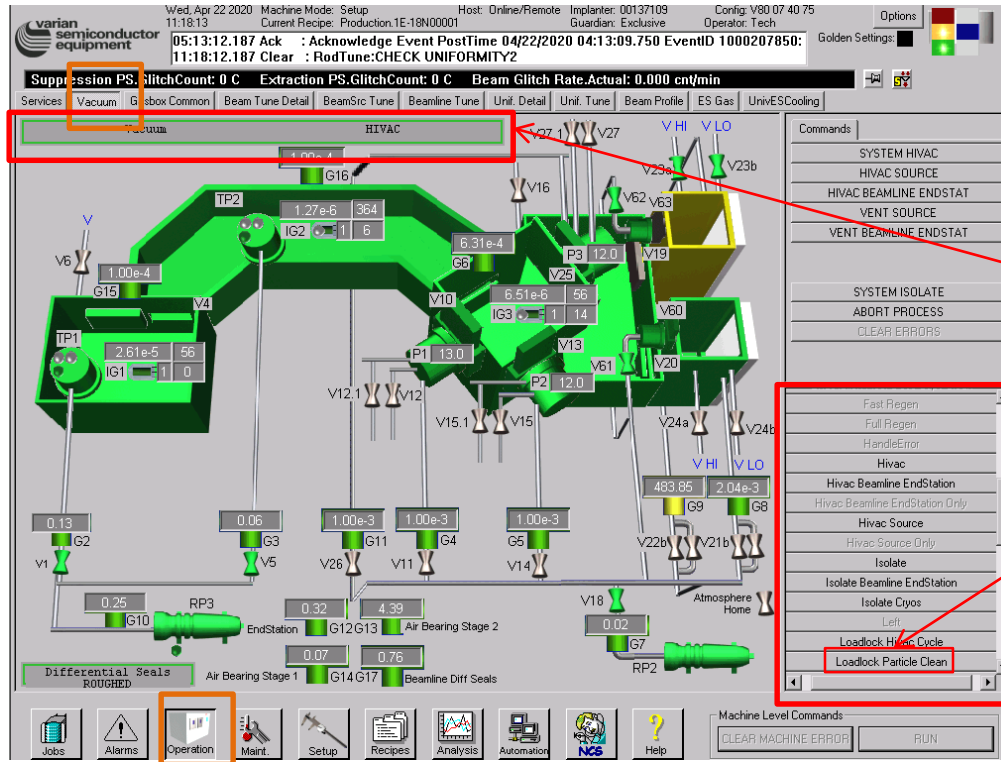
Lamp, wafer video viewing  
4611553-0001



At any time if the tool has a fault or you have a question **STOP** and get a Technician

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Wipe down load locks and  
cassette nests

From the  
**Operation** button,  
**Vacuum** detail, double click  
the **Vacuum FSM** then on  
on the **Menu** detail there is  
an alphabetical list, select  
**Loadlock Particle Clean**.



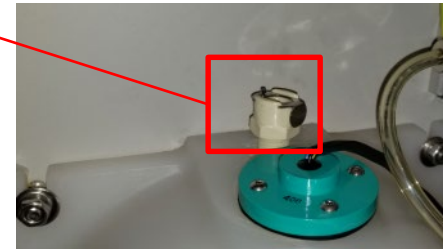
At any time if the tool has a fault or you have a question **STOP** and get a Technician

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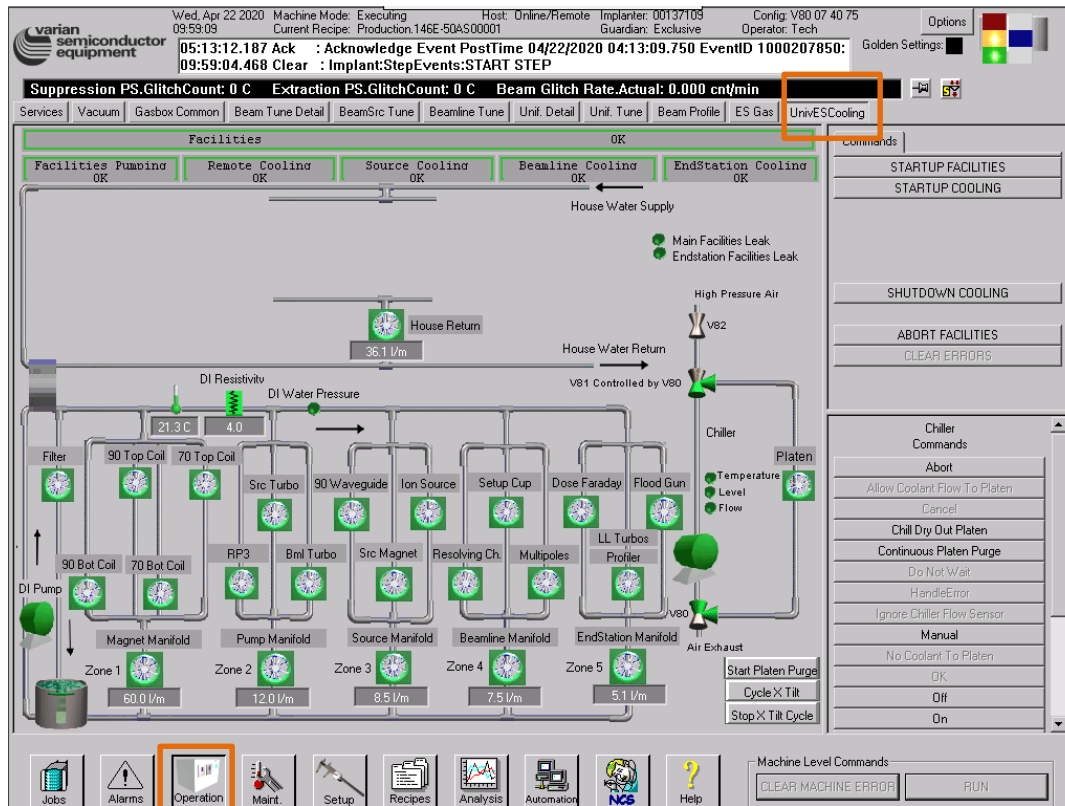


Fill the DI Water reservoir at the quick disconnect shown below.



At any time if the tool has a fault or you have a question **STOP** and get a Technician

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Verify the flow readback shows off when the pump is off or the valves are closed.

Verify all the water QD's are connected and valves are open.

From the **Operation** button, **UnivESCooling** detail the cooling system items will be green when flowing/good and yellow or red when there is a problem.

Inspect for any water leaks and repair.



At any time if the tool has a fault or you have a question **STOP** and get a Technician

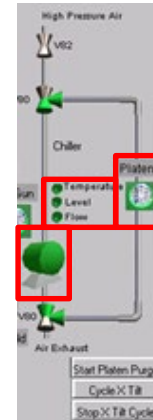
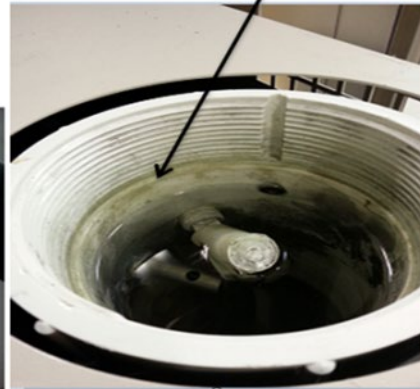
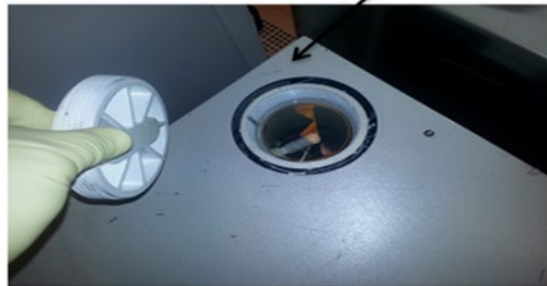
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Remove cap from chiller reservoir.

Fill with D.I. Water up to this shoulder and then replace cap.



Fill the platen chiller.

Fill with 40/60 DowFrost premix.

Verify chiller setpoint is 15C and readback is steady.

Verify the flow readback shows OFF when turned off and ON when turned on as shown on the **Operation** button, **UnivESCooling** detail the cooling system.

At any time if the tool has a fault or you have a question **STOP** and get a Technician\*\*\*Printed copies are **NOT** controlled documents\*\*\*

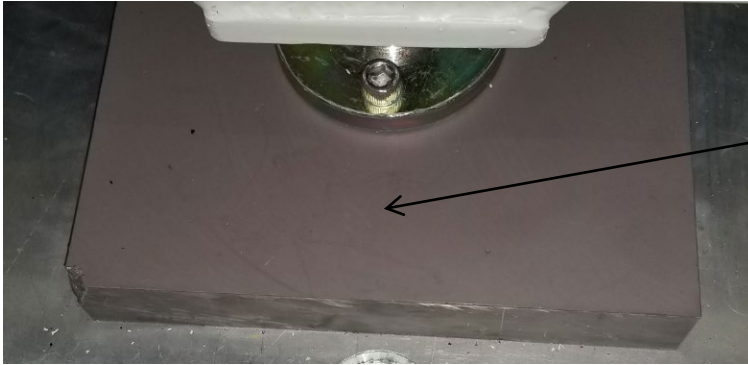
## ARSENIC HOUSEKEEPING PROCEDURES

Wipe down tool surfaces where arsenic may accumulate source, electrode, analyzer, plus all hand tools/carts and work surfaces used during PM. Dispose of all arsenic waste in the proper drum and do not over fill drum. If full get another empty and label for arsenic waste.

Check the following items after maintenance activities and they are complete (Unless otherwise commented)

1. All unneeded materials (replaced parts, cable ties, packing materials, etc) are removed from all areas of the tool and returned to their proper place.
2. Clean dirt and debris from on, around or under the tool.
3. Panels and screws in place, doors and panels secure.
4. Cabling neatly arranged and dressed.
5. Return exchange/repairable parts, recyclable materials, unused cleaning materials, computer discs, manuals, documentation, etc. to their proper location.
6. Complete any needed PTS updates and stockroom return paperwork.

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Inspect and wipe off any debris from the 90 and 70 isolation pads and bushings.

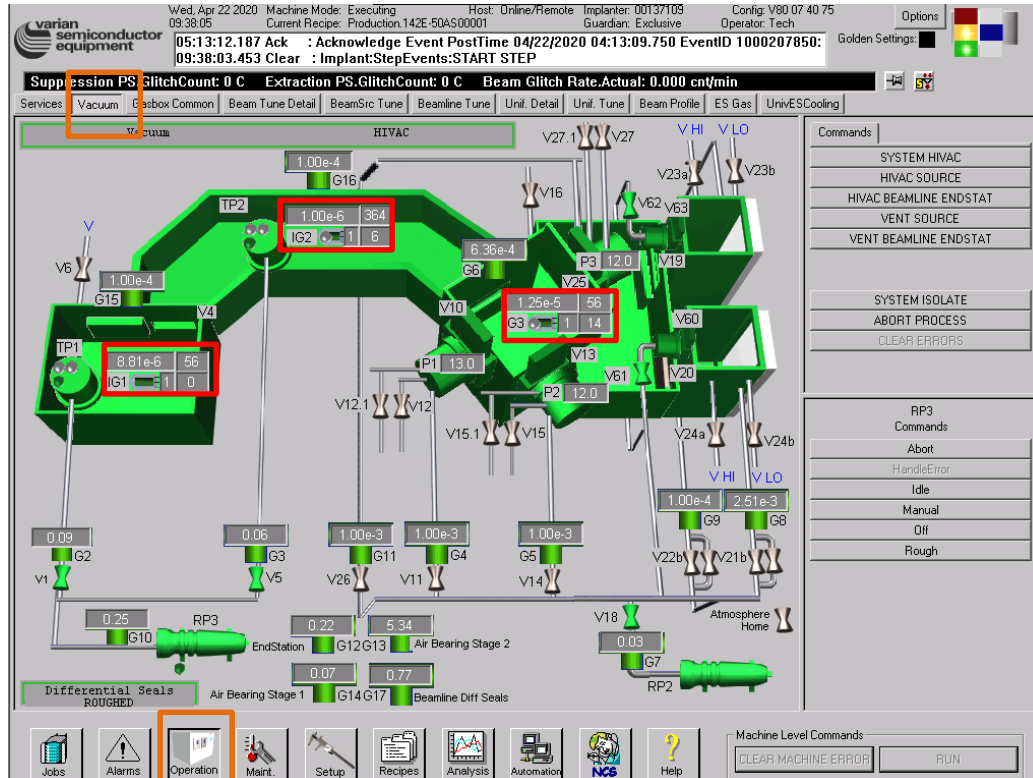
When not clean the isolation pads can track a high voltage arc across them.



At any time if the tool has a fault or you have a question **STOP** and get a Technician

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Record Post-PM Vacuum.

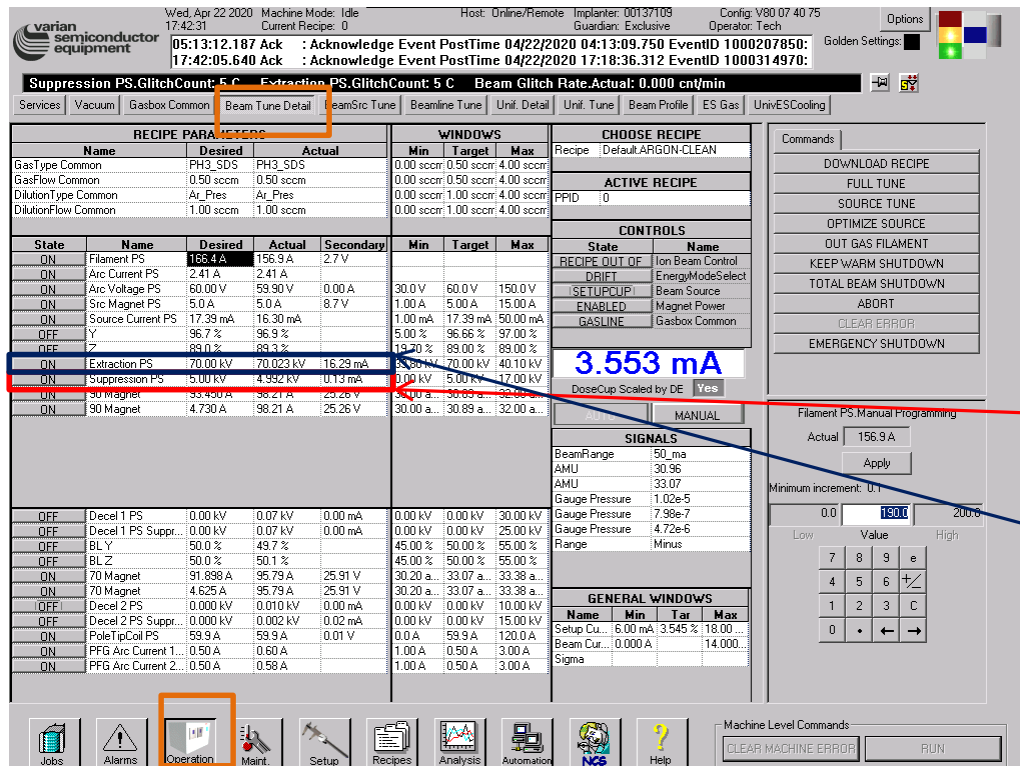
IG1\_\_\_\_\_ IG2\_\_\_\_\_ IG3\_\_\_\_\_

Base pressure required is better than  
2.0e-6 for IG3 and  
5.0e-6 for IG1 and IG2.

From the **Operation** button, **Vacuum**  
detail the IG's can be viewed.

At any time if the tool has a fault or you have a question **STOP** and get a Technician

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Condition the HV power supplies.

From the **Operation** button, **BeamTuneDetail** detail the individual beam generation power supplies can be controlled.

The tool must be in high vacuum, doors closed & locked with a successful system startup.

Turn ON the Suppression PS and command to 5  
Wait for the Suppression HV to stop glitching

Turn ON the Extraction PS and command to 10  
Wait for the extraction HV to stop glitching  
Step up the Extraction command by 10 to 80  
Wait after each step for the glitching to stop

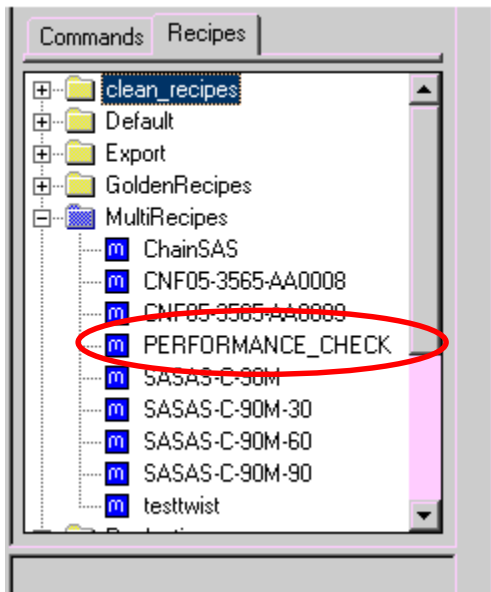
At any time if the tool has a fault or you have a question **STOP** and get a Technician

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## Performance Check

Using 1 non production wafer (getter wafer) run the “Performance Check” multi-recipe. Ensure the tool tunes and runs the job without arcing. Assist tool with tuning as needed.

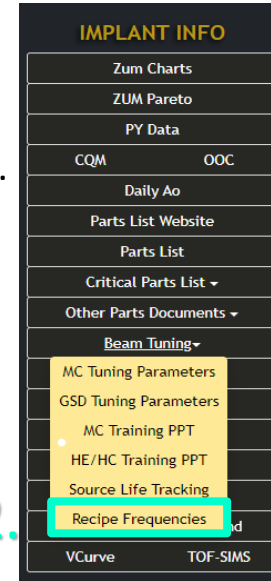


At any time if the tool has a fault or you have a question **STOP** and get a Technician

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## Post SMM Top 5 Recipe Tune Up

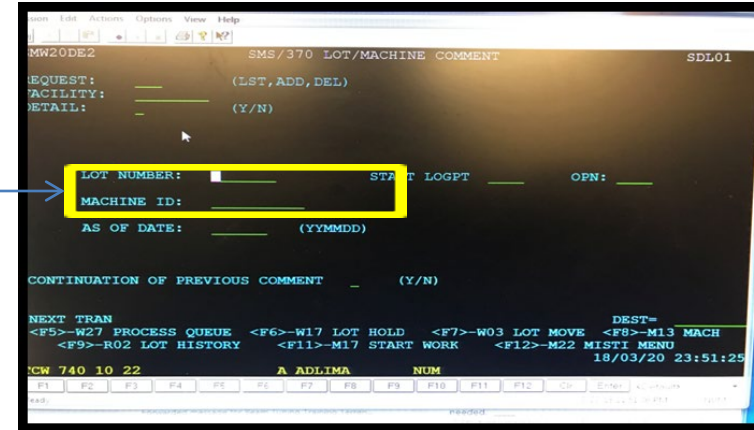
1. Go to the Implant EE homepage
2. Under Implant Info click the dropdown for Beam Tuning and select Recipe Frequencies.  
[http://dmos10/Cesr/mlcd/PM\\_Tracker/recipe\\_frequencies.pl](http://dmos10/Cesr/mlcd/PM_Tracker/recipe_frequencies.pl)
3. Select Viista in the top left corner.
4. Tune the top 5 recipes that are listed for the tool you are working.
  - a) Verify you are not close to the limit for any of the tunable parameters
    - i. Source Beam I
    - ii. X Axis
    - iii. Z Axis
    - iv. Implant ROI I
    - v. Uniformity
  - b) Reach out to EE or 1<sup>st</sup> shift if you can not tune the recipe or it struggles to tune within the allowed range.
5. The purpose of this is to increase the efficiency of the tuning not just that it can tune the recipes.



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Update XID of tool for any thing that was completed during this PM or needs addressed during the next PM. The XID is the tool Misti ID preceded by an "X" for example the XID for IM401 is XIM401. If the XID cannot be completed document what is needed.

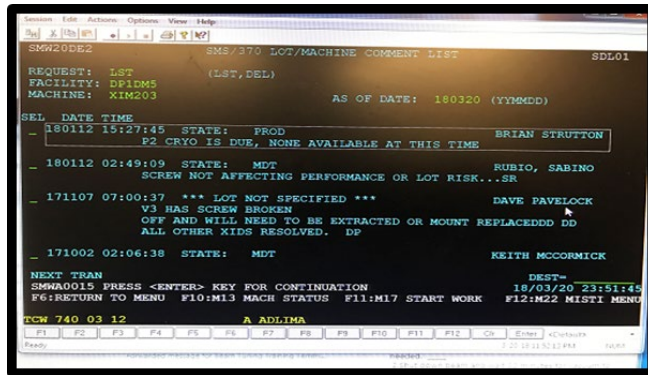
- Use SMW20DE2 to view comments
- X in front of tool performing PM on (xim203)
- Check Dates and Comments for anything needed.



Tool ID: IM203

XID: XIM203

P2 Cryo due on next PM



At any time if the tool has a fault or you have a question **STOP** and get a Technician

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Complete a radiation survey with a beam running. All readings must be less than 0.25mR/hr. Troubleshoot and fix if necessary. Complete the online form on our web page at the link below.

Scan outside of tool at points on form and record



## Check Cal Date

### Ex. Filling out form



**DMOS5 ION IMPLANT RADIATION SURVEY**

Survey Date:	3/8/2018	MISTI ID:	IME03
Survey Instrument:	Iscros	Beam Current:	2ma
Instrument Serial Number:	A138D	Species:	ARFON
Calibration Dates:	3/9/2017	Energy:	20KEV
Technician:	JON	Source Pressure:	3.8E-5T
Background:	0	<b>READINGS IN MR/HR</b>	

										FRONT																													
0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9										
																														0	1	2	3	4	5	6	7	8	9
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0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9										

Submit Cancel

At any time if the tool has a fault or you have a question **STOP** and get a Technician

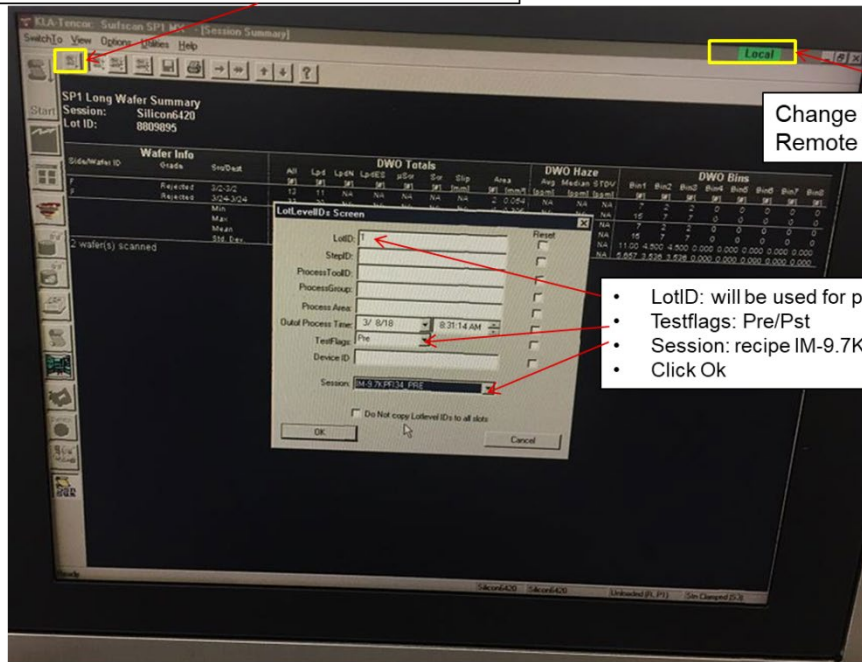
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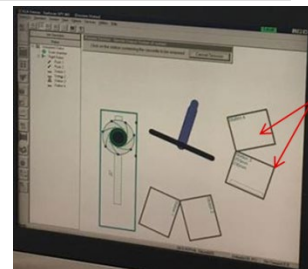
Run a PCPR test on both load locks with any standard MFG qual beam & record the Map to Map Adders using MXII/8CPR1 donor wafers. Adders must be < upper zone b of the production qual chart.

Load offline PC on load port; select this icon.



Change to Local; back to Remote once complete!

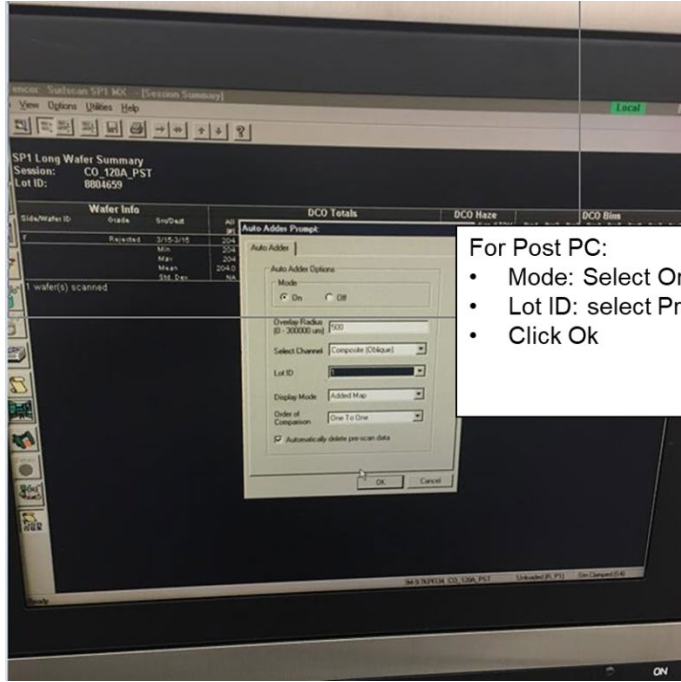
- LotID: will be used for post PC
- Testflags: Pre/Pst
- Session: recipe IM-9.7KPF134\_PRE/IM-9.7KPF134\_PST
- Click Ok



Select appropriate port

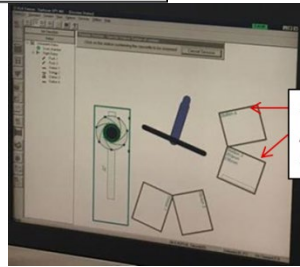
At any time if the tool has a fault or you have a question **STOP** and get a Technician  
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For Post PC:

- Mode: Select On
- Lot ID: select Pre wafer #/name
- Click Ok



Select appropriate port  
After it completes, look for  
Scan results(total adders)

At any time if the tool has a fault or you have a question **STOP** and get a Technician\*\*\*Printed copies are **NOT** controlled documents\*\*\*

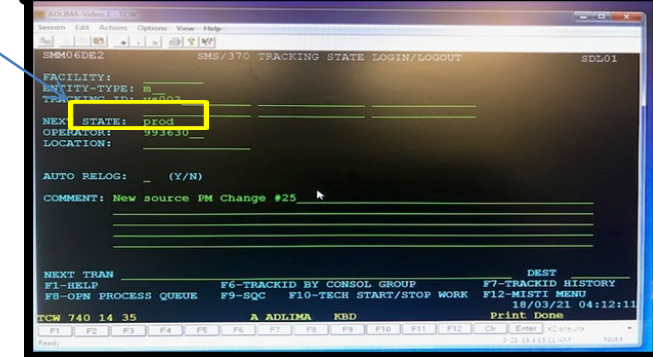
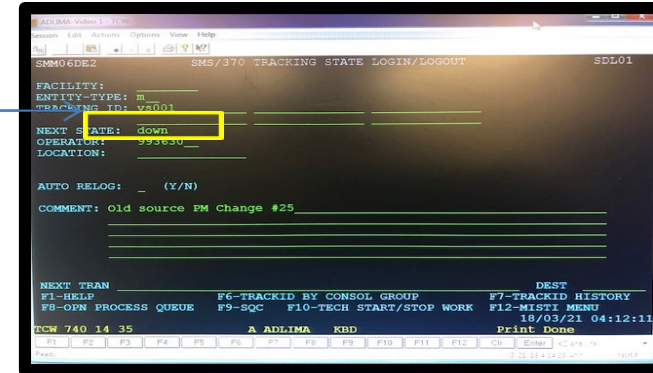
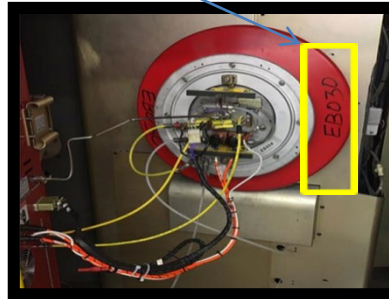
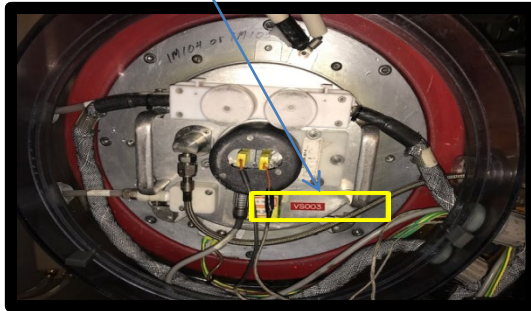


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Change the state codes of Dirty assemblies to DOWN on SMS.

- SMM06DE2
- Include tool changed on & PM #
- Log new parts to PROD and old parts to DOWN

Locations of assembly MISTI Numbers  
VS003 EB030



At any time if the tool has a fault or you have a question **STOP** and get a Technician

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## 7.0 5S

- a) After any PM procedure, 5S the work area.
- b) Wipe down all surfaces around the area the PM was performed.
- c) Put away all tools and spare parts, and ensure the tool is ready for Manufacturing to use.
- d) Move the tool to LBQS state.



# 8.0 Spec Revision History

Spec Revision	Comment (What is changed)	Editor	Approver of Procedure or ECN Number	Date Revised
000	Initial Creation	Douglas Hicks	20084016	03/24/2020
001	Update Links	Douglas Hicks	20286002	10/16/2020
002	Input Performance Check	Luke Merryweather	23123024	05/04/2023
003	Input Post PM Recipe Tune	Luke Merryweather	23290004	10/17/2023
005	Fixing the Rev to match SMS Spec	Luke Merryweather	24059016	02/28/2024

## 9.0 Data Retention

- Recorded and Checklist data shall be retained per QP016-1.

**\*\*\*DO NOT EDIT THIS PAGE\*\*\***  
**Needed for internal specification purposes**