

Regular Group Leaders Meeting Minutes
Lab Activity Report
August 12, 2013

To: Cleanroom Users
From: Jake Hes

Next Activity Report: 8/30/13

I. Summary of the INRF and BiON Facility Infrastructure Issues:

For the last three years the INRF has had various infrastructure issues. Ranging from Power, Chill water, Compressed air, and exhaust problems. The most recent issue occurred last April when an odor was smelled which was caused by Aluminum etch. The INRF was shut down for a period of time to investigate the problem. EH&S and Facilities had consultants look into the problem. It was determined the exhaust was inadequate, meaning insufficient exhaust flow. Some of the chemical laminar flow hoods that deal with hazardous materials such as acids were de-activated. This process has been moved to the BiON after repair and certification. These benches are Laminar flow chemical benches. Users have been trained, as there is a new standard operating procedure, now that the Laminar flow has been activated. The HF bench also has an HF monitor installed.

The INRF and BiON had been dealing with humidity issues the last few months. In the INRF the humidity was so high the smoke detectors were going off. The percentage was over 70%. Some of the components are experiencing build up of Oxide or rust and causing the tools to fail. In the BiON in some areas the humidity was over 65% and the humidifier reservoirs would overflow and leak from the ceiling and in some cases onto lab equipment or very close. Recently facilities replaced the make-up water that was industrial water with water softener water to remove the alkaline build up from the water so the Alkaline will not affect the valve components. They are also planning to fabricate overflow pans in case the drain valves fail.

EH&S and consultants have reviewed the SOPs and chemicals used for Lithography and electroplating processing. Permission to restart these processes was given. As for bringing all the benches back online in the INRF, I met with facilities and the design firm is presently working out the design issues. The contractors are planning to start the interim fix the first of December and finish the second of January 2014. This work will impact portions of the lab periodically. The completion of this project is planned for the end of April 2014. This project will also include and improve the CDA (clean dry air) that support the pneumatics on various tools in the INRF. Presently the pneumatics has water and oil in the system, which is causing the evaporators, aligners and sputtering systems to fail.

II. Action Lab Infrastructure Equipment Upgrade:

Started on the upgrade for the STS August 5th. Replaced the Turbo model TB 900 to a turbo TB 1500 due to no longer manufacturer support for the TB 900. Finished installing the pump by the end of the week. Established base pressure and ran etch processes. Will be installing the Trinity operating system starting August 12th. If everything goes well we should be verifying existing recipes the week of the 19th. If no major changes need to be made the tool should be available on August 21st.

Installing temperature controlled distilled chill water system for the new STS oxide etcher located in the BiON. This system will be duplicated in INRF to give us the capability of a set point and improve conductivity of the chill water. This will reduce build up of condensation on high voltage RF lines and contamination within the cooling system and arcing. Installing various components to give computer visibility for system condition.

III. Regular Equipment Updates

Summary for the INRF Clean Room

All metal evaporation and sputtering systems

CHA E-beam 1 is **UP**:

CHA Mack 50 is **UP**:

CHA E-beam 2 is **DOWN**: System under repair pneumatic issues due to water and oil contamination. High voltage power supply needs looked into for E-GUN.

Thermal evaporator in STAND-BY:

PE 2400 A sputter (dielectric) in STAND-BY:

PE 2400 B sputter (metal) is **DOWN**:

The J-arm has a water leak inside the chamber, needs to be located and repaired.

PE 4400 sputter (metal) in STAND-BY:

Lithography

Aligners

FEI E-beam writer is **DOWN**: System column and Ion pumps need baked out for regeneration due to power interruption.

MA6 is **UP**:

MJB3 Off Line:

Quintel Off Line:

Kasper is Off Line:

Oriel Flood exposure system is **DOWN**: Due to high voltage power supply issues. Repaired need installed.

Cannon i4 Stepper staff tool is **Off Line**: Shut down due to CDA contaminated with oil and water. Concern for optic and air bearing being damaged.

Lithography Ovens

Soft and Hard Bake Ovens are all is **UP**:

Yes HMDS Oven is **UP**:

Photoresist Spinners are all **UP**:

Ashers

Technics 500 II Plasma Asher system is **DOWN**: Problems with RF power supply will not generate a plasma.

Gasonics L3500 Plasma system is **UP**:

PECVD

PlasmaTherm PECVD is **UP**:

BMR PECVD low-T nitride/oxide staff tool is **DOWN**: Having software or hardware issues. Will not vent properly.

Anicon 150mm low-T nitride/oxide staff tool is **DOWN**: Experiencing high temperature problems. Heating element okay, slave and set point controllers working properly. Looking at low voltage Interface cards that drive the high voltage power supply for the heating elements.

EasyTube 3000 First-nano Furnace is **UP**:

ASM- LPCVD System:

Nitride tube – **Off-line.**

Poly tube – **Off-line.**

Oxide tube – **Off-line.**

} Needs new operating system

Cambridge Nanotech (ALD) System is **UP**:

RIE

Plasma Therm RIE is **UP**:

STS ICP staff tool is **UP**:

TRION ICP/RIE is **UP**:

XeF2-Etching System is **DOWN**: Mechanical pump out for repair. Will be set up for synthetic oil.
ECD – 8/15/13

Ion Milling System is **DOWN**: Experiencing gun power supply issues. Low emission current. No ECD.

SEM

Hitachi S-4700 SEM is **DOWN**: System column and Ion pumps need baked out for regeneration due to power interruption.

Hitachi S-520 is **off-line**:

Tool is not being used.

K&S 780 dicing saw is **DOWN**: Spindle flange damaged. Sent out for repair, received 8/7/13.
Needs installed and system checked out. ECD 8/16/13

Tempress 602 Dicing saw is **DOWN**: alignment problem with blade and stage. No ECD.

All Variable speed Polishers are **UP**:

All Characterization tools are **UP**:

Tousimis 815C CPD Critical Point Dryer is **UP**:

Furnaces and Ovens

Wet Oxidation Tube is **UP**:

Dry Oxidation Tube is **UP**:

Boron Diffusion Tube is **UP**:

Stabilization Tube is **UP**:

Long Anneal Tube is **UP**:

Sinter Tube is **UP**:

Mini Brute Tube is **UP**:

RTP Rapid Thermal Process is **off line**: Due to chill water pump needing replaced or repaired.
No ECD

Blue M Oven GS 600c Inert Oven is **DOWN**: system will not operate at high temperature.
Either the heating element or controller is not engaging. Operates at low temperature but
ramp rate slow.

Blue M Oven SPX 400c Inert Oven is **UP**

Lindberg Nanotube furnace is **UP**:

Wire Bonders

K&S 4124 Ball Bonder is **UP**:

MECH-EL TU-907 Wedge bonder is **UP**:

MECH-EL 827 Ball Bonder is **UP**:

Bond Strength Tester Microtester MCT22 is **UP**:

Characterization tools

Dektak 3 Profilometer is **UP**:

Dektak XT Profilometer is **UP**:

Ellipsometer Gardner is **UP**:

Ellipsomete Ruddlph Auto El is **UP**:

Filmetrics Thin-Film Analyzer is **UP**:

Stress Measurement Tencor is **UP**:

H-S Optical Profiler 150 OP is **UP**:

Summary for the BiON Clean Room

All metal evaporation and sputtering systems

CHA E-beam Model SCL-600-RAP **Tool needs to be installed**

MRC sputter (metal) Model 8667 **Tool needs to be installed**

Dielectric Evaporation

Parylene Evaporator Model PPS 2010 is **UP:**

Molecular Vapor Deposition

Applied (MST) MVD 100 is **UP:** Just finished installing re-circulating pump on chiller unit 8/6/13. Dry pump failed due to high temperature. Need to install flow and temperature sensors that will shut down dry pump if chiller fails. Fortunate dry pump did not get damaged.

Aligners Lithography

Karl Suss Mask Aligner Model MA56 is **UP:**

AB&M Flood exposure system is **UP:**

Quintel Mask Aligner BiON is **UP:**

Angtech LTD Model SP100 Plasma Asher system is **UP:**

Laurel Spinners for SU-8 and Photoresist are all **UP:**

Lithography Ovens

Soft and Hard Bake Ovens all **UP:**

Vacuum Oven **UP:**

Ashers

Harrick Plasma asher is **UP:**

Anatech LTD-SP100 Plasma Asher is **DOWN:** Timer on system malfunctioning. Ash time cannot be lengthened or shortened. Needs replaced.

Technics II 500 is **DOWN:** Power supply for RF will not start up when required. Communication error.

PECVD System

Tylan 1000 PECVD system BiON **Tool needs to be installed.**

Dry Etching System

Plasma Technology Model 800-MP-RIE **Tool needs to be installed.**

Plasma Technology Model DP-800-UP Deep RIE **Tool needs to be installed.**

Ablation Tool

Resonetics RapidX250 Ablation laser **off Line:** Due to the chiller removed and reinstalled on the Nanoimprinter.

Embossing Tools

Jenoptik HEX03 Nanoimprinter is **UP:**

AIT Pressing Equipment Model 1210P is **UP:**

GEO Knight Pressing Equipment is **UP:**

Cell Culture Tools

Forma Scientific CO2 water Incubator is **UP:**

Laminar Flow Bio hoods are **UP:**

Characterization tools

Dektak 3 Profilometer is **UP:**

Alpha-Step 200 Profilometer is **UP:**