Chapter 6.01

**Hummer Sputtering System**  
(hummer – 382)  
(For SEM Samples Only)

1.0 **Title**  
Hummer Sputtering System

2.0 **Purpose**  
It is to reduce the charging up of the samples by the e-beam of the scanning electron microscope.

3.0 **Scope**  
The Hummer Sputtering System is for depositing a thin layer of gold- palladium on the SEM samples.

4.0 **Applicable Documents**

4.1 Operation procedures posted by the Hummer Sputtering System.

4.2 Hummer Sputtering System Manual is available in the office.

5.0 **Definitions & Process Terminology**

6.0 **Safety**

NEVER LEAVE THE CHAMBER UNDER VACUUM WHEN THE SYSTEM IS NOT IN USE!

7.0 **Statistical/Process data**

7.1 Problem and comment section under equipment section of the wand.

7.2 Enable message for hummer.

8.0 **Available Process, Gases, Process Notes**

8.1 Ar gas.

9.0 **Operating Procedure**

9.1 Enable the (hummer) system using the wand.

9.2 The roughing pump should be on.

9.3 Open the chamber by lifting the hinged top plate. Place your specimens on the pedestal and replaced the top plate.

9.4 Ensure that the Coat/Pump switch is set to Pump.

9.5 Plating Procedure:

   9.5.1 Place mode switch to D.C. Plate.

   9.5.2 Turn on the Hummer main power switch. Pump until the pressure is between 20 mtorr to 50 mTorr. (If it doesn’t happen, switch the valve to “Coat” for a while. This will allow argon gas to flush any water molecules or nitrogen out of the chamber. The pressure
should be approximately 200 mTorr. You may open it up to about 500 mTorr for flushing the chamber. DO NOT use this knob as a shut off valve!)

9.5.3 When the chamber pressure reaches 20 mTorr to 50 mTorr, turn the valve from “Pump” to “Coat” and allow the pressure to stabilize at 200 mTorr.

9.5.4 Turn high voltage power on.

9.5.5 Turn high voltage dial until the current is at 25 mA. (You should see a stable purple plasma.)

9.5.6 Turn the timer dial to the desired time setting and switch to “Auto”. A thickness of 50A to 100A is sufficient for most SEM viewing purposes. Generally, 1-2 minutes coating is enough. Pulse mode can reduce the temperature of the deposition on the samples. On the pulse mode, the timer only counts the time when Cycle is on.

9.5.7 After the coating time has elapsed, the plasma will shut off automatically.

9.6 Turn off and unload procedure:

9.6.1 Turn high voltage dial to 0.

9.6.2 Turn off high voltage switch.

9.6.3 Switch the valve from “Coat” to “Pump”.

9.6.4 Set the timer switch back to manual.

9.6.5 Turn off the Hummer system main power switch.

9.6.6 Vent the chamber; remove your samples.

9.7 Close the vent valve and the top lid.

9.8 Disable the system. (The vacuum pump should be off.)

10.0 Troubleshooting Guidelines

DO NOT leave the Hummer operating unattended! If you believe something is not working right, write up a Fault report- DO NOT try to “fix” it.

Note: Never leave the chamber under vacuum. It will suck all the pump oil out of the pump in the event of a power failure. Leave the chamber vented!

11.0 Figures & Schematics

12.0 Appendix
The system should be in the following status before operation:

- Main Power Switch: OFF
- High Voltage Switch: OFF
- Voltage Control: 0
- Process Control: MANUAL
- Vent Valve: CLOSED
- Mode Selector: D.C. PLATE
- Coat/Pump Switch: PUMP
- Argon Gas Line: ON