

Ion Beam Surface Cleaning Instructions:

1. Follow the laminated "getting started" manual that will walk you through getting the plasma ignited and a small current of ions flowing and neutralized.

2. General Specs to use:

Active (set): These are parameters you will set
Beam Voltage: 800V
Beam Current: 25mA (adjusted with cathode voltage)
Accelerator Voltage: 100V
Discharge Voltage: 35V
Neutralizer Emission Current: 27.5mA (adjusted with Neutralizer voltage to ~10-20% more than beam current)
Pressure: 2e-4Torr (set by Ar flow via MFC)

Passive (get): These are parameters you will write down as readings
Accelerator Current: 0.9mA
Discharge Current: 1.37A
Cathode Voltage: 10.4V
Cathode Current: 8.24A
Neutralizer Filament Current: 6.0A
Ar flow rate: 76.1 (this will determine pressure, note flow needed to get pressure above)

3. Notes:
 - a. You should be able to over-neutralize the beam by 10-20% easily, i.e. with Neutralizer Filament Currents <6.5A. If this is not possible, try increasing the pressure in the chamber. If that doesn't help either, something is broken (Fuse or Filament). DO NOT go above 6.5A on the filament to make sure it doesn't blow out.
 - b. Be careful when removing and installing the Al cover over the source since the filament is not protected. Cap the mill after use to prevent contamination by other evaporations.
 - c. The mill works better if the evaporator shutter is OPEN during milling, since it slightly gets in the way of the beam / deflects it
 - d. Try to center the beam on the sample holder. A rotating sample will be best for uniformity. Beam diameter is only 2 inches.
4. A few known rates at conditions above:
 - a. Al₂O₃ (air oxidized aluminum) - 5nm/min (Markus Ansmann)
 - b. InP – 50nm/min. (Uttam Singiseti)