

ES-1 Beamline and Exposure Station

Port 032 on the Aladdin storage ring. The beamline has no integral optics other than two 13μ Be exit windows. A fixed set of additional filters can be inserted. The exposure station is a vacuum chamber which may be backfilled with nitrogen or other gases. Exposure is performed by mounting samples to a computer-controlled scanning stage, which can be programmed for a variety of XY movements. Anyone using ES-1 must first receive training from a CNTech staff member, not from a student. All users must record details in the beamline log book.

Materials forbidden: Liquids

Materials allowed: Anything else you can fit through the chamber door

Flux ($mW/mA\ cm$):

(see appendix for more filter combinations)

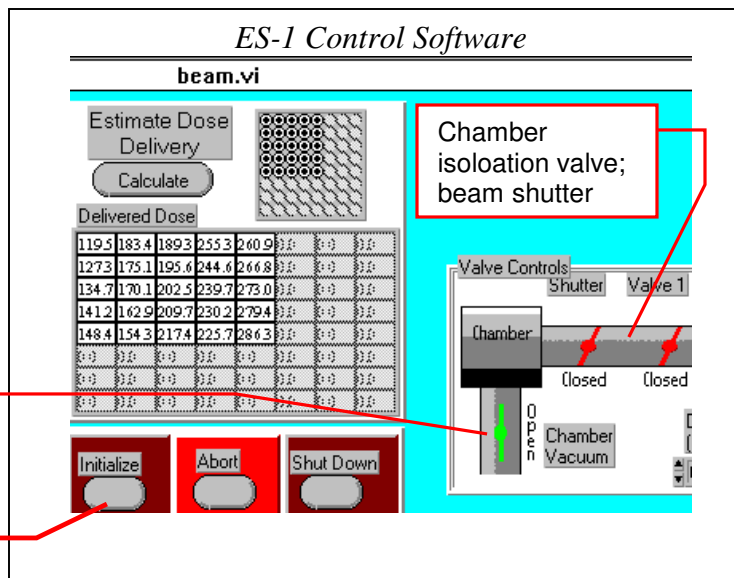
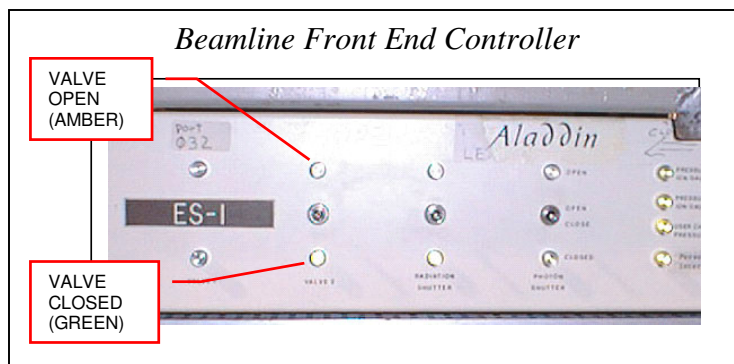
Filters	800 MeV	1 GeV

1) STANDBY MODE AND INITIALIZATION

When you first arrive, verify that:

- The beamline Front End is **closed**
- The LabView control software (beam.vi) is running
- The chamber isolation valve and the beam shutter are **closed** (red).
Clicking on valve control icons toggles the valve state
- The chamber pump valve is **open** (green)
- The chamber pump (under the chamber stand) is running

Then, click the “Initialize” button



Chamber pump valve

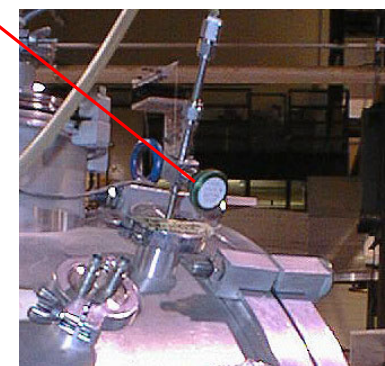
Initialization

2) VENT THE CHAMBER

- **Close** the chamber pump valve (its icon changes to red; the pump keeps running)
- Be damn sure all the other valves are **closed**
- **Open** the nitrogen source valve. Noise from the pressure relief valve is OK.
- **Open** the nitrogen feed valve.
- When the chamber door swings open, try not to let the **O-ring** fall off.
- **Close** both nitrogen valves.

Nitrogen source valve

Nitrogen feed valve



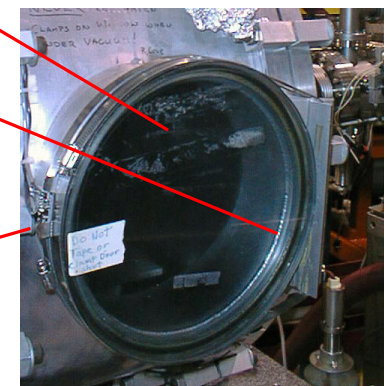
3) LOAD SAMPLES

- All samples should be mounted to a **standard backplate**
- For setup runs, mount phosphor paper and measure its position relative to the sample
- Hang backplate on mounting pins on XY stage
- Secure the backplate to the XY stage

Chamber door

O-ring

Interlock switch



4) PUMP DOWN

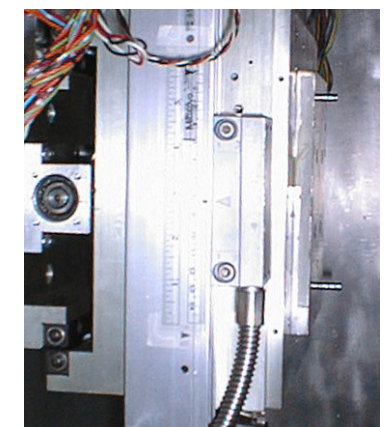
- Check that **O-ring** is properly seated
- Toggle the **chamber pump valve** icon. (The valve won't actually change state until the **interlock switch** is satisfied).
- Press the **chamber door** shut without getting your fingers pinched. You should hear the pump start to labor.
- Verify that chamber pressure, read on the **convection gauge**, is dropping

5) SET UP THE BEAMLINE

- **Filters:**
- **Apertures:**
- **Stage position:**
- **Environment:**

6) SET UP THE SOFTWARE

- **Exposure method:**
- **Shutter control**



MAKE AN EXPOSURE

THE BEAMLINE

PREPARING THE BEAMLINE FOR YOUR EXPOSURE

THE CHAMBER

THE CONTROL ELECTRONICS

SOFTWARE

Initialization does this:

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TROUBLESHOOTING

MOUNTING SAMPLES