

Brookhaven National Laboratory/National Synchrotron Light Source			
Subject:	VACUUM PROCEDURES FOR BEAMLINE X-25A		
Number:	LS-OPS-0102	Revision:	B
		Effective:	03/20/07
			Page 1 of 3
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*Approval signatures on file with master copy.

The following procedures must be followed when bleeding up different beam line sections and when returning these sections to operation (refer to Beam Line Layout Drawing):

I. FRONT END (PROCEDURE TO BE PERFORMED BY NSLS VACUUM GROUP ONLY)

A. Bleed-Up

1. Notify the Coordinator (Beeper 5824).
2. Refer to Front End Vacuum Procedures (SLS-07.19-13-1)

B. Return to Operation

1. Notify the Coordinator (Beeper 5824).
2. Refer to Front End Vacuum Procedures (SLS-07.19-13-1)

II. Section Between Valve 1A and Be Window 1A (Graphite Filter Tank)

A. Bleed up

1. Notify the Coordinator (Beeper 5824).
2. Close and seal Valve 1A and Front-End Vat Valve.
3. Coordinator places Yellow Tag on Valve 1A and the Front-End Vat Valve.
4. Hook up turbo pump to Graphite Filter Tank section.
5. Slowly bleed up with boil-off N₂ while Coordinator monitors Front-End pressure.

B. Return to Operation

1. Bake and pump to $<2 \times 10^{-9}$ Torr.
2. Notify the Coordinator (Beeper 5824).
3. Prepare for RGA scan.*
4. Open Valve 1A provided pressure $<2 \times 10^{-9}$ downstream of the valve.
5. Perform RGA scan.*
6. If RGA scan or pressure reading (if no RGA scan is required) is satisfactory, Coordinator removes Yellow Tag from Valve 1A.
7. Remove any unprotected turbo pump from this section or valve off the turbo pump and place a Yellow Tag on the valve. **

III. Section Between Be Window 1A and Manual Valve 2A (First MIRROR Tank)

A. Bleed up

1. Notify the Coordinator (Beeper 5824).
2. Close and seal Valve 1A.
3. Coordinator places Yellow Tag on Valve 1A.
4. Close and seal Valve 2A to preserve downstream vacuum.
5. Slowly bleed up (with N₂ boil-off) while Coordinator monitors pressure in the Graphite Filter Tank section (Graphite Filter Tank).

B. Return to Operation

1. Pump to $<1 \times 10^{-4}$ Torr.
2. Notify the Coordinator (Beeper 5824).
3. Open all in-line valves, except Valve 1A.

Brookhaven National Laboratory/National Synchrotron Light Source			
Subject:	VACUUM PROCEDURES FOR BEAMLINE X-25A		
Number:	LS-OPS-0102	Revision:	B
		Effective:	03/20/07
			Page 2 of 3

4. Open Valve 1A provided pressure $<1 \times 10^{-4}$ Torr downstream of Be Window 1A.
5. If pressure is satisfactory, Coordinator removes Yellow Tag from Valve 1A.

IV. Section between Manual Valve 2A and Manual Valve 3A (Monochromator Tank and Pipe)

A. Bleed up

1. Notify the Coordinator (Beeper 5824).
2. Close and seal Valve 2A.
3. Coordinator places Yellow Tag on Valve 2A.
4. Close and seal Valve 3A to preserve downstream vacuum.
5. Slowly bleed up while Coordinator monitors pressure upstream of Manual Valve 2A (First Mirror Tank).

B. Return to Operation

1. Pump to $<1 \times 10^{-4}$ Torr.
2. Notify the Coordinator (Beeper 5824).
3. Open all in-line valves, except Valve 2A.
4. Open Valve 2A provided pressure $<1 \times 10^{-4}$ Torr downstream of Be Window 1A.
5. If pressure is satisfactory, Coordinator removes Yellow Tag from Valve 2A.

V. Section between Valve 3A and Valve 4A (Second Mirror -Tank)

A. Bleed up

1. Notify the Coordinator (Beeper 5824).
2. Close and seal Valve 3A and Valve 2A.
3. Close and seal Valve 4A to preserve downstream vacuum.
4. Coordinator places Yellow Tag on Valve 3A and Valve 2A.
5. Slowly bleed up while Coordinator monitors pressure upstream of Valve 3A (Monochromator Tank and Pipe).

B. Return to Operation

1. Pump to $<1 \times 10^{-4}$ Torr.
2. Notify the Coordinator (Beeper 5824).
3. Open all in-line valves, except Valve 3A and Valve 2A.
4. Open Valve 3A provided pressure $<1 \times 10^{-4}$ Torr downstream of Valve 3A.
5. Open Valve 2A provided pressure $<1 \times 10^{-4}$ Torr downstream of Valve 2A.
6. If pressure is satisfactory, Coordinator removes Yellow Tags from Valve 3A and Valve 2A.

VI. Section between Valve 4A and Beryllium Window 2A (Hutch Pipe)

A. Bleed up

1. Notify the Coordinator (Beeper 5824).
2. Close and seal Valve 4A and Valve 3A.
3. Coordinator places Yellow Tags on Valve 4A and Valve 3A.
4. Slowly bleed up while Coordinator monitors pressure upstream of Be Window 1A (Graphite Filter Tank).

Subject:	VACUUM PROCEDURES FOR BEAMLINE X-25A					
Number:	LS-OPS-0102	Revision:	B	Effective:	03/20/07	Page 3 of 3

B. Return to Operation

1. Pump to $<1 \times 10^{-4}$ Torr.
2. Notify the Coordinator (Beeper 5824).
3. Open all in-line valves, except Valve 4A and Valve 3A.
4. Open Valve 4A provided pressure $<1 \times 10^{-4}$ Torr downstream of Valve 4A.
5. Open Valve 3A provided pressure $<1 \times 10^{-4}$ Torr downstream of Valve 3A.
6. If pressures are satisfactory, Coordinator removes Yellow Tags from Valve 4A and Valve 3A.

*** NSLS POLICY FOR RGA SCANS (24 HOUR NOTICE REQUIRED)**

An RGA scan is required before returning to operation if there is a major change of hardware in the vacuum system, i.e. changing of samples, mirrors, windows, monochromator crystals or gratings, manipulators, detectors, etc., **with the following two exceptions:**

1. After UHV sample chambers have been bled up for replacing components, an RGA scan will not be required if the chamber pressure is returned to $< 2 \times 10^{-9}$ Torr and the Front End pressure remains $< 2 \times 10^{-9}$ Torr when vacuum sections upstream of the chamber are opened into the Front End.
2. If any vacuum section upstream of the bled-up section remains at a pressure of $< 9 \times 10^{-10}$ Torr as read using a hot-filament ion gauge, when the entire beamline is opened into the Front End, and the Front End pressure does not increase, no RGA is required.

**** NSLS TURBO PUMP POLICY**

An unprotected turbo pump is one not separated from the Front End by a beamline valve which automatically closes in the event of a power loss or a pressure increase at the turbo pump. **No unprotected turbo pump can share a contiguous vacuum with the Front End.**

**Document Review
Frequency**

3 Years

Review signatures on file
with master copy of
controlled document

NSLS REVISION LOG	
Document Number:	LS-OPS-0102
Subject:	VACUUM PROCEDURES FOR BEAMLINE X-25A

> See NSLS Quality Control Coordinator for original revision and review signatures <

REVISION TABLE		
Rev	Description	Date
B	Initial release into Controlled Document System. Beamline upgrades with addition of 2 nd Mirror Tank.	03/20/07