

Brookhaven National Laboratory/National Synchrotron Light Source			
Subject:	VACUUM PROCEDURES FOR BEAMLINE X-3B		
Number:	LS-OPS-0094	Revision:	B
		Effective:	08/17/06
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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 1B AND Be WINDOW 1B

A. Bleed-Up

1. Notify the Coordinator (Beeper 5824).
2. Close and seal Valve 1B, Front-End High Vacuum Valve, and downstream Valve 2B.
3. Coordinator places Yellow Tag on Valve 1B controller.
4. Hook up Turbo Pump to this section. (Valve 5B).
5. Turn off Ion Pump #1
6. Open Valve 5B.
7. Slowly bleed-up with boil-off N₂ while Coordinator monitors Front-End pressure.

B. Return to Operation

1. Pump to $< 2 \times 10^{-9}$ Torr.
2. Pump section between Be Window 1B and Valve 2B to 1×10^{-3} Torr.
3. Notify the Coordinator (Beeper 5824).
4. Prepare for RGA scan.*
5. Open Valve 1B if pressure $< 2 \times 10^{-9}$ Torr downstream of valve.
6. Perform RGA scan.*
7. If RGA scan or pressure reading (if no RGA scan required) is satisfactory, Coordinator removes Yellow Tag from Valve 1B.
8. 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 1B AND VALVE 2B

A. Bleed-Up

1. Notify the Coordinator (Beeper 5824).
2. Close and seal Valve 1B and downstream Valve 2B.
3. Verify Turbo Valve 6B is closed.
4. Coordinator places Yellow Tag on Valve 1B controller.
5. Slowly bleed-up with boil-off N₂ while Coordinator monitors pressure between Valve 1B and Be Window 1B.

B. Return to Operation

1. Pump to $< 1 \times 10^{-3}$ Torr.
2. Notify the Coordinator (Beeper 5824).

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3. Open Valve 2B provided pressure $< 1 \times 10^{-3}$ Torr upstream (and downstream) of valve.
4. Open Valve 1B provided pressure $< 2 \times 10^{-9}$ Torr between Valve 1B and Be Window 1B.
5. If pressure is satisfactory, Coordinator removes Yellow Tag from Valve 1B controller.

IV. SECTION BETWEEN VALVE 2B AND VALVE 3B, PRIMARY APERTURE & SPOOL

A. Bleed-Up

1. Notify the Coordinator (Beeper 5824).
2. Close and seal Valve 2B and downstream Valve 3B.
3. Turn off ION Pump #2
4. Coordinator places Yellow Tag on Valve 2B controller.
5. Slowly bleed-up while Coordinator monitors pressure between Be Window and Valve 2B

B. Return to Operation

1. Pump to $< 1 \times 10^{-3}$ Torr.
2. Notify the Coordinator (Beeper 5824).
3. Open Valve 3B provided pressure $< 1 \times 10^{-3}$ Torr downstream of valve.
4. Open Valve 2B provided pressure $< 1 \times 10^{-3}$ Torr downstream of valve.
5. If pressure is satisfactory, Coordinator removes Yellow Tag from Valve 2B controller.

V. SECTION BETWEEN VALVE 3B AND VALVE 4B, MONOCHROMATOR

A. Bleed-Up

1. Notify the Coordinator (Beeper 5824).
2. Close and seal Valve 3B, and downstream Valve 4B.
3. Coordinator places Yellow Tag on Valve 3B controller.
4. Slowly bleed-up while Coordinator monitors pressure between Valve 3B and Be Window .

B. Return to Operation

1. Pump to $< 1 \times 10^{-3}$ Torr.
2. Notify the Coordinator (Beeper 5824).
3. Open Valve 4B provided pressure $< 1 \times 10^{-3}$ Torr downstream of valve.
4. Open Valve 3B provided pressure $< 1 \times 10^{-3}$ Torr downstream of valve.
5. If pressure is satisfactory, Coordinator removes Yellow Tag from Valve 3B controller.

VI. SECTION BETWEEN VALVE 4B AND BEAM EXIT WINDOW 2B, MIRROR

A. Bleed-Up

1. Notify the Coordinator (Beeper 5824).
2. Close and seal Valve 4B.
3. Turn off ION Pump #3
4. Coordinator places Yellow Tag on Valve 4B controller.
5. Slowly bleed-up while Coordinator monitors pressure between Valve 4B and Be Window

B. Return to Operation

1. Pump to $< 1 \times 10^{-3}$ Torr.
2. Notify the Coordinator (Beeper 5824).
3. Open Valve 4B and Valve 3B provided pressure $< 1 \times 10^{-3}$ Torr downstream of valve.
4. If pressure is satisfactory, Coordinator removes Yellow Tag from Valve 4B.

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*** 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-0094
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> See NSLS Quality Control Coordinator for original revision and review signatures <

REVISION TABLE		
Rev	Description	Date
B	Initial release into Controlled Document System.	08/17/06