

| Brookhaven National Laboratory/National Synchrotron Light Source | | | |
|------------------------------------------------------------------|---------------------------------------------|-------------------------|--------------------|
| Subject: | VACUUM PROCEDURES FOR BEAMLINE X-28C | | |
| Number: | LS-OPS-0088 | Revision: | C |
| Effective: | 03/13/09 | Page 1 of 3 | |
| Prepared By: M. Sullivan | Reviewed By: J. Klug | Approved By: S. Ehrlich | Approved By: E. Hu |

*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 1C AND VALVE 2C, TRANSPORT SECTION #1

A. Bleed-Up

1. Notify the Coordinator (Beeper 5824).
2. Close and seal Valve 1C, Valve 2C, and the Front-End Valve.
3. Hook up turbo pump to this section and isolate turbo.
4. Coordinator places Yellow Tag on Valve 1C and the Front-End Valve.
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.* Open all valves except Valve 1C.
4. Open Valve 1C provided pressure $< 2 \times 10^{-9}$ Torr.
5. Perform RGA scan.*
6. If RGA scan or pressure reading (if no RGA scan required) is satisfactory, Coordinator removes Yellow Tags from Valve 1C and the Front-End Valve.
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 1C AND VALVE 3C, TRANSPORT SECTION #2

A. Bleed-Up

1. Notify the Coordinator (Beeper 5824).
2. Close and seal Valve 2C and Valve 3C.
3. Note the pressure on Grandville Philips Ion gauge controller X28C # 3 IG1 and monitor Pressure during bleed-up.

| | | | |
|-----------------|---------------------------------------------|-------------------|--------------------|
| Subject: | VACUUM PROCEDURES FOR BEAMLINE X-28C | | |
| Number: | LS-OPS-0088 | Revision: | C |
| | | Effective: | 03/13/09 |
| | | | Page 2 of 3 |

4. Turn off ION PUMP 2 & 2A. The controller of IP2 is located inside X28B EESE and labeled X28C IP2. The controller for IP2a is located on the rear wall of the X28C EESE in the slope front rack and is labeled X28C IP2a.
5. Note the convector gauge "B" pressure on Grandville Philips controller X28C #2.
6. Coordinator places Yellow Tag on Valve 2C.
7. Connect N₂ gas from a dewar to the downstream manual right angle valve located on the 8" cross above IP2a.
8. SLOWLY and VERY SLIGHTLY open the valve to vent the system .
9. Coordinator monitors pressure on IG1 located on Grandville Philips controller X28C #2.

B. Return to Operation

1. Disconnected N₂ from right angle valve and connect turbo cart.
2. Pump down system watching the pressure on convector gauge "B" pressure on Grandville Philips controller X28C #2
3. When convector gauges reaches a pressure of 1×10^{-3} turn on IP2 which is located on Grandville Philips Ion gauge controller X28C # 3 IG1.
4. When pressure reaches 5×10^{-5} burp ION PUMPS 2 & 2a several times. The controller of IP2 is located inside X28B EESE and labeled X28C IP2. The controller for IP2a is located on the rear wall of the X28C EESE in the slope front rack and is labeled X28C IP2a.
5. When the pressures reaches 8×10^{-6} turn on the IP2 & IP2a.
6. When the pressures reaches 1×10^{-6} close the right angle valve and torque the valve to 1 ft/lb more then the label on the valve.
7. Turn off and disconnect the turbo cart.
8. Notify the Coordinator (pager # 5824).
9. If pressures are satisfactory, Coordinator removes Yellow Tag from Valves 2C.

IV. SECTION BETWEEN VALVE 3C AND Be WINDOW 2C, EXIT SECTION

A. Bleed-Up

1. Notify the Coordinator (Beeper 5824).
2. Close and seal Valve 3C.
3. Coordinator places Yellow Tag on Valve 3C.
4. Slowly bleed-up with boil-off N₂ while coordinator monitors pressure between Be Window 1C and Valve 3C (Transport Section #2).

B. Return to Operation

1. Bake and pump to $< 1 \times 10^{-6}$ Torr.
2. Notify the Coordinator (Beeper 5824).
3. Open Valve 3C provided pressure $< 1 \times 10^{-6}$ Torr downstream of the valve.
4. If pressure is satisfactory, Coordinator removes Yellow Tag from Valve 3C.

| Brookhaven National Laboratory/National Synchrotron Light Source | | | | |
|------------------------------------------------------------------|---------------------------------------------|------------------|---|----------------------------|
| Subject: | VACUUM PROCEDURES FOR BEAMLINE X-28C | | | |
| Number: | LS-OPS-0088 | Revision: | C | Effective: 03/13/09 |
| | | | | Page 3 of 3 |

*** 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

| LIGHT SOURCES DIRECTORATE REVISION LOG | | |
|-----------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|
| Document Number: | | LS-OPS-0088 |
| Subject: | | VACUUM PROCEDURES FOR BEAMLINE X-28C |
| Rev | Description | Date |
| B | INITIAL RELEASE INTO CONTROLLED DOCUMENT SYSTEM. | 02/22/06 |
| C | Section III A, step 3: removed words “turn off Ion Gauge” and replaced with “monitor pressure during bleed-up”. Omitted Section III A, step 10 entirely. Changed Preparer from D. Abel to M. Sullivan. Changed Approver from C. Foerster to E. Hu. | 03/13/09 |
| | | |
| | | |
| | | |