

<b>Brookhaven National Laboratory National Synchrotron Light Source</b>		<b>Number:</b> LS-OPS-0045	<b>Revision: B</b>
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<b>Subject: VACUUM PROCEDURES FOR BEAMLINE X10C</b>			
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\*Document must contain approved signatures for validity.

The following procedures must be followed when bleeding up different beam line sections and when returning these sections to operation .

## **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 FRONT END AND VALVE C1**

### **A. Bleed-Up**

1. Hook-up turbo pump to this section, pump out the hose, and isolate turbo.
2. Notify Coordinator (Beeper 5824).
3. Close and seal Front End HV valve and valves X10A1, X10B1 and X10C1.
4. Turn off ion gauges X10A F.E., X10B F.E. and X10C F.E. and ion pumps A1, B1 and C1 on beamlines and have vacuum group turn off ion gauge/pump(s) in Front End chamber.
5. Coordinator places Yellow Tags on Front End HV valve and valves X10A1, X10B1 and X10C1.
6. Slowly bleed-up with boil-off LN2 while Coordinator monitors ring pressure.

### **B. Return to Operation**

1. Pump section down to  $<2.0 \times 10^{-9}$  Torr, isolate turbo.
2. Notify Coordinator (Beeper 5824).
3. Prepare for RGA scan.
4. Open valves X10A1, X10B1 and X10C1 into Front End provided pressure  $<2.0 \times 10^{-9}$  Torr downstream of Front End valve.
5. Perform RGA scan.\*
6. If RGA scan or pressure reading (if no RGA scan required) is satisfactory, Coordinator opens Front End HV valve and removes yellow tags from Front End HV valve and valves X10A1, X10B1 and X10C1.
7. Remove the unprotected turbo pump from this section.\*\*

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### III. SECTION BETWEEN VALVE C1 AND VALVE C2

#### A. Bleed-Up

1. Hook-up turbo pump to this section, pump out the hose, and isolate turbo.
2. Notify the Coordinator (Beeper 5824).
3. Close and seal the Front End HV valve and valves C1 and C2.
4. Coordinator places Yellow Tags on Front End HV valve and valve C1.
5. Turn off ion pump C2.
6. Slowly bleed-up with boil-off LN2 while Coordinator monitors pressure between the Front End and valve C1.

#### B. Return to Operation

1. Pump section down to  $<2.0 \times 10^{-9}$  Torr, isolate turbo.
2. Open valve C2.
3. Notify the Coordinator (Beeper 5824).
4. Prepare for RGA scan.
5. Open valve C1 into Front End provided pressure  $<2.0 \times 10^{-9}$  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 Tags from Front End HV valve and valve C1.
8. Remove unprotected turbo pump from this section.\*\*

### IV. MONOCHROMATOR SECTION BETWEEN VALVES C2 AND C3

The following procedure is valid for monochromator crystal changes.

#### A. Bleed-Up

1. Close and seal valves C1, C2 and C3.
2. Hook-up turbo pump to this section, pump out the hose, and isolate turbo.
3. Turn off ion pump C3, ion gauge X10C Mono. and PZT high voltage.
4. Notify the Coordinator (Beeper 5824).
5. Coordinator places Yellow Tags on valves C1 and C2.
6. Slowly bleed-up the section between valves C2 and C3 with LN2 boil-off while Coordinator monitors ion pump C2 pressure.

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## **B. Return to Operation**

1. Pump section down to  $<5.0 \times 10^{-8}$  Torr, isolate turbo.
2. Open valve C3.
3. Notify the Coordinator (Beeper 5824).
4. Open valves C2 and C1, Coordinator confirms X10 Front End pressure is  $<2.0 \times 10^{-9}$  Torr.
5. If pressure is satisfactory, Coordinator removes Yellow Tags from valves C1 and C2.
6. Remove unprotected turbo pump from this section.\*\*

## **V. SECTION BETWEEN VALVE C3 AND BE WINDOW**

### **A. Bleed-Up**

1. Close and seal valves C2 and C3.
2. Hook-up turbo pump to this section, pump out the hose, and isolate turbo.
3. Turn off ion gauge X10C Mirror and ion pumps C4 and C5.
4. Notify the Coordinator (Beeper 5824).
5. Coordinator places Yellow Tags on valves C2 and C3.
6. Slowly bleed-up the section with boil-off LN2 while Coordinator monitors pressure on ion gauge C2 between valves C2 and C3 (monochromator).

### **B. Return to Operation**

1. Pump section down to  $<5.0 \times 10^{-8}$  Torr, isolate turbo.
2. Notify Coordinator (Beeper 5824).
3. Open valves C2 and C3, Coordinator confirms X10 Front End pressure is  $<2.0 \times 10^{-9}$  Torr.
4. If pressure is satisfactory, Coordinator removes Yellow Tags from valves C2 and C3.
5. Remove unprotected turbo pump from this section.\*\*

### **\* 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.**

NSLS REVISION/REVIEW LOG	
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> See NSLS Quality Control Coordinator for review signatures <

REVISION TABLE		
Rev	Description	Date
B	Significant changes to beamline configuration	02/07/02