

Brookhaven National Laboratory/ LIGHT SOURCES DIRECTORATE						
Subject:	Ventilation Check Procedure for Protein Crystallography					
Number:	LS-ESH-0064	Revision:	1	Effective:	05/22/09	Page 1 of 4
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1. Purpose

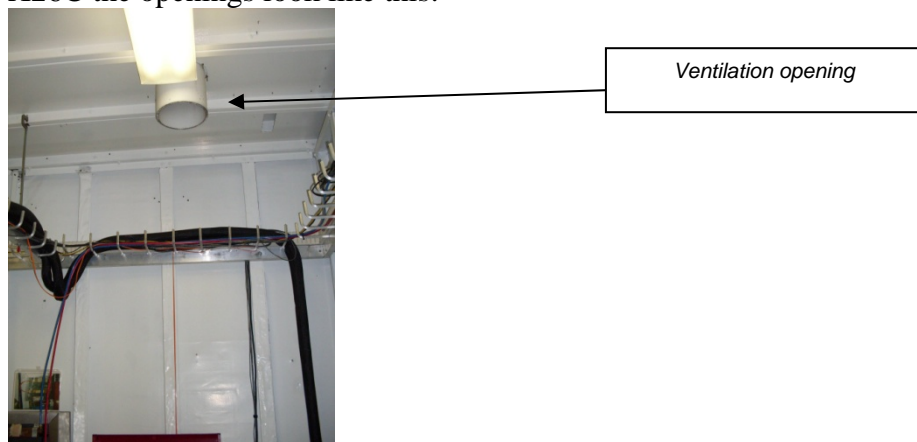
The protein crystallography (PXRR) beamlines at NSLS require a LN2 storage dewar inside the hutch which continually flows nitrogen across a sample. These inside dewars (typically 50L) have an auto-fill system and are connected to larger dewars situated outside the hutch. The normal and postulated accident conditions require some ventilation in the area to prevent oxygen displacement. This procedure provides a means to take an approximate measurement of flow through at least one of the ventilation fans to ensure the minimum acceptable air flow rate of 80 cfm. The fans are rated at 525 cfm, and most hutches have more than one fan.

2. Scope

There are currently 10 PXRR beamlines at NSLS. Eight require annual fan checks. These are: X3A, X4C, X6A, X8C, X12B, X12C, X25, and X26C. Two have independent ventilation (X4A and X29A), and do not rely on fans for ventilation. The X4A hutch has an independent air conditioning system which circulates cooled air into the hutch and is required for temperature control of the experimental equipment. A loss of cooling air flow would be quickly observed due to heat load. The X29A hutch has an air duct from the building ventilation system connected directly into the hutch.

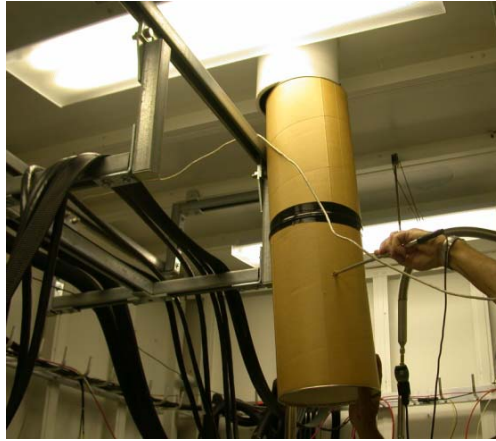
3. Procedure

There are several configurations for ventilation openings in the hutches. For X6A, X12C, X25 and X26C the openings look like this:

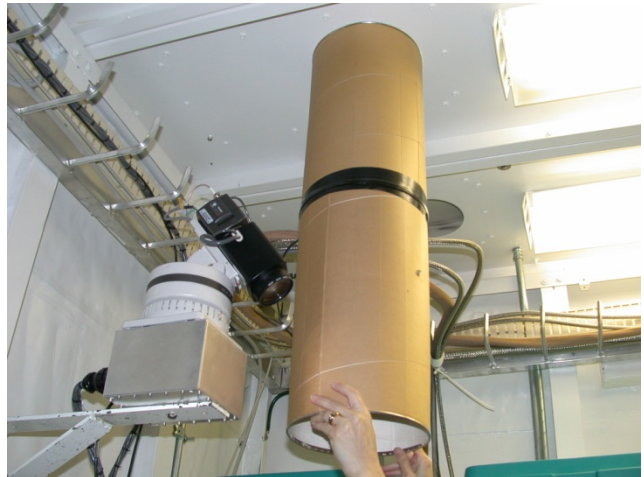


There are two ways to perform a fan check. The velometer can be held directly against the opening, or at the end of the ventilation test jig as shown below. If the ceiling is very high, it is easier to hold the test jig against the opening. Two people are recommended for this operation. The fan opening and test jig opening is 9.5" in diameter. Since the velometer can only convert to cubic feet per minute (cfm) when the opening diameter is in whole numbers, measure the linear fpm and multiply by the area of 0.49 ft².

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For X3A and X8C the opening looks like this:



The velometer may be held against the opening, or the test jig can be used.

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For X4C and X12B, the fans can be tested from outside the hutch:



X4C



X12B

4. Recordkeeping

Flow in each hutch must be verified greater than 80 cfm, with the exception of X4C (50 cfm). Flow verification records are kept by the ES&H Coordinator.

5. Attachments

5.1 PXRR Ventilation Check

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PXRR Hutch Ventilation Annual Check

Hutch	Linear FPM	Area ft ²	CFM Lfpm * area	Required CFM	PASS Y/N
X3A		0.49		80	
X4C*		0.11		50	
X6A		0.49		80	
X8C		0.49		80	
X12B		0.49		80	
X12C		0.49		80	
X25		0.49		80	
X26C		0.49		80	

* X4C has a lower flow requirement (50 cfm) due to lower LN2 capacity

Name:

Life#:

Signature: