Certification and Ducting of Biosafety Cabinets in Research and Teaching Laboratories

Scope/Summary: This policy outlines the requirements for certification and proper ducting of Biological Safety Cabinets (BSCs) at MIT.

Background: It is the Committee on Assessment of Biohazards and Embryonic Stem Cell Research Oversight (CAB/ESCRO) policy that Biological Safety Cabinets used in research or teaching laboratories be certified annually and after every move or relocation to verify proper function.

In many instances BSCs are used for handling Risk Group 1 or 2 microorganisms or human cells along with non-hazardous chemicals or reagents. In these cases, a certified and properly functioning Class II Type A2 BSC is designed to safely recirculate back into the lab without the need for additional ventilation.

However, some experiments requiring the use of a BSC can also involve the use of small volumes of volatile chemicals or radioactive materials. If research personnel use volatile materials in a non-vented cabinet, odors or trace chemicals could be discharged into the lab environment. The thimble or canopy connection to the building HVAC exhaust system prevents the release or discharge of odors, fumes or trace chemicals directly into the laboratory environment.

Installation of any biosafety cabinet must be done in consultation with the EHS Biosafety Program. Risk assessment of proposed future work and that registered in the Biological Research Registration will determine the appropriate ducting of the biosafety cabinet to be installed. It is recommended that every lab retain one biosafety cabinet that is canopy or thimble connected if possible in order to allow for research flexibility.

Work at BL2+ containment must follow CAB/ESCRO Policy 01 whereby BSCs are thimble or canopy connected unless otherwise approved by the committee. At BL2+, thimble connections provide an additional level of safety in the rare event that HEPA integrity is lost.

I. Certification

- New BSC's must be certified upon installation and on an annual basis to ensure proper functioning.
- BSC's must be recertified after every move or relocation. Experience has shown that it is possible to damage or shift the "seating" of the HEPA filters within cabinets during relocation.
- The Primary Investigator (PI) is responsible for ensuring the BSC(s) in their lab remain certified.

II. Ducting

- Only Type II Class B BSCs that are hard ducted to the building's HVAC systems are appropriate for use with volatile toxic chemicals or volatile radioactive chemicals in greater than minute quantities.
- Use of minute amounts of volatile toxic chemicals or volatile radioactive materials in Class II Type A2 BSCs requires that the cabinet be vented to the outside via a thimble or canopy connection to the building's HVAC system.
- BSCs that are canopy or thimble connected should also have an audible and visual alarm that will indicate if the building ventilation exhaust fan fails (per NSF/ANSI 49 Standard update, January, 2011)[i]

References:

[i] The NSF/ANSI 49 Standard, which establishes the design and certification parameters for Biosafety Cabinets, was recently modified (January, 2011) to include the requirement that Class II Type A2 BSC connected to a building HVAC system via a thimble or canopy connection should also have an audible and visual alarm that will indicate if the ventilation exhaust fan fails.

Revision History:

Approved 03/11/2011
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