

Bunsen burner and biosafety cabinets

Hazards of using a Bunsen burner inside a BSC

Although the use of Bunsen burners has long been an accepted practice in microbiological laboratories to ensure sterility, this should not be carried over into biological safety cabinets (BSCs). BSCs provide a near microbe-free environment and burners are not necessary. In fact, open flames disrupt the laminar air flow of a BSC, compromising protection of the worker and the sterility of the product. The excessive heat buildup may damage the HEPA filters and compromise cabinet integrity.

Also, the use of natural gas inside a BSC is a fire hazard. Most of the BSCs used in the University of Cincinnati recirculate air within the cabinet (i.e. Class II type A2 – former A/B3) and if flammable vapors or gases are allowed to recirculate inside the equipment, an explosion may occur. With time, because the cabinet circulates air, even trace amounts of flammable gas released inside of the cabinet may reach considerable concentrations which may be ignited by any spark (blowers are not spark proof).

If I use a canopy to “vent” my BSC, do I eliminate such hazards?



NO. Canopies (also called thimble connections) are sometimes connected to Class II type 2 cabinets as an alternative for experiments involving volatile toxic chemicals and/or radionuclides which need a sterile environment. This way, hazardous materials which cannot be filtered by the HEPA filters are not released inside the room. Those connections are not, however, an option for the hazards caused by a Bunsen burner inside the equipment.

The risks of containment loss and fire remain the same regardless of the use of a canopy. Regarding the fire hazard, remember that the risk is inside and not outside of the equipment. The only BSCs which would eliminate fire risk would be BSCs with 100% exhaust through the building (i.e. Class II type B2 or Class III).



Alternatives to open flames - There are disposables that can be used, such as loops, spreaders, and other disposable equipment. Reusable instruments such as forceps, scissors and scalpels can be autoclaved. Electric incinerators or hot bead sterilizers can be used to sterilize reusable loops and may be adapted for other instruments.

If it is determined that a flame is absolutely necessary, there are touch plate burners that operate with a contained pilot light so that an open flame is only present when your hand is resting on the touch plate. Additional requirements for use of this device are that there be a gas shut-off valve outside the cabinet, the devices must be turned off when not in use and that the proper hose or tubing be used for connection. It is also suggested that these devices be used as far to the back of the cabinet as possible.

For additional information, please contact the Biosafety Office at 558-6182 & 558-5210 or inbiocom