Use of Gas Burners in Biosafety Cabinets

Background

Early microbiologists had to rely on open flames to ensure sterility while engaging in certain techniques. With the advancement of modern technology, including the introduction of the Biosafety cabinet, the use of an open flame is almost always no longer necessary. In fact, the use of open flames in a Biosafety cabinet

- disrupts the air flow, compromising protection of both the worker and the work
- causes excessive heat buildup, may damage HEPA filters and/or melt the adhesive holding the filter together, thus compromising the cabinet’s integrity
- presents a potential fire or explosion hazard. Electrical components such as the fan motor, lights and electrical outlets are not designed to operate in flammable atmospheres, where a flash fire could be ignited by a spark.
- inactivates manufacturers warranties on the cabinet: cabinet manufacturers will assume no liability in the event of fire, explosion or worker exposure due to the use of a flammable gas in the cabinet. Additionally, the UL approval will automatically be void.

A recent laboratory fire at NC State University emphasizes the need for investigators to routinely re-evaluate common procedures in the laboratory. Does your lab use an open flame in the vicinity of any alcohol or flammable liquid to sterilize implements? Could flammable gases be ignited by an open flame? Many alternatives exist that are preferable to the use of an open flame.

NC State University has taken a strong stance against the use of gas burners in biological safety cabinets. NC State University will avoid the installation of natural gas in new or relocated biological safety cabinets. Gas lines should be removed from existing cabinets.

Alternatives

Alternatives for researchers that need to disinfect instruments in a Biosafety cabinet or in the vicinity of flammable liquids include:

- Bact-Cinerator (see example)
- The Electric Bunsen Burner (see example)
- Glass bead sterilizer (see example)—good for use with a steel spreader (example);

Alternatives that avoid the need to disinfect instruments with an open flame:

- disposable plastic ware;
- pre-sterilized inoculating loops, needles, and cell spreaders;
- pre-autoclaved forceps, tweezers scalpels, etc. in covered autoclavable plastic containers or the special sleeves supplied for this use by various companies. These can be used individually, then placed in an autoclavable discard tray for autoclaving and reuse.

EHS is available for consultation regarding alternatives to the use of open flames: 515-6858.