TEXAS A&M UNIVERSITY SAN ANTONIO
Research and Academic Environmental Health & Safety

Fact Sheet: Safe Alternative to Open Flames in a Biosafety Cabinet

Use of an open flame (bunsen burner) within a biological safety cabinet (BSC) directly impacts the BSC's laminar air flow and compromises its efficiency and user safety.

- *Air flow disruption*. Heated air from an open flame mixes with the Class II BSC's downward laminar flow to produce turbulence and recirculation inside the work area. Aerosolized particles will be distributed throughout the BSC, compromising both personnel and product protection.
- *Excessive heat build-up*. This can damage the HEPA filter and housing resulting in loss of BSC integrity and migration of contaminants into and out of the BSC. Additionally, loss of media components (e.g., growth factors, amino-acids, and vitamins) and heat-sensitive cell lines as well as worker discomfort impact research stability and quality.
- *Fire or explosion hazard*. Excessive heat may cause flammable liquids used for disinfection to vaporize creating a flammable atmosphere. An open flame or electrical discharge may ignite the vapor causing a flash fire or explosion.
- *Void Manufacturer's Warranty and UL Listing*. Fires within a BSC caused by use of open flames will nullify the manufacturer's warranty and UL listing.

What I need to know

Do not use an open flame in the BSC. The BSC provides a near microbe-free environment.

Heated air in the BSC disrupts laminar flow and impacts the HEPA filter/housing, media, cell lines, and workers.

Safe alternatives to bunsen burners

- Use disposable sterile loops and sterile lab supplies. This eliminates the need to use open flames for sterilizing.

- Autoclave utensils and equipment prior to use. Place loops, spreaders, needles, forceps, scalpels and other tools in autoclavable plastic or wrap in autoclavable foil.

- Use a Bacti-Cinerator to sterilize loops and needles safely and conveniently while preventing infectious spatter and cross-contamination.

- The Electrical Bunsen Burner combines the efficiency of a gas burner of an electric heater. It is ideal for sterilizing inoculating needles and loops, and for heating small flasks, test tubes, and beakers.

- The Bead Sterilizer provides a safe, effective, and convenient method for sterilizing small instruments without using flames, gases, or chemicals.

References

1. USC Safe Alternatives to Open Flames in BSC
2. Biosafety in Microbiological and Biomedical Laboratories (BMBL) 6th edition.
3. WHO Biosafety Manual 4th Edition, WHO 2020
4. Sterile disposable loops (Fisher Scientific catalog #22-363-596)
5. Bacti-Cinerator (VWR catalog #101412-622)
6. Electrical Bunsen Burner (Daigger Scientific catalog #EF3540)
7. Instrument Micro Bead Sterilizer (Kent Scientific Corporation)