

# Danger of Open Flames in Biosafety Cabinets



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Don't let this be your Biosafety Cabinet!

## ENVIRONMENTAL HEALTH & SAFETY

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Use of open-flame natural gas burners in a Biosafety Cabinet (BSC) increases the chance of a fire.

### Overview

**Two recent USC fires were caused by the use of a Bunsen burner in a BSC.** The cabinets recycle a percentage of air and can build up gas vapor from tubing leaks and incomplete combustion, and vapor from alcohol and other solvents present.

Open flame sterilization of utensils and surfaces in microbiological laboratories is a common practice that unfortunately migrated to Biosafety Cabinets. Use of a Bunsen burner to flame sterilize bacteriological loops and needles, bottles, tweezers, scissors, and scalpels is unnecessary and presents several hazards: fire, explosion, disrupted air flow, heat damage to the HEPA filter, and a voided manufacturer warranty. Biosafety Cabinet manufacturers are opposed to the practice and will not assume liability in the event of fire, explosion or worker injury if natural gas is used within their cabinets. Gas connectors are generally now provided only upon customer insistence.

### Discussion

Bunsen burners are no longer necessary to ensure sterile utensils and surfaces. The Center for Disease Control and Prevention (CDC) states that “open-flames are not required in the near microbe-free environment of a biological safety cabinet” and “create turbulence which disrupts the pattern of air supplied to the work surface” jeopardizing the sterility of the work area. The major Biosafety Cabinet manufacturers and the World Health Organization (WHO) also strongly discourage the practice.

Autoclaving or use of disposable sterile loops are preferred alternatives. When absolutely necessary, use a touch-plate microburner. This type of burner produces a flame only when the user’s hand rests on a connected platform.

### Recommendations

- Use disposable sterile loops;
- Autoclave utensils and equipment;
- Replace Bunsen burners with electrical incinerators for sterilization;
- Minimize flammables in the BSC: keep only amounts needed for the shift;
- If a flame is absolutely necessary, use a touch-plate microburner to provide flame on demand; this reduces the risk of maintaining a full flame by negligence and conserves gas consumption.

Potentially dangerous experiments should never be left unattended, especially when an open flame is involved.

Contact EH&S for a hazard evaluation prior to use of toxic, explosive or flammable substances in your BSC.

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