

Bunsen burners are commonly used in laboratories to create a sterile environment for biological procedures and equipment sterilization. Traditional Bunsen burners use a natural gas line in a laboratory bench connected to a burner to create an open flame. In the presence of flammable chemicals, they create a higher risk for fires and injuries. Additionally, piped natural gas can increase the risk of a gas leak in laboratories.

Hierarchy of Controls

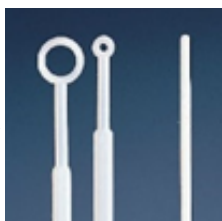
When biological procedures require sterilization, consider other options over the piped natural gas Bunsen burner model. The hierarchy of controls listed below should be implemented based on laboratory operations. They are listed from most protective to least protective.



Bunsen Burner

When using open flame burners, always employ best practices:

- Inspect the Bunsen burner and tubing (if applicable) regularly.
- Tubing should consist of a flame-retardant material. Replace the tubing if it is frayed or damaged.



Elimination: Disposable Plastic Loops



Substitution: Bead Sterilizer

- Never leave an open flame unattended, turn off equipment when not in use.
- Remove all flammable materials from the immediate area, and do not keep an open flame under a low shelf
- Use caution near the open flame. Do not reach over the flame, and be sure to wait for the burner to cool before touching.

Hot Tip!

Do not use a Bunsen burner inside of a biosafety cabinet. An open flame will disrupt the integrity of the HEPA filter, compromising the biosafety cabinet.



Engineering: Touch activated flame burner

Hierarchy of Controls (cont.)

Elimination

Eliminate the open flame. Instead, use a laminar flow hood, biosafety cabinet, and disposable or autoclaved tools.

Substitution

Substitute the open flame for an alternative heating method.

Options include electric heating burners, bead sterilizers, or micro incinerators.

Engineering Controls

Remove the risk of an open flame as much as possible. Options include burners that prevent a continuous flame via touch activation mechanisms and have built-in safety features such as automatic shutoff.

Note: alcohol lamps are not permitted in laboratories and FDNY regulations limit butane. Contact EH&S at labsafety@columbia.edu if you are considering either of these options.

Administrative Controls

Include open flame safety and training in SOPs. This includes designating locations for burner usage far from flammable chemicals, low shelving, and checks to ensure natural gas lines are turned off at the end of a procedure.

PPE

Standard laboratory PPE must always be used. This includes a lab coat and safety glasses. And appropriate gloves. Long hair should be tied back.

Have more questions? Reach out to EH&S at Labsafety@columbia.edu or give us a call

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