

INDIANA UNIVERSITY-PURDUE UNIVERSITY AT INDIANAPOLIS
LABORATORY SAFETY POLICY

Subject: Policy for the Safe Use of Gas Cartridge Bunsen Burners

Effective Date: 11/18/2011

Approved: Laboratory Safety Committee

Policy: 126

PURPOSE AND BACKGROUND:

Bunsen burners and compressed flammable gas cartridges present hazards to the IUPUI community. Bunsen burners produce an open flame and burn at a high temperature, and as a result, there is potential for an accident to occur. Flammable gas cartridges contain flammable gas under pressure and have the potential for explosion and/or fire. The following policy was created to ensure the proper use and storage of these devices.

SCOPE:

This policy applies to all University research laboratories and any auxiliary laboratory support areas. This policy must be followed by all staff, faculty, students and guests of the University community.

POLICY:

Authority and Responsibility

Environmental Health and Safety is responsible for:

1. Developing and implementing a gas cartridge bunsen burner safety policy;
2. Assessing the safe use of gas cartridge bunsen burners and proper storage of unused gas cartridges during annual laboratory safety inspections.

Laboratory Directors or Principal Investigators are responsible for:

1. Complying with all aspects of the Policy for the Safe Use of Gas Cartridge Bunsen Burners;
2. Ensuring all staff, faculty, students and guests of the University comply with all aspects of the Policy for the Safe Use of Gas Cartridge Bunsen Burners.

Departments are responsible for:

1. Ensuring that the principal investigator complies with the procedures in this policy;
2. Assuming the responsibilities of the Laboratory Director or Principal Investigator if the area is a shared space such as a cold room or teaching lab.

Burner Requirements

Gas cartridge bunsen burners must have the following safety controls:

- a) Flame monitoring
- b) Over-temperature switch
- c) Footswitch or handswitch activation
- d) No more than 2 burners may be used in 500 square feet of laboratory space.

For examples of suggested models please see appendix A.

Gas Cartridge Requirements

- a) No more than 2 cartridges that are not in use may be stored in 500 square feet of laboratory space.
- b) Footswitch or handswitch activation
- c) Utilize a gas cartridges containing no more than 250g of gas
- d) Empty gas cartridges may be disposed of in the general waste stream

Gas Cartridge Storage Requirements

- a) Store in a well-ventilated area, well away from all sources of heat and ignition.
- b) Do not expose containers to a temperature greater than 50°C
- c) Do not store in a vehicle (heating by the sun)
- d) Do not store with acids, bases, oxidizing agents or combustible materials

Burner Safety

- a) Keep open flame away from any overhead shelving, equipment or light fixtures.
- b) Ensure all papers, notebooks, combustible materials and all flammable chemicals are removed from the area where the burner will be used.
- c) All long hair, dangling jewelry, or loose clothing must be tied back or confined when using an open flame.

- d) Do not use an open flame within 5 feet of flammable chemicals.
- e) Notify laboratory personnel present in the lab that the burner will be in use.
- f) Follow all manufacturer instructions for the use of the burner.
- g) Allow the burner to cool before handling.
- h) Do not use bunsen burners or open flames in biosafety cabinets

NONCOMPLIANCE/PENALTIES:

Staff, faculty, students and guests of the University whose willful actions violate existing federal and state regulation may be held criminally and civilly liable for their actions.

In the event the University is cited and fined by federal, state or local regulatory agencies for actions or activities contrary to the procedures in this policy, the department(s) involved in the citation may be accountable for payment of the issued fine.

In addition, the University may initiate disciplinary actions, up to and including dismissal, against any staff or faculty found to be in violation of this policy.

PROGRAM OVERSIGHT AND EMPLOYEE ASSISTANCE:

The Department of Environmental Health and Safety will serve as a technical resource for the implementation of this program. The Department will also serve to oversee the development and implementation of any educational materials as needed.

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Appendix A-Examples of approved models

FIREBOY Safety Bunsen Burner



Working with an open flame is an integral part of many routine applications in life sciences and chemistry laboratories. But the dangers of working with alcohol burners, ordinary gas cookers or standard Bunsen burners connected to the house gas system should not be underestimated. Hence, it is not surprising that explosions and fires caused by such devices are common sources of laboratory accidents.

The FIREBOY Safety Bunsen Burner was developed to eliminate these dangers. Its elaborate design provides the user with the most convenient way of operation and at the same time meets today's highest safety standards. Safe operation DVGW* safety certified, the FIREBOY is proven to ensure highest application safety by eliminating the risk of gas leaking and explosion. With the FIREBOY, gas flows and the flame ignites only if consciously activated by the operator. To prevent unignited gas leakage, the FIREBOY automatically tries to reignite the flame if it accidentally extinguishes.

Should it for any reason fail to do so, the unit will interrupt the gas supply. An automatically shut off after a user-defined maximum burning time, eliminates any danger if the unit is unintentionally left on.

Convenient handling

The FIREBOY is built to provide a convenient operation. All functions are easily controlled by the intuitive graphical user interface. Gas ignition is both rapid and safe - the FIREBOY requires no lighter or matches. The FIREBOY can be operated in different operation modes. The automatic ignition, triggered by the optical sensor or the foot switch, allows hands-free operation.

Independent and portable

The FIREBOY provides you with maximal flexibility if equipped with a rechargeable battery and a gas cartridge adapter. All adapters can be easily connected to the FIREBOY by a proprietary quick coupling system - a perfect solution for working in a laminar bench flow or even outdoors.

Functional and robust design

The FIREBOY requires only minimal bench space. It is robust and cannot tip over during use. The smooth, chrome-plated metal housing is easy to clean and provides both UV and solvent resistance. To protect the burner chamber from contamination when working with liquids, the folding stand at the base of the FIREBOY can be used to incline the device.

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Safer than Bunsen burners, ensures the maximum level of laboratory safety

- Unique safety features
- Two-year manufacturer's warranty
- All stainless steel exterior construction provides optimum sterility
- Each unit includes a SS windshield (2069N54)
- Conforms to CE, DIN 30665 Part 1 and GS-DVGW

Safety laboratory burners are ideal for use in microbiology, cell biology and biotech laboratories. Designed for heating and flame sterilization, Gasprofis make controlled heating of media and bottle neck flaming easy.

Gasprofi burners include a number of safety features to ensure the maximum possible level of laboratory safety. The exclusive DoubleClick IR-Sensor permits operation only if the sensor is activated twice. Unintentional ignition is not possible and safety is considerably improved. The Safety Control System (SCS) shuts off the gas supply if the unit overheats, if the electrical supply is interrupted or if the flame is extinguished. Unique burner head control extinguishes the flame should the burner head become soiled. The Gasprofis are equipped with internal timers if a defined burning time is needed. For the short-term range (2-25 sec), conventional footpedal operation should be used. The flame stays on as long as the footpedal is pressed. For the long-term range, the start-stop function with 5-60 minute timer should be used. Stand-by mode automatically shuts off unit after a period of non-use. Pre-set burning time and all other gas and burner functions are microprocessor-controlled. Applying pressure to the foot pedal ignites the flame, which is extinguished upon release. The flame monitor ensures a safe operation of the flame. Flame intensity up to 1350°C.

Convenient and versatile, burner can run on natural gas, propane or butane (for portability) and nozzles for each are included. Power can be supplied to the foot pedal or directly to the unit. Burner head removes easily for cleaning and replacement. Inline gas filter protects the valve against soiling. Adjustable tilt mechanism, on both sides, protects the burner tube against spilled liquids, which drain out through the bottom. All models include box spanner, screwdriver, tubing connector and instruction manual. The Safety Control System constantly analyzes

potential sources of danger and, if necessary, initiates protective measures.

Controlled heating is made possible through a stainless steel foot pedal (included) that regulates the burning time by continuous pressure or by stop/start and allows the highest degree of safety and comfort in the smallest possible space. Gasprofi 1 comes with two foot-pedal operating modes. Finely graduated regulators for gas and air allow infinitely variable regulation of the flame's size and intensity up to 1350°C. Complete stainless steel construction guarantees a high level of working sterility. Dimensions, mm: 98 W x 60 H x 110 D; Weight 3.3 lbs.

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StarFire Bunsen Burners



StarFire Bunsen Burners

The Argos StarFire ST and XT offer a safe alternative to standard laboratory Bunsen burners. The stainless steel body and compact size make it ideal for use in laminar flow hoods. Both units can be operated with standard house gas or with an integrated gas cartridge (sold separately). As an added safety feature both models include an overheating protection system that automatically shuts off the gas should the unit overheat. Gas supply is also cut off if the flame is extinguished for any reason. Burner head can be easily removed for cleaning any spilled liquids.

StarFire XT: Power Supply, 3.6V NiMH battery pack, two nozzles (propane & butane/natural gas) and gas tubing adapter.

StarFire ST: Power Supply, two nozzles (propane & butane/natural gas) and gas tubing adapter.

UltraFire

The new UltraFire from Orange Scientific offers a free control without any physical contact over the totally independent unit. A simple movement of the hand or even of a test tube in front of the modern infra-red sensor will automatically ignite the flame. A rechargeable built-in battery offers electricity independence.

A single disposable gas cartridge is sufficient for the sterilization of approximately 1500 inoculation loops. If needed, the UltraFire can also be connected directly to electricity and to a gas cylinder.

But however it is used, the innovative UltraFire provides optimal safety and ease of operation.

UltraFire switches itself off if:

- the flame is extinguished
- there is a power cut
- the maximum flame temperature is exceeded

In addition, an optical alarm warns for safety switch-off. Even if the instrument is connected to the mains, a voltage of only 7.2 V is used - a further safety aspect.

Ergonomically designed for ease of handling

UltraFire is compact and well-designed. The buttons for setting gas, air and operating time are easy to operate and the inclined keyboard is easy to clean. LEDs indicate the operating mode.

3 operational modes in one!

Sensor

Nothing could be simpler! In this operating mode, all you have to do is pass your hand max. 6-8 cm over the sensor and it will ignite automatically. And it can be set to extinguish itself automatically 3 to 12 seconds after ignition.

Foot switch

Here, the flame is ignited and extinguished by a simple foot switch - hence enabling individual ignition times to be used keeping both hands free for other operations.

Continuous

In this mode, the flame is ignited by pressing a button and remains so until extinguished. A safety timer is incorporated that switches off the instrument if it is not used (settable from 10 to 60 minutes).

