

Standard Operating Procedure: Propane-style Torch Use

Description

This standard operating procedure outlines the handling and use of hand torches attached to a propane or butane fuel cylinder. Review this document and supply the information required to make it specific to your laboratory. Per this document, laboratories should use appropriate controls and personal protective equipment when using hand torches. Torches produce a single open flame by burning a continuous stream of flammable gas used for heating, sterilization, and combustion.

Responsible Party

Principal Investigator (Approval)

Signature	Printed Name	Date
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Potential Hazards

Torches present burn and fire hazards due to the high-temperature open flame produced.

Engineering Controls

Non-flame alternatives shall be used where possible.

No Flames are allowed in biological safety cabinets (BSCs), ductless fume hoods, or laminar flow clean benches. Alternatives include infrared (Bacti-Cinerator) and glass bead sterilizers.

Administrative Controls

- All hand-held torches must contain an instant-off trigger.
- Hands-free torches must be attached to a non-tipping stand or placed on a holder to prevent them from falling during operation.
- When torches are not in use, the fuel bottle must be disassembled and stored in a flammable cabinet or gas cylinder cabinet (if compatible).
- Do not leave in direct sunlight. Never store at temperatures above 120°F (49°C). Never drop, throw, or puncture fuel cylinders.

Personal Protective Equipment (PPE)

- Wear appropriate laboratory attire.
- Wear eye protection (must meet ANSI Z87.1 standard). Safety glasses must be upgraded to chemical safety splash goggles if a splash, spray, or mist hazard exists.
- Wear a flame-resistant lab coat. Do not wear synthetic clothing.
- Use nitrile gloves (Note: nitrile gloves are combustible).

Essential Safety Precautions Before Start-Up

- Check cylinder and appliance seals before use. Never use cylinders with damaged or missing seals. Discard cylinders if dirt or rust particles are present in valve areas.
- If the torch is damaged, return it for repairs.
- Make sure the torch head is turned off before attaching a fuel cylinder. Be sure to hold the cylinder upright while attaching hoses or appliances. Hand-tighten only—never use tools to tighten, as overtightening can damage seals.
- Once the appliances are attached, put soapy water on the connections and look for bubbles. Also, listen for the hiss of escaping gas, feel for extreme cold, and smell for rotten egg odors. Do not use if you detect fuel leaking.

- DO NOT attempt to replace the safety orifice. The orifice has a special filter and should not need replacement. As a safety feature, the burner tube may bend if the torch is dropped. This feature protects the orifice and the torch's regulator.

Work Practice Controls

- Ensure proper personal protective equipment is worn.
- Tie-back any long hair, dangling jewelry, or loose clothing.
- Remove any overhead shelving within 3 ft above the working surface.
- Remove all papers, notebooks, and chemicals from the area.
- Know the location of the closest fire extinguisher (there should be one in the lab or the hallway).
- Notify others in the laboratory of the torch's use. Make sure a clear egress pathway is available to exit the lab in case of fire.
- Check the torch is stable on the lab bench before igniting to ensure it is not knocked over while in use.
- Open the cylinder valve when ready to ignite the torch.
- Point the torch away from yourself and light it using a flint striker or a lighter with an extended nozzle, keeping your hand away from the flame. Never use a match to ignite the torch. Adjust the flame intensity by opening or closing the cylinder valve.
- While using the torch, keep it upright.
Note: DO NOT use the torch with the fuel cylinder tipped more than 60 degrees from its upright position, as this may cause the torch to flare. If the appliance sputters or flares up, turn the cylinder upright and turn the unit off. Wait for unburned gas to dissipate before reigniting.
- Do not leave the burning torch unattended.
- Extinguish the torch by shutting off the cylinder's valve and allowing gas to burn out of the line. Allow hand torches to cool after use.
- When not in use, place the torch in the Torch Holder to keep it safe, secured, and upright. This will reduce the chances of the torch being knocked down accidentally.
- For long-term storage, detach the fuel cylinder for the hand torch when not in use and replace caps to keep valves clean.

Additional Precautions for Loop and Flame Sterilization

- Ethanol pretreatment must be thoroughly dried before flame ignition.
- Ethanol used in loop and flame sterilization must be limited to a volume of less than 20 mL.
- Ethanol beaker must be in secondary containment to prevent tipping or spilling.
- The ethanol beaker must be located at least two ft. from an open flame.

Exposures or Unintended Contact

Report all emergencies, injuries, spills, and fires to UDPD by calling 302-831-2222.

Contact EHS for advice on chemical exposure symptoms or assistance in performing an exposure assessment.

Please report all work-related accidents, injuries, illnesses, or exposures to EHS at 302-831-8475 within 24 hours and complete and submit the First Report Form at

<https://udapps.nss.udel.edu/casforms/ehs/firstreport/index.jsp>.

Complete the EHS Near Miss form and submit it to EHS as necessary:

<http://www.udel.edu/ehs/forms/downloads/nearmiss.pdf>

Accidental Release/Leak Procedure

- When a gas leak occurs, **personal safety should always come first**.
- Alert and clear everyone immediately where the gas leak occurred.
- Avoid breathing gas.
- Contact EHS 302-831-8475 for release assistance.

Decontamination and Disposal

NEVER throw cylinders in a lab trash box or the trash or recycling dumpster.

Cylinder decon is NOT necessary. All Fuel (propane, butane, etc.) bottles must be disposed of via Chemical Waste Request: https://udapps.nss.udel.edu/webforms/embtform?wf_id=316&wf_ty=blank.

Training of personnel

All personnel are required to complete the **Lab Safety Training** through SciShield, including but not limited to:

Fire Safety Training (required): <https://delaware.scishield.com/rafttraining/course/253>

High-hazard Training (required): <https://delaware.scishield.com/rafttraining/course/544>

Addendum for specific lab use of a torch

(Indicate the location and briefly describe the intended use of a torch in the lab)

Torch is used in location _____ to _____ (add details)

Certification (Please sign below)

I have read and understood the above SOP. If I plan to modify this procedure, I agree to contact my supervisor or Lab Manager.

User's Name (Reviewer)	Signature	Date Trained