

STANDARD OPERATING PROCEDURE

Updated: July 14, 2015

Hydrogen/Oxygen Hand Torch (1357 CNAM/Toll Physics)

Torches using any combination of Hydrogen or Oxygen produce a high temperature flame that can result in property damage or severe personal injury if not used properly. Exercise caution when using the hand torch. Make sure that the hand torch is properly secured when in use or stored.

Protect your eyes at all times with approved goggles. Oxygen/hydrogen heating and brazing may produce hazardous rays (infrared/ultraviolet), so an approved filter lens (at least a number five shade or darker) should be used. Do not allow bystanders to look directly at your work without proper eye protection.

Appropriate protective clothing such as gloves, aprons, safety shoes, etc. is required when using hand torch. Reflected heat, molten metal or sparks can cause severe burns to unprotected parts of the body.

Hydrogen and oxygen heating or brazing operations should be performed whenever possible in an open, well ventilated area or in a hood. Combustion fumes and fumes from material or heated flux must be adequately exhausted or dispersed from the work area. If the lab has “snorkel” exhaust to remove hazardous vapors from the benchtop, the snorkel must be placed as close as possible to the point of contaminant generation (generally within 4 – 6”).

Use only compressed gas cylinders that are approved by the Department of Transportation (DOT), and follow the instructions and safety procedures provided by your gas cylinder supplier, such as:

- Cylinders must be in the vertical position when in use and secured from falling.
- Keep cylinder valve protection caps on and valves closed whenever cylinders are not in use.
- **Place cylinders away from flames or sparks.**

Never use compressed gases from cylinders without an approved gas pressure regulator attached to the outlet of the cylinder. Use caution to keep flames and heated objects away from the gas hoses. Use only a spark/friction lighter or approved pilot light to ignite the flame at the torch tip. Never use a match or cigarette lighter.

It is recommended that flash arrestors be installed in the system between the regulator and the torch.

Connect hoses to properly selected regulators and flash arrestors. Before lighting torch, test all connections with a dilute solution of soap and water. Never test with or near an open flame.

Lighting and flame adjusting

- To light the torch, open the hydrogen valve only and light with an approved lighter.
- Once lit, add oxygen.
- Continue to add hydrogen then oxygen alternately until the individual whole flames just raise from the tip. Then reduce the gases slightly. This will prevent the tip from overheating. If the tip overheats, change to a smaller size tip. An overheated tip indicates an insufficient supply of hydrogen and oxygen.
- A hydrogen/oxygen flame is nearly invisible since there is no carbon in hydrogen. Viewing the flame against a black background or with reduced lighting greatly improves the visibility of the flame.
- Shutting down the torch: close the oxygen valve first, then close the hydrogen valve.

Always close cylinder valves when torch setup will be left unattended. Then bleed the oxygen and hydrogen lines.