SafetyNet #2

UCDAVIS SAFETY SERVICES

OXYACETYLENE SAFETY GUIDELINES

Last Revised: 4/13/17

A. Summary

Oxygen and acetylene are a common fuel/gas mixture that make up oxyacetylene, which is used for welding activities. Oxygen alone is not flammable, but it is an accelerant, making the contents it comes into contact with burn hotter and faster. Acetylene, on the other hand, is an extremely flammable gas. Acetylene cylinders are equipped with a porous material which are filled with acetone. Acetylene gas dissolves in acetone (a flammable solvent), allowing the acetylene to be handled safely; however, there are still safety concerns in regards to storage. Acetylene cylinders must **NEVER** be stored on the side, because it can make the acetylene come out of solution, causing a dangerous increase in cylinder pressure. Acetone could also be drawn into the flame burning in the torch, and cause a flashback; an explosion that progresses through the torch.

B. Flashback Arrestors

Environmental Health & Safety (EH&S) recommends that all oxyacetylene rigs be equipped with flashback arrestor (gas safety) devices for the best protection against accidental flashback and explosion.

Flashback arrestors offer triple protection against explosions by providing:

- A filter that stops the flame from traveling back to the regulator.
- A check valve that stops reverse flow of gases.
- A cut-off valve that stops the flow of gases.

Check valves are also safety devices, but they do not provide the same level of protection as flashback arrestors. While properly maintained check valves prevent reverse flow of gases, they may not stop a "flame front" traveling back to the regulator.

Flashback arrestors are sold in a set of two (one for oxygen and one for acetylene), and are permanently mounted on the oxyacetylene rig between the regulators and hoses. They can be regularly tested "in line" without disconnection.

C. Acetylene Regulator Maximum Pressure

Acetylene line pressure that exceeds 15 psig is extremely **DANGEROUS**. Acetylene gas can become unstable and violently decompose when more than 15 pounds of pressure is used, so it is imperative that pressure never exceed 15 psig when working with university equipment.

D. Gas Cylinder Storage

Refer to SafetyNet #60: Compressed Gas Safety for information on proper storage and handling of backup or empty gas cylinders. Always store acetylene gas cylinders upright and properly secured.

E. Fire Department Notification and Permits

Supervisors are responsible for notifying Fire Department Dispatch before the start of welding/cutting operations, pursuant to UC Davis Policy and Procedures PPM 390-40 and PPM 290-86. An Online Hazardous Conditions (Hot Work) Permit must be submitted at least 72 hours before the start of work. Notification must be done before the start of each job, unless the work is in a permitted location where welding is routinely done. Fire Prevention Services requires a fire watch be maintained for at least 30 minutes after the completion of cutting and welding activities. Contractors must also obtain a UC Davis Fire Department Hazardous Conditions (Hot Work) permit.

If you are unsure whether your procedure requires a permit, consult Fire Prevention Services (530-752-1493).

F. Basic Handling Information

- Never allow oxygen to contact oil, grease, or other combustible materials.
- Use the proper regulator for each specific gas.
- Only qualified technicians should repair a regulator.
- Keep regulators free of oil, grease, and other combustible materials.
- Never starve a tip (not supplying enough fuel to heating tips); this can cause a flashback.
- Always store and use cylinders in an upright position.
- Never stand in front or behind a regulator when opening the cylinder valve. Stand to the side.
- Do not open acetylene cylinder valves more than 1 1/2 turns.
- Always make sure the working area is safe and free of combustible materials.