MSHA's Accident Prevention Program
Safety Idea

Safety and Health are Values!

Hazards of Acetylene Gas

Acetylene is the most common gas used for fueling cutting torches. When mixed with pure oxygen in a cutting torch assembly, an acetylene flame can reach a temperature of 5700 F. ACETYLENE IS EXTREMELY FLAMMABLE AND EXPLOSIVE. Many users may not be aware of the unique characteristics of acetylene that create special hazards compared to other fuel gases. These hazards include the following:

- Acetylene is chemically unstable which makes it very sensitive to conditions such as excess pressure, excess temperature, static electricity, or mechanical shock. Exposure to any of these conditions can cause it to undergo a violent, explosive decomposition reaction. If this reaction or ignition occurs within the torch base or supply hose it can propagate back into the storage cylinder causing it to explode violently.
- Acetylene is very easy to ignite. In fact, the energy from a static spark capable of igniting acetylene is lower than for any other fuel gas except hydrogen. The static charge developed by walking across a carpet floor on a dry day can be 1700 times greater than that needed to ignite acetylene! When unburned acetylene gas is discharged from a torch, static electricity can be generated at the torch tip. If the tip comes in contact with a ground path, a static spark capable of igniting the gas can occur.
- Acetylene burns at a very fast rate. The very fast burn rate can accelerate the rate at which pressure is generated in an explosion beyond what would occur for other fuels. This makes acetylene explosions more violent than those of other fuels.
- Acetylene forms explosive compounds with copper, brass, copper salts, mercury/mercury salts, silver/silver salts and nitric acid. Under no circumstances should acetylene gas come in contact with unalloyed copper, except in a torch. Any contact of acetylene with high-alloyed copper piping will generate copper acetylide, which is very reactive and may result in a violent explosion. Also, an explosion hazard will result if the gas comes into contact with silver bearing materials such as those used in silver-brazed pipeline joints.
- For additional detailed information on the hazards of acetylene, visit: http://www.mshas.gov/alerts/hazardsofacetylene.htm

Issued:	04/19/2002
Tag #	AP2004-M105