



## 001: Acetylene and Fuel Gases

### *Facts about fuel gases*

All fuel gases catch fire easily. A spark or heat source can set them off, but red heat isn't necessary for ignition—some of these gases ignite at just 600°F.

Air containing between 4% and 74% hydrogen is explosive. You've probably heard of the Hindenburg disaster, in which a hydrogen-filled airship in New Jersey essentially behaved like a bomb.

Air containing from 2.6% to 80% acetylene is explosive.

Liquefied petroleum is usually compressed to 300 PSI.

Hydrogen is compressed up to 2000 PSI.

At 25 PSI, acetylene is unstable and can explode without an ignition source. But, adding porous acetone to an acetylene cylinder safely permits higher compression.

Acetylene is usually compressed to 250 PSI—well beyond its stability point of only 25 PSI. Thus, the acetone is critical to safety.

Heat deprives acetone of its ability to hold acetylene.

Acetylene cylinders have fusible plugs that will melt at about the boiling point of water.

### *Cautions*

If an acetylene valve freezes up, thaw it with lukewarm water. Pour the water over the valve, not the cylinder.

Never use a flame to thaw a valve on an acetylene tank. Doing so is dangerous when using any compressed gas, but it is especially dangerous when acetylene is present.

Because compressed fuel gases and acetylene are liquid while under pressure, keep the cylinders positioned so that the valve is up. Otherwise, you may release shots of liquid, rather than gas. The liquid will subsequently expand and produce a pronounced concentration of gas.

If you do release a shot of liquid from a compressed gas cylinder, shut off the valve immediately. Ventilate the area to remove the gas. If the amount released was significant, report to your foreman that gas levels may be beyond safe limits.

Don't rely on a gas meter reading to determine whether an area is free of explosive gases. You must know the nature of a given gas, and know where to look for it with the gas meter. It is easy to get a false reading if you do not have training specific to using a gas meter for a particular gas.

Fuel gases and acetylene are much heavier than air. In the event of a leak, these gases will tend to sink, relative to the environment. They will fill depressions in the floor, fill toolboxes, and generally replace the safe air in lower elevations. If you check for these gases with a gas meter, look in all the low places. Remember, a concentrated pool of such gas in a low area may be hard to detect. Meanwhile, you have a fire and explosion hazard.

Hydrogen is 14 times lighter than air, and will rise above normal air. You could be breathing clean air under an explosive hydrogen blanket and not know it.

### *Discussion leader duties for this session:*

Obtain a gas welding rig (compressed gas, carts, valve/regulator assembly, hoses) for demonstration during the discussion portion.

### *What this Safety Talk covers:*

How to prevent acetylene and fuel gases from igniting or exploding.

### *Discussion notes :*

