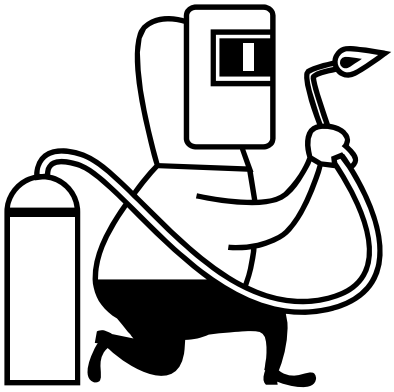

Gas Welding

There are many safety factors to consider for the safe use and storage of gas welding equipment and industrial gas cylinders. A good sound knowledge of this information will protect us.

Let's first take a look at the safe storage of cylinders.

- Cylinders must be stored in a dry, protected and well-ventilated area, and securely fastened in an upright position. They must be placed at least 20 feet from combustibles, sparks, excessive heat and open flames. Cylinders should not be stored near stairways, elevators or shafts.
- Acetylene cylinders should be secured in an upright position prior to and during use. Acetylene is packaged in a cylinder filled with Diatemaceous Earth. The acetylene is dissolved in acetone and the solution is then pumped into the cylinder. If the cylinder is placed on its side and then set upright again, it takes some time for the system to re-equilibrate and for the acetone to drain out of the dip tube in the valve. If welding is done during this period, the weld will be high in carbon due to the acetone. If welding is done with the cylinder on its side, you may get "spitting".
- All cylinders that are not connected for use must be capped. Stored oxygen cylinders must be separated from stored fuel gas cylinders or combustibles by at least 20 feet or by a 5-foot high, fire-resistant barrier with a 30-minute rating.
- All cylinders that are connected for use must be lashed or chained; cylinders must be clearly marked to identify the contents. Mark empty tanks with the letters MT, and close the valves and replace the caps securely. Empty cylinders should never be placed where they could become part of an electrical circuit.
- Because regulators are delicate, they must be handled carefully. Never use pliers or pipe wrench to attach them. Never pound valves equipped with wheels to open or close them. "Creeping" regulators must be repaired immediately.
- Hoses should be color coded to avoid using the wrong hose. Any hoses with leaks, worn spots or burns must be replaced or repaired before use.
- Oxygen hose connections are threaded right-handed. Acetylene and other fuel gas hose connections are threaded left-handed. This helps prevent accidentally switching oxygen and fuel gas hoses.
- Hoses can be tested for leaks by immersing them in tap water or grease-free soapy water. Do not try to repair hoses with tape.
- Use only fittings that are bronze or brass (less than 65 percent copper). Never use copper because it forms copper acetylide, which can explode.
- Never use oil, grease or a similar substance on torches or regulators, because in the presence of oxygen they may burn, or if ignited, explode.
- Before hookup always make sure the cylinder outlets are pointing away from each other. This prevents improper mixtures in case a leak occurs. When opening the cylinder valve, never face the gauge--stand to one side to prevent injury caused by malfunctioning valves.
- Anyone looking directly at the flame should have eye protection with dark lenses, and if near the torch, a hood to protect against slag. Flash burns are the most common injury associated with welding; they are caused by exposure to ultraviolet light and can affect anyone near the welder even if you are not looking at the welding flame. Although this usually occurs with arc welding, anyone within about 20 feet of a welder should have polycarbonate safety glasses wih side shields, which will block ultraviolet light. Dark glasses are not required to prevent uv burns.

To properly light a welding torch:

First, purge the hoses.

- **Open the valve on the acetylene cylinder--3/4 of a turn is best, but never more than 1 1/2 turns.**
- **Open the acetylene torch valve 1/4 turn.**
- **Adjust the acetylene to working pressure (less than 15 psig or 30 psia) with the gas regulator screw.**
- **Close the acetylene torch valve.**

Follow these procedures with oxygen cylinders and torches:

- **Slowly open the oxygen cylinder valve all the way.**
- **Open the oxygen torch valve l/2 turn.**
- **Use the gas regulator crew to adjust the oxygen to working pressure.**
- **Turn off the oxygen torch valve.**

To light the torch:

- **Reopen the acetylene torch valve 1/4 turn and light the gas with a friction lighter. Never use matches.**
- **Open the oxygen valve 1/4 turn and adjust the flame.**

To shut off the torch:

- **Close the torch valves--acetylene first, then the oxygen.**
- **Close the cylinder valves again--acetylene first, then the oxygen.**
- **Open both torch valves to release the pressure.**
- **Shut off the regulator adjusting handle until you can no longer feel any spring tension.**
- **Close the torch valves.**

<u>These procedures reduce the chance of leaks and possible fire.</u>

- Leave the valve wrench on the acetylene cylinder whenever the valves are open; this permits an emergency shut-off of the gas.
- Do not leave pressure in the hoses. If you must leave the area, shut off the oxygen and acetylene at the cylinder.
- Hard, sharp tools should not be used for cleaning tips, except where such tools are specifically recommended by the tip manufacturer. Use appropriate tip cleaner or softer metal wire, like brass.
- Never weld or cut on drums, tanks, barrel or any other containers until they have been thoroughly cleaned to eliminate all flammable substances. First, use an appropriate cleaning agent and then, water or steam.
- Check out and vent all hollow spaces before preheating, cutting or welding.
- Don't weld or cut on pipes or other metals that are in contact with combustible wall, partitions, ceilings or roofs if the work is close enough to start a fire by conducting heat through the metal.