Standard Operating Procedure (SOP)
Acetylene and Oxygen Safe Use for Welding

Special Hazards of Acetylene
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 theoretically reach over 5700°F. Users of this type of equipment are generally familiar with the fire hazards associated with hot flames and the production of hot slag. However, many users may not be aware of the unique characteristics of acetylene itself that create special hazards compared to other fuel gases.

An acetylene molecule is held together by what is known as a triple carbon bond. This bond is useful in that it stores substantial energy that can be released as heat during combustion. However, the triple carbon bond is unstable, making acetylene gas very sensitive to conditions such as excess pressure, excess temperature, static electricity, or mechanical shock.

Flammable range:
Acetylene has a very wide range of flammability. The lower flammable limit (LFL) is typically listed as 2.5% and the upper flammable limit (UFL) is listed as 81%. Although acetylene will not undergo combustion at concentrations above the UFL, it can undergo an explosive decomposition reaction, even at concentrations of 100%.

- Never use acetylene or its equipment in any way not consistent with recognized good practice.
- Always maintain acetylene cutting equipment in proper working condition to prevent inadvertent leakage of acetylene or oxygen into the surrounding work environment.
- Protect all cylinders from falling objects. Avoid rough handling, dropping, or knocking of cylinders to prevent damaging the cylinder, fusible plugs, relief devices, cylinder valves or gauges. Storing acetylene cylinders on their side makes the acetylene less stable and less safe, and increases the likelihood of solvent loss and resultant decomposition.
  Acetylene cylinders should be stored and used in the upright position and firmly secured to prevent falling or being knocked over.
Acetylene gas is ignitable over a wide range of concentrations.

Ease of ignition:
Acetylene is a very easy gas 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 ignition energy of acetylene in air is approximately seventeen times lower than that of methane. 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 mixed with pure oxygen, the ignition energy of acetylene is almost 100 times lower than it is in air.

- Never discharge unburned acetylene gas from a torch except for the normal process of lighting the torch.
- Never discharge unburned acetylene gas from a torch into any type of container or vessel. 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 acetylene can occur.
Rate of combustion reaction:
Because of its simple chemical makeup and sensitive triple bond, acetylene burns at a very fast rate. This very fast burning rate can accelerate the rate at which pressure is generated in an explosion beyond what would occur for other fuels. This, in turn, can make acetylene explosions more violent than for other fuels.

- Never discharge unburned acetylene gas into any type of container, vessel, enclosure, or pipe (such as a “potato gun”) with the intent of igniting the gas to “demonstrate” the hazards of acetylene, or to propel an object from an enclosure or tube.

Because of the very fast reaction rate of burning acetylene, it is not generally possible to design an enclosure to safely vent the explosive pressures. Furthermore, because of the ease of ignition of acetylene, premature ignition is very possible. From The US Department of Labor and Industries.

ACETYLENE CYLINDERS

<table>
<thead>
<tr>
<th>Size</th>
<th>MC</th>
<th>B</th>
<th>3</th>
<th>4</th>
<th>4M</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height (in.)</td>
<td>15.4</td>
<td>23.2</td>
<td>31</td>
<td>39.5</td>
<td>38</td>
<td>38</td>
</tr>
<tr>
<td>Weight (lbs.)</td>
<td>7.5</td>
<td>23.4</td>
<td>42.3</td>
<td>73</td>
<td>98.6</td>
<td>135</td>
</tr>
<tr>
<td>Nominal Volume (cubic ft.)</td>
<td>10</td>
<td>40</td>
<td>75</td>
<td>140</td>
<td>200</td>
<td>300</td>
</tr>
</tbody>
</table>

Safe handling of acetylene cylinders
An acetylene cylinder has a different design from most other gas cylinders. It consists of a steel shell containing a porous mass. The acetylene gas in the cylinder is dissolved in acetone which is absorbed by the porous mass. Pure acetylene gas cannot be pressurized without the danger of explosion, and uses acetone to stabilize it from reacting with oxygen. For example, 1 liter of acetone has the capability to dissolve 250 liters of acetylene at 10 atmospheric pressures (ATM), this is for economical storage.

Acetylene can remove acetone from a horizontal tank easier than placed in a vertical position. If an acetylene tank is found laying down, it is critical that the tank should remain in an upright position for at least 24 hours to redistribute the acetone in the porous substrate and prevent decomposition.
Decomposition of the acetylene is triggered by heat, eg when it is:
- Placed in radiant exposures, i.e. direct sunlight or heat sources;
- Involved in a fire;
- Scorched by flames from a blowtorch; or
- Involved in a flashback.

The porous mass slows down any decomposition of the gas. From the start of decomposition to the cylinder exploding could take several hours. This should provide time for emergency action.

Decomposition can be triggered more easily and proceed more rapidly if:
- The porous mass has been damaged by repeated flashbacks;
- The cylinder has been mishandled or dropped;
- The cylinder valve is leaking; or
- The acetylene in the hoses is above the pressure recommended by the supplier.

**Flashbacks**
There are a number of incidents each year where a flashback into an acetylene cylinder triggers decomposition, leaving the cylinder in a dangerous, unstable condition, which can lead to an explosion.

Flashbacks are commonly caused by a reverse flow of oxygen into the fuel gas hose (or fuel into the oxygen hose), producing an explosive mixture within the hose. The flame can then burn back through the torch, into the hose and may even reach the regulator and the cylinder. Flashbacks can result in damage or destruction of equipment, and could even cause the cylinder to explode.

The following precautions will help to prevent flashbacks:
- Only use regulators, flashback arrestors, hoses and blowpipes designed for acetylene and oxygen, respectively, and marked and manufactured to the correct standards.
- Make sure the blowpipe is fitted with spring-loaded non-return valves.
- Use the correct gas pressures and nozzle size for the job.
- Use the correct lighting-up procedure.
  - Purge the hoses before lighting the torch to remove any potentially explosive gas mixtures.
  - Aim the gas tip upwards, acetylene is lighter than air
  - Use a spark igniter and light the gas quickly after turning it on.
- Maintain the equipment in good condition.

These measures will reduce the risk of a flashback but will not completely eliminate it. Non-return valves will not stop a flashback once it has occurred.

**Protecting cylinders from flashbacks**
Fit flashback arresters to both the oxygen and fuel gas hoses near to the regulators. Fit non-return valves (often called check valves) on the torch, to prevent back feeding of gas into the hoses. For long lengths of hose, fit arresters on both the torch and the regulator.
Flashback Arrestor

The fitting of a flashback arrester is not a substitute for safe working practice. If a flashback does occur:

- If safe, immediately close both the blowpipe/nozzle valves, oxygen first, then acetylene. (Note: this is opposite to the normal closing-down procedures); close both cylinder valves; if the flame cannot be put out at once, evacuate the area and call the fire and rescue services;
- If the fire is quickly put out, do the following:
  - Find the cause of the incident and examine all equipment for damage;
  - Do not move or vent cylinder, monitor for any heat over the next hour;
  - If a hotspot is detected, or the cylinder begins to vibrate, immediately evacuate the area and call the fire and rescue service;
  - before using again, make sure all equipment is working effectively, especially anything that might have been affected by heat. If in doubt, consult your supplier.
  - If it is safe to do so, close the cylinder valves on both fuel gas and oxygen.
  - If the fire cannot be put out at once, evacuate the area and call the emergency fire services.
  - After a flashback, carefully check for damage to the torch, hoses, regulators, flashback arresters and other components. Replace parts if you need to. If in doubt, consult your supplier.

Acetylene cylinders involved in a flash back
You should pay particular attention to any acetylene cylinder which has been involved in a flashback or affected by fire. There is a risk that the acetylene could start to decompose, and the cylinder could explode. If an acetylene cylinder becomes hot or starts to vibrate, you must evacuate immediately and call the emergency fire services.
OXYGEN

Oxygen behaves differently to air, compressed air, nitrogen and other inert gases. It is very reactive. Pure oxygen, at high pressure, such as from a cylinder, can react violently with common materials such as oil and grease. Other materials may catch fire spontaneously. Nearly all materials including textiles, rubber and even metals will burn vigorously in oxygen.

Even a small increase in the oxygen level in the air to 24% can create a dangerous situation. It becomes easier to start a fire, which will then burn hotter and more fiercely than in normal air. It may be almost impossible to put the fire out. A leaking valve or hose in a poorly ventilated room or confined space can quickly increase the oxygen concentration to a dangerous level.

The main causes of fires and explosions when using oxygen are:
- Oxygen enrichment from leaking equipment;
- Use of materials not compatible with oxygen;
- Use of oxygen in equipment not designed for oxygen service;
- Incorrect or careless operation of oxygen equipment.

Oxygen enrichment is often the result of:
- Leaks from damaged or poorly maintained hoses, pipes and valves;
- Leaks from poor connections;
- Opening valves deliberately or accidentally;
- Not closing valves properly after use;
- Using an excess of oxygen in welding, flame cutting or a similar process;
- Poor ventilation where oxygen is being used.

Never use materials incompatible with oxygen

Some materials react explosively if they come into contact with pure oxygen at high pressure. Other materials may catch fire spontaneously. Such materials are incompatible with oxygen. Equipment designed for oxygen service is made from materials and components that have been tested and proved to be compatible, and are safe for the purpose. The reasons for a particular design and choice of material are not always obvious. Using substitute materials or components, which appear to be similar but are not proven to be oxygen compatible, is extremely dangerous and has caused many accidents.

O-rings and gaskets

There are hundreds of different types of rubber and elastomer, and most are not compatible with oxygen. All O-rings in contact with oxygen gas should be made of fluoroplastic or a similar fluorocarbon elastomer.

Metal components

Many metals and alloys are not suitable for use with oxygen. All metals in contact with oxygen in the main flow stream should be of appropriate materials suitable for the given oxygen service. In general, diaphragm casings, diaphragm plates, springs, and other parts not in the main flow stream may be of ordinary materials such as carbon steel, stainless steel, or cast iron. It is
suggested, however, that all valve body and trim parts in contact with the flow stream be made of copper, copper alloy, or nickel-copper alloys.

**Oxygen Cylinders**

A typical oxygen cylinder is made of steel and has a capacity of 220 cubic feet at a pressure of 2,000 psi and a temperature of 70°F. Each oxygen cylinder has a high-pressure outlet valve located at the top of the cylinder, a removable metal cap for the protection of the outlet valve during shipment or storage, and a low melting point safety fuse plug and disk. All oxygen cylinders are painted green for identification. Technical oxygen cylinders are solid green, while breathing oxygen cylinders are green with a white band around the top.

**Cylinder Sizes**

<table>
<thead>
<tr>
<th>Liters</th>
<th>50</th>
<th>49</th>
<th>44</th>
<th>44H</th>
<th>44HH</th>
<th>16</th>
<th>7</th>
<th>3</th>
<th>0.4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Oxygen Equipment**

You should always:

- Open the valve slowly. Rapid opening, particularly of cylinder valves, can result in momentarily high oxygen velocities. Any particles will be pushed through the system very quickly, causing frictional heat. Alternatively, if the system has a dead end such as where a pressure regulator is connected to an oxygen cylinder, heat can be generated through compression of the oxygen. Both cases can result in a fire;
- Ensure that the pressure adjusting screw of the pressure regulator is fully unwound, so that the regulator outlet valve is closed before opening the oxygen cylinder valve, particularly when opening the cylinder valve for the first time after changing cylinders;
- Ensure that cylinder valves are closed and piped supplies isolated whenever work is stopped. Do not try to cut off the supply of oxygen by nipping or kinking flexible hose when changing equipment, eg blowpipes;

Maintain hoses and other equipment in good condition. Leak tests can be carried out easily using a proprietary spray or liquid solution that is certified for use on oxygen systems. Soap or liquids that may contain grease should not be used.
WELDING HOSES
The cylinder regulators and torch are usually connected together by double line rubber hoses. Double line hose is known as type VD. The Oxygen line is green, the fuel line red. Hoses are available in four sizes, 3/16, 1/4, 3/8 and 1/2 inch I.D. There are different grades of double line hose used for Acetylene. They are:

- Non-oil resisting rubber cover
- RM- carries both a non-oil and flame and oil resisting cover
- (for use with all fuel gases & Acetylene) flame and oil resisting cover.

Grades R & RM should be marked for Acetylene only. Grade T should be marked fuel gas. All hoses should be marked as to their service level (light, standard or heavy). Date of manufacture, maximum working pressure, (200 psig) nominal I.D size and if it meets RMA/CGA IP-90 (Rubber Manufactures Association, Compressed Gas Association) specifications for rubber welding hose. The fittings on the hoses are marked as to right and left handed threads.

Single line hose come in three grades, L, light duty, S, standard duty and H, heavy duty. And are also limited to a working pressure of 200 psig.

TORCHES

The torch assembly consists of the handle, oxygen and fuel gas valves and mixing chamber. Welding tips or a cutting attachment can be used with the handle allowing it to be used for welding, heating and cutting operations. Oxygen and fuel gas flow through tubes inside the handle which blend in the mixing chamber or tip. It is at the tip that the mixed gases are ignited. There are two basic mixer types, the equal or medium pressure type (also known as balance or positive pressure type) and the injector type. The equal pressure type is the most common and is used with fuel gas pressures that are above 1 psi. Oxygen and fuel gas enter the torch at almost equal pressures. The injector type is used when fuel gas pressures are less than 1 psi. In this type, Oxygen at high pressure pulls the fuel gas into the mixing chamber.
The welding tip is mounted on the end of the torch handle and through it the oxygen and fuel gas mixture feed the flame. Tips are available in a variety of shapes and sizes to fit most any welding job and are identified by number. The larger the number, the larger the hole in the tip and the thicker the metal that can be welded or cut. Welding tips have one hole and cutting tips have a centrally located hole with a number of smaller holes located around it in a circular pattern. The cutting Oxygen comes from the center hole with the preheat flame coming from the holes around it. Many factors determine the size tip to use, but mainly the thickness of the metal to be welded or cut determines which tip size to use. The attachments at the end of this article will serve as a guide to tip selection.

**ACETYLENE WELDING TIPS**

<table>
<thead>
<tr>
<th>Metal Thickness</th>
<th>Tip Size</th>
<th>Rod Size</th>
<th>Oxygen Pressure</th>
<th>Acetylene Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/64 - 1/32</td>
<td>000</td>
<td>1/16</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>1/32 - 3/64</td>
<td>00</td>
<td>1/16</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>1/32 - 5/64</td>
<td>0</td>
<td>3/32</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>3/64 - 3/32</td>
<td>1</td>
<td>1/8</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>1/16 - 1/8</td>
<td>2</td>
<td>5/32</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>1/8 - 3/16</td>
<td>3</td>
<td>3/16-1/4</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>
CUTTING ATTACHMENTS

A cutting attachment connects to the end of the torch handle in place of the welding tip and allows for the cutting of metal up to 8 inches thick. For cutting metal over 8 inches, the use of a cutting torch instead of a cutting attachment should be used. The fuel gas valve on the torch handle is used to adjust the fuel. The Oxygen valve on the torch handle is opened full and the Oxygen flow for the preheat flame is adjusted using the Oxygen valve on the cutting attachment. The cutting Oxygen is controlled by the lever operated valve on the attachment.

CUTTING TORCH

The cutting torch is connected to the hoses in place of the welding handle and is used for cutting thicker metal than can be cut with the cutting attachment, or for heavy duty cutting work. The cutting torch like the welding handle is equipped with Oxygen and fuel gas valves with a lever operated Oxygen valve that controls the flow of cutting Oxygen to the tip. (Center hole in the cutting tip) In the two tube model, Oxygen and fuel gas mix and flow to the tip in the larger bottom tube with the cutting Oxygen flowing to the tip in the top tube. In three tube models, Oxygen and fuel gas flow to the tip in the bottom tubes and cutting Oxygen flows to the tip in the top tube.
Regulators
The Compressed Gas Association (CGA) has promulgated the specifications for a standard set of cylinder valve outlet fittings to be used on compressed gas cylinders. CGA fitting configurations (thread type, direction, and size) are specific to various classes of compressed gas. Typical classes are inert gases, flammable gases, highly corrosive gases, and oxygen. Brass is the most common material used in pressure regulators. Other materials, notably stainless steel, are used when gas compatibility with brass is an issue, or in higher-purity applications. The different CGA fittings are designed to prevent mismatches of equipment and gas (e.g., it is not possible to use an oxygen regulator on a hydrogen cylinder).

Importantly, users should never attempt to defeat this safeguard with the use of adapters. Equally important, PTFE tape, oil, or any other lubricant should not be used on the inlet connection of a regulator. PTFE tape can shred, and fluid lubricants will find their way into the flow stream; neither should be inside the regulator. As a reminder, CGA guidelines require servicing of regulators every 5 years. (CGA E15-2011)

A general discussion regarding regulators is found in the EWU Standard Operating Procedure for Compressed Gas Cylinders. In the oxygen regulator, the oxygen enters through the high-pressure inlet connection and passes through a glass wool filter that removes dust and dirt. Turn the adjusting screw in, to the right, to allow the oxygen to pass from the high-pressure chamber to the low-pressure chamber of the regulator, through the regulator outlet, and through the hose to the torch at the pressure shown on the working pressure gauge. Changes in this pressure may be made at will, simply by adjusting the handle until the desired pressure is registered. Turning the adjusting screw to the right INCREASES the working pressure; turning it to the left DECREASES the working pressure.

The operation of the two-stage regulator is similar in principle to the single-stage regulator. The difference is that the total pressure decrease takes place in two steps instead of one. On the high-pressure side, the pressure is reduced from cylinder pressure to intermediate pressure. On the low-pressure side, the pressure is reduced from intermediate pressure to working pressure. Because of the two-stage pressure control, the working pressure is held constant, and pressure adjustment during welding operations is not required.

The acetylene regulator controls and reduces the acetylene pressure from any standard cylinder that contains pressures up to 500 psi. It is of the same general design as the oxygen regulator, but it will not withstand such high pressures. The high-pressure gauge, on the inlet side of the regulator, is graduated from 0 to 500 psi. The low-pressure gauge, on the outlet side of the regulator, is graduated from 0 to 30 psi.

Free acetylene is unstable at pressures above 15 psig. Pressures exceeding 15 psi can cause pocketing of free acetylene within the porous cylinder tank and excessive thermal buildup, both can lead to tank decomposition. For most welding and cutting processes, the acetylene pressure should not exceed 0.62 bar (9psi)
Standard Operating Procedure (SOP)
Acetylene and Oxygen Safe Use for Welding

**Acetylene Regulator**

The Low Pressure Gauge
Indicates the delivery pressure to the hoses & torch.

15 psi Maximum Use Pressure

The High Pressure Gauge
Indicates the pressure from tank.

Connection

The Pressure Adjusting Screw
Turning clockwise allows the gas to flow.
Turning counterclockwise Reduces or stops the gas flow.

**Oxygen Regulator**

Low Pressure Gauge

High Pressure Gauge

Oxygen Regulators are right hand thread

Oxygen Regulators are left hand thread.
Opening the Regulator
Stand to the side of the regulator when opening the cylinder valve. Cylinder regulators have a relief device to prevent excessive pressure from developing. High pressure cylinder gauges have solid-front, safety-back construction. When subjected to excessively high pressure, the light-metal safety back will blow off to relieve the pressure. Even if the gauge glass breaks, the burst of venting gas can be startling. On rare occasions, old or improperly maintained oxygen regulators will ignite. But even a new oxygen regulator can burst into flame if the cylinder valve is suddenly turned on full. The quick burst of high-pressure gas from the cylinder into the regulator recompresses the oxygen inside the regulator and heats it to several thousand degrees Fahrenheit. Oxygen cylinders with regulators attached should always be opened slowly.
Standard Operating Procedure (SOP)
Acetylene and Oxygen Safe Use for Welding

HOW TO SET UP A RIG FOR WELDING

Clearing the Valves
Remove the acetylene cylinder’s protective cap, and move the bottle so that the valve outlet nozzle is pointed away from yourself and others. Slightly open the valve by turning the knob handle or by using a T wrench (if required), about a quarter turn counterclockwise. After a second has elapsed, turn the valve the opposite direction until the valve is seated. Wipe out the inside of the valve nozzle and threads to remove any debris from the seat of the regulator fitting. Remove the protective cap of the oxygen cylinder and repeat the same process to clear the oxygen valve. Again, inspect and clean out the inside of the nozzle.

Attaching the Regulators
Turn the adjusting screw of the valve outlet nozzle counterclockwise by hand until no resistance is felt. Insert the regulator nozzle into the regulator fitting and tighten the regulator nut by hand while the regulator is supported with your opposite hand. Snug the fitting nut with a fitting wrench. Complete the oxygen regulator attachment by following the same steps.
Attaching the Hoses
Connect the red hose to the acetylene regulator turning counterclockwise by hand, to prevent any damage to threads. The acetylene hose is also notched at the fitting to help in identification. Find the black or green hose and attach to the oxygen regulator, repeating the same process, but rotating clockwise while attaching.

If new hoses are being used, talcum powder may be present inside the hoses during the manufacturing process. To remove residual powder, grasp the free ends of the hose and point away from yourself. Slowly open the acetylene valve and adjust the regulator adjusting screw clockwise until the low pressure gauge indicate 10 psi. After approximately two seconds, close the regulator screw. Blow out the oxygen hose in the same manner, opening the cylinder valve slowly and then increasing the working pressure to 10 psi as well. After two seconds, close the regulator screw and valve.

Assembling the Torch and Tip
Select the tip you plan to use. Attach the tip by hand-screwing it to the torch head end. Connect the red hose to the torch nozzle marked ‘fuel’ or ‘gas’ and the green or black hose to the nozzle marked ‘oxy’. Tighten the hose acetylene hose end counterclockwise, and the oxygen hose end clockwise. Finish both hose ends and the tip end by using a wrench to secure the fittings.
Standard Operating Procedure (SOP)
Acetylene and Oxygen Safe Use for Welding

Make sure the torch valves are closed by turning both oxygen and acetylene valve clockwise. Check to see if the tip is clean. If it is not, insert the appropriately sized cleaner that is slightly smaller in diameter, into the tip opening. Carefully guide the tip cleaner straight up and down, as to not damage the orifice. Graduate to a tip cleaner the same size opening as the hole and repeat the cleaning process.

Stand to one side and slowly open the oxygen cylinder valve one half-turn. Turn the adjusting screw until the oxygen working-pressure gauge reads 20 pounds per square inch. Repeat with the acetylene tank valve a quarter-turn and then increasing working pressure at the regulator until the gauge reads 5psi. Close both cylinder tank valves and watch both cylinder pressure gauges; if they fall, there is a leak present. Repeat steps 2 through 4, tightening all the fittings, then repeat checking for leakage again.

If tightening the fittings does not solve the problem, you can locate a leak by brushing all the fittings and the hoses with a soapy solution. Mix a capful of liquid dishwashing detergent in a gallon of water (Do not use soap containing lanolin or oils). Bubbles will appear at loose fittings or punctures in the hoses. If a fitting leaks beyond correction, return it to the supplier for replacement. After a successful leak test, reset the regulators for the correct tip pressure.
**Standard Operating Procedure (SOP)**

**Acetylene and Oxygen Safe Use for Welding**

**LIGHTING UP**

Before lighting the blowpipe, purge the hoses by opening the gas supply to each hose for a few seconds. This will flush out any flammable mixtures of gases in the hose.

- Purge one hose at a time and close the blowpipe valve after purging.
- Use a well-ventilated area.
- Aim the gas tip upwards, acetylene is lighter than air
- Use a spark ignitor to light the gas.
- Use the correct gas pressures and nozzle sizes for the job.

**MOBILE STORAGE AND TRANSPORT OF WELDING CYLINDERS**

- Always transport acetylene cylinders in a well-ventilated, preferable open vehicle. Never transport acetylene cylinders in an enclosed compartment within a vehicle. Even a tiny gas leak can create a highly explosive environment.
- Cylinder valves should *always* be closed during transport. Acetylene cylinders are never totally empty. Small amounts of dissolved acetylene remain in the solvent used to stabilize the gas inside the cylinders, which can leak out and ignite during transport.
- Make sure the valve covers are in place, and regulators are removed prior to cylinder transport. Both of these items can be damaged, and potentially cause major problems, including an explosion, when the cylinders are next used.
- Always be sure to properly secure cylinders, ideally in an upright, vertical position, separated from the driver’s compartment. Cylinder brackets are a great option for securing tanks in transport.
- Acetylene gas is highly flammable, DO NOT SMOKE while transporting acetylene cylinders.
- When you reach your destination, remove the cylinders from your vehicle immediately. Never store acetylene cylinders inside your vehicle.

Related Documents:  Compressed Gas Cylinders SOP  
Welding Safety SOP

---

Results of an Acetylene explosion in a vehicle.  
Welding cart setup. Cylinders must be chained to the cart. When transporting in a vehicle keep them upright and strapped in place.