

Oxyacetylene Cutting: An In-Depth Guide

Oxyacetylene cutting is a thermal cutting process that utilizes a flame fueled by a mixture of oxygen and acetylene to melt metal. This method is highly effective for cutting ferrous and non-ferrous metals, particularly when working with thick plates. The process is favored in metal fabrication, repair shops, and other industrial settings due to its adaptability and efficiency.

The Oxyacetylene Cutting Process

Before starting to cut, it's critical to understand the equipment and steps involved in oxyacetylene cutting, as well as the necessary safety precautions.

Equipment Needed

- **Oxyacetylene Torch:** Comprises a torch handle, nozzle, and mixing chamber.
- **Oxygen Cylinder:** Typically green, contains high-pressure oxygen.
- **Acetylene Cylinder:** Usually gray, holds acetylene gas.
- **Cutting Tip:** Specific to the thickness of the material being cut.
- **Regulators:** Used to control the pressure of gases coming from the cylinders.
- **Hoses:** One red (for acetylene) and one green (for oxygen).
- **Protective Gear:** Including safety goggles, flame-resistant gloves, protective clothing, and a welding apron.

Setting Up for Oxyacetylene Cutting

1. **Select the Cutting Equipment:** Choose an appropriate cutting torch and tip according to the thickness of the metal you intend to cut. For 3/8" plate, a cutting tip designed for that thickness will be necessary.
2. **Inspect Equipment:** Check all hoses and connections for leaks or damage. Ensure that the regulators are functioning correctly and that the cutting tip is clean and free from obstructions.
3. **Position Cylinders Appropriately:** Place the oxygen and acetylene cylinders upright and secured to a stable surface. Ensure they are located away from any combustibles and in a well-ventilated area.
4. **Attach Hoses:** Connect the oxygen hose to the oxygen regulator and the acetylene hose to the acetylene regulator. Ensure that the connections are tight.
5. **Open Cylinder Valves:** Open the cylinder valves slowly—first the oxygen cylinder, followed by the acetylene cylinder. Do not open both cylinders simultaneously.
6. **Adjust the Regulators:** Set the pressure on the regulators. For cutting, the typical settings are:
 - **Oxygen:** 20-50 psi
 - **Acetylene:** 5-9 psi

You can not cut stainless with oxyacetylene

7. **Light the Torch:**

- Open the acetylene valve on the torch slightly and use a spark lighter or flint lighter to ignite the gas. (Never use matches or lighters).
- Once lit, gradually open the oxygen valve until a “neutral flame” is achieved—this flame will have a defined inner cone and is generally quiet with no hissing. A neutral flame has a proper balance of oxygen and acetylene.

Directions for Cutting 3/8" Plate

1. **Mark the Cutting Line:** Use a marking tool (like a soapstone marker) to clearly define the line where you intend to cut. This line ensures accurate cuts.
2. **Position the Plate:** Secure the plate being cut on a stable surface, such as a welding table, ensuring it doesn't move during cutting.
3. **Prepare to Cut:**
 - Hold the torch at a 90-degree angle with the nozzle aligned closely above the cutting line.
 - Preheat the metal along the cutting line by moving the flame back and forth until the metal reaches a glowing red color—a process that may take a few seconds.
4. **Start the Cutting Process:**
 - Open the oxygen valve on the torch quickly to initiate the cutting process. This will cause the metal along the line to ignite and melt.
 - Move the torch in a steady motion along the cutting line. A speed of about 1 to 3 inches per second is recommended for a 3/8" plate, depending on the coating and condition of the metal.
5. **Continue Cutting:** Maintain the flame just above the cut area; the molten metal will drip through the plate. Adjust the speed if necessary, ensuring a clean and even cut without excessive slowing or hastening.
6. **Finish the Cut:** Once you reach the endpoint, lower the torch slightly to ensure you finish cutting through the material and cleanly separate the two pieces.
7. **Turn Off the Torch:** Close the acetylene valve first, followed by the oxygen valve. This prevents flashback and keeps the torch safe.

Safety Precautions

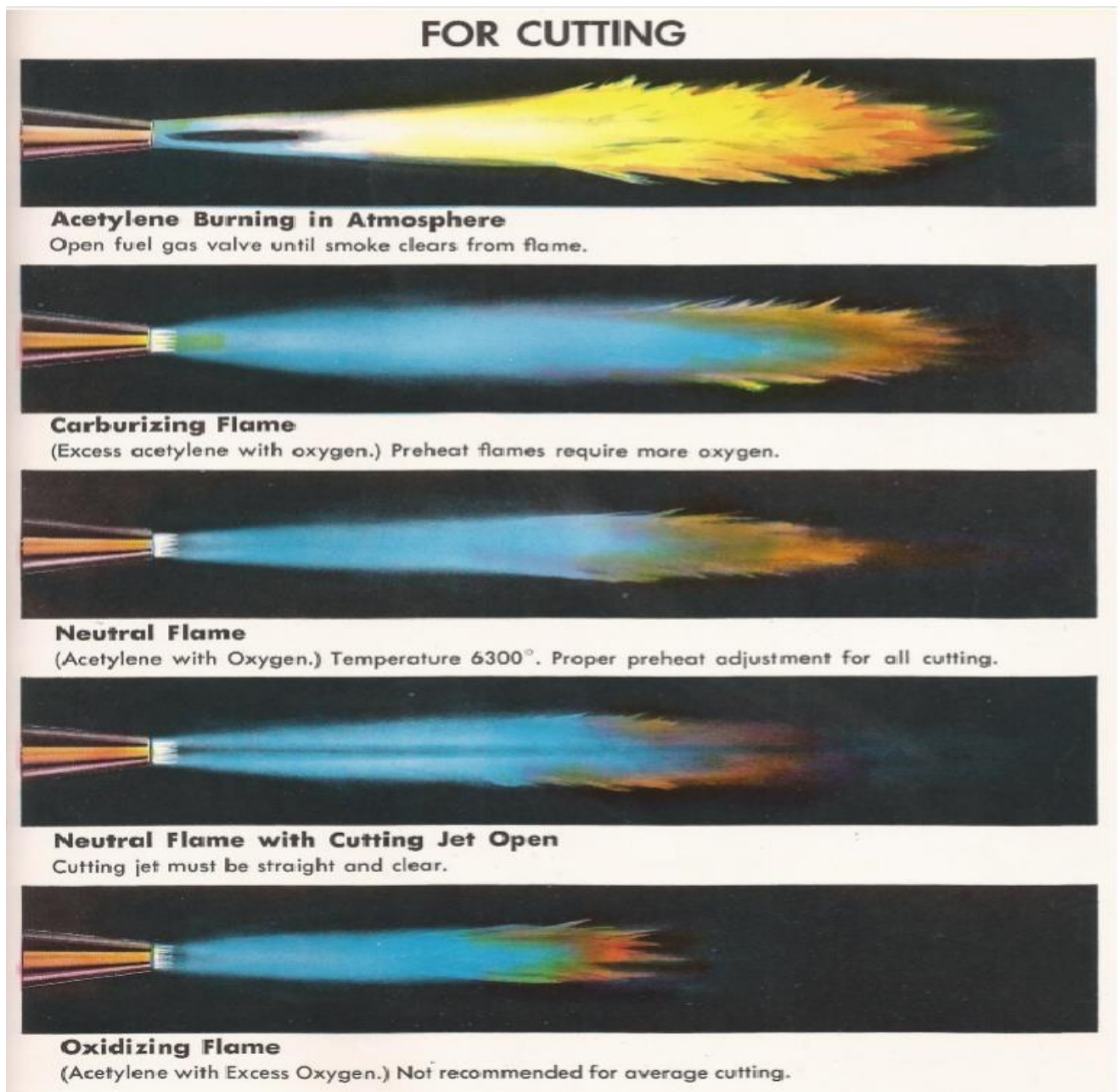
Safety is paramount when working with oxyacetylene cutting equipment:

1. **Personal Protective Equipment (PPE):** Always wear safety goggles with appropriate filter lenses, flame-resistant gloves, and protective clothing to protect against sparks and hot metal.

You can not cut stainless with oxyacetylene

2. **Work Environment:** Ensure the work area is free from flammable materials, and maintain good ventilation to mitigate the risk of gas

Ideal cutting flame is a neutral flame with minimal distortion when you add cutting oxygen.



You can not cut stainless with oxyacetylene

Refer to this chart for selecting tip size and proper gas flow depending on the material thickness.



CUT CHARTS

OXY-FUEL

Compatible with
Victor®

GPP

| Metal Thickness | Tip Size | Cutting Oxygen (PSIG)** | Preheat Oxygen (PSIG)* | Preheat Fuel Gas (PSIG) | Speed I.P.M. | Kerf width |
|-----------------|----------|-------------------------|--|-------------------------|--------------|------------|
| 1/8" | 000 | 20/25 | For 3-Hose Machine Torches Only See Table On Reverse Side | 2/5 | 24/28 | .04 |
| 1/4" | 00 | 20/25 | | 2/5 | 21/25 | .05 |
| 3/8" | 0 | 25/30 | | 3/5 | 20/24 | .06 |
| 1/2" | 0 | 25/35 | | 3/5 | 18/22 | .06 |
| 3/4" | 1 | 30/35 | | 3/6 | 15/20 | .08 |
| 1" | 2 | 35/40 | | 3/6 | 14/18 | .09 |
| 1 1/2" | 2 | 40/45 | | 4/8 | 12/16 | .09 |
| 2" | 3 | 40/45 | | 4/8 | 10/14 | .10 |
| 2 1/2" | 3 | 45/50 | | 5/9 | 9/12 | .10 |
| 3" | 4 | 40/50 | | 6/9 | 8/11 | .12 |
| 4" | 5 | 45/55 | | 6/9 | 7/10 | .14 |
| 5" | 5 | 50/55 | | 6/10 | 6/9 | .14 |
| 6" | 6** | 45/55 | | 6/10 | 5/7 | .17 |
| 8" | 6** | 55/65 | | 8/12 | 4/6 | .18 |
| 10" | 7** | 55/65 | | 8/12 | 3/5 | .34 |
| 12" | 8** | 60/70 | | 10/14 | 3/4 | .41 |
| 15" | 10** | 50/70 | | 10/16 | 2/4 | -- |
| 18" | 12** | 45/65 | | -- | 2/3 | -- |



* Applicable for 3-hose machine cutting torches only. With a 2-hose cutting torch, preheat pressure is set by the cutting oxygen.
 ** For best results use appropriate capacity torches and 3/8" hose when using tip size 6 or larger. Torches with flashback arrestors require up to 25% more pressure as tip size increases (15 PSI maximum acetylene pressure). *** All pressures are measured at the regulator using a 25' X 3/8" hose for tip size 6 and larger.

AmericanTorchTip.com 941-753-7557 sales@attcusa.com

† American Torch Tip Company is in no way affiliated with the above-named manufacturer(s). References to the above-named machines, torches and numbers are for your convenience only. American Torch Tip is not necessarily authorized by the above-named manufacturer(s) to provide replacement parts. Most parts advertised for sale are made by, or for, American Torch Tip Company and other parts, as indicated, are original parts manufactured by the above-named OEM and are simply being resold by American Torch Tip Company. Part numbers followed by an * are manufactured by the respective OEM.

You can not cut stainless with oxyacetylene

Refer to the chart above for correct flow pressure and tip size.

GREEN – OXYGEN

RED – FUEL

Flow of gas to the torch

Set oxygen between 20-50 Psi

Pressure in the bottle



Pressure in the bottle

Flow of acetylene to the torch

Set between 3-8 psi



You can not cut stainless with oxyacetylene