Oxyacetylene Cutting

By Matt Scott
Introduction

- OAC is a cutting process that rapidly oxidizes (burns) carbon steel like scissors cutting paper!
- By the end of the shift you will be able to:
  - Describe the process
  - Set up the torch
  - Make a cut
8 Steps to Making a Quality Cut

1. Safety Check
2. Select a tip based on metal thickness
3. Adjust gas pressures
4. Ensure the tip is clean
5. Set torch to neutral flame
6. Get Comfortable
7. Maintain a consistent *Coupling Distance*
8. Remove dross while metal is still hot
Step 1 – Safety

● At a Glance
  – Stop look and listen before using!
  – Did you ensure the cylinders were chained up and hoses were in good shape?
  – Did you scan the whole system to see if there was anything odd?

● SAFETY FIRST!!!!!!!!!
Steps 2 - Tip Selection

- The key in making a quality cut!!!!!
### Step 3 – Setting the Gas Pressure

<table>
<thead>
<tr>
<th>Metal Thickness</th>
<th>Tip Size</th>
<th>Oxygen Pressure</th>
<th>Acetylene Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/8”</td>
<td>000</td>
<td>20-25</td>
<td>3-5</td>
</tr>
<tr>
<td>¼”</td>
<td>00</td>
<td>20-25</td>
<td>3-5</td>
</tr>
<tr>
<td>3/8”</td>
<td>0</td>
<td>25-30</td>
<td>3-5</td>
</tr>
<tr>
<td>½”</td>
<td>0</td>
<td>30-35</td>
<td>3-5</td>
</tr>
<tr>
<td>¾”</td>
<td>1</td>
<td>30-35</td>
<td>3-5</td>
</tr>
<tr>
<td>1”</td>
<td>2</td>
<td>35-40</td>
<td>3-6</td>
</tr>
</tbody>
</table>

Victor Cutting Equipment
Step 4 – Ensure the Tip is Clean

- Indicators of a clean tip are:
  - Preheat flames are sharp and the same length.
  - Outer flame does not shrink with the “oxygen blast”
  - Oxygen column stays straight with “oxygen blast” on. It does not spread out (diverge).
Step 5 - Set torch to Neutral Flame

- A neutral flame is when you have the same ratio of acetylene and oxygen burning
- Most efficient cutting flame setting
- Flame temperature is 5800 Fahrenheit
Step 6 – Get Comfortable

- Steady yourself when cutting
Step 7 - Maintain a Consistent Coupling Distance

- **Coupling Distance** is defined as the distance the blue flames are above the metal (also known as *Stand Off* in PAC)
- This distance should be 1/8” – 3/8”
Step 8 – Post Cut Clean Up

- Remove dross immediately after Cutting…It’s easier at this point.
- Your Cut quality is based on the 7 prior steps. Work at those and you’ll have less GRINDING!

Dross = Metal Waste

= Metal Waste  Dross
Common Vocabulary

- Dross
- Kerf
- Working Pressure vs. Cutting Pressure
- Flashback vs. Backfire
- Oxygen vs. Air
Other Metal Removing Processes
Carbon Arc and Plasma Arc
<table>
<thead>
<tr>
<th>Process Name</th>
<th>Oxyacetylene Cutting</th>
<th>Air Carbon Arc Cutting</th>
<th>Plasma Arc Cutting</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AWS Abbreviation s</strong></td>
<td>OAC</td>
<td>CAC-A</td>
<td>PAC</td>
</tr>
<tr>
<td><strong>Heating Mechanism</strong></td>
<td>Heats metal via gas.</td>
<td>Heats metal via electric arc (electrode is made of graphite and coated with copper for strength and conductivity).</td>
<td>Heats metal via ionized plasma gas.</td>
</tr>
<tr>
<td><strong>Metal removal mechanism</strong></td>
<td>Removes metal/dross with industrial grade oxygen.</td>
<td>Removes metal/dross with compressed air.</td>
<td>Removes metal/dross by the secondary gas (air).</td>
</tr>
<tr>
<td><strong>Capability</strong></td>
<td>Cuts only ferrous metal (relies on the rapid oxidation of steel).</td>
<td>Will cut any conductive metal (will deposit carbon and this may be detrimental).</td>
<td>Cuts any conductive metal.</td>
</tr>
<tr>
<td><strong>Equipment</strong></td>
<td>Cylinders Regulators Flashback arrestors Hoses Torches Tips</td>
<td>Power Source Compressed air Arc Air Torch Electrodes</td>
<td>Power Source Compressed air Torch consumables</td>
</tr>
<tr>
<td><strong>Safety</strong></td>
<td>Cylinder care/storage #5 filter lens Flying sparks Flashbacks/backfires Ventilation</td>
<td>Electrical shock #12 filter lens Flying sparks UV/IR Ventilation Noise</td>
<td>Electrical Shock #10 Filter lens Flying sparks UV/IR Ventilation Noise</td>
</tr>
</tbody>
</table>
**WLD FFA–S**
Advance OAC  Mild Steel

<table>
<thead>
<tr>
<th>Inch</th>
<th>MM</th>
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<tbody>
<tr>
<td>1/16&quot;</td>
<td>1.6</td>
</tr>
<tr>
<td>1/8&quot;</td>
<td>3.2</td>
</tr>
<tr>
<td>1/4&quot;</td>
<td>6.4</td>
</tr>
<tr>
<td>3/8&quot;</td>
<td>9.5</td>
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<tr>
<td>1/2&quot;</td>
<td>12.7</td>
</tr>
<tr>
<td>5/8&quot;</td>
<td>15.9</td>
</tr>
<tr>
<td>3&quot;</td>
<td>76.2</td>
</tr>
</tbody>
</table>

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Portland Community College  
Welding Technology

Tolerance: (Unless otherwise specified)  
Dimensional ± 1/16" Angle ± 5°

Drawn By: John Deering

Date: 05/10/04

Approve Date Sheet

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Oxyacetylene Straight Cutting
Track Torch

* USE THIS MATERIAL FOR THE LAP JOINT WELDING PROJECTS.

3/8" - 1/2"

10"

3"

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Welding Technology

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<td>12.7</td>
</tr>
<tr>
<td>1&quot;</td>
<td>25.4</td>
</tr>
</tbody>
</table>

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Dimensional: ± 1/16" Angle: ± 5°

WLD 111-04

Drawn By:
John Deering

Check By:

Date: 10/01/03

Size: QC NO. Rev.

Approve Date Sheet
Where to Get More Information

- Owners Manual
- *Welding Principles and Applications* by Larry Jeffus
- PCC Welding