# PVL Cutting Torch

## REQUIRED MATERIAL

**PVL Cutting Torch**
- PVL Torch
- Hoses 100 metre
- Gas regulator
- Oxygen \( \text{O}_2 \) per m³
- Gas mixture per 79ltr
- Underwater igniter

**Oxy/Thermic Cutting Torch**
- Oxy/Thermic torch
- Hoses & 50mm cable 100 metre
- Earth cable 100 metre
- Welding generator
- Oxygen \( \text{O}_2 \) per m³
- Electrodes per box
- Gas regulator
- Cut off switch (Knife switch)

## Transportation Weight and Dimensions

<table>
<thead>
<tr>
<th>Item</th>
<th>Dimensions</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Torch, hoses, regulator &amp; spares.</td>
<td>L x B x H = 58 x 78 x 40</td>
<td>Total Weight = 65kg</td>
</tr>
<tr>
<td>MAP Gas bottle</td>
<td>L x B x H = 30 x 30 x 127</td>
<td>Bottle weight = 32kg, Gas weight = 34kg</td>
</tr>
<tr>
<td>Torch, cables, switch, regulator &amp; spares.</td>
<td>L x B x H = 120 x 100 x 75</td>
<td>Total Weight = 300kg</td>
</tr>
<tr>
<td>Thermic electrodes per box</td>
<td>L x B x H = 50 x 10 x 10</td>
<td>Total Weight = 12kg</td>
</tr>
<tr>
<td>DC generator (Powcon)</td>
<td>L x B x H = 84 x 51 x 50</td>
<td>Total Weight = 100kg</td>
</tr>
</tbody>
</table>

## Consumption Proportions

- 1 Bottle of Gas to 10 bottles of Oxygen
- 10 Packs of Electrodes to 10 bottles of Oxygen
Divers involved in the PVL cutting tests.

Personnel and Locations:
In the Roermond harbour.

Diver 1
Diver 2.

Observations & Results:

Diver 1

- Easy to ignite
- Quick cut
- Easy operation
- Easy adjustment
- Little material required (no generator, earth cable etc.)
- Robust cutting torch with no/minimal maintenance

Diver 2.

- Simple to start
- Simple for me to burn
- Ideal when used for what it is designed

In the pool at Weert.

Diver 3
Diver 4
Diver 5
Diver 6
Diver 7
Diver 8
Diver 9

Diver 3.

- Easy to start
- Only bracings require a little practice but are also possible
- Not difficult to adjust
- Only 2 valves for the diver to control
  1 for on/off
  1 for the cutting Oxygen
- The flame from the torch can be seen through the cut as you move along the plate
Diver 4.

- Easy to ignite
- Clear view of your cut through the material
- You are not blinded by the flame so full concentration can be given to the burning

Diver 5.

- Easy and quick to ignite
- Little material required (Gas, Oxygen, hose, regulator, torch)
- Head is short so always close to material and small sections are always possible because there is no electrode inserted
- No current needed to strike up (electricity)
- In water ignition
- Material does not need to be stainless (rust-proof)
- Easy to adjust with the regulator on the surface
- Easy operation underwater (valve fully opened or closed)
- Cut is clean and quick
- With little experience it is practical to use
- Minimal back up maintenance needed because of its simplicity
- Noise was louder in the tank than in the harbour
- Be aware “blowback” of trapped excess gas when cutting in enclosed areas
- Straight cut

Diver 6.

- Ideal use for what it was designed (fast production)
- No excuses with the electrode torch (collets, washers, leaks etc.)
- No problems with rusting
- Simple to adjust (and to regulate)
- Little noisier
- No problems with blinding in clear water
- No electrodes
- Little maintenance
- Everyone is able to burn with the PVL
- Less problems with uncut material (bridges)
- Nearly all is possible with the PVL cutting torch
Diver 7.

- Easy to ignite
- Simple to cut
- 10cm thick material, no problem
- Everyone can use the PVL cutting torch
- No electrodes to change
- Straight cut

Diver 8

- Easy and quick to ignite
- Simple to burn
- Everyone can use the PVL cutting torch
- No problems with blinding in clear water
- Cut is clean and quick

Diver 9.

- Easy to start the PVL cutting torch
- No problems with electrodes
- Not difficult to adjust
- Easy to ignite
CUTTING TORCH TEST

The test was conducted by cutting through the middle of a 25mm thick and 1.2m long steel plate. The plate was held in a vice and cut horizontally. The time recorded is the actual time taken to cut the steel plate completely into two sections.

<table>
<thead>
<tr>
<th>Diver</th>
<th>Location</th>
<th>Material</th>
<th>Initial Oxygen Pressure</th>
<th>Final Oxygen Pressure</th>
<th>Cylinder Capacity</th>
<th>Total O₂ Consumption</th>
<th>Initial Gas Pressure</th>
<th>Final Gas Pressure</th>
<th>Consumed electrodes</th>
<th>Time Began</th>
<th>Time Finished</th>
<th>Total Time</th>
<th>Visibility</th>
<th>Total Cost of Cut</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diver 1</td>
<td>Weert</td>
<td>Steel strip 160x1200x25mm</td>
<td>180 bar</td>
<td>160 bar</td>
<td>40 ltr</td>
<td>1740 ltr</td>
<td>Not applic</td>
<td>Not applic</td>
<td>Not applic</td>
<td>11:56</td>
<td>12:02</td>
<td>6 min 17 secs</td>
<td>35 cm</td>
<td>Euro 11.00</td>
</tr>
<tr>
<td>Oxy/Thermic Torch</td>
<td>Diver 1</td>
<td>Steel strip 160x1200x25mm</td>
<td>120 bar</td>
<td>100 bar</td>
<td>47 ltr</td>
<td>7250 ltr</td>
<td>Not applic</td>
<td>Not applic</td>
<td>19</td>
<td>09:27</td>
<td>10:08</td>
<td>41 mins</td>
<td>35 cm</td>
<td>Euro 86.00</td>
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PVL Cutting Torch

Oxy/Thermic Cutting Torch

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## CONCLUSION

<table>
<thead>
<tr>
<th>ADVANTAGES</th>
<th>DISADVANTAGES</th>
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<tbody>
<tr>
<td>+ Lightweight &amp; compact for transport</td>
<td>– Experience and practice is needed to cut some types of bracings</td>
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<tr>
<td>+ Low consumable costs</td>
<td>– Nearly everything is possible to cut</td>
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<tr>
<td>+ Easy to ignite</td>
<td>– Louder than the Oxy/Thermic torch</td>
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<tr>
<td>+ Simple operation</td>
<td>– Gas should not be too cold</td>
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<tr>
<td>+ Quick cutting in the right conditions</td>
<td>– Gas bottles should be kept in a warm environment</td>
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<tr>
<td>+ Good vision of the cut through the material</td>
<td></td>
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<tr>
<td>+ No risk from temporary blindness (arceye)</td>
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<tr>
<td>+ No power supply required (electricity)</td>
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<tr>
<td>+ Equipment does not need to be rust-proof</td>
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<tr>
<td>+ Clean, straight cut</td>
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<tr>
<td>+ Minimal maintenance &amp; spares</td>
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<tr>
<td>+ No excuses relating to torch problems</td>
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<tr>
<td>+ Easy to use for unskilled personnel</td>
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<tr>
<td>+ Less chance of leaving uncut material (bridges)</td>
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<tr>
<td>+ Ability to cut thick material</td>
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</table>