

Speciality Welds



SwordfishTM (Arc) Cutting Electrodes

The new Swordfish electrode is a brand new iron oxide, non-exothermic/oxy-arc cutting electrode that requires no oxygen, allowing cutting to take place both above and below water more safely and conveniently. The process requires no special equipment; a standard DC 400 amp welding power source, cables and our standard stinger are all that's required. As no oxygen is necessary, and indeed the oxygen produced by the electrode is low, the potential dangers are therefore significantly reduced. (See evaluation report commissioned by Shell).



However, all safe underwater cutting precautions must be observed. We would draw your attention to AODC 035 code of practice for "Safe use of electricity underwater" and IMCA D003 "Oxy-arc cutting operations underwater".



The electrodes are available in 4.0 and 5.0mm and will provide a clean precise cut, with minimal skill, in a wide range of materials; including steel, stainless steel, cast iron, bronze, copper and even aluminium, both above and below the waterline. Although no special skills are required, we do recommend a period of training be undertaken to ensure familiarity with the cutting techniques required and to ensure maximum efficiency is achieved.

These electrodes may be used to cut materials when conventional oxy-arc/exothermic cutting is regarded as a safety hazard, or when no oxygen is available. The electrodes may be used for piercing holes for bolts, removal of rivets, cutting of chain and other attachments as well as more standard straight line cutting of structures, etc. The electrodes can be used in all positions. **It is essential for safe and efficient operations that welding cables are in excellent condition and sized according to current/cable length. For long cables (over 50M) an increase in CSA will be required from 50mm²(normal) to 75mm² or even 90mm². Also, a fully insulated welding stinger is used (we recommend our stinger) and the earth/ground connection be secure, and located in close proximity to the point of cutting.**

DC only, with straight (-Ve) or reverse (+Ve) polarity. The choice of polarity will depend upon the environment and the thickness of material. The preferred, or first choice is (-Ve) as this ensures that the heat ratio is greatest in the material, although the operator may find the electrode appears to perform more efficiently on (+Ve), due to the increased burn off rate of the electrode.

Caution: The cutting of steel by use of this product will produce copious amounts of molten liquid material and depending upon position and visibility, precautions need to be exercised so as to prevent any injury to the diver.



Gas Analysis (Underwater)

Elements	Mean Values %
Hydrogen	76.38
C.Monoxide	15.61
C.Dioxide	3.31
Nitrogen	2.45
Oxygen	0.65

Technical Data

Cutting Parameters

Electrode Dia	4.0mm(5/32")	5.0mm(3/16")
Electrical Characteristics		
Current Type: Polarity	DC Only DCSP (-Ve) or DCRP (+Ve)	
Amps & material thickness ranges:	260 - 320 6 - 12mm	320 - 380 12 - 30mm
Volts: (OCV)	70 - 80 (Max)	

Sales & Technical Enquiries

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Cutting & Usage Guide

Health & Safety

- Take all necessary precautions when cutting.
- Follow employer's safety practices.
- Fume and gases can be hazardous to your health.
- Electric shock can kill.
- Arc rays can injure eyes and skin.
- Use adequate ventilation while cutting on the surface.
- Wear suitable eye protection/filter lens and protective clothing.
- Do not touch live electrical parts.
- Wear insulating gloves underwater.
- Use an approved safety knife switch.
- Only change the electrode when cold.
- Use an approved stinger
- Ensure a good return connection is made before striking an arc.

The guidelines as specified by the AODC035 code of practice "Safe use of electricity underwater" and IMCA D003 "Oxy - Arc Cutting Operations Underwater" should always be understood.

Storage & Care

Any physical damage to the electrode coating will have a detrimental effect. Electrodes should be handled and stored in a manner that prevents any physical damage. Electrodes should remain in their packaging until required. Other than avoiding prolonged immersion in water, no other special precautions are necessary when using the **Swordfish™**, as the waterproof coating provides excellent physical protection.

Handling & Transportation

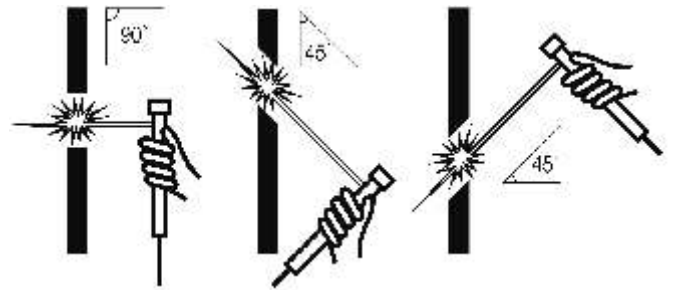
Electrodes may be used directly from the packet and taken into the water in quantities that will allow for their use within a reasonable time. Any unused electrodes should be discarded. Ensure the transportation method allows for the electrodes to arrive at the work site damage free.

Caution: The cutting of steel by use of this product will produce copious amounts of molten liquid material and depending upon position and visibility, precautions need to be exercise so as to prevent any injury to the diver. **Read all general safety precautions as associated with general arc welding before attempting to use this product**

Operating Instructions

To maximise the efficiency of the cutting process, ensure you remain in touch contact with the material at all times. Typical electrode positions for cutting will be as shown. On thick sections, make an in and out sawing movement to help push the electrode through the material and push the molten material away from the end of the electrode. The use of a steep electrode angle will assist in achieving this outcome. Ensure the molten material has been removed

from the cut line before continuing to draw the electrode along the material, otherwise the molten material may re-fuse itself into the cut line. Do not try and force the electrode to cut any faster than the optimum current allows. The cutting efficiency is slower than exothermic/oxy-arc processes. On thinner sections, simply drag the electrode along the material, maintaining sufficient pressure to keep the electrode against the workpiece. Consider gravity as an aid to cutting where possible.



Note:

We recommend a #12 welding filter be used for the typical currents used for this product.

Electrode Preparation

Ensure the power is COLD.

- Fit a new electrode and gently rub the tip against an abrasive surface, so as to remove the waterproof coating, thereby ensuring good electrical contact.

Caution must be exercised so as not to unduly damage the flux coating.

- Carefully place the electrode where required, call to make it HOT, the arc should strike, if not, gently twist the electrode while exerting a slight downward pressure.

Local Representative