TRAINING

EQUIPMENT

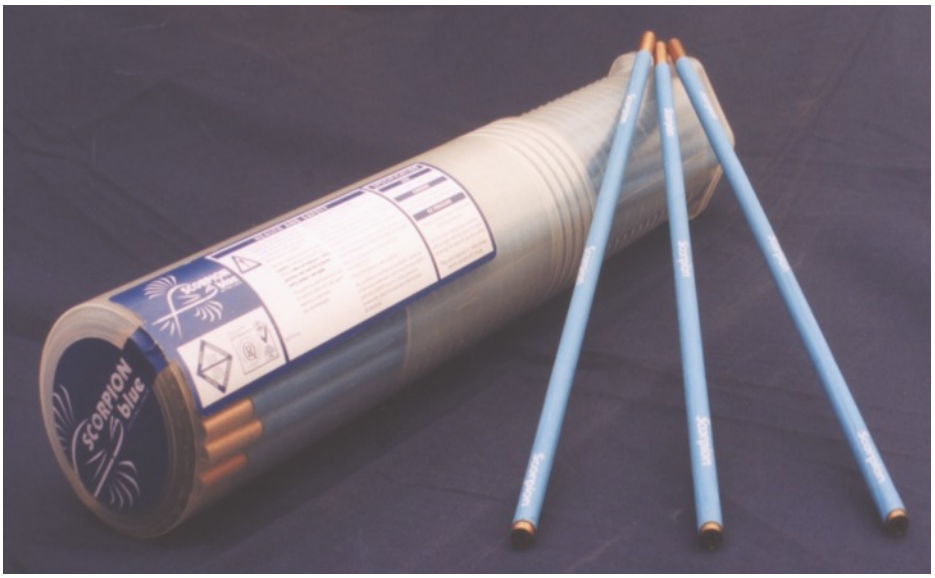
CONSULTANCY

ELECTRODES

Speciality Welds

Oxy Arc Cutting Lance

The Scorpion blue exothermic cutting lance has many uses in industry for both dry and wet applications alike. Typical uses include cutting steel bracings on offshore structures, pipelines, removing jetty and pier foundations, cutting through concrete caissons, vessels, propellers and many different types of marine salvage. The lance will cut through the following materials with ease:- plain carbon & low-alloyed steels, cast irons, stainless steels, non-ferrous metals, concrete, rock, rope, wood and marine growth.



The process simply requires an industry standard underwater cutting torch (**Stinger**™) connected to a multistage high flow oxygen regulator, a DC welding machine and a safety isolation switch (**Piranha**™). *(See separate data sheet for details)*

Should you prefer to cut with power on, the Scorpion lance should require no more than 150 amps at the tip. However, the lance will also burn with no electrical power, once ignited, as long as the oxygen flow is maintained. The lance burns at approximately 6000 °C (10,000 °F) a temperature that will melt most materials with ease. The principle of operation, having ignited the arc is to allow oxygen to flow down through the centre of the lance. This creates and maintains an exothermic reaction, which will continue to burn, with or without the power, until the oxygen flow is stopped.

TECHNICAL SPECIFICATION:

9.5mm (3/8") x 450mm (18") hollow copper coated steel tube, having an inner bundle of solid wire segments. All Scorpion lances are insulated with a high visibility blue polyolefin tubing for safety. They are supplied in 9.4kg (20.5lb) boxes, which contain 50 lances.

GENERAL HEALTH & SAFETY GUIDELINES:

SERIOUS INJURY may result when cutting underwater using an oxygen-cutting lance. Only fully trained and certified divers shall be allowed to perform underwater cutting operations and that all diving operations shall be carried out in accordance with recognised National or International diving regulations. It is essential that the operator, supervisor and others are aware of the dangers of cutting underwater, using oxygen. Safety should always be in the forefront of everybody's mind. Follow all employers' safety practices. The guidelines as specified by the 'AODC' 'Safe use of electricity underwater' code of practice and 'IMCA' publication 'D003 Oxy-Arc cutting operations Underwater' should be read and understood by all personnel.

Only fully trained individuals shall be permitted to use this product.
Only use torches designed for underwater oxygen-cutting applications (**Stinger**™).
Inspect torch and other equipment prior to use to ensure operational functionality.
Ensure all connections are tight and properly insulated where necessary.
All cutting operations should be conducted using DC (-Ve) polarity. In addition, there must be a positive operating disconnecting switch (also referred to as a knife switch) in the circuit. We recommend our **Piranha**™ 400-amp duel pole, certified, isolation switch. This switch shall not be operated unless specifically directed by the diver. When the diver calls for a change the tender must confirm that change to the diver. A procedure shall be developed to check the integrity of the electrical circuit before commencing any cutting operations

Underwater cutting operations use oxygen, therefore, all safety precautions concerning the use of oxygen must be observed. Oxygen itself is not flammable, however, the presence of oxygen will drastically increase the speed and force with which burning takes place. For cutting in a closed compartment, pipe, tank, tubular, etc a means must be provided to permit the escape of all entrapped gases. Having the diver work from the highest point down may reduce the possibility of trapping gas mixtures that could lead to explosions, in any event, a means to allow un-burnt

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gases to escape must be made before cutting operations begin. When cutting a vent hole the following factors should be considered.

a) if there is a pressure differential between the inside of the enclosed space and the surrounding water there can be a danger of pressure release, or suction.
b) If the presence of flammable gases is suspected before cutting operations start, the cutting of a vent hole should be made using cold cutting methods.

Cylinders should be stored upright in a well ventilated area, whether full or empty and away from sources of heat and ignition. Never store other products in a cylinder store, or have them nearby, particularly oils, paints and corrosive liquids. Always open cylinder valves slowly and with care, using the correct spindle key and ensure the regulator is fully wound out to ensure damage is prevented to the gauge, otherwise the sudden inrush of pressure from the gas cylinder may permanently damage the regulator. Never allow oil, grease or other petroleum based substances to come in contact with cylinder valves, regulators, hoses or any other part of the oxygen supply system. Ensure the pressure gauge is suitable for the total pressure within the cylinder. Pressure regulators for gas cutting are of the multi-stage type. Always treat a pressure regulator as a precision instrument. Check that the regulator offers a suitable working pressure for the cylinder pressure, also check the bullnose seating for damage. Only use regulators and hoses, which have been designed for the particular gas you wish to use.

Cutting operations produce extreme localized heat and molten material. Never attempt to cut without the proper filter lens to protect eyes. Skin should also be protected from heat and molten material. Always wear suitable protective gloves.

SETTING UP EQUIPMENT:

Having noted the guidelines stated above proceed as follows;

Ensure cylinder valve is free of dirt.
Fit the gauge and secure, ensuring the valve regulator is fully wound out before opening the cylinder.
Inspect the oxygen hose for any obvious damage and fittings are secure.
Open cylinder, slowly, and pressurise the hose to the working pressure and check for leaks. We recommend a working pressure of approximately 100-150 psi above hydrostatic pressure, at the tip.
Ensure torch valve operates correctly and is in a good state of repair.
Ensure cable is connected to the safety switch and polarity is set to negative (-Ve) to the torch. (If cutting with power off, polarity is not important). High currents are not required; a machine capable of 200 amps at 60% duty cycle is more than adequate for cutting with power on.
Ensure cable is of at least 50mm^2 (2/0) double insulated.
Ensure safety switch operates correctly.

PREPARING TO CUT:

Attach the ground clamp to the work as close as possible on a clean area. Ensure the diver is not situated in-between the ground and the area where he is cutting.
The diver should ensure he carries out the cutting operation from a position to the side of the area to be cut and not directly facing it. This will ensure that should an explosion occur, the blast energy is not directly channelled into the diver. The supervisor should remind the diver of this throughout the diving operation. Any oxy-arc cutting operation is potentially dangerous and should therefore, be part of a risk assessment.
Fit a lance to the torch, ensuring that it fits snugly against the washer and then tighten the locking head. Always ensure the correct size of collet is fitted for the size of lance being used. All Scorpion cutting lances are 9.5mm (3.8").
When the diver is ready to cut, he should flush the torch with oxygen and maintain flow.
Energise the torch
Strike an arc
Proceed with the cutting operation, once burning the power can be turned off. If cutting with power 'on' then ensure polarity is negative (-Ve).
Ensure you always leave at least 75mm (3") of the lance unused; in this way it can be removed with ease and also ensures no accidental damage occurs to the torch head.

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