A New Improved Industry-Standard Underwater Wet Welding Electrode

NAUTILUS
SUBSEA WELDING

HOT..It's COOL Underwater Welding is so

The **Nautilus** is a specially formulated rutile-based flux coated wet welding electrode, with enhanced chemical formulations, designed to weld structural steels to the highest possible qualities underwater.

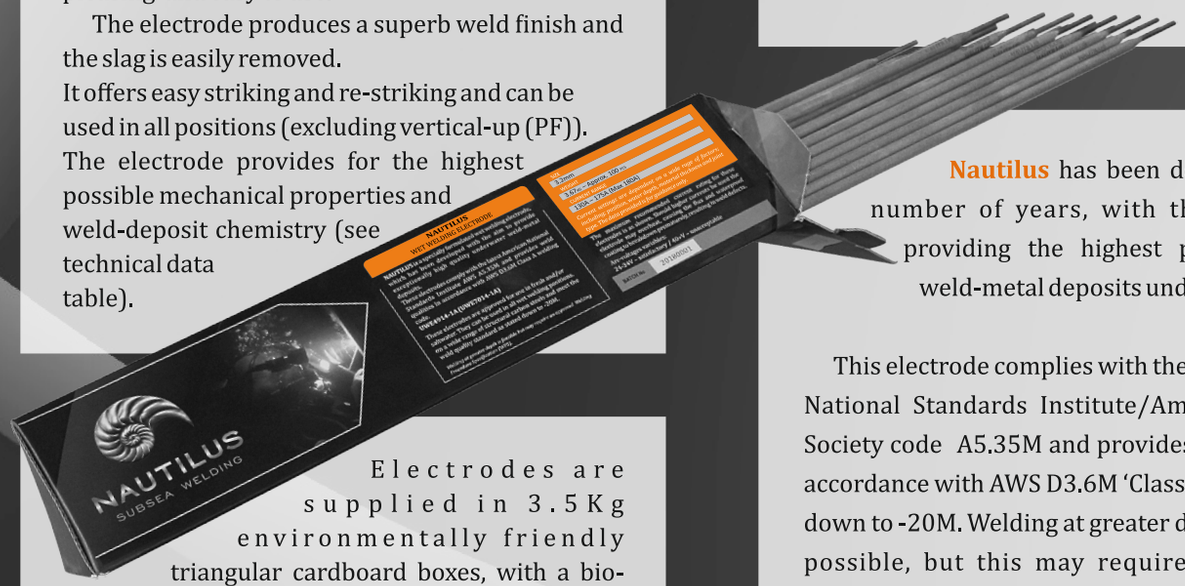
The electrode also has a special clear vinyl based waterproof coating, to ensure maximum resistance to water and moisture penetration. This coating allows higher levels of misuse in its handling and care and also provides excellent electrical insulation and improved safety for the diver.

The electrode has a very smooth, soft arc characteristic that all welder-divers will find very pleasing and easy to use.

The electrode produces a superb weld finish and the slag is easily removed.

It offers easy striking and re-striking and can be used in all positions (excluding vertical-up (PF)).

The electrode provides for the highest possible mechanical properties and weld-deposit chemistry (see technical data table).



Electrodes are supplied in 3.5Kg environmentally friendly triangular cardboard boxes, with a bio-degradable heat-shrink sleeve. Each box contains approximately 90 electrodes.

Recommended Welding Techniques & Parameters

We recommend one of the following **touch** welding techniques be used.

- ✓ **Drag**
- ✓ **Oscillation**
- ✓ **Step-back**

These electrodes are designed to operate over a current range of 130-175A. However, for most fillet welds the optimum current range may be considered as 135-155A – ***Try this first.***

Nautilus has been developed over a number of years, with the sole aim of providing the highest possible quality weld-metal deposits underwater.

This electrode complies with the latest American National Standards Institute/American Welding Society code A5.35M and provides weld quality in accordance with AWS D3.6M 'Class A' welding code, down to -20M. Welding at greater depth is perfectly possible, but this may require an additional approved Welding Procedure Specification (WPS) to be produced.

The electrode is approved for use in fresh and/or saltwater.

Electrode Specification
UWE4914-1A (UWE7014-1A)

Mechanical & Chemical Analysis

Mechanical Properties %	Wet *
Tensile Strength	
UTS [Mpa]	496
Yield [Mpa]	456
Elongation [%]	15.2
Reduction of Area [mm²]	78.6
Charpy Impact [J] @ -20°	36.33
Chemical Analysis **	[%]
Carbon (C)	0.04
Manganese (Mn)	0.57
Silicon (Si)	0.22
Sulphur (S)	0.01
Phosphorous (P)	0.02
Nickel (Ni)	0.41
Chromium (Cr)	0.02
Copper (Cu)	0.01
Nitrogen (N)	0.005

** Tests were carried out on S355G10+M Steel*
*** Deposited Weld Metal*

ELECTRODES
SAFETY SWITCHES
STINGERS

Welding & Usage Guide

- Take all necessary precautions when welding to safeguard yourself and others. Follow all employer's safety practices and this safety product user guide

HEALTH & SAFETY GUIDANCE

- This product is designed to be used underwater (wet) and all personnel shall be trained in the use and safe practice of underwater wet welding before using this product.
- The guidelines specified by the code of practice IMCA "D045" Safe Use of Electricity Underwater should be read, understood and followed.
- A safe OCV should always be used and this should not exceed 70 volts. An OCV of 45 volts is highly recommended.
- Electric shock can kill, do not touch live electrical parts.
- Arc rays can injure eyes and skin, wear suitable eye protection and protective clothing.
- Welding fumes can be hazardous to your health.
- Wear rubber gloves and appropriate diving dress.
- Use approved underwater electrode holders only.
- Use an approved circuit breaker and only change the electrode when "cold".
- Use three phase DC current welding machines.
- Use negative polarity (-Ve) whenever possible.

NOTE: IMCA recommends all underwater wet welding should be carried out using DCSP (-Ve) polarity. However, the electrode will also perform satisfactorily on DCRP (+Ve) should this be necessary, although when using this polarity, greater caution needs to be exercised with regards to diver safety due to increased electrolysis.

Storage & Care

- Any physical damage to the electrode coating will have a detrimental effect on weldability.
- 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 and direct sunlight, no special precautions are necessary when using **Nautilus**, as the waterproof coating provides excellent physical protection, thereby allowing for higher levels of mishandling.

Handling & Transportation

- Electrodes should be transported in a suitable welder's quiver. Electrodes that have been submerged for longer than 60 minutes should be discarded, as a detrimental effect on both the welding performance and the resultant weld quality may ensue.

Electrode Preparation

- Ensure the power is "COLD". Fit a new electrode and gently rub the tip against an abrasive surface, to remove the waterproof coating form the tip, thus ensuring a good electrical contact is made.
  Caution must be exercised so as not to unduly damage the flux coating at the tip.
  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 until the arc strikes.
  If the electrode sticks, without sight of the arc, current-flow may have commenced and damaged the waterproof coating, due to overheating, causing blisters.
  If this occurs, this electrode needs to be discarded.

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...underwater with **NAUTILUS!**