

# Professional Diving Services

Part of the Professional Divers Group

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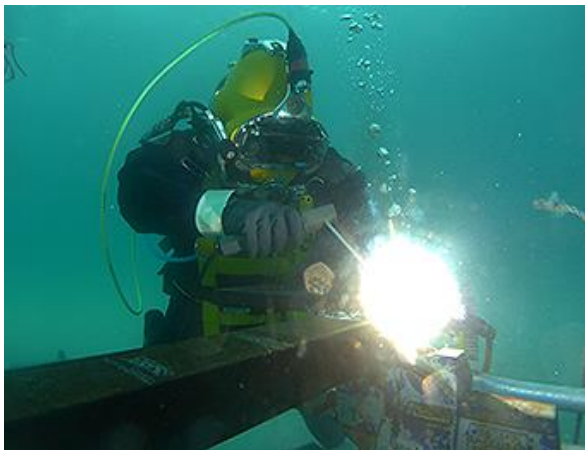
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## Underwater Welding

The two main categories of underwater welding techniques are:

1. Wet underwater welding
2. Dry underwater welding (also called Hyperbaric welding)



The definition of underwater welding usually refers to the wet welding technique where there is no mechanical barrier that separates the welding arc from the water. In wet underwater welding, shielded metal arc welding is commonly used, employing a waterproof electrode. In each of these cases, the welding power supply is connected to the welding equipment through insulated and waterproof cables. The wet welding process is generally limited to low carbon equivalent steels.

Where high integrity welds are required dry underwater welding may need to be undertaken. In dry underwater welding, the weld is performed at the prevailing pressure in a dry chamber filled with a gas mixture sealed around the structure being welded.



The applications of underwater welding is diverse and often used in underwater construction, ship repair and pipelines. Steel is the most common material welded.

### Safety Precautions

- Use an adequate size DC welding generator using straight polarity. Straight polarity is obtained by connecting the negative cable to stinger and the positive to the earth lead. Never use AC for welding in the water.
- Divers should wear insulated gloves at all times when welding.
- Attach the earth clamp of the generator as close to the worksite as practical so that the diver is never between the electrode and the earth.
- Make sure there is a knife/disconnect switch on the stinger side of the current. When the diver is changing welding electrodes or doing anything other than welding, the isolation switch must be in the open position (cold). It is important that the opening and closing of the switch be directed by the diver. Each command

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should be confirmed by the diver using the terminology “make it hot,” or “make it cold.”

- Polarity can be checked by immersing the electrode tip and earth clamp into a bucket of saltwater. Energize the rod by closing the knife switch. A stream of bubbles should rise from the electrode tip. If not reverse the polarity and retest.
- After the diver enters the water, the first task is to clean a spot for the earth clamp. The spot should be in a position in front of the diver, as close as practical to the weld joint and should be scraped or wire brushed shiny clean.
- The diver should make a test weld to check the “heat” at working depth.
- The hand should never be closer than 4” from the electrode tip.

