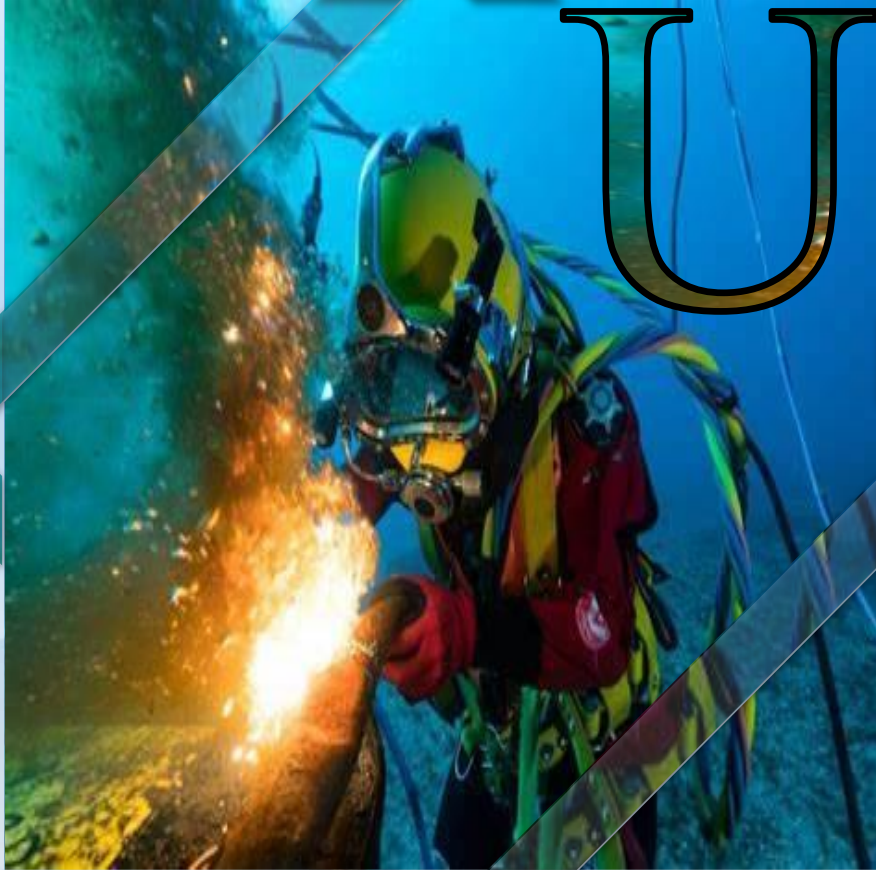




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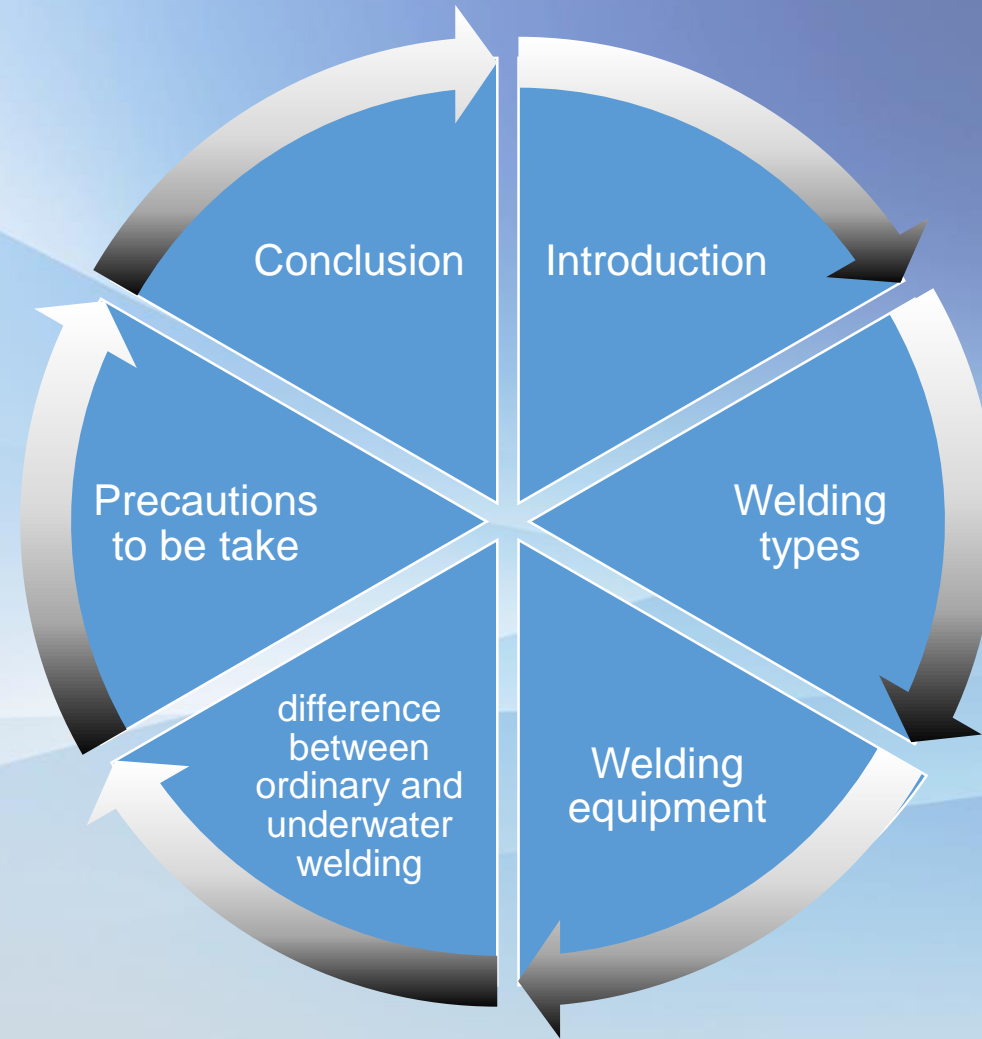


Underwater Welding

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Introduction

Underwater welding is a specialized discipline of welding that involves joining metal parts submerged underwater. It is widely used in various industries, especially in the fields of construction and repair of marine structures, subsea pipelines, oil and gas platforms, and other subsea infrastructure.



Welding types

- ***Submerged arc welding (SAW):***

Submerged arc welding is a widely used method for underwater welding. It uses an electric arc to melt a continuous electrode wire that is submerged in a granular flux.



- ***Shielded Metal Arc Welding:***

This underwater welding technique uses shielded electrodes to generate an electric arc. It is often used for underwater repairs and welding work requiring high mobility.



- ***Underwater TIG (Tungsten Inert Gas) welding:***

Underwater TIG welding is a precise method that uses an electric arc between a tungsten electrode and the workpiece. Argon is generally used as an inert gas to protect the weld from oxidation.



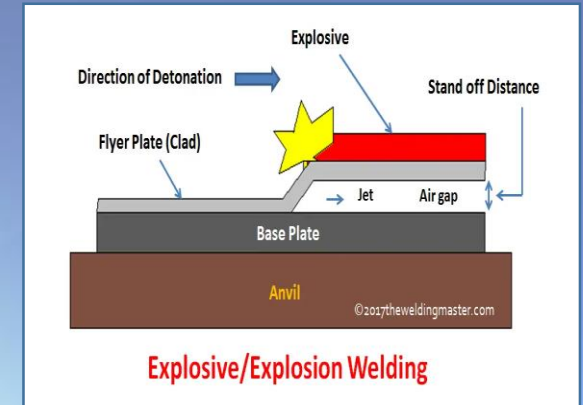
- ***Underwater MIG/MAG (Metal Inert Gas/Metal Active Gas) welding:***

This welding method uses an electric arc between a wire electrode and the part to be welded. It is suitable for various underwater welding applications, especially for welding thicker parts.



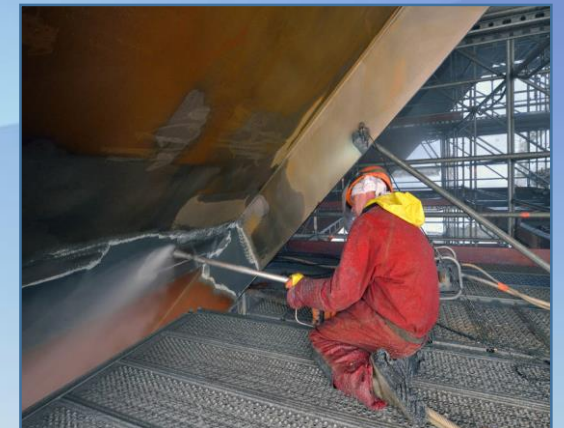
- ***Explosion Welding:***

Explosion welding is a method that uses an explosive charge to weld metal parts together. This is a less common technique, used in very specific situations.



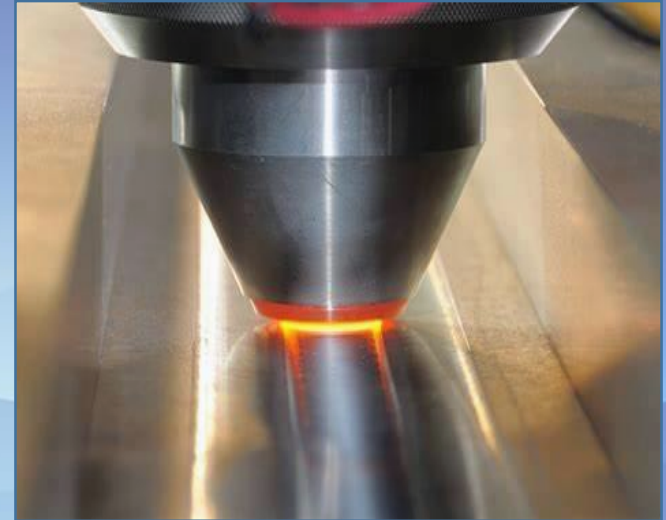
- ***Ultra-high pressure welding (UHPW):***

Ultra-high pressure welding is used to weld underwater stainless steel pipes and pipelines. It can be used for deep offshore and subsea applications.



- ***Friction Welding:***

This technique involves rubbing metal parts against each other to generate heat through friction, then welding them together. Underwater friction welding is used in some repair and construction operations.



Welding equipment

- ***Dry suit:***

Underwater welders wear dry suits that protect them from cold water and maintain a stable body temperature. These suits include gloves, boots and a full-face helmet.



- ***Welding mask:***

The underwater welding mask is equipped with a transparent face shield and tinted lenses to protect the welder's eyes from the electric arc. It is generally connected to a communications system.



- ***Electrodes:***

Special electrodes are used to generate the electric arc during underwater welding. These electrodes must be designed to be water resistant.



- ***Insulated Cables:***

Welding cables are insulated to prevent electric shock underwater. They are also designed to resist corrosion.



- ***Underwater Cameras:***

To improve visibility, underwater cameras can be used to monitor welding operations.



- ***Underwater lighting:***

Lighting is essential to ensure adequate visibility when welding underwater. Underwater spotlights are often used.



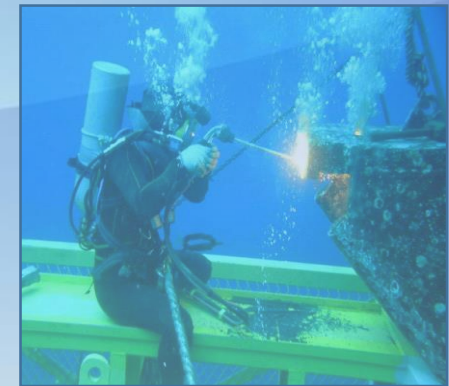
difference between ordinary and underwater welding

Ordinary welding and underwater welding differ mainly because of the environment in which they are performed. Here are the main differences between these two welding methods:

- Working environment
- Preparing the weld area
- Protection of the electric arc and the weld pool
- Special equipment and materials
- Security



Ordinary welding



Underwater welding

Precautions to be take

- ***Training:***

Underwater welders must complete specialized training to learn how to work in underwater conditions, manage risks and use equipment properly.

- ***Equipment Inspection and Maintenance:***

Underwater welding equipment, including welders, cables, electrodes and corrosion protection, must be regularly inspected and maintained to ensure proper operation.

- ***Managing Currents and Tides:***

Welders must be aware of currents and tides that can affect their work. Planning welding work must take these factors into account.

- ***Visibility control:***

Visibility underwater is often limited. The use of underwater lighting, cameras, and other visual aid equipment is common to improve visibility when welding.

- ***Corrosion Prevention:***

Corrosion protection is essential to ensure the durability of underwater welds. Appropriate anti-corrosion coatings must be applied.

- ***Electrical Safety:***

Due to the conductivity of water, special measures must be taken to ensure electrical safety when welding underwater.

example images for underwater welding



Conclusion

In conclusion, underwater welding is a specialized discipline essential for the construction, maintenance and repair of underwater infrastructure, such as pipelines, oil platforms, sea walls and naval structures. It creates strong and durable welds despite the challenges posed by the underwater environment.