

Taking the Plunge: A Guide to Starting an Underwater Welding Career

Over the years, a number of people have expressed an interest in careers in underwater welding, but were unsure how to get started. Welders, students, divers, and other interested men and women have contacted the American Welding Society (AWS) for guidance. In order to help those prospective underwater welder-divers, the D3B Subcommittee on Underwater Welding has provided answers for eight commonly asked questions.

This article was prepared by the American Welding Society's D3B Subcommittee on Underwater Welding.

The answer to the questions presented in the article are not intended as recommended practice nor as endorsement of any definitive means of pursuing underwater welding as an occupation. Rather, the aim is to provide enough useful information to assist those interested, as well as define some of the mis-conceptions associated with the trade. For additional information and/or a need for specialized training, the subcommittee recommends ANSI/AWS D3.6, Specification for Underwater Welding, as a comprehensive reference and resource for industry-accepted practice.

1) What skills are prerequisite to entering the field of underwater welding?

The skills suggested for entering the field of underwater welding can best be defined by the following typical description of a welder-diver from the AWS D3.6 Standard and the qualifications generally recognized.

“Welder-diver: A certified welder who is also a commercial diver, capable of performing tasks associated with commercial subsea work, weld setup and preparation, and who has the ability to weld in accordance with the AWS D3.6, Specification for Underwater Welding Specification for Underwater Welding (i.e., wet or dry), and other weld-related activities (see item 7.0).”

By description, an experienced welder-diver must possess: commercial diving skills (i.e., be familiar with the use of specialized commercial diving equipment, have an understanding of diving physiology, diving safety, rigging, the underwater environment, communication, etc.); weld setup and preparation skills (i.e., the ability to perform tasks typically assigned to a fitter or rigger, such as materials alignment and materials preparation including beveling, stripping of concrete, fitting a steel patch or repair plate, etc.); and the ability to certify to a required underwater weld procedure.

2) I am a certified surface welder, what other training do I need to qualify as a welder-diver?

The majority of work performed by an average welder-diver does not involve the welding operation itself, but rather executing the tasks that lead up to and follow the actual welding activities. Except under special circumstances, a welder-diver in most cases must possess both certified welder skills and commercial diving skills.

It is suggested that if you have no prior commercial diving experience you should attend one of the recognized commercial diving schools. Commercial dive schools vary insofar as duration of course, cost, etc., however, most offer a basic commercial diver certificate upon successful completion. The candidate may be required to pass a diving physical prior to school acceptance and in some cases a written exam. It is suggested that a dive physical be taken regardless, to avoid going through the expense of training only to later find you have a disability that prevents your entering the profession. A listing of U.S. commercial diving schools accredited by the Association of Commercial Diving Educators can be obtained by contacting: Association of Diving Contractors (ADC), 2611 FM 1960 W., Suite F204, Houston, TX 77068; (713) 893-8388; FAX (713) 893-5118.

As a general rule, candidates seeking underwater welding as a career will decide whether or not they are comfortable with their career choice after completing basic commercial dive training.

Once that basic commercial diver training is completed, it is common practice to apply for employment at one of many commercial diving companies that offer underwater welding as a service. An interview with the company of your choice is recommended to express your career goals in underwater welding and past welding experience. Expect to begin your career as a diver tender (apprentice diver) initially. As a diver tender you will gain valuable practical experience while learning the trade.

Before performing on-the-job underwater welding, most diving contractors will require that you achieve sufficient skill in wet and/or dry underwater welding to pass qualification tests and be certified in accordance with the requirements of ANSI/AWS D3.6, *Specification for Underwater Welding*. The time required to advance to welder-diver varies subject to supply and demand of welder-diver personnel, skill, motivation, experience and other factors. Most commercial diving firms have their own policies and procedures regarding this matter.

3) I am already a certified diver, what other training do I need to qualify as a welder-diver?

The welding processes, classes of weld and qualification tests associated with underwater welding are described in ANSI/AWS D3.6. We recommend the specification as a reference for weld procedure and welder qualification. It is also a good source of other helpful information.

If you are already certified as a “commercial diver” and work for a company that offers underwater welding services, it is recommended that you communicate to your company your career objectives and ask what welder skills they are looking for. If you are unemployed or do not work for a company that offers underwater welding services, it is suggested that you communicate with the commercial diving firm of your choice that offers underwater welding services and train to its requirements.

If you are certified as a “scuba diver” (e.g., NAUI, PADI, etc.), it is suggested that you attend a commercial diving school. Sport dive training does not include the safe use of commercial diving equipment, offshore commercial work environment/safety, and other education as

recommended by the Association of Diving Contractors *Consensus Standards for Commercial Diving Operations*.

Underwater welding is a skill you also have to master once you obtain the basic commercial diving skills required. Again, it is suggested that you communicate with the commercial diving firm of your choice that offers underwater welding services, and train to its requirements. Each commercial diving firm has its own policies and procedures regarding this matter.

4) What are the age limitations of a welder-diver?

There is no age restriction on commercial welder-divers. There are, however, physical requirements. It is recommended and generally required that all commercial divers pass an annual dive physical. ADC has an industry-accepted dive physical format that is used by many of its members in the United States and other countries (e.g., some companies may have other requirements, subject to the regulations of the country where they are located, etc.).

The commercial diving profession is physical demanding. It is rare to see an active commercial welder-diver over the age of 50.

5) What is the availability of work for an entry-level welder-diver?

This is a difficult question to answer. It is more appropriate to ask the company with whom you seek and/or gain employment. There are a number of diving procedures that serve the various types of underwater industrial requirements, each of which have different underwater welding needs. Like many professions, work availability is always subject to: supply vs. demand, the economics of a given industry, whether you are free to relocate outside your place of residence (including overseas), what other related skills you have in addition to diving and welding, etc. A number of welder-divers have established a reputation of high-quality workmanship and/or productivity and are asked for by name. The company you choose to work for is also a factor.

The answer to the question is that there is work available for entry-level welder-divers; however, the amount of work available is subject to the aforementioned variables.

6) What salary can I expect to make as a welder-diver?

An average salary vs. grade index would be interesting to look at if there were one, but the truth of the matter is that salaries for welder-divers cover a wide range. We know some welder-divers earn \$15,000 per year while others earn in excess of \$100,000. Because the majority of welder-divers are paid on a project-by-project basis, salaries are subject to the same variables as work availability. In addition, other factors such as depth, dive method and diving environment affect pay rates. The company with whom you gain employment should be able to tell you the salary range you can expect to earn.

7) What other skills are recommended to supplement my qualifications as a welder-diver?

The commercial diving and underwater welding industry is as diverse as the customers it serves. The welder-diver qualifications required for a given assignment vary from project to project. Ideally, a diving contractor would like its welder-divers to be “a jack of all trades and a master of them all!” Practically speaking, possessing the skills that are common to underwater welding operations, in addition to welding and diving, are recommended. Primarily these skills are: underwater cutting (oxyfuel, abrasive water jet, mechanical cutting equipment, etc.); fitting and rigging; inspection and nondestructive testing (visual, magnetic particle, ultrasonics, radiography, eddy current, etc.); drafting; and underwater photography (still photo and video).

Not all welder-divers possess the variety of skills that may be required to complete an underwater welding project. Diving contractors typically combine personnel resources to satisfy the capabilities required. Hence, the more skills the welder-diver maintains the more valuable he becomes in meeting project qualification requirements. The most desirable underwater welder-divers are those who are qualified to: assist the diving contractor in pre-job planning (e.g., having the ability to photograph/video, draft and report on work requirements prior to the actual underwater welding operation); cut, clean, rig, install, and fit up the sections they will weld; and work with personnel responsible for inspecting the completed welds.

Formal training is recommended for whatever skills you wish to qualify for. Many diving contractors, and the customers they serve, work under quality programs that demand evidence of training and/or qualifications. Therefore, it is recommended that the training you receive be accredited or offer a certificate of completion (e.g., a welding certificate, a diving certificate, an ASNT Level II or CSWIP ultrasonic certificate, riggers certificate, etc.). Maintaining the qualifications you obtain is just as important as receiving them as there has been many a job lost to a welder-diver who has let his certification lapse.

8) What future career opportunities are there for an experienced welder-diver?

There are a number of career opportunities for experienced welder-divers. Many go on to become engineers, instructors, and diving operations supervisors, fill management positions, qualify as AWS Certified Welding Inspectors (CWI), and serve as consultants for underwater welding operations and other related fields.

Ideally, a career as a welder-diver should serve as a stepping stone to other opportunities for those who choose the profession.

Industry has and will continue to demand higher quality standards for underwater welds and more certification of underwater welding systems and personnel. These demands will challenge the underwater welding community to meet more complex technical specifications, safety standards, welding criteria, inspection methods, environmental factors, and other considerations. To meet these challenges, tomorrow's welder-divers will rely on the knowledge and experience of their predecessors who have gone on to become welding engineers, welding engineer divers, supervisors and instructors. These individuals will provide the technical support needed for coming underwater welding operations.

A career as a welder-diver can be an exciting and rewarding profession. It cannot be overstated that safety through training is paramount to any welder-diver candidate.

The majority of work performed by an average welder-diver does not involve the welding operation itself, but rather executing the task that lead up to and follow the actual welding activities. Except under special circumstances, a welder-diver in most cases must possess both certified welder skills and commercial diving skills.

It is suggested that if you have no prior commercial diving experience you should attend one of the many recognized commercial diving schools. Commercial dive schools vary insofar as duration of course, cost, etc., however, most offer a basic commercial diver certificate upon successful completion. The candidate may be required to pass a diving physical prior to school acceptance and in some cases a written exam. It is suggested that a dive physical be taken regardless, to avoid going through the expense of training only to later find you have a disability that prevents your entering the profession. A listing of U.S. commercial diving schools accredited by the Association of Commercial Diving Educators can be obtained by contacting: Association of Diving Contractors (ADC), 2611 FM 1960 W., Suite F204, Houston, TX 77068; (713) 893-8388; Fax (713) 893-5118.