

Background Information and References:

Fabricator/Fitter

Definition: Works heavily with blueprints and is responsible for laying out, fabricating and tacking parts together. Fabricator/fitters will then hand the part off to a production welder to weld, or will weld it themselves. Fabricator/fitters tend to have responsibilities dealing with metalworking tools for cutting, drilling, grinding, and other fabrication processes and may use fasteners (bolts, rivets, screws, etc.) to put parts together; more so than a production welder will. Mathematic and measuring skills are important for fabricator/fitters.

Salary: According to the Bureau of Labor Statistics, the mean annual salary for a welder was \$36,600. The 50 percent (median) income level for a welder was \$34,800 on an annual basis. National average salaries in the welding industry are often used as a guideline when determining an individual welder's average annual salary.

A welder fabricator's experience in the industry partially determines his average annual salary level. According to My Salary, level one welders with minimal experience in the field earn an average of \$34,100 on an annual basis. Level two welder fabricators with two or more years of experience in the field earn an average of \$40,200 per year. Those with the highest level of expertise in the industry, level three senior welders with over four years of experience, earn an average of \$46,500 on a yearly basis.

Education: Fabricators require specialized training, through a high school vocation-technical program or a post-secondary diploma program at a trade school. Other welder fabricators earn associate's degrees or technical diplomas in welding from technical, community, or junior colleges.

Production Welder

Definition: Typically welds the same part over and over again. They usually work off of blueprints. Some production welders will have parts fitted by a fabricator/fitter before they weld. Some production welders need to fabricate/fit their own parts before welding. Production welders typically have to reach a certain daily goal based on a certain amount of weld (usually in inches) required or number of parts made.

Salary: The average salary of a production welder employed in the United States is about \$37,000 per year. A shipyard welder in Chicago can earn as much as \$41,000 annually, but a spot welder averages about \$23,000 per year. Auto body welding specialists can earn up to \$50,000 annually.

Education: A production welder job may require only a high school diploma and a basic understanding of mathematics for measurements, but a technical diploma or associates degree in welding is preferred. A welder must have special knowledge of the machines and tools he operates, including how to repair and maintain them. Blue print reading also is required. The welder also must have the ability to identify raw materials, have familiarity with the production process and familiarity with quality control issues. Military contractors may require special testing and Department of Defense clearances will be required, according to Career Planning.

Custom and Maintenance Welders

Definition:

Custom Welders have very similar welding tasks as that of Fabricators. However, a custom welder works on custom style weldments, not the same thing over and over. A custom welder may work off of blueprints, or may have to create their own shop drawings to work off of. They may also do welding on equipment and machinery. Custom welders often work with other companies or individuals to create or modify a product. Because of this, they tend to work with all different types of metals, so knowledge of metals and their properties are important to custom welders. Auto mechanics, auto body repair technicians, diesel mechanics, and industrial mechanics will likely do custom welds during their careers.

Maintenance Welders typically do the same work as any maintenance personnel. Most people in a maintenance department will do some welding on broken down equipment and machinery. Auto mechanics, auto body repair technicians, diesel mechanics, and industrial mechanics will likely weld during their career.

Salary: According to the Bureau of Labor Statistics the mean annual salary for a welder was \$37,370. The average range is from \$23,940 to \$53,690. National average salaries in the welding industry are often used as a guideline when determining an individual welder's average annual salary.

Education: The work of custom welders requires specialized training, which may occur as part of a high school vocation-technical program or a post-secondary diploma program at a trade school. Some welding opportunities will require an associate's degrees in welding from a community or junior colleges.

Millwright

Definition: Fabricates and maintains industrial machinery and equipment. The work heavily with blueprints and will install or tear down equipment in factories. Welding is only part of the job. Their duties are similar to industrial mechanics, but tend to be on a larger scale. They need to be good with math and precision measurements along with rigging and moving around big, heavy machinery.

Salary: According to the Bureau of Labor Statistics the mean annual salary for a welder was \$49,820. The average range is from \$31,110 to \$72,500.

Education: All millwrights, in an industrial environment, are required to have a high school diploma, GED, or equivalent. Most employers are more willing to have employees who have studied at a trade school with specific courses in industrial technology. A background in mechanical drawing and mathematics is a great start.

Pipe Welder

Definition: Pipe welders work in a wide range of industries, including manufacturing and plumbing. Pipe welders work with blueprints to do layout and piping, and then weld the piping together. They typically need to be certified and have special training. Most piping systems are made of steel and stainless steel depending on their application.

Salary: The typical American pipe welder earns \$36,630 a year on average. This works out to \$17.61 hourly. Pipe welders in the bottom 10th percentile earn \$23,420, while those in the top 90th percentile bring in \$52,420. The top three states that employ the greatest number of pipe welders are Louisiana, Oklahoma and Mississippi. Louisiana pipe welders bring in an average of \$40,760 per year --- the highest salary average in the group , while Oklahoma rings in at \$34,770, and Mississippi at \$35,910. The highest paying state for pipe welders is Alaska, where they net an average yearly salary of \$61,550. This is followed by Hawaii, at \$52,210, and the District of Columbia, at \$51,900.

Education: Pipe welders typically need no more than a high school diploma to get hired, although they should at least have a basic understanding of the welding process before applying. Many pipe welders serve apprenticeships following high school, learning the trade under the supervision of an experienced worker. Pipe welding courses may be offered as part of a welding program at a trade school or technical college, and there are some welding programs that specifically train for pipe welding.

Construction and Installation Workers

Definition:

Construction workers have a variety of job duties. One of those duties may be welding. Since construction workers do a great deal of erecting structures, metals, specifically steel, may be of the materials they work with. Steel framing for buildings or rebar for road construction are examples of some welding that may be required by a construction worker.

Installation workers install equipment and machinery in a shop or factory. Many welding and fabricating shops require an installation crew to go on site to their customers to install the equipment or machinery built in the shop. An installation worker may do a great deal of traveling, so a driver's license and clean driving record are important. An installation worker will install a number of different components of equipment, such as electrical or plumbing work. Many times, equipment and machinery made in a shop needs to stay within certain dimensions so that it can be legally transported by semi-truck. When it reaches the site of the customer, welding may be required to complete the project. Welding is sometimes needed to install the equipment in order to meet up with existing equipment in a factory.

Salary: According to the Bureau of Labor Statistics the mean annual salary for a welder was \$37,370. The average range is from \$23,940 to \$53,690.

Education: High school diploma or GED with a minimum number of year's related training and experience is usually required. Most employers are more willing to have employees who have studied at a trade school with specific courses in the field.

Welding Inspector (CWI)/Quality Control

Definition: Personnel are required to make sure that welding done in a company reaches certain standards. Certain testing, destructive (DT) and nondestructive (NDT) in nature will be performed by welding inspectors and quality control.

Certified Welding Inspectors need to be present during all welder certification tests; and then will perform testing (destructive test- guided bend test) on the weld certification specimen, following certain requirements in order to determine whether the test will pass or fail. CWI's need to have several years of experience as a certified welder, take courses in welding code, and pass a stringent written test along with a physical welding test in order to become qualified.

Quality Control personnel may be required to perform basic nondestructive testing on welds typically performed in a workplace. Quality Control is also responsible for making sure that workers are holding all proper measurements and following weld procedure. Quality control basically checks up on the work being done in a shop and makes sure everything is made to the customer's as well as the company's standards. Sometimes, quality control personnel are required to be a CWI.

Salary: The salary for certified welding inspectors depends heavily on how much experience the inspector has in the job. With one to four years of experience, an inspector can expect to make between \$40,000 to \$60,000 a year. An inspector who has worked 20 years or more will make up to \$100,000 a year.

Education: The American Welding Society (AWS) offers three certification levels for welding inspectors:

- certified associate welding inspector, certified welding inspector, senior certified welding inspector

Educational pathways for certified welding inspectors include high school welding classes and certificate programs at vocational schools, trade schools, technical schools or community colleges. Would-be welders can even earn associates or bachelor's degrees in welding technology before becoming inspectors.

Welding Engineer

Definition: A welding engineer is a person with the demonstrated education, experience, and knowledge in specialized fields of welding, brazing, cutting and materials joining. Welding engineering is a broad field that covers fields from automotive and shipbuilding to nuclear power, aerospace and mining. If there is joining of metals involved then there is probably a welding engineer involved in the process. Require a college degree. Engineers may have a variety of responsibilities. They are the brains behind welding. Engineers may have to troubleshoot welding problems and develop solutions, procedures, or techniques for these problems. Engineers may be involved with creating new welding equipment and welding technology.

Salary: An average salary for a welding engineer is \$77,000 per year. However, the range can vary from \$60,000 to as much as \$113,000 per year.

Education: Most welding Engineers must have both high school and post-secondary education. Education is usually in general engineering, calculus-based structure.

Courses include work in: mathematics, physical metallurgy, physics, chemistry, engineering mechanics, thermodynamics and fluids, core engineering requirements.

Welding Education in General:

- Trade and vocational colleges often offer courses in welding basics, which can include courses specific to pipe welding. The same is true of some high school shop classes. Besides welding, areas of study might include physical metallurgy, chemistry and mechanical drawing.
- One educational avenue to consider is the Armed Forces. The U.S. Armed Forces provides training and certification in general and pipe welding, and some pipe welders begin as soldering or brazing workers, molding together smaller parts while learning the basics of the trade.

Lesson 1.1: Fact Sheet - Welding Career Opportunities

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Salary Range:

- Mean annual salary: \$36,600
- Median annual income level: \$34,800
- National averages:
 - Level one – minimal experience in the field: \$34,100
 - Level two – two or more years of experience: \$40,200
 - Level three – (senior welders with over four years of experience): \$46,500
- A welder fabricator's salary can depend upon geographic location, the type of industry and experience in the field.

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