

Trade Profile

Welder



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RED SEAL TRADE PROFILE

Welder



STRUCTURE OF THE TRADE PROFILE

This profile has two sections that provide a snapshot of the trade's description, and all trade activities as they are organized in the Red Seal Occupational Standard:

Description of the Welder trade: an overview of the trade's duties, work environment, job requirements, similar occupations and career progression

Task Matrix: a chart which outlines graphically the major work activities, tasks and sub-tasks of this trade

Major Work Activity (MWA): the largest division within the standard that is comprised of a distinct set of trade activities

Task: distinct actions that describe the activities within a major work activity

Sub-task: distinct actions that describe the activities within a task

A complete version of the occupational standard, which provides additional detail for the trade activities, skills and knowledge can be found at www.red-seal.ca.

Description of the Welder Trade

“Welder” is this trade’s official Red Seal occupational title approved by the CCDA. This standard covers tasks performed by welders.

Welders permanently join pieces of metal by applying heat, using filler metal or fusion processes. They join parts being manufactured, build structures, repair damaged or worn parts and apply wear surfaces. They use various welding processes to join structural steel and metal in vessels, piping and other components. They also use various cutting and gouging processes as well as fabricate parts, tools, machines and equipment used in the construction and manufacturing industries. They must be knowledgeable in weld faults (discontinuities), how they happen and how to correct them.

Welders may specialize in certain types of welding such as custom fabrication, ship building and repair, bridge building and repairs, marine infrastructure, aerospace, pressure vessels, pipeline, structural welding, and machinery and equipment repair. There is a large diversity of materials used and products manufactured, resulting in a greater range of processes and specializations.

Welders may be self-employed contractors or be employed by companies such as fabrication shops, steel and platform manufacturers, refineries, mechanical contractors, transportation contractors (heavy machinery, aircraft, shipbuilding, railcar repair), and specialized welding shops. Their work may be performed outdoors or indoors, on land or in water, and travel may be required to jobs in remote locations.

In order to meet high quality standards, welders require attributes such as good mechanical ability, manual dexterity, good vision, excellent hand-eye coordination, and the ability to concentrate on detail work. They should be able to work independently and as part of a team. They also require the ability to work efficiently and accurately, to visualize a finished product, to reason logically and to understand metallurgy. They must be able to read and understand fabrication drawings and a variety of different prints depending on the industry.

Occupational hazards in this trade include: sparks, gases, hazardous fumes, burns, heavy lifting, repetitive stress and exposure to ultra-violet and infra-red radiation. Environmental conditions may include working at heights, in confined spaces, in trenches and in extreme temperatures.

With experience, welders may advance to positions such as lead hand, welding supervisor, welding inspector, welding engineer and project manager.

This standard recognizes similarities or overlaps with the work of industrial mechanics (millwrights), sheet metal workers, steamfitters/pipefitters, metal fabricators (fitters), ironworkers and boilermakers. With additional training, welders can transfer their skills to these related trades.

Welder

Task Matrix and Weightings

A – Performs common occupational skills

16%

| | | | |
|---|---|---|---|
| Task A-1 Maintains tools and equipment 25% | A-1.01 Maintains hand, power, layout and measuring tools | A-1.02 Maintains stationary machinery | A-1.03 Maintains thermal cutting equipment |
| | A-1.04 Maintains welding equipment | | |
| Task A-2 Uses access and material handling equipment 15% | A-2.01 Uses access equipment | A-2.02 Uses material handling equipment | |
| Task A-3 Performs safety-related activities 25% | A-3.01 Performs hazard assessments | A-3.02 Maintains safe work environment | A-3.03 Uses personal protective equipment (PPE) and safety equipment |
| Task A-4 Organizes work 15% | A-4.01 Uses documentation and reference material | A-4.02 Interprets drawings and welding symbols | A-4.03 Plans job tasks |
| | A-4.04 Organizes materials | | |

Task A-5
Performs routine trade activities
28%

A-5.01 Performs quality inspection

A-5.02 Marks welds, materials and parts

A-5.03 Controls temperature of weldments

A-5.04 Stores welding consumables and gas cylinders

A-5.05 Selects welding processes and power source

A-5.06 Performs equipment start-up and shut-down

A-5.07 Finishes final product

Task A-6
Uses communication and mentoring techniques
2%

A-6.01 Uses communication techniques

A-6.02 Uses mentoring techniques

B – Performs layout and fabrication of components for welding

22%

Task B-7
Performs layout
44%

B-7.01 Develops templates

B-7.02 Transfers dimensions from drawings to materials

Task B-8
Fabricates components
56%

B-8.01 Prepares materials

B-8.02 Fits components for welding

B-8.03 Assembles components

C – Performs cutting and gouging

18%

Task C-9
Uses tools and equipment for non-thermal cutting and grinding
25%

C-9.01 Selects cutting and grinding tools

C-9.02 Cuts using stationary power tools

C-9.03 Cuts using shears and ironworkers

C-9.04 Cuts using hand tools

C-9.05 Cuts using portable power tools

| | | | |
|---|---|--|--|
| Task C-10 Uses oxy-fuel gas cutting (OFC) process for cutting and gouging 30% | C-10.01 Selects OFC gas and equipment | C-10.02 Sets up OFC equipment | C-10.03 Sets operating parameters for OFC equipment |
| | C-10.04 Performs cut and gouge using OFC equipment | | |
| Task C-11 Uses plasma arc cutting (PAC) process for cutting and gouging 26% | C-11.01 Selects PAC equipment and consumables | C-11.02 Sets up PAC equipment | C-11.03 Sets operating parameters for PAC equipment |
| | C-11.04 Performs cut and gouge using PAC equipment | | |
| Task C-12 Uses air carbon arc cutting (CAC-A) process for cutting and gouging 19% | C-12.01 Selects CAC-A equipment and consumables | C-12.02 Sets up CAC-A equipment | C-12.03 Sets operating parameters for CAC-A equipment |
| | C-12.04 Performs cut and gouge using CAC-A equipment | | |

D – Performs welding processes

44%

| | | | |
|---|---|---------------------------------------|---|
| Task D-13 Welds using shielded metal arc welding (SMAW) process 33% | D-13.01 Selects SMAW equipment and consumables | D-13.02 Sets up SMAW equipment | D-13.03 Sets operating parameters for SMAW |
| | D-13.04 Performs weld using SMAW equipment | | |

Task D-14
 Welds using flux cored arc welding (FCAW), metal cored arc welding (MCAW) and gas metal arc welding (GMAW) processes
34%

D-14.01 Selects FCAW, MCAW and GMAW gas, equipment and consumables

D-14.02 Sets up FCAW, MCAW and GMAW equipment

D-14.03 Sets operating parameters for FCAW, MCAW and GMAW

D-14.04 Performs weld using FCAW, MCAW and GMAW equipment

Task D-15
 Welds using gas tungsten arc welding (GTAW) process
24%

D-15.01 Selects GTAW gas, equipment and consumables

D-15.02 Sets up GTAW equipment

D-15.03 Sets operating parameters for GTAW

D-15.04 Performs weld using GTAW equipment

Task D-16
 Welds using submerged arc welding (SAW) process
9%

D-16.01 Selects SAW equipment and consumables

D-16.02 Sets up SAW equipment

D-16.03 Sets operating parameters for SAW

D-16.04 Performs weld using SAW equipment