



On-the-Job Learning and Education Outline

Welder, Combination	
Job Description: Use hand-welding, flame-cutting, hand-soldering, or brazing equipment to weld or join metal components or to fill holes, indentations, or seams of fabricated metal products.	
RAPIDS Code: 0622CB	O*NET Code: 51-4121.06

Section 1 – On-the-Job Learning (Work Experience) - 29 CFR § 29.5(b)(4))

1. Every apprentice is required to participate in related instruction in technical subjects related to the occupation.
2. The sponsor /participating employer must ensure Apprentices are rotated throughout the various work processes to ensure a well-rounded professional upon completion of the Apprenticeship and identify what methodology will be used to track progression of experience on-the-job.
3. Such on-the-job training shall be carried out under the direction and guidance of a qualified professional.

The following identifies the major work processes in which Apprentices will be trained.

Apprenticeship Competencies – Technical

The below on-the-job-learning (OJL) work process competencies are intended as a guide. It need not be followed in any sequence, and it is understood that some adjustments may be necessary in the hours allotted for different work experience. In all cases, the apprentice is to receive sufficient experience to make them fully competent and use good workmanship in all work processes, which are a part of the trade. In addition, the apprentice shall be fully instructed in safety and OSHA requirements.

Ratings are:

Demonstrates Fundamentals – Apprentice can perform the task with some coaching.

Proficient in Task – Apprentice performs tasks properly and consistently.

Completion Date – Date apprentice completes final demonstration of competency.

Apprentices need to be “proficient in task” in each category, by each of their nine-month reviews during the apprenticeship in order to be considered for any merit increases or to have successfully completed the apprenticeship. The evaluation will be conducted in accordance with the employer’s competency-based performance evaluation system.

Sponsor: New Hampton Community Schools

Apprentice Name: _____

Start Date _____



Item	Welder Combination: Technical Competencies	Demonstrated Fundamental	Proficient in Tasks	Completion Date	N/A
A.	<p>Air Carbon Arc Cutting (CAC-A) – Gouging A) set-up, adjust, and regulate air pressure, power source, torch. B) identify appropriate electrode, proper current settings, and travel speed. C) perform maintenance on CAC-A equipment.</p>				
B.	<p>Oxy-Fuel Cutting (OFC) A) set-up, adjust, and regulate tanks, hoses, and torches. B) perform manual straight cutting. C) perform manual bevel cutting. D) perform manual washing. E) how to pierce.</p>				
C.	<p>Mechanical Cutting A) Demonstrate the ability to select and properly utilize a variety of mechanical cutting equipment. Examples include but not limited to: Sawzall, Chop Saw, Abrasive Cutoff Wheel, Port-a-Band, Horizontal Bandsaw, Vertical Bandsaw. B) Demonstrate the ability to maintain a variety of mechanical cutting pieces of equipment to include blade changes. C) Operate mechanical methods of pipe weld joint preparation equipment <i>(if applicable)</i></p>				
D.	<p>Plasma Cutting (PAC) A) Demonstrate the ability to make successful cuts utilizing manual plasma cutting equipment, B) Demonstrate the ability to apply a straight edge to plate steel for precision cutting. C) Demonstrate the ability to set-up, identify electrode failure, and change out plasma cutting electrodes.</p>				
E.	<p>Shielded Metal Arc Welding (SMAW) A) set-up, operate, and maintain S.M.A.W. equipment. B) identify electrode. C) fillet weld plate in designated positions. D) groove weld plate in designated positions. E) weld pipe in the vertical and horizontal positions. F) cut and gouge using carbon arc-air method. G) demonstrate the ability to operate pipe weld joint preparation tools. <i>(If applicable)</i></p>				
F.	<p>Gas Metal Arc Welding (GMAW-S) A) set-up, operate, and maintain GMAW equipment. B) identify and utilize different diameters of wire electrode. C) fillet weld pipe-to-plate in designated positions. D) weld pipe in the vertical and horizontal positions. E) demonstrate the ability to operate weld joint preparation tools.</p>				
F-1	<p>Gas Metal Arc Welding (GMAW-S) or (GMAW-P)</p>				



	<p>A) Weld a 3/16" (0.2") [5 mm] horizontal fillet weld in T joint in the horizontal position in a straight line.</p> <p>B) Weld a 5/16" (0.3") [8 mm] horizontal fillet weld in Lap joint in the horizontal position in a straight Line.</p> <p>C) Weld square groove butt joint in the flat position.</p> <p>D) Weld flare bevel groove T joint in the flat and horizontal positions.</p> <p>E) Weld a 3/16" (0.2") [5 mm] horizontal fillet weld in T joint in the horizontal position around a small diameter pipe.</p> <p>F) Weld a 5/16" (0.3") [8 mm] horizontal fillet weld in T joint in the horizontal position around a small diameter pipe</p>				
F-2	<p>Gas Metal Arc Welding (GMAW-S) or (GMAW-P)</p> <p>(A) Weld a 5/16" (0.3") [8 mm] horizontal fillet weld in T joint in the horizontal position in a straight line.</p> <p>(B) Weld a 3/8" (0.4") [10 mm] horizontal fillet weld in T joint in the horizontal position in a straight line (2 pass).</p> <p>(C) Weld a 1/2" (0.5") [13 mm] horizontal fillet weld in T joint in the horizontal position in a straight line (3 pass).</p> <p>(D) Weld a 5/16" (0.3") [8 mm] horizontal fillet weld in T joint in the horizontal position around a small diameter pipe.</p> <p>(E) Weld bevel (single, Vee, flair) groove welds in The flat position</p>				
G.	<p>Flux Cored Arc Welding (FCAW)</p> <p>A) set-up, operate, and maintain F.C.A.W. equipment.</p> <p>B) identify electrode.</p> <p>C) fillet weld plate in designated positions.</p> <p>D) groove weld plate in designated positions.</p> <p>E) Weld pipe in the designated positions.</p>				
H.	<p>Dual Shield Arc Welding (FCAW-G)</p> <p>A) set-up, operate, and maintain FCAW-G equipment.</p> <p>B) identify electrode.</p> <p>C) fillet weld plate in designated positions.</p> <p>D) groove weld plate in designated positions.</p> <p>E) Weld pipe in the designated positions.</p>				
I.	<p>Gas Tungsten Arc Welding (GTAW)</p> <p>A. Set-up and operate GTAW equipment to include foot pedal systems and scratch start systems.</p> <p>B) Demonstrate the ability to complete GTAW fillet welds in the flat position on carbon steel.</p> <p>C) Demonstrate the ability to GTAW fillet welds in multiple positions.</p> <p>D) Obtain instruction on the proper techniques for TIG welding on stainless steel.</p> <p>E) Obtain instruction on the proper techniques for TIG welding aluminum.</p>				
J.	<p>Tools and Equipment</p> <p>A) operate grinders, de-bur stock, rough removal of material.</p> <p>B) use and care for hand tools. Wrenches, hammers, punches, pliers, etc.</p> <p>C) use and care for measuring devices. Tape measures, rules, scales, caliper, dividers, etc.</p> <p>D) use and care for precision measurement equipment.</p>				



New Hampton Community Schools

Home of the Chickasaws



Registered Apprenticeship

K.	<p>Fabrication and Assembly</p> <p>A) layout stock from blueprints, sketches, and templates. B) drill, ream, countersink, counter-bore, spot face, and tap holes using portable equipment. C) chip and grind material using handheld tools. D) set-up and target piping assemblies. E) basic rigging and crane signaling.</p>				
L.	<p>Weld Layout, Jigs, and Fixtures</p> <p>A) Verify components match blueprint specs. B) Assemble parts using jigs and fixtures. C) Tack weld parts in a fixture. D) Identify jig and fixture process improvements. E) Finish weld parts in a fixture</p>				
M.	<p>Lean Manufacturing</p> <p>A) Understand the principles of 5S. B) Weld to specified welding intervals. C) Participate in company incentive programs.</p>				
N.	<p>Weld Inspection</p> <p>A) Understand the acceptance criteria required for weld completion. B) Communicate effectively with weld inspection personnel. C) Examine joint fit-up and surface preparation prior to welding operations.</p>				
O.	<p>Miscellaneous (Optional per Company Request, Request must be approved by the Sponsor)</p> <p>This section is reserved for companies to add company specific skills that will aid in the retention of employee post apprenticeship in addition to above requirements. For example, finishing, NDE inspection, material acquisition, welder Certifications...the possibilities are endless that will help the company build a stronger employee.</p>				

Employer: _____

Apprentice: _____

Mentor: _____

Supervisor: _____

Sponsor: _____

Date Completed: _____