



ONTARIO COLLEGE OF TRADES

ORDRE DES MÉTIERS DE L'ONTARIO

Apprenticeship
Training Standard

Pressure Systems
Welder

Trade Code: 456P

Development Date: October 2009

Please Note: Apprenticeship Training and Curriculum Standards were developed by the Ministry of Training, Colleges and Universities (MTCU). As of April 8th, 2013, the Ontario College of Trades (College) has become responsible for the development and maintenance of these standards. The College is carrying over existing standards without any changes.

However, because the Apprenticeship Training and Curriculum Standards documents were developed under either the *Trades Qualification and Apprenticeship Act* (TQAA) or the *Apprenticeship and Certification Act, 1998* (ACA), the definitions contained in these documents may no longer be accurate and may not be reflective of the *Ontario College of Trades and Apprenticeship Act, 2009* (OCTAA) as the new trades legislation in the province. The College will update these definitions in the future.

Meanwhile, please refer to the College's website (<http://www.collegeoftrades.ca>) for the most accurate and up-to-date information about the College. For information on OCTAA and its regulations, please visit: <http://www.collegeoftrades.ca/about/legislation-and-regulations>

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APPRENTICESHIP PROGRAM SUMMARY/GUIDELINES

1. **Program Definition: Pressure Systems Welder** is defined as a person who welds metal plates, shells, tubes, drums and structures to assemble and repair boilers and pressure systems to meet pressure test standards.

PRESSURE SYSTEMS WELDER is an approved apprenticeship program for the purposes of the *Apprenticeship and Certification Act, 1998* (ACA).

2. **Program Guidelines**

- **On-The-Job Train Duration (for apprentices)**
The Industry Committee has identified 5,280 hours as the duration generally necessary for any apprentice to become competent in the skills required. There may be individual circumstances where the duration varies from this guideline.
- **In-School Training Duration**
The Industry Committee has identified 480 hours of in-school training as the duration generally necessary for an apprentice to complete the in-school curriculum for this program, except where an apprentice has been exempted from any level of that curriculum.
- **Ratio**
The Industry Committee has identified a journeyman-to-apprentice ratio of one journeyman or individuals who are deemed equivalent to a journeyman status to one apprentice as the ratio generally necessary for an apprentice to be properly trained on the job in this program. There may be individual circumstances where the ratio varies from this guideline.

3. **Program Requirements**

- **Restricted Skill Sets**
This program does not contain any restricted skill sets as per Ontario Regulation 565/99, Restricted Skill Sets. Therefore, an individual is not required to be registered apprentice or possess certification in order to perform skills contained in the program.
- **Academic Standard**
The Industry Committee has identified the minimum academic standard for entry to this program as completion of Grade 12 or ministry-approved equivalent.

(See ACA Policy 102, Confirming Academic Requirements)

- **Eligibility for Exam Challenge (*for Non-apprentice C of Q Applicants*)**
The challenger must:
 - provide proof of competency in all mandatory (unshaded) skills as identified in the Training Standard or Schedule of Training; and
 - demonstrate that he/she has acquired 5,760 hours of on-the-job training.

(See ACA Policy 150, Assessing Applicants for the Certificate of Qualification)
- **Eligibility for Program Completion (*for Apprentices*)**
The apprentice must:
 - achieve competency in all mandatory (unshaded) skills as identified in the Training Standard or Schedule of Training.
 - complete the in-school training as outlined in the industry and ministry-approved Curriculum Standard.

(ACA Policy 309, Completion of an Apprenticeship Program)
- **Other Information**
- **Other Resources**
Complete program requirements, policies, and standards can be obtained by referring to the following resources:
 - *Apprenticeship and Certification Act, 1998 (ACA)*;
 - ACA General Regulation 573/99;
 - ACA Exemption Regulation 566/99;
 - Program-specific Apprenticeship Training Standards or Schedules of Training; and
 - ACA Program and Policy Manual
- **Other Required Certification**
N/A
- **Academic Background**
Industry has identified relevant secondary school course(s) likely to increase an individual's chances of success if completed prior to program entry. For details, see the document Apprenticeship Subject Pathways.

**COMPETENCY ANALYSIS PROFILE
Pressure Systems Welder**

(All unshaded skill sets must be demonstrated/completed)

SKILL SETS

SKILLS

<p>APPLY ASME STANDARDS TO WELDS</p> <p align="center">U0811.0</p>	<p>Select ferrous and/or non-ferrous base metals</p> <p align="center">U0811.01</p>	<p>Select ferrous and/or non-ferrous filler metals</p> <p align="center">U0811.02</p>			
<p>USE WELD PROCEDURE SPECIFICATION</p> <p align="center">U0812.0</p>	<p>Apply information extracted from the weld procedure specification pertaining to essential variables</p> <p align="center">U0812.01</p>	<p>Apply information extracted from the weld procedure specification pertaining to non-essential variables</p> <p align="center">U0812.02</p>	<p>Apply information extracted from the weld procedure specification pertaining to supplementary essential variables</p> <p align="center">U0812.03</p>		
<p>APPLY WELDER PERFORMANCE QUALIFICATIONS</p> <p align="center">U0813.0</p>	<p>Interpret “actual” and “range variables qualified”</p> <p align="center">U0813.01</p>	<p>Assess individual performance requirements</p> <p align="center">U0813.02</p>			
<p>SELECT PRESSURE WELDING COMPONENTS</p> <p align="center">U0814.0</p>	<p>Select ferrous and non-ferrous base metals</p> <p align="center">U0814.01</p>	<p>Select filler metals</p> <p align="center">U0814.02</p>			
<p>SELECT PRESSURE WELDING PROCEDURE</p> <p align="center">U0815.0</p>	<p>Select pressure welding essential variables</p> <p align="center">U0815.01</p>	<p>Select pressure welding non-essential variables</p> <p align="center">U0815.02</p>	<p>Select pressure welding supplementary variables</p> <p align="center">U0815.03</p>		

PRESSURE SYSTEMS WELDER

CUT AND PREPARE PIPES/TUBES, TANKS OR VESSELS U0816.0	Cut openings with manual and semiautomatic oxy-fuel equipment U0816.01	Cut openings with manual and semiautomatic plasma arc equipment U0816.02	Prepare weld joints in pipes/tubes, tanks or vessels U0816.03		
COMPLETE ASSEMBLY OF PIPES/TUBES, TANKS OR VESSELS U0817.0	Verify components as described on the drawing U0817.01	Assemble and tack weld components as described on the drawing U0817.02	Verify that the assembly meets the requirements U0817.03		
WELD PRESSURE SYSTEMS WITH SMAW, GTAW, GMAW AND FCAW PROCESSES U0818.0	Select and set up welding equipment U0818.01	Install GTAW consumables U0818.02	Install GMAW and FCAW consumables U0818.03	Adjust and verify welding process parameters U0818.04	Weld using the SMAW process U0818.05
	Weld using the GTAW process U0818.06	Weld using the GMAW process U0818.07	Weld root passes using the GMAW or FCAW process U0818.08	Weld fill and cover passes using the SMAW, GTAW, GMAW or FCAW process U0818.09	
BRAZE METAL ON PRESSURE SYSTEMS U0819.0	Select and configure oxy-fuel-gas heating equipment U0819.01	Select consumables U0819.02	Braze lap joints in copper, copper to stainless steel, stainless steel to stainless steel and carbon steel to stainless steel U0819.03	Carry out shut down procedure U0819.04	
REPAIR DEFECTIVE WELDS U0820.0	Determine probable location of defects U0820.1	Remove defects and prepare joint for repair welding U0820.2	Re-weld joints U0820.3		

PRESSURE SYSTEMS WELDER

PERFORM SPECIALIZED TECHNIQUES	Mirror weld using the GTAW or SMAW process	Window weld using the GTAW or SMAW process			
U0821.0	U0821.01	U0821.02			

PREFACE

This training standard was developed by the Workplace Training Branch of the Ministry of Training, Colleges, and Universities (MTCU), in partnership with the Welder and Metal Fabricator Industry Committee and in consultation with representatives from the industry. This document is intended to be used by apprentice, supervisor/trainer and sponsor/employer as a "blueprint" for training and as a prerequisite for completion and certification.

This training document becomes the apprentice's only record of workplace training performance.

Supervisor/trainer and apprentice are required to sign off and date the skills following each successful acquisition, unless a skill is marked shaded (optional).

The care and maintenance of this training document are the joint responsibility of the apprentice and the sponsor/employer. By signing off the skill, the supervisor/trainer and the apprentice are indicating that the apprentice has demonstrated competence of the skill. This training standard has been developed specifically for documenting the apprentices' acquisition of skills of the trade.

DEFINITIONS

ACA

Apprenticeship and Certification Act, 1998

Certificate of Apprenticeship (C of A)

Certification issued to individuals who have demonstrated that they have completed an apprenticeship in Ontario.

Certificate of Qualification (C of Q)

Certification issued to C of Q applicants who have achieved a passing grade on the certification exam for their trade.

Competency Analysis Profile

A document that identifies the training needs of an individual trade and details the skills/skill sets that must be demonstrated.

Competence

The ability of an individual to perform a skill repeatedly and without assistance in the workplace to the standard set out in the Training Standard or Schedule of Training.

General Performance Objective (On-the-job Skill Set)

Describes set of skills which include all performance objectives under that skill set

Industry Committee (IC) - under the ACA and Provincial Advisory Committee (PAC) under the TQAA

Under the ACA and TQAA, the Minister may appoint a provincial committee in any trade or group of trades to advise the Minister in matters relating to the establishment and operation of apprenticeship training programs and trades qualifications.

Journeyman or Equivalent

A person who has acquired the knowledge and skills in a trade, occupation or craft as attested to by a provincial or territorial authority.

Mandatory

Status assigned to unshaded individual skills, skill sets or general performance objective which must be signed off for the apprentice to complete their program

Optional

Status assigned to shaded individual skills, skills sets or general performance objective for which sign-off is not required for the apprentice to complete the program.

Sign-off

Signature of the sponsor/employer of record or an individual, to whom that sponsor or employer has delegated signing authority, indicating an apprentice's achievement of competence.

Skill

Individual skill described in the Training Standard (note: does not mean the larger skill groups referred to in the Training Standard as Skill Sets, Training Units, or General Performance Objective, but the individual skills that make up those groups).

Skill Sets

Group of individual skills found in the Training Standard (may also be called Training Unit or General Performance Objective)

Skill Set Completion Form

Lists all skill sets and includes space for sign-off by sponsor/employer of record.

Sponsor/Employer

Means a person that has entered into a registered training agreement under which the person is required to ensure that an individual is provided with workplace-based training in a trade, other occupation or skill set as part of an apprenticeship program approved by the Director.

Sponsor/Employer of Record

Refers to the sponsor or employer documented as the signatory to the current training agreement or contract. In order for a sponsor/employer to be considered for the training of apprentices, they must identify that the workplace has qualified journeypersons or equivalent on site and can identify that the workplace has the tools, equipment, materials, and processes which have been identified by Provincial Advisory Committees (PACs) or Industry Committees (ICs) to be required for the trade.

Supervisor

An individual, who oversees the execution of a task, oversees the actions or work of others.

Trainer

A qualified trainer in a compulsory trade is a journeyperson with a Certificate of Qualification or in a voluntary trade is an individual who is considered equivalent to a journeyperson with a Certificate of Qualification.

TQAA

Trades Qualification and Apprenticeship Act.

Training Standard

A document that has been written in concise statements, which describe how well an apprentice must perform each skill in order to become competent. In using the document, trainers will be able to ensure that the apprentice is developing skills detailed for the occupation.

IMPORTANT DIRECTIONS

Apprentice

1. All complete skills or skill sets must be signed and dated by both the apprentice and sponsor/employer when either all terms of the contract have been completed or the apprentice leaves the employ of the employer.
2. It is the responsibility of the apprentice to inform the apprenticeship staff at the local Ministry of Training, Colleges and Universities office regarding the following changes:
 - change of sponsor/employer address;
 - change of apprentice name or address;
 - transfer to a new sponsor/employer.
3. The Skill Set Completion Form must be completed and signed by the current sponsor/employer and presented to the local Apprenticeship Client Services Office at the fulfillment of all terms of a Contract of Apprenticeship/Training Agreement.
4. The apprentice completion form with the Completed and Authorized Training Standard must be presented to the local Apprenticeship Client Services Unit.

Sponsors/Employers and Supervisors/Trainers

The Training Standard identifies skills required for this trade/occupation and its related training program.

This Training Standard has been written in concise statements which describe how an apprentice must perform each skill in order to become competent. Competence means being able to perform the task to the required standard.

In using this Training Standard, supervisors/trainers will be able to ensure that the apprentice is developing the skills detailed for the trade/occupation.

Supervisors/Trainers and apprentices are required to sign off and date the skills following each successful acquisition.

Sponsors/Employers participating in this training program will be designated as the Signing Authority and are required to attest to successful achievement by signing the appropriate box included at the end of each skill set.

NOTICE OF COLLECTION OF PERSONAL INFORMATION

1. At any time during your apprenticeship training, you may be required to show this training standard to the Ministry of Training, Colleges and Universities (the Ministry). You will be required to disclose the signed Apprenticeship Completion form to the Ministry in order to complete your program. The Ministry will use your personal information to administer and finance Ontario's apprenticeship training system, including confirming your completion and issuing your certificate of apprenticeship.
2. The Ministry will disclose information about your program completion and your certificate of apprenticeship to the Ontario College of Trades, as it is necessary for the College to carry out its responsibilities.
3. Your personal information is collected, used and disclosed by the Ministry under the authority of the Ontario College of Trades and Apprenticeship Act, 2009.
4. Questions about the collection, use and disclosure of your personal information by the Ministry may be addressed to the:

Manager, Employment Ontario Contact Centre
Ministry of Training, Colleges and Universities
33 Bloor St. E, 2nd floor, Toronto, Ontario M7A 2S3
Toll-free: 1-800-387-5656; Toronto: 416-326-5656
TTY: 1-866-533-6339 or 416-325-4084.

**ROLES & RESPONSIBILITIES OF APPRENTICE, SPONSOR/EMPLOYER
AND SUPERVISOR/TRAINER**

Apprentice “Apprenticeship is Learning On-the-job”

- Practice safe work habits.
- Use your apprenticeship training standard as a journal to keep track of which skills you have achieved.
- Talk over your training plan with your Training Consultant, Employer, Union, or Sponsor.
- Know what tools are required for your trade and how to use them.
- Ask questions and keep asking.
- Talk to your employer about your training needs.
- Demonstrate enthusiasm and good work habits.
- Ensure that you and your supervisor/trainer sign off skill/skill sets upon demonstration of competency.

Sponsor/Employer “Training is an Investment”

- Demonstrate safe work habits.
- Attest to successful achievement by signing the skill/skills sets.
- Provide opportunities and time for the apprentice to learn the trade.
- Offer practical trade training experiences that cover all of the skill sets.
- Foster work ethics that support training while minimizing productivity losses.
- Set out clear expectations, then recognize or reward performance excellence.
- Involve both the apprentice and supervisor/trainer in developing the training plan.
- Use the Training Standard as a monitoring tool and part of regular performance evaluations.
- Select supervisors/trainers with good communication skills and who work well with others.
- Encourage supervisors/trainers to take upgrading courses - (e.g. Train the Trainer, Mentor Coach, etc).
- Complete the Skill Set Completion Form once the apprentice has demonstrated competency in the training.
- Ensure that the apprentice always works under the direction of or has access to a qualified supervisor/trainer.
- Vary the apprentice’s exposure to all the skills set out in the training standard.

Supervisor/Trainer

- Demonstrate safe work habits.
- Treat apprentices fairly and with respect.
- Use the Training Standard as a guide to evaluating competence in each skill area. In using the Training Standard, supervisors/trainers will be able to ensure that the apprentice is developing skills detailed for the trade/occupation.
- Review the Training Standard with the apprentice and develop a training plan.
- Respond fully to all questions.
- Be patient. Explain what is to be done then, show how it is done, and then let the apprentice demonstrate the task.
- Provide continuous feedback.
- Sign off individual skills/skill sets once the apprentice demonstrates competence in the skill.

Suggestions for Assessing the Progress of the Apprentice in the Workplace

- Use informal daily observation.
- Provide constructive feedback to build confidence.
- Allow the supervisor/trainer time to teach and demonstrate the skills.
- Take prompt action wherever problems occur.
- Conduct regular performance reviews involving the apprentice, supervisor/trainer and sponsor/employer.
- Use the Training Standard as the reference for establishing the competency of the apprentice.

SKILL SET COMPLETION FORM

SKILLS SETS	TITLE	SIGNING AUTHORITY
U0811.0	APPLY ASME STANDARDS TO WELDS	
U0812.0	USE WELD PROCEDURE SPECIFICATION	
U0813.0	APPLY WELDER PERFORMANCE QUALIFICATIONS	
U0814.0	SELECT PRESSURE WELDING COMPONENTS	
U0815.0	SELECT PRESSURE WELDING PROCEDURE	
U0816.0	CUT AND PREPARE PIPES/TUBES, TANKS OR VESSELS	
U0817.0	COMPLETE ASSEMBLY OF PIPES/TUBES, TANKS OR VESSELS	
U0818.0	WELD PRESSURE SYSTEMS WITH SMAW, GTAW, GMAW AND FCAW	
U0819.0	BRAZE METAL ON PRESSURE SYSTEMS	
U0820.0	REPAIR DEFECTIVE WELDS	
U0821.0	PERFORM SPECIALIZED TECHNIQUES	

NOTE ON SHADED PERFORMANCE OBJECTIVES AND SKILLS:

- Shaded performance objectives and skill sets are optional. The shaded skills do not have to be demonstrated or signed-off for completion of the on-the-job component of the apprenticeship
- The in-school curriculum learning outcomes will cover all of the skill sets, both shaded and unshaded.
- The Certificate of Qualification examination will test the whole of the trade and may test both shaded and unshaded performance skill sets.

U0811.0 APPLY ASME STANDARDS TO WELDS

GENERAL PERFORMANCE OBJECTIVE

Select pressure welding components in agreement with criteria relating to material (P numbers), consumable (F numbers) and deposited weld metal characteristics (A numbers), in accordance with American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (ASME - BPVC).

PERFORMANCE OBJECTIVES

SKILLS

U0811.01 Select ferrous and/or non-ferrous base metals identified in the weld procedure specification under materials description (P number) without error, in accordance with American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (ASME - BPVC).

Date Completed

Apprentice

Supervisor/Trainer

U0811.02 Select ferrous and/or non-ferrous filler metals identified in the weld procedure specification under filler materials description (F number) without error, in accordance with American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (ASME - BPVC).

Date Completed

Apprentice

Supervisor/Trainer

Sponsor/Employer Name

Sponsor/Employer Signature

U0812.0 USE WELD PROCEDURE SPECIFICATION

GENERAL PERFORMANCE OBJECTIVE

Apply relevant variables of the weld procedure specification by selecting, adjusting and controlling them so that the welding will be performed correctly in accordance with the weld procedure specification.

PERFORMANCE OBJECTIVES

SKILLS

U0812.01 Apply information extracted from the weld procedure specification pertaining to essential variables found in *ASME* Code Section IX such as “P” numbers, “F” numbers, weld process, pre-heat and post heat so that welding is performed in accordance the weld procedure specification and the *ASME* Code.

Date Completed

Apprentice

Supervisor/Trainer

U0812.02 Apply information extracted from the weld procedure specification pertaining to non-essential variables found in *ASME* Code Section IX such as joint design, positions, technique, and electrical characteristics so that welding is performed in accordance the weld procedure specification and the *ASME* Code.

Date Completed

Apprentice

Supervisor/Trainer

U0812.03 Apply information extracted from the weld procedure specification pertaining to supplementary essential variables found in *ASME* Code Section IX such as post weld heat treatment, group numbers, and filler metal diameter so that welding is performed in accordance the weld procedure specification and the *ASME* Code.

Date Completed

Apprentice

Supervisor/Trainer

Sponsor/Employer Name

Sponsor/Employer Signature

U0813.0 APPLY WELDER PERFORMANCE QUALIFICATIONS

GENERAL PERFORMANCE OBJECTIVE

Apply the welder performance qualification by interpreting the essential and non-essential variables found on the welder performance qualification sheet and assess individual qualifications so that welder performance qualifications are adhered to.

PERFORMANCE OBJECTIVES

SKILLS

U0813.01 Interpret “actual” and “range variables qualified” found on the *ASME* or *TSSA* welder identification card (s) including thickness qualified, filler metal, progression, and position so that the weld is performed in accordance with the *ASME* Code Section IX.

Date Completed

Apprentice

Supervisor/Trainer

U0813.02 Assess individual performance requirements as they apply to the weldment so that the conditions and variables are correctly applied in accordance with the *ASME* Code Section IX.

Date Completed

Apprentice

Supervisor/Trainer

Sponsor/Employer Name

Sponsor/Employer Signature

U0814.0 SELECT PRESSURE WELDING COMPONENTS

GENERAL PERFORMANCE OBJECTIVE

Select pressure welding components in agreement with criteria relating to material (P numbers), consumables (F numbers) and deposited weld characteristics (A numbers), in accordance with American Society of Mechanical Engineers (*ASME*) code standards.

PERFORMANCE OBJECTIVES

SKILLS

U0814.01 **Select ferrous and non-ferrous base metals** identified in the Weld Procedure Specification under materials description (P number), so that the materials used meet the *ASME* code criteria identified in the *ASME* Code Section II part A (Ferrous) and Section II part B (Non-Ferrous) along with *ASME* Code Section IX].

Date Completed

Apprentice

Supervisor/Trainer

U0814.02 **Select filler metals** extracted from *ASME* Code Section II part C (Filler Metals) along with *ASME* Code Section IX, so that the filler metals (“F” & “A” numbers) used comply with the Weld Procedure Specification.

Date Completed

Apprentice

Supervisor/Trainer

Sponsor/Employer Name

Sponsor/Employer Signature

U0815.0 SELECT PRESSURE WELDING PROCEDURE

GENERAL PERFORMANCE OBJECTIVE

Select pressure welding essential, non-essential and supplementary variables in the weld procedure specification based on *ASME* Code Section IX, such as material (P numbers), consumables (F numbers), weld process, pre-heat and post heat, joint design, positions, technique, electrical characteristics weld heat treatment, group numbers, and filler metal diameter so that welding will be performed in accordance the weld procedure specification and the *ASME* Code.

PERFORMANCE OBJECTIVES

SKILLS

U0815.01 **Select pressure welding essential variables** in the weld procedure specification based on *ASME* Code Section IX, such as “P” numbers, “F” numbers, weld process, pre-heat and post heat so that welding will be performed in accordance the weld procedure specification and the *ASME* Code.

Date Completed

Apprentice

Supervisor/Trainer

U0815.02 **Select pressure welding non-essential variables** in the weld procedure specification based on *ASME* Code Section IX, such as joint design, positions, technique, and electrical characteristics so that welding will be performed in accordance the weld procedure specification and the *ASME* Code.

Date Completed

Apprentice

Supervisor/Trainer

U0815.03 **Select pressure welding supplementary variables** in the weld procedure specification based on *ASME* Code Section IX, such as post weld heat treatment, group numbers, and filler metal diameter so that welding will be performed in accordance the weld procedure specification and the *ASME* Code.

Date Completed

Apprentice

Supervisor/Trainer

Sponsor/Employer Name

Sponsor/Employer Signature

U0816.0 CUT AND PREPARE PIPES/TUBES, TANKS OR VESSELS

GENERAL PERFORMANCE OBJECTIVE

Cut openings in pipes/tubes, tanks or vessels by cutting metal to size using one of several processes; and preparing weld joints so that the finished product meets the requirements of the job specification and/or applicable codes and standards.

PERFORMANCE OBJECTIVES

SKILLS

U0816.01 Cut openings with manual and semiautomatic oxy-fuel equipment in pipes/tubes, tanks or vessels by selecting tips, pressures, travel speeds required; making bevel cuts, window cuts, and piercing cuts in accordance with manufacturers' instructions for the intended application so that the cut is made to the applicable code or standard.

Date Completed

Apprentice

Supervisor/Trainer

U0816.02 Cut openings with manual and semiautomatic plasma arc equipment in pipes/tubes, tanks or vessels by selecting gas, gas pressure and amperage settings travel speeds required; making bevel cuts, window cuts, and piercing cuts in accordance with manufacturers' instructions for the intended application so that the cut is made to the applicable code or standard.

Date Completed

Apprentice

Supervisor/Trainer

U0816.03 Prepare weld joints in pipes/tubes, tanks or vessels by using equipment such as grinders and beveling machines so that the joint preparation meets the requirements of the welding specification and/or the applicable code or standard.

Date Completed

Apprentice

Supervisor/Trainer

Sponsor/Employer Name

Sponsor/Employer Signature

U0817.0 COMPLETE ASSEMBLY OF PIPES/TUBES, TANKS OR VESSELS

GENERAL PERFORMANCE OBJECTIVE

Complete assembly of pipes/tubes, tanks, vessels and components by verifying component completeness, assembling components, tack welding components, and checking weld joint fit up and condition so that the assembly meets the requirements of the welding specification and/or the applicable code or standard.

PERFORMANCE OBJECTIVES

SKILLS

U0817.01 Verify components as described on the drawing by identifying components as being correct and complete through stampings or other identification processes or systems so that the assembly will meet the requirements of the welding specification and/or the applicable code or standard.

Date Completed

Apprentice

Supervisor/Trainer

U0817.02 Assemble and tack weld components as described on the drawing by aligning joints in the correct configuration and tack welding so that the assembly meets the requirements of the welding specification and/or the applicable code or standard.

Date Completed

Apprentice

Supervisor/Trainer

U0817.03 Verify that the assembly meets the requirements of the drawing or specification by, measuring and checking weld joint fit up and component configuration so that the assembly meets the requirements of the welding specification and/or the applicable code or standard.

Date Completed

Apprentice

Supervisor/Trainer

Sponsor/Employer Name

Sponsor/Employer Signature

U0818.0 WELD PRESSURE SYSTEMS WITH SMAW, GTAW, GMAW AND FCAW PROCESSES

GENERAL PERFORMANCE OBJECTIVE

Weld pipes/tubes, tanks and vessels with the shielded metal arc (SMAW), gas tungsten arc (GTAW), gas metal arc (GMAW) and flux-cored arc (FCAW) welding processes, in all positions common to the process, from one side only without solid backing (where access to the joint is restricted in one or more planes for GTAW) by adjusting welding process parameters, applying the correct welding technique and assessing the behavior of the material as welding progresses so that the welds are correctly completed in accordance with the weld procedure specification and the requirements of the applicable code or standard.

PERFORMANCE OBJECTIVES

SKILLS

U0818.01 Select and set up welding equipment by selecting power source, feeder, welding cable assemblies, welding gun, welding electrode holder, gun liners, gas distributor, gas cup and seals, contact tubes, flow meter, personal equipment and tools, and assembling them so that all the equipment necessary to weld with the required process is available and is correctly set up or installed in accordance with manufacturer's instructions for the intended application.

Date Completed

Apprentice

Supervisor/Trainer

U0818.02 Install GTAW consumables by choosing the shielding gas, purging equipment, type and size of filler rod and the tungsten electrode type and size and shaping the tungsten electrode for the welding application and the composition and thickness of the base material so that the correct shielding gas, tungsten and filler rod are installed in accordance with the welding procedure specification and manufacturer's instructions.

Date Completed

Apprentice

Supervisor/Trainer

U0818.0 WELD PRESSURE SYSTEMS WITH SMAW, GTAW, GMAW AND FCAW PROCESSES (cont.)

U0818.03 Install GMAW and FCAW consumables by extracting requirements from the applicable welding procedure specification or following directions of supervisor; identifying the correct shielding gas or gas mixture, purging equipment and the type and size of filler metal for the welding position, joint type, and the composition and thickness of the base material; and mounting these consumables so that the correct gas and filler wire are installed in accordance with the welding procedure specification and manufacturer's instructions for the intended application.

Date Completed

Apprentice

Supervisor/Trainer

U0818.04 Adjust and verify welding process parameters by choosing the equipment configuration which meets the welding procedure specification requirements for size and quality of weld including voltage and wire feed speed; shielding gas flow rate; purge flow rate and purge time; and testing the settings and adjusting the operation of the equipment so that the correct balance of penetration, fusion, profile and weld size is achieved for the welding application and that it meets the weld quality requirements of CSA or ASME.

Date Completed

Apprentice

Supervisor/Trainer

U0818.05 Weld using the SMAW process on groove joints from one side without backing in all positions, where access is restricted in one plane (6GR F3 and F4 root passes) using any one of carbon steel, stainless steel or other alloys; and in the work environment identified by the employer so that the weld is performed in accordance with the approved welding procedure specification and meets the weld inspection requirements of the applicable code or standard

Date Completed

Apprentice

Supervisor/Trainer

U0818.0 WELD PRESSURE SYSTEMS WITH SMAW, GTAW, GMAW AND FCAW PROCESSES (cont.)

U0818.06 Weld using the GTAW process on groove joints from one side without solid backing in all positions, using any one of carbon steel, stainless steel, aluminum or other alloys; and applying the correct welding technique so that the weld is performed in accordance with the approved welding procedure specification and meets the requirements of the applicable code or standard.

Date Completed

Apprentice

Supervisor/Trainer

U0818.07 Weld using the GMAW process on groove joints from one side without solid backing in all positions, where access is restricted in one plane (6GR) using any one of carbon steel, stainless steel or other alloys; and applying the correct welding technique so that the weld is performed in accordance with the approved welding procedure specification and meets the weld inspection requirements of the applicable code or standard

Date Completed

Apprentice

Supervisor/Trainer

U0818.08 Weld root passes using the GMAW or FCAW process on groove joints from one side without solid backing in the flat, horizontal and vertical down positions, using any one of carbon steel, stainless steel, aluminum or other alloys so that the weld is performed in accordance with the approved welding procedure specification and meets the requirements of the applicable code or standard.

Date Completed

Apprentice

Supervisor/Trainer

U0818.0 WELD PRESSURE SYSTEMS WITH SMAW, GTAW, GMAW AND FCAW PROCESSES (cont.)

U0818.09 Weld fill and cover passes using the SMAW, GTAW, GMAW or FCAW process on groove joints in all positions, using any one of carbon steel, stainless steel or other alloys so that the weld is performed in accordance with the approved welding procedure specification and meets the requirements of the applicable code or standard.

Date Completed

Apprentice

Supervisor/Trainer

Sponsor/Employer Name

Sponsor/Employer Signature

U0819.0 BRAZE METAL ON PRESSURE SYSTEMS

GENERAL PERFORMANCE OBJECTIVE

Braze pressure systems composed of various metals in all positions with the oxy-fuel-gas (OFG) process by selecting and configuring oxy-fuel-gas apparatus; obtaining consumables; brazing lap joints, assessing the behavior of the material while brazing progresses so that process operations are correctly performed in accordance with the requirements of the applicable code or standard.

PERFORMANCE OBJECTIVES

SKILLS

U0819.01 Select and configure oxy-fuel-gas heating equipment by selecting torch, heating tip, filler alloy type and diameter and flux type; adjusting gas pressures; selecting personal equipment and tools; and assembling them so that all the equipment necessary to braze joints in various metals using the oxy-fuel-gas (OFG) process is available and is correctly set up in accordance with the requirements of the applicable code or standard.

Date Completed

Apprentice

Supervisor/Trainer

U0819.02 Select consumables by determining the applicable brazing procedure or following directions of supervisor; and identifying the type and size of filler metal and flux type so that the correct consumables are available for the intended application in accordance with the requirements of the applicable code or standard.

Date Completed

Apprentice

Supervisor/Trainer

U0819.0 BRAZE METAL ON PRESSURE SYSTEMS (cont.)

U0819.03 Braze lap joints in copper, copper to stainless steel , stainless steel to stainless steel and carbon steel to stainless steel by choosing the equipment configuration including fuel gas, oxygen pressures and heating tip sizes; testing the settings and adjusting the operation of the equipment; preparing the joint; preheating the joint and adding the filler alloy so that the correct combination of penetration, fill and flow of filler alloy through the joint is achieved, the correct joint profile and size are achieved for the brazing application and that it meets the requirements of the applicable code or standard.

Date Completed

Apprentice

Supervisor/Trainer

U0819.04 Carry out shut down procedure by storing heating equipment; post cleaning braze joint assemblies; and removing residual fluxes so that the joint is capable of performing in the intended service environment.

Date Completed

Apprentice

Supervisor/Trainer

Sponsor/Employer Name

Sponsor/Employer Signature

U0820.0 REPAIR DEFECTIVE WELDS

GENERAL PERFORMANCE OBJECTIVE

Repair defective welds in pressure systems by determining the probable location of discontinuities, removing the defect, ensuring the defect has been removed, preparing the cavity for re-welding and re-welding so that the repaired joint meets the weld quality requirements of *CSA* or *ASME*.

PERFORMANCE OBJECTIVES

SKILLS

U0820.01 Determine probable location of defects by visually examining the joint, and /or reviewing nondestructive examination results of the joint so that the defects are correctly located in preparation for removal.

Date Completed

Apprentice

Supervisor/Trainer

U0820.02 Remove defects and prepare joint for repair welding by selecting and employing the most appropriate method (gouging, grinding or chipping); removing the defect; and preparing the joint for welding so that the defect is completely removed and the joint can be repair welded to meet the quality requirements of the applicable code or standard.

Date Completed

Apprentice

Supervisor/Trainer

U0820.03 Re-weld joints using the appropriate process and in a manner which meets the quality requirements of the applicable code or standard.

Date Completed

Apprentice

Supervisor/Trainer

Sponsor/Employer Name

Sponsor/Employer Signature

U0821.0 PERFORM SPECIALIZED TECHNIQUES

GENERAL PERFORMANCE OBJECTIVE

Perform specialized techniques in pressure systems by performing window and mirror welding so that the weld applied through the specialized technique meets the weld quality requirements of *CSA* or *ASME*.

PERFORMANCE OBJECTIVES

SKILLS

U0821.01 Mirror weld using the GTAW or SMAW process, where vision is restricted in one plane, on groove joints from one side without backing in all positions, using any one of carbon steel, stainless steel or other alloys in the work environment identified by the employer so that the weld is performed in accordance with the approved welding procedure specification meeting the weld inspection requirements of the applicable code or standard

Date Completed

Apprentice

Supervisor/Trainer

U0821.02 Window weld using the GTAW or SMAW process, where access is restricted in two planes, on groove joints from one side without backing in all positions, using any one of carbon steel, stainless steel or other alloys in the work environment identified by the employer so that the weld is performed in accordance with the approved welding procedure specification meeting the weld inspection requirements of the applicable code or standard

Date Completed

Apprentice

Supervisor/Trainer

Sponsor/Employer Name

Sponsor/Employer Signature

APPRENTICE RECORD

APPRENTICE NAME (Print):

SPONSOR/EMPLOYER INFORMATION	
Training Agreement #	
Name	
Address	
Telephone	
E-mail Address	

SUMMARY OF TRAINING	
Employment Start Date	
Employment End Date	
Total hours of training & instruction between dates of employment.	

Date Completed

Apprentice

Supervisor/Trainer

APPRENTICE RECORD

APPRENTICE NAME (Print):

SPONSOR/EMPLOYER INFORMATION	
Training Agreement #	
Name	
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Total hours of training & instruction between dates of employment.	

Date Completed

Apprentice

Supervisor/Trainer

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Employment Start Date	
Employment End Date	
Total hours of training & instruction between dates of employment.	

Date Completed

Apprentice

Supervisor/Trainer

APPRENTICE COMPLETION FORM

APPRENTICE NAME	
Print	
Signature	
Social Insurance Number	

Skill Sets when completed should be signed by the Supervisor/Trainer and presented with this completion form to your local Apprenticeship Client Services Office. Any supporting documentation should also be attached.

In-school Completed (Proof to be provided) Yes () No () Not applicable ()

Hours completed as Per Contract: Yes () No () Not applicable ()

SPONSOR/EMPLOYER INFORMATION	
Name	
Address	
Telephone	
E-mail Address	
Signature of Signing Authority	

You will be required to disclose this signed form to the Ministry of Training, Colleges and Universities in order to complete your program. The Ministry will use your personal information to administer and finance Ontario's apprenticeship training system. For further information please see the notice/declaration for collection of personal information that is referenced in the table of contents of this training standard.