

WELDER

Ontario
Practical Assessment

2019.01

Please read all the information provided before you start the assessment.

This assessment tests four welding processes (FCAW, SMAW, GMAW, GTAW), five plate assemblies (measurement, visual and bend), and three oxy-acetylene cutting tests (measurement and visual). Unless otherwise advised by the examining officer, you may do the tests in any logical order. Review the enclosed marking sheet for specifications.

Materials Provided:

NWPE #1 & #3

- 4 pieces – 100 mm x 152 mm x 10 mm (4" x 6" x 3/8") P-1 Plates cut/bevel one end at 30° - 37.5°

NWPE #2 & #5

- 2 pieces – 100 mm x 152 mm x 10 mm (4" x 6" x 3/8") P-1 Plates cut/bevel one end at 30°
- 2 pieces – 100 mm x 152 mm x 10 mm (4" x 6" x 3/8") P-1 Plates cut at 90° both ends
- 2 pieces – 50 mm x 177 mm x 6 mm (2" x 7" x 1/4") P-1 Backing plates cut at 90° both ends

NWPE #4

- 2 pieces – 100 mm x 152 mm x 6 mm (4" x 6" x 1/4") P-1 Plates cut/bevel one end at 30° - 37.5°

NWPE #6

- 1 piece – 100 mm x 152 mm x 10 mm (4" x 6" x 3/8") for Oxy-Fuel Test (note: 6" is to allow material to be flame cut down to 5" as a final dimension)

Extra Materials:

- +/- 25 mm x 50 mm (+/-1" x 2") P-1 tabs for bridge or run off tabs
- All required welding electrodes, welding wire and shielding gas as described in the following pages
- Smaller plate pieces for setting of welding machine

Candidate to Provide:

- Helmet, goggles, gloves, personal hand tools and appropriate safety equipment including CSA approved work boots and safety glasses. **Candidates not having this safety equipment will not be allowed to perform the practical assessment.**
- Angle grinder, grinding discs and buffing wheel.

General Instructions:

1. You will be allowed six (6) hours to complete this assessment of all "six projects" and (2) hours for bending of the straps for the "five" weld tests. The weld tests are a visual assessment to the acceptance criteria complete with a face and root bend. The Oxy-Fuel project is minimum pass mark of 70%. Do not engage in needless conversation with assessors or other candidates. Pay close attention to the availability of welding and cutting stations in order to complete the assessment in the time allotted.
2. **You must follow these instructions precisely**, as well as any additional instructions by the assessors. You may ask the assessors for clarification of these instructions at any time.
3. You are required to wear and/or use all appropriate safety equipment.
4. **There is no extra set of coupons issued during this assessment.** The original coupons issued at the beginning of the assessment are the only coupons you will have to work with.
5. **Plates must be stamped** with candidate number and position letter, test coupon identification letter (F=Face and R=Root), as illustrated on the following pages, **before** beginning the exam.
6. Any **single** coupon/strap receiving a complete fracture rating (see last point of page 2) will result in a re-test of the failed position immediately following this testing. During the re-test, the coupon/strap will be bent on the face or root as applicable. One (1) hour will be allowed for this re-test.

Note: Failure to complete this re-test when instructed to do so by the assessors will result in failure of the entire assessment. This re-test may not be done at any time other than the day of the original assessment.**

7. Any **two** straps receiving a complete fracture rating in one test coupon will result in failure of the **entire assessment**.

8. When you have completed the assessment, clean up your workstation.
9. Tests will be marked in the absence of the candidates. Stay away from the bending station until called by the assessors to review your assessment results.
10. **If a candidate fails any of the retests this will result in failure of the Ontario Practical Assessment.**
11. Official assessment results will be emailed to the Ontario College of Trades at practicals@collegeoftrades.ca and issued to the candidate within four weeks after the testing date.

****The costs associated with any re-testing will be set by the testing centre and the number of items that need to be retested.**

Welding Test Centres have set been up across the province for Trade Equivalency Assessment applicants to complete the testing. Once a centre has a minimum of three (3) to a maximum of six (6) registrations the practical assessment will be scheduled.

The following Testing Centres are available for the Welder Practical Assessment:

GTA Region

UA Local 46
936 Warden Avenue
Scarborough, ON
Contact: D. Hardy
dhardy@ualocal46.org

Southwestern Ontario

UA Local 527
225 Frobisher Drive
Waterloo, ON
Contact: D. Twomey
dan.twomey@ua527.com

Technical Training Group
428 Forman Avenue
Stratford, ON
Contact: S. Bontaine
sbontaine@technicaltraininggroup.org

Mohawk College
481 Barton Street
Stoney Creek, ON
Contact: K. Underhill
kenneth.underhill@mohawkcollege.ca

UA Local 67
195 Dartnall Road
Hamilton, ON
Contact : D. McGavin
dmcgavin@ualocal67.com

Eastern Ontario

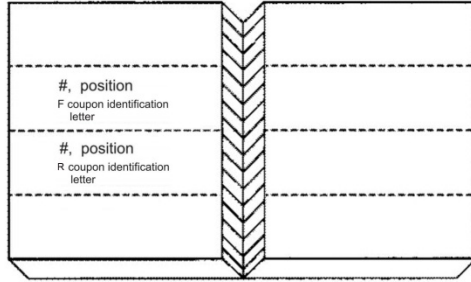
UA Local 71
1250 Ages Drive
Ottawa, ON
K1G 5T4
Contact: E. Turpin
eric@ualocal71.com

Northern Ontario

UA Local 800
1640 Bancroft Drive
Sudbury, ON
P3B 1R8
Contact: A. Iannucci
Anthony.iannucci@ualocal800.com

UA Local 628
969 Alloy Drive
Thunder Bay, ON
Contact: D. Rojik
dan628@tbaytel.net

Welding Process Tests



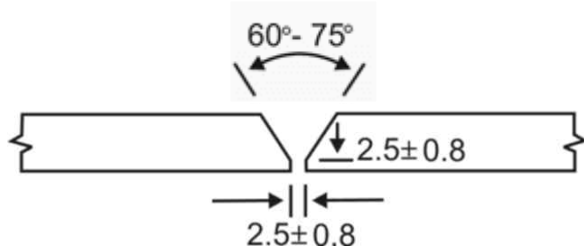
- Before beginning to weld, stamp your straps as illustrated above with your candidate number, **leave a space**, and then the position letter. For example, if your candidate number is 3 and the strap is for the vertical position, mark the strap **3 V** on both halves. For project 4, the double position, use the letter **D** as the position number. **Re-test coupons** (if required) are to be stamped in the same way, except **double stamp** the position letter before beginning any welding.
- Coupons are to be tacked to each other on the bevel side unless otherwise described for each project. Maximum length of tacks is 13 mm (1/2") after feathering. All tacks and feathering of tacks may be done in the flat position. Any tool or grinder may be used for feathering of tacks. If the tack appears faulty, you may remove it. The original bevel must still be used following any tack repair. Run off tabs and/or bridge tacks are allowed in any of the tests.
- All welding is to be done from the bevel side **only**.
- **All roots must be completed as described in the following pages. Root passes must be completed and ground in position only. NOTE: For project #4 it is required to request a marker to inspect your GTAW root pass IN POSITION once it has been completed. Once completed, a root pass can not be removed.** In the event that the entire root pass is unable to be completed without a stoppage, a tie-in is allowed. The stop is allowed to be feathered **while in position only**.
- Fill and cover passes for open root WPS' are allowed to be ground during the welding process.
- When completed, **wire wheel or wire brush only** and present your completed coupons to the assessors for marking **before surface grinding begins**.
- Grind the welded surfaces to the thickness of the original parent metal. **Maximum** deviation is – 0.8 mm (1/32"). **Failure to maintain original coupon thickness to within this tolerance throughout the weld area will result in a COMPLETE FRACTURE rating for the coupon.** See last point at the bottom of this page.
- The excess weld metal deposited at the edges of the 152 mm (6") coupons may be ground flush with the parent metal. **Do not grind parent metal.**
- Cut the coupons lengthways once down the middle Cut one 37mm (1 1/2") strap each side of the centre line of the test specimen. Straps measuring less than 37 mm (1 1/2") will have points deducted. **Minimum width is 37 mm (1 1/2")**. Straps outside an allowance of +/- 1/16" will receive a **COMPLETE FRACTURE RATING. Do not grind the cut edges of the straps.** Knock off the slag and **lightly** file the edges to remove any burrs.
- During bending, a **complete fracture** is a fracture exceeding 6.4 mm (1/4") starting from either edge or exceeding 3.2 mm (1/8") anywhere else. A **single** strap having a complete fracture will result in a **re-test** of the failed position at the end of this assessment. **Two** straps having a complete fracture will represent a **failure of the entire assessment**.

Welding Procedure Specification (WPS): NWPE #1

Position: 3G Uphill

Process: SMAW

Joint Design and Tolerance:



Suggested Sequence:



Base Metal: Low Carbon Steel Plate CSA G40.21 GR 300W/A36 (Thickness: 3/8" Plate / 10mm Plate)

Filler Metal:

F3:E4310/E4311
(E6010/E6011/E7018)
rootF4:E4918 (E7018)
hotpass, fill and cap

Diameter of Electrode:

F3: 2.4mm (3/32")/3.2mm
(1/8")F4: 2.4mm (3/32")/3.2mm
(1/8")

Shielding:

NA

Welding Notes:

Coupons must be tacked within the bevel only using F3 or F4 electrodes.

Root passes must be completed and ground in position only.

Hotpass, fill and cover passes may be ground during the welding process.

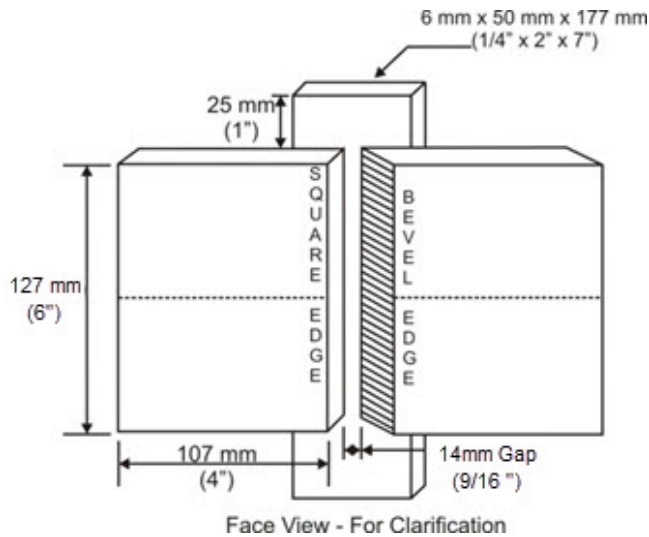
Stringer beads / weave passes may be used to fill and cap.

Welding Procedure Specification (WPS): NWPE #2

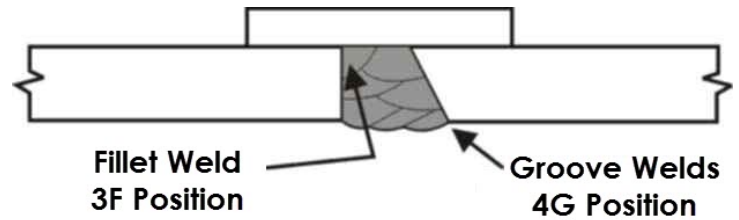
Position: 3F (First Pass) Uphill
4G (Fill and Cap)

Process: SMAW

Joint Design and Tolerance:



Suggested Sequence:



Base Metal: Low Carbon Steel Plate CSA G40.21 GR 300W/A36 (Thickness: 3/8" Plate / 10mm Plate)

Filler Metal:

F4:E4918 (E7018)

Diameter of Electrode:

F4:3.2mm (1/8")

Shielding:

NA

Welding Notes:

Backing plate is to be tacked on the topside of the coupons.

Coupon must be presented to the markers for verification of fit-up prior to beginning root weld.

Stringer beads / weaves are allowed on this two-position test.

Fillet weld for the square shoulder must be performed in the vertical position.

All remaining welding to be performed in the overhead position.

Coupon must be presented to the markers for fillet weld review **prior to joint completion.**

Backing plate to be removed using any thermal or mechanical process to **within 1.6 mm (1/16")** of the parent metal.

No grinding is allowed at any time during the welding or gouging processes, wire wheel only.

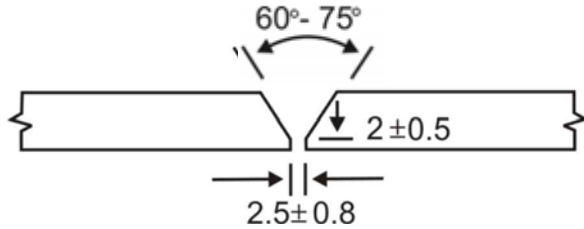
Coupon must be presented to the markers after backing plate removal, **prior to face and root grinding.**

Welding Procedure Specification (WPS): NWPE #3

Position: 1G

Process: GMAW

Joint Design and Tolerance:



Suggested Sequence:



Base Metal: Low Carbon Steel Plate CSA G40.21 GR 300W/A36 (Thickness: 3/8" Plate / 10mm Plate)

Filler Metal:

F6: ER49S-6 (ER70S-6)

Diameter of Electrode:

0.9 mm (0.035")

Shielding:

Gas: 75% Ar 25% CO₂
and/or

Gas: 92% Ar 8% CO₂

Flowrate: 12-17 L/min
(25-35 cfh)

Welding Notes:

Root face and gap to be determined by candidate.

Bridge tacks will be allowed **within the bevel only** using GMAW at the discretion of the candidate.

Run on/run off tabs or bridge tabs **tacked to the edges of the coupon only** will be allowed at the discretion of the candidate.

Stringer/weave passes can be used to fill and cap.

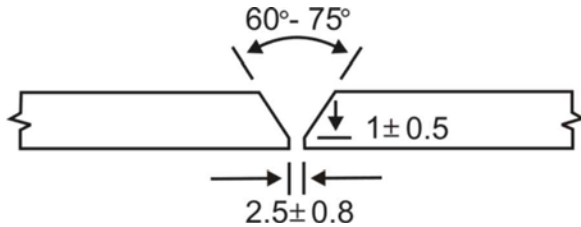
Candidate may select transfer mode.

Welding Procedure Specification (WPS): NWPE #4

Position: 2G

Process: GTAW

Joint Design and Tolerance:



Suggested Sequence:



Base Metal: Low Carbon Steel Plate CSA G40.21 GR 300W/A36 (Thickness: 1/4" Plate / 6mm Plate)

Filler Metal:

F6: ER49S-2 (ER70S-2)

Root, hotpass, fill and cap

Diameter of Filler Metal:

2.5 mm (3/32") – 3.2 mm (1/8")

Shielding:

Argon

Flowrate: 7-17 L/min
(15-35 cfh)

Welding Notes:

Filler metal rod diameter at the discretion of the candidate.

Root face and gap to be determined by the candidate.

NOTE: coupons must be tacked **within the bevel only** using GTAW.

NOTE: you must request a marker to inspect your GTAW root pass *IN POSITION* once it has been completed before proceeding with GTAW hotpass, fill and cap.

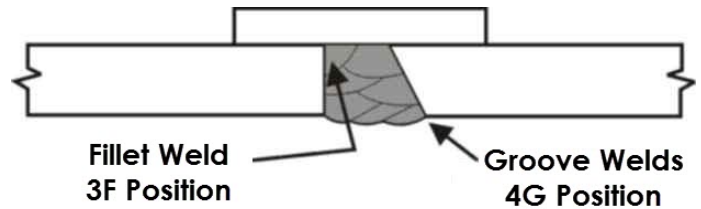
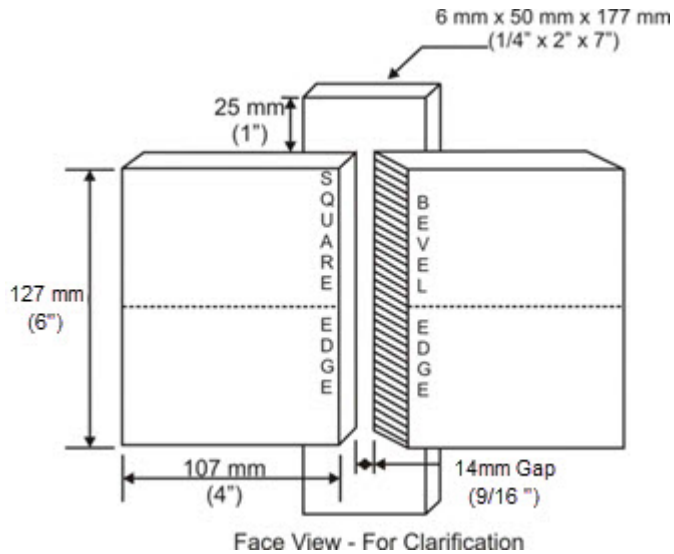
Welding Procedure Specification (WPS): NWPE #5

Position: 3F (First Pass) Uphill
4G (Fill and Cap)

Process: FCAW

Joint Design and Tolerance:

Suggested Sequence:



Base Metal: Low Carbon Steel Plate CSA G40.21 GR 300W/A36 (Thickness: 3/8" Plate / 10mm Plate)

Filler Metal:

F6:E491T-9 (E71T-1)

Diameter of Electrode:

1.1 mm (0.045")

Shielding:

100% CO₂ or

75% Ar 25% CO₂

Flow Rate: 17 - 20L/PM (35 - 45
cfh)

Welding Notes:

Backing plate is to be tacked on the topside of the coupons.

Coupon must be presented to the markers for verification of fit-up prior to beginning root weld.

Stringer beads / weaves are allowed on this two-position test.

Fillet weld for the square shoulder must be performed in the vertical position.

Coupon must be presented to the markers for fillet weld review **prior to joint completion.**

All remaining welding to be performed in the overhead position.

Backing plate to be removed using any thermal or mechanical process to **within 1.6 mm (1/16")** of the parent metal.

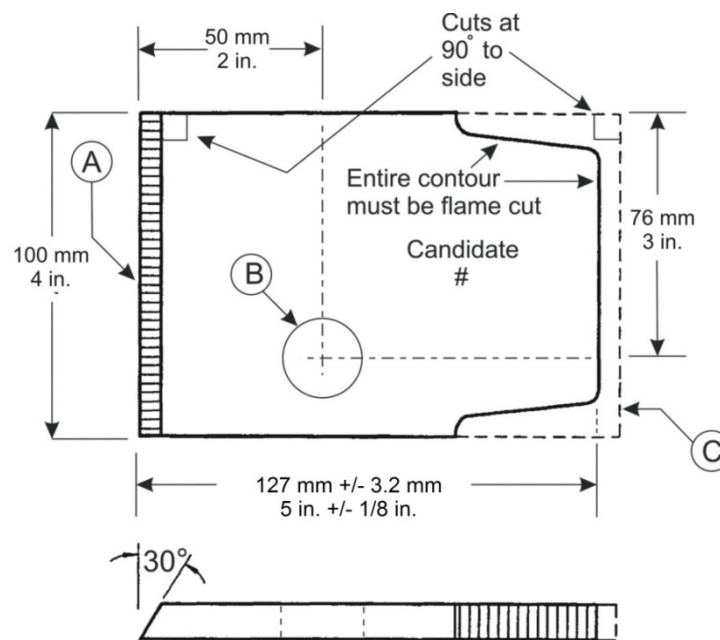
No grinding is allowed at any time during the welding or gouging processes, wire wheel only.

Coupon must be presented to the markers after backing plate removal, **prior to face and root grinding.**

Welding Procedure Specification (WPS): NWPE #6

Position: N/A

Process: Oxy-Fuel Cutting



Directions:

- Only one 100 mm x 152 mm x 10 mm (4" x 6" x 3/8") Low carbon/mild Steel flatbar cut at 90° both ends will be provided for this portion of the test. **No retest coupon will be allowed for this portion of the assessment.**
- Any measuring device may be used for marking layout lines. A 1" NPS pipe and a section of 100 mm (4") channel or template of same will be provided for marking the layout lines for the applicable projects of this test.
- **The 1" circle and the cope projects are to be cut freehand. The 30 degree bevel project can be completed freehand or with the use of a guide.** Failure to do so will result in a deduction of 10 points for that portion of this test.
- **No grinding is permitted on any cut edges.** Knock off the slag and **lightly** file the edges to remove any burrs. Grinding of either cut edge will result in a deduction of 10 points for that portion of this test.
- **Overall length of the finished test plate must be within the tolerance stated in the above diagram.** Failure to do so will result in a deduction of 10 points from either Project A or Project C at the discretion of the markers.

<p>Project A:</p>	<p>Perform a 30° cut along the 100 mm (4") end as shown in the diagram. Cut must be at 90° to the sides. The cut angle is allowed a maximum tolerance of +/- 3°. Cut angle between +/- 4° to +/- 10° of 30° will result in a deduction of 2 points. Cut angle in excess of +/- 10° of 30° will result in a deduction of 10 points.</p>
<p>Project B:</p>	<p>Locate and perform a circular 90° cut to accept a 1" NPS pipe as shown in the diagram. The fit of the pipe is allowed a maximum 3/32" clearance at any point. Clearance between 2.5 mm (3/32") and 6.5 mm (1/4") will result in a deduction of 2 points. Clearance of 6.5 mm (1/4") or more will result in a deduction of 10 points.</p>
<p>Project C:</p>	<p>Perform a coping cut to accept a 100 mm (4") channel or template as shown in the diagram. Cut must be at 90° to the sides. The fit of the channel is allowed a maximum 2.5 mm (3/32") clearance at any point. Clearance between 2.5 mm (3/32") and 6.5 mm (1/4") will result in a deduction of 2 points. Clearance of 6.5 mm (1/4") or more will result in a deduction of 10 points.</p>

