

# REFERENCE SYLLABUS

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For

**GRADE “B”  
PRESSURE WELDER**

**CERTIFICATE of COMPETENCY  
EXAMINATION**

## **GENERAL INFORMATION**

### **INTRODUCTION:**

This Syllabus is intended to assist candidates preparing for the Grade "B" Pressure Welder Certificate of Competency Examination pursuant to the Alberta Safety Codes Act, Pressure Welders Regulation.

To obtain a Grade B Pressure Welder Certificate of Competency, a candidate must pass the performance qualification test required by the Administrator and conducted by a Safety Codes Officer.

### **ELIGIBILITY:**

To qualify to take a Grade "B" Pressure Welder Certificate of Competency examination, a candidate must:

- a. Hold a Journeyman Welder Certificate of Proficiency issued under the *Apprenticeship and Industry Training Act*, **or**
- b. Hold a Journeyman Welder's Interprovincial Red Seal Certificate of Competency from another jurisdiction, **or**
- c. Hold an Alberta Journeyman Welder Equivalency Document issued by Alberta Career Development and Employment.

Additionally:

- d. An Alberta Welding Apprentice may be examined by a Safety Codes Officer during the last term of schooling and at the completion of the final practical examination. The examination conducted by the Safety Codes Officer will be in accordance with the Grade "B" Pressure Welder Certificate of Competency Examination. If the candidate passes the examination a "Letter of Recognition" will be issued by the Administrator. A candidate who subsequently provides the Administrator with proof of Journeyman status shall be issued a "B" Pressure Welder Certificate of Competency.

### **APPLICATION TO UNDERTAKE EXAMINATION:**

A candidate for examination shall deliver, to a safety codes officer at least twenty one days before the examination date, an application on the form prescribed by the Administrator.

Each person applying to take an examination shall pay the specified fee.

The candidate must show picture I.D. and eligibility documentation at the examination.

**GRADE "B" PRESSURE WELDER  
PERFORMANCE QUALIFICATION TEST**

The following procedure outlines the manner in which the performance qualification tests will be conducted by ABSA for the Grade "B" Pressure Welder Certificate of Competency.

**Test Coupon:**

The test coupon will be a 6 inch diameter, schedule 80, carbon steel seamless pipe prepared with a 32 degree bevel to a feather edge.

**Test Positions:**

One-quarter (1/4) of the coupon circumference will be welded in the 2G position and the remaining portion in the 5G position.

**Electrodes:**

The electrodes used for the test shall be:

Root Pass (either)

- An E6010 (1/8 inch diameter)  
or
- An ER70S-2 (3/32 inch or 1/8 inch diameter) with a SFA 5.12 classified Tungsten electrode (1/8 inch diameter) using 100% Argon shielding gas and no backing gas

Fill and capping passes

- An E7018 (3/32 inch and 1/8 inch diameters)

**Examination Time:**

Candidates will have 3.5 hours to prepare, tack and weld the test coupons, and one (1) hour to prepare the bend specimens.

**Preparation and Tacking:**

When preparing coupons for tacking, the size of the root face (land), the width of the root gap (spacing), and the use of the 2G or 5G positions for tacking shall be at the candidate's discretion. The four tack welds are to be made using the E-6010 or ER70S-2 electrode and shall be a maximum  $\frac{3}{4}$  inch in length. All tack welds shall be of good quality, as they are considered part of the weld. After tacking the coupon, the candidate may feather the tacks prior to the coupon being presented to the Safety Codes Officer.

**Welding:**

After the candidate completes tacking of the coupon, it will be presented to the Safety Codes Officer. The Safety Codes Officer will then mark the portion of the coupon that is to be welded in the 2G (horizontal) position with the remainder to be used for the 5G position weld.

The candidate will then weld the horizontal (2G) root pass, using an E-6010 or ER 70S-2 electrode with the pipe axis in the vertical plane. When the candidate completes the 2G root pass, the coupon shall be presented to the Safety Codes Officer for evaluation.

Providing the 2G root pass is acceptable, the coupon shall then be placed in the 5G position (pipe axis in the horizontal plane) with one end of the completed 2G root placed at the top (12:00). The candidate will alert the Safety Codes Officer to then mark the position and height of the coupon. Once the coupon is positioned for welding, the marked coupon and positioner shall not be moved. The candidate will then weld the 5G portion of the root pass with an E-6010 or ER70S-2 electrode with the welding progression upward. The candidate will present the coupon to the Safety Codes Officer for evaluation upon completion of the 5G root pass.

If the root pass proves to be acceptable, the candidate shall complete the fill and cap passes of the 5G position weld using an E-7018 electrode with an upward progression. The fill passes shall use a weave pattern and the capping passes may be either a weave or stringer pattern. The candidate will present the coupon to the Safety Codes Officer for evaluation upon completion. The coupon will then be repositioned (axis in vertical plane) to complete the 2G position fill and cap using stringers and an E-7018 electrode. The candidate will present the coupon to the Safety Codes Officer for evaluation upon completion.

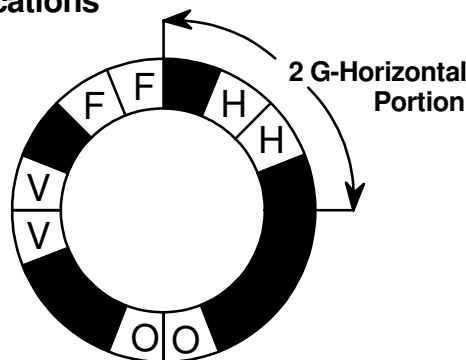
**Bend Specimens:**

Four face and four root bend test specimens are required for this combined position. Test specimens will be marked on the coupon by the Safety Codes Officer as per the following sketch. The specimens should be approximately 1.5 inches in width and ground flush on both side with edges deburred. Candidates may radius the corners of the specimens to 1/8 inch maximum.

Excessive grinding that reduces the thickness of the specimens below the nominal thickness shall result in the test being considered a failure.

**Bend Specimen Locations**

- F - Flat**
- H - Horizontal**
- V - Vertical**
- O - Overhead**



**Required Standards:**

The root pass shall be of uniform width and the penetration not exceeding 1/8 inch maximum reinforcement. All welds shall be free of excessive penetration, cracks, craters, exposed porosity, undercut and lack of fusion.

The finished weld shall be uniform, free from undercut or arc strikes. Excessive weld reinforcement is not permitted and the weld cap must not exceed 1/8 inch.

The guided bend tests shall have no open defects in the weld or heat affected zone exceeding 1/8 inch measured in any direction on the convex surface of the specimen. Open defects occurring on the corners of the specimen during bending shall not be considered, unless there is evidence that they result from slag inclusions, lack of fusion, or other internal defects.

The failure of any bend specimen shall be considered as a complete failure of the test.

The performance test may be terminated at any stage of review, if it becomes apparent that the candidate does not have the required skill to produce satisfactory results or is taking an excessive length of time to complete any phase of the test.

**NOTES:**

A candidate who is successful in passing this examination will be issued:

1. A Certificate of Competency as a Grade B Pressure Welder.
2. An initial performance qualification card valid for two years from the date of issuance.

**Candidates Failing the Examination:**

A candidate failing to pass any performance qualification test conducted by a Safety Codes Officer shall not be permitted to take a re-test for a period of one month from the date of the failed test, unless permitted to do so by a Safety Codes Officer.

A candidate failing to pass two consecutive performance qualification tests, conducted by a Safety Codes Officer, shall not be permitted to take a further retest for a period of 3 months from the date of the last test, unless the welder provides proof of having successfully completed an upgrading course in pressure welding satisfactory to the Administrator.