

Canadian Welding Bureau

Welding Procedure Qualification
AWS D1.1 vs CSA W47.1

Comparison of Key Concepts and Requirements

This document provides a general comparison of key concepts and requirements of CSA W47.1 and AWS D1.1. It is not intended to be a comprehensive review nor should it be used to specify, determine or evaluate specific requirements. The source documents should be consulted for specific information.



Section:	CSA W47.1	AWS D1.1
<p>General: The company shall only use qualified welding procedures in production.</p>	<p>General: Applicable.</p>	<p>General: Applicable.</p>
<p>Documentation of welding procedures: The company is required to properly document welding procedures in accordance to the work to be conducted in the shop or in the field.</p>	<p>Documentation of welding procedures: (a) Welding Procedure Specification (WPS) – general document outlining welding procedures to be followed in construction; (b) Welding Procedure Data Sheet(s) WPDSs – joint specific welding procedure documentation outlining all essential variables, joint configuration, materials, consumables, etc.</p>	<p>Documentation of welding procedures: (a) Not Applicable; (b) Welding Procedure Specification(s) WPSs – welding procedure documentation outlining all essential variables, joint configuration, materials, consumables, etc.</p>
<p>Qualification process: a) By successfully meeting the pre-qualification requirements of a governing standard; b) By successfully performing a PQR in accordance to this standard or other governing standard; c) By successfully meeting the qualification requirements of other recognized national or international standard.</p>	<p>Qualification process: a) Applicable (includes those defined in CSA W59, AWS D1.1, AWS D1.3, AWS D1.5) b) Applicable (includes methodology defined in CSA W47.1 / W59, AWS D1.1, AWS D1.3, AWS D1.5) c) Applicable; As acceptable to the CWB</p>	<p>Qualification process: a) Equivalent (includes those defined in AWS D1.1) b) Equivalent (includes methodology defined in AWS D1.1); c) Applicable; As acceptable to the Engineer</p>
<p>Qualification responsibility: a) Fabricator / Manufacturer; b) Witnessing by independent third party (e.g. laboratories).</p>	<p>Qualification responsibility: a) Applicable, but requires witnessing by CWB; b) Applicable, requires approval of CWB</p>	<p>Qualification responsibility: a) Applicable; b) Accredited laboratories or other recognized certification bodies as acceptable to the Engineer.</p>

<p>Approval of procedures: a) Administrator of the standard; b) Fabricator / Manufacturer; c) Independent third party (e.g. certified welding inspectors).</p>	<p>Approval of procedures: a) Applicable; CWB is the independent administrator; b) Not Applicable; approval only by CWB c) Not Applicable; approval only by CWB</p>	<p>Approval of procedures: a) Not Applicable; no independent administrator; b) Applicable; c) Applicable.</p>
<p>Witnessing of testing responsibility: a) Administrator of the standard; b) Fabricator / manufacturer; c) Independent third party (e.g certified welding inspectors).</p>	<p>Witnessing of testing responsibility: a) Applicable; CWB is the independent administrator; b) Not Applicable; witnessing only by CWB or authorized representative c) Not Applicable. witnessing only by CWB or authorized representative</p>	<p>Witnessing of testing responsibility: a) Not Applicable; no independent administrator; b) Applicable; c) Applicable.</p>
<p>Mechanical testing responsibilities: a) Administrator; b) Fabricator / Manufacturer; c) Accredited testing organization; d) Certified welding inspection organization for mechanical testing; e) Independent third party (certified welding inspector); f) Other laboratories accredited to ISO requirements.</p>	<p>Mechanical testing responsibilities: a) Applicable; CWB is the independent administrator; b) Applicable; if equipment available and approved by CWB; c) Applicable; acceptable to the CWB; d) Applicable; if Welding inspection organization certified to CSA W178.1; e) Not Applicable; f) Applicable; if acceptable to the CWB.</p>	<p>Mechanical testing responsibilities: a) Not Applicable; no independent administrator b) Applicable; if equipment available; c) Applicable (e.g. A2La accreditation); d) Applicable; e) Applicable; acceptable to the Engineer. f) Applicable; acceptable to the Engineer.</p>

<p>Period of effectiveness: a) WPS; b) WPDS;</p>	<p>Period of effectiveness: a) Indefinitely; c) Indefinitely;</p>	<p>Period of effectiveness: a) Indefinitely; b) Not applicable; document not required</p>
<p>Previous Qualifications: a) WPS; b) WPDS;</p>	<p>Previous Qualifications: a) As acceptable to the CWB; b) As acceptable to the CWB;</p>	<p>Previous Qualifications: a) As acceptable to the Engineer; b) Not applicable; document not required</p>
<p>Permitted Processes: a) Shielded metal arc welding (SMAW); b) Flux cored arc welding (FCAW) and metal cored arc welding (MCAW); c) Gas metal arc welding (GMAW); d) Submerged arc welding (SAW); e) Gas tungsten arc welding (GTAW); and f) Electroslag welding (ESW) and Electrogas welding (EGW); g) Other welding processes. Note: For the GMAW process, metal transfer includes the short-circuiting, globular, spray, and pulsed arc modes. For GMAW process only spray transfer mode is considered prequalified.</p>	<p>Processes: a) Applicable; b) Applicable; c) Applicable; d) Applicable; e) Applicable; f) Applicable; g) Applicable; required to meet all requirements of the standard. Note: Applicable.</p>	<p>Processes: a) Applicable; b) Applicable for FCAW only; c) Applicable; however GMAW and MCAW considered a single grouping; d) Applicable; e) Applicable; f) Applicable; g) Applicable; required to meet all requirements of the code. Note: Applicable.</p>

<p>Prequalification Requirements:</p> <ul style="list-style-type: none"> a) Prequalified joints; b) Base materials listed; c) Base materials not listed; d) Certified consumables; e) Non-certified consumables; f) Preheat and interpass listed; g) Welding parameters recommended by consumables manufacturers. 	<p>Prequalification Requirements:</p> <ul style="list-style-type: none"> a) Applicable; b) Applicable; c) Applicable, if deemed equivalent to listed materials by the Contractors Engineer; d) Applicable; e) Permitted with additional testing required; f) Applicable; g) Applicable. 	<p>Prequalification Requirements:</p> <ul style="list-style-type: none"> a) Applicable; b) Applicable; c) Not permitted; d) Applicable; e) Permitted with additional testing required; f) Applicable; g) Applicable.
<p>Procedure Qualification Testing (PQT):</p> <ul style="list-style-type: none"> a) Fillet Weld (FW)*; b) Partial Joint Penetration Weld (PJP)*; c) Complete Penetration Joint Weld (CJP)*; d) Plug and Slot welds; e) Arc Spot Welds (ASW). <p>*All welds on either plate or tubular.</p>	<p>Procedure Qualification Testing (PQT):</p> <ul style="list-style-type: none"> a) Applicable; b) Applicable; c) Applicable; d) Applicable; e) Applicable. 	<p>Procedure Qualification Testing (PQT):</p> <ul style="list-style-type: none"> a) Applicable; b) Applicable; c) Applicable; d) Applicable; e) Not applicable.
<p>Test Methods Mandatory:</p> <ul style="list-style-type: none"> a) Visual; b) Root and Face bends for $T \leq 10\text{mm}$; c) Side bends for $T > 10\text{mm}$; d) Macro-etch; Supplementary: e) NDE; f) CVN; 	<p>Test Methods</p> <ul style="list-style-type: none"> a) Applicable; b) Applicable; c) Applicable; d) Applicable; e) Contract requirement; f) Contract requirement; g) Contract requirement; 	<p>Test Methods</p> <ul style="list-style-type: none"> a) Applicable; b) Applicable; c) Applicable; d) Applicable; e) Contract requirement; f) Contract requirement;

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<p>g) Hardness; h) All Weld Metal Tension;</p>	<p>h) Applicable for testing of non-certified consumables or contract requirement.</p>	<p>g) Contract requirement; h) Applicable for testing of non-certified consumables or contract requirement.</p>
<p>Essential Variables for PQR: a) Nominal plate thickness range; b) Nominal pipe or tube wall thickness range; c) Nominal pipe diameter range; d) Partial joint penetration range; e) Range of fillet weld sizes; f) Plate welding position; g) Pipe or tube welding position; h) Filler metal certification; i) Electrode diameter change; j) Type of current (AC or DC); k) Type of transfer mode; l) Shielding gas certification; m) SAW specific parameters; n) Welding process; o) Backing / backgouging; p) Preheat / interpass temperature or post weld heat treatment; r) Base metal;</p>	<p>Essential Variables for PQR: a) Applicable; b) Applicable; c) Applicable; d) Applicable; e) Applicable; f) Applicable; Flat gets also qualified by any other position; g) Applicable; h) Applicable; Requires CWB certification; i) Applicable; j) Applicable; k) Applicable; l) Not applicable; All shielding gases permitted by the certification consumables; m) Applicable; n) Applicable; o) Applicable; p) Applicable; r) Applicable; Accepts non-listed materials equivalent to materials tested.</p>	<p>Essential Variables for PQR: a) Applicable; b) Applicable; c) Applicable; d) Applicable; e) Applicable; f) Applicable; Flat gets also qualified by horizontal position; g) Applicable; h) Applicable; Requires AWS certification; i) Applicable; j) Applicable; k) Applicable; l) Not applicable; All shielding gases permitted by the certification consumables; m) Applicable; n) Applicable; o) Applicable; p) Applicable; r) Applicable; Doesn't accept non-listed materials equivalent to materials tested.</p>