

# Canadian Welding Bureau

Welding Personnel Qualification Testing  
CSA W47.1: 2009 U7 vs AWS D1.1: 2015

## 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.



# Welding Personnel Qualification Testing CSA W47.1: 2009 U7 vs AWS D1.1: 2015

<b>Section:</b>	<b>CSA W47.1</b>	<b>AWS D1.1</b>
<p><b>General:</b> The company shall only use tack welders, welders and welding operators qualified in accordance with this standard.</p>	<p><b>General:</b> Applicable.</p>	<p><b>General:</b> Applicable.</p>
<p><b>Qualification process:</b> a) By successfully meeting the qualification requirements of this standard;  b) By successfully performing a PQR in accordance to this standard;  c) By successfully meeting the qualification requirements of other recognized national or international standard.</p>	<p><b>Qualification process:</b> a) Applicable;  b) Applicable;  c) As acceptable to the CWB.</p>	<p><b>Qualification process:</b> a) Applicable;  b) Applicable;  c) As acceptable to the Engineer.</p>
<p><b>Qualification responsibility:</b> a) Fabricator / manufacturer;  b) Union, test centers, educational institutions;  c) Independent third party (e.g. laboratories)</p>	<p><b>Qualification responsibility:</b> a) Applicable, but requires witnessing by CWB;  b) Applicable, but requires CWB accreditation for this type of facilities and witnessing by CWB;  c) Not Applicable.</p>	<p><b>Qualification responsibility:</b> a) Applicable;  b) Applicable. Require AWS accreditation for this type of facilities;  c) Applicable.</p>
<p><b>Witnessing of testing responsibility:</b> a) Administrator of the standard;  b) Fabricator / Manufacturer;  c) Independent third party (e.g certified welding inspectors).</p>	<p><b>Witnessing of testing responsibility:</b> 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><b>Witnessing of testing responsibility:</b> a) Not Applicable; no independent administrator;  b) Applicable;  c) Applicable.</p>

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<p><b>Mechanical testing responsibilities:</b></p> <ul style="list-style-type: none"> <li>a) Administrator;</li> <li>b) Fabricator / Manufacturer;</li> <li>c) Accredited testing organization;</li> <li>d) Certified welding inspection organization for mechanical testing;</li> <li>e) Independent third party (certified welding inspector);</li> <li>f) Other laboratories accredited to ISO requirements.</li> </ul>	<p><b>Mechanical testing responsibilities:</b></p> <ul style="list-style-type: none"> <li>a) Equivalent; CWB is the independent administrator;</li> <li>b) Applicable; if equipment available and approved by CWB;</li> <li>c) Applicable; acceptable to the CWB;</li> <li>d) Applicable; if welding inspection organization certified to CSA W178.1;</li> <li>e) Not Applicable;</li> <li>f) Applicable; if acceptable to the CWB.</li> </ul>	<p><b>Mechanical testing responsibilities:</b></p> <ul style="list-style-type: none"> <li>a) Not Applicable; no independent administrator.</li> <li>b) Applicable;</li> <li>c) Applicable (e.g. A2La accreditation);</li> <li>d) Applicable;</li> <li>e) Applicable;</li> <li>f) Applicable; acceptable to the Engineer.</li> </ul>
<p><b>Period of effectiveness:</b></p> <ul style="list-style-type: none"> <li>a) Tack welder;</li> <li>b) Welder;</li> <li>c) Welding operator.</li> </ul>	<p><b>Period of effectiveness:</b></p> <ul style="list-style-type: none"> <li>a) Indefinitely;</li> <li>b) Two years;</li> <li>c) Indefinitely.</li> </ul>	<p><b>Period of effectiveness:</b></p> <ul style="list-style-type: none"> <li>a) Indefinitely;</li> <li>b) Indefinitely;</li> <li>c) Indefinitely.</li> </ul>
<p><b>Suspension of qualification:</b></p> <ul style="list-style-type: none"> <li>a) Tack welder;</li> <li>b) Welder;</li> <li>c) Welding operator.</li> </ul>	<p><b>Suspension of qualification:</b></p> <ul style="list-style-type: none"> <li>a) Question his/her ability to tack;</li> <li>b) Not engaged in welding for more than 3 months for his qualification or question his/her ability to weld;</li> <li>c) Not engaged in welding for more than 1 year for his qualification or question his/her ability to weld.</li> </ul>	<p><b>Suspension of qualification:</b></p> <ul style="list-style-type: none"> <li>a) Question his/her ability to tack;</li> <li>b) Not engaged in welding for more than 6 months for his qualification or question his/her ability to weld;</li> <li>c) Not engaged in welding for more than 6 months for his qualification or question his/her ability to weld.</li> </ul>
<p><b>Type of qualifications:</b></p> <ul style="list-style-type: none"> <li>a) Transferable;</li> <li>b) Non-transferable.</li> </ul>	<p><b>Type of qualifications:</b></p> <ul style="list-style-type: none"> <li>a) Between CWB certified fabricators / erectors;</li> <li>b) Applicable; valid only when working with the company where qualification was obtained.</li> </ul>	<p><b>Type of qualifications:</b></p> <ul style="list-style-type: none"> <li>a) Not applicable;</li> <li>b) Applicable; valid only when working with the company where qualification was obtained.</li> </ul>

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<p><b>Previous Qualifications:</b> a) Transferable.</p>	<p><b>Previous Qualifications:</b> a) As acceptable to the CWB.</p>	<p><b>Previous Qualifications:</b> a) As acceptable to the Engineer.</p>
<p><b>Renewal of Qualifications:</b> a) Tack welder;  b) Welder;  c) Welding operator.</p>	<p><b>Renewal of Qualifications:</b> a) Not applicable;  b) Retesting required every 2 years;  c) Not applicable.</p>	<p><b>Renewal of Qualifications:</b> a) Not applicable;  b) Not applicable;  c) Not applicable.</p>
<p><b>Extent of Qualifications on standard test assemblies:</b> a) Tack welder;  b) Welder;  c) Welding operator.</p>	<p><b>Extent of Qualifications on standard test assemblies:</b> a) 3mm to unlimited;  b) 3mm to unlimited for FW, S and T classes;  c) 3mm to unlimited for FW, S and T classes.</p>	<p><b>Extent of Qualifications on standard test assemblies:</b> a) 3mm to unlimited;  b) 3mm to 19mm when test on 10mm plate;  3mm to 2T when test on plate 10mm to 24mm plate;  5mm to unlimited when test on 25mm plate;  c) 3mm to 19mm when test on 10mm plate; 3mm to 2T when test on plate 10mm to 24mm plate; 5mm to unlimited when test on 25mm plate.</p>
<p><b>Extent of Qualifications on non-standard test assemblies:</b> a) Tack welder;  b) Welder;  c) Welding operator.</p>	<p><b>Extent of Qualifications on non-standard test assemblies:</b> a) Not applicable;  b) Restricted to ranges listed on WPDS;  c) Restricted to ranges listed on WPDS.</p>	<p><b>Extent of Qualifications on non-standard test assemblies:</b> a) Not applicable;  b) Not applicable;  c) Not applicable.</p>
<p><b>Records of Qualifications:</b> a) Tack welder;  b) Welder;  c) Welding operator.</p>	<p><b>Records of Qualifications:</b> a) Issued by CWB;  b) Issued by CWB;  c) Issued by CWB.</p>	<p><b>Records of Qualifications:</b> a) Issued by manufacturer / contractor;  b) Issued by manufacturer / contractor;  c) Issued by manufacturer / contractor.</p>

<p><b>Qualification of welding personnel – General:</b> a) The process;  b) The mode of transfer where applicable;  c) The mode of process application;  d) The classification (S, T, FW, WT, or ASW);  e) The class (position of welding);  f) The consumables; and  g) The thickness range.</p>	<p><b>Qualification of welding personnel – General:</b> a) Applicable;  b) Applicable;  c) Applicable;  d) Applicable;  e) Applicable;  f) Applicable; and  g) Applicable.</p>	<p><b>Qualification of welding personnel – General:</b> a) Applicable;  b) Applicable;  c) Applicable;  d) Not Applicable; Groove, Fillet Weld and Tack Weld.  e) Applicable;  f) Applicable; and  g) Applicable.</p>
<p><b>Processes:</b> 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).  Note: For the GMAW process, metal transfer includes the short-circuiting, globular, spray, and pulsed arc modes. A change to short-circuiting from globular, spray, or pulsed arc, or vice versa, shall require a separate qualification.</p>	<p><b>Processes:</b> a) Applicable;  b) Applicable;  c) Applicable;  d) Applicable;  e) Applicable;  f) Applicable.  Note: Equivalent.</p>	<p><b>Processes:</b> a) Applicable;  b) FCAW considered separate qualification;  c) Applicable; GMAW and MCAW considered same process;  d) Applicable;  e) Applicable;  f) Applicable.  Note: Equivalent.</p>

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<p><b>Consumables:</b> Only certified consumables shall be used for testing.</p>	<p><b>Consumables:</b> Applicable. Certified by the CWB to CSA W48 or applicable AWS A5 series.</p>	<p><b>Consumables:</b> Not applicable. Declaration by the electrode manufacturer of conformance to the applicable AWS A5 series.</p>
<p><b>Test assemblies:</b> a) Tack welder;  b) Welder – Fillet weld;  c) Welder - plate;  d) Welder - pipe;  e) Welding operator – plate.  Note: CSA W47.1 mandates fillet weld testing for all groove welders.</p>	<p><b>Test assemblies:</b> a) Applicable;  b) Applicable;  c) Single bevel groove onto a backing bar; T=10mm. Different options for the butt joint, but FW assembly is required.  d) One single assembly of OD 150mm and 10mm WT, single vee 75°. FW assembly required.  e) Single bevel groove onto a backing bar; T=10mm. Different options for the butt joint, but FW assembly is required.</p>	<p><b>Test assemblies:</b> a) Applicable;  b) Applicable;  c) Single vee onto a backing bar. Different assembly thicknesses for limited and unlimited thickness. Different assemblies for horizontal position and different thicknesses for limited and unlimited thicknesses.  d) Different assemblies OD 50 and 75mm or OD 150mm and 165mm. 60° angles vee joints configurations welded onto a backing or without backing. FW assembly not required.  e) Single vee onto a backing bar. Different assembly thickness and joint configuration.</p>
<p><b>Welding personnel classifications:</b> a) Pipe;  b) Plate;  c) Fillet Weld;  d) Tack Weld;  Pipe qualifies for plate, fillet and tack weld.  Plate qualifies for fillet and tack weld;  Fillet qualifies for tack weld; CJP qualifies for PJP.</p>	<p><b>Welding personnel classifications:</b> a) Applicable - T class;  b) Applicable – S class;  c) Applicable – FW;  d) Applicable - WT;  Applicable – T qualifies for S for FW and WT.  Applicable;  Applicable; Applicable.</p>	<p><b>Welding personnel classifications:</b> a) Applicable – groove weld;  b) Applicable – groove weld;  c) Applicable – FW;  d) Applicable - WT;  Not applicable.  Applicable;  Not applicable; Applicable.</p>

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<p><b>Modes of process application:</b>  a) Manual welding;  b) Semiautomatic welding;  c) Mechanized welding; and  d) Automatic welding.</p> <p>Note: Welders qualified with a semi-automatic process are also considered qualified welding operators in the same process(es).</p>	<p><b>Modes of process application:</b>  a) Applicable;  b) Applicable;  c) Applicable; and  d) Applicable.</p>	<p><b>Modes of process application:</b>  a) Applicable;  b) Applicable;  c) Applicable; and  d) Applicable.</p>
<p><b>Start / Stop required:</b>  a) Tack welder;  b) Fillet welder;  c) Plate welder;  d) Pipe welder;</p>	<p><b>Start / Stop required:</b>  a) Not applicable;  b) One stop;  c) Two stops in the root of the joint;  d) Two stops for 1G, 2G, 6G assemblies and 4 stops 2G-5G assembly;</p>	<p><b>Start / Stop required:</b>  a) Not applicable;  b) One stop;  c) Not applicable;  d) Not applicable.</p>
<p><b>Welding positions:</b>  a) Flat;  b) Horizontal;  c) Vertical; and  d) Overhead.</p>	<p><b>Welding positions:</b>  a) Applicable;  b) Applicable;  c) Applicable; and  d) Applicable.</p>	<p><b>Welding positions:</b>  a) Applicable;  b) Applicable;  c) Applicable; and  d) Applicable.</p>

<b>Extent of qualifications for welding positions:</b>	<b>Extent of qualifications for welding positions:</b>	<b>Extent of qualifications for welding positions:</b>
<p>a) Tack welder;</p> <p>b) Fillet Welder;</p> <p>c) Plate Welder;</p> <p>d) Pipe welder;</p>	<p>a) Tack welder (WT); 1F qualifies 1F 2F qualifies 2F 2F, 3F qualifies 2F, 3F 2F, 3F, 4F qualifies 2F, 3F, 4F</p> <p>b) Fillet Welder (FW); 1F qualifies 1F 2F qualifies 2F 2F, 3F qualifies 2F, 3F 2F, 3F, 4F qualifies 2F, 3F, 4F</p> <p>c) Plate Welder (S); 1GF qualifies 1G, 2F 1GF, 2GF qualifies 1G, 2G, 2F 1GF, 2GF, 3GF qualifies 1G, 2G, 3G, 2F, 3F 1GF, 2GF, 3GF, 4GF qualifies 1G, 2G, 3G, 4G, 2F, 3F, 4F</p> <p>d) Pipe welder (T); 1G, 2F qualifies 1G, 2F 2G, 2F qualifies 2G, 2F 2G, 5G, 2F, 3F qualifies 1G, 2G, 3G, 2F, 3F 2G, 5G, 2F, 3F, 4F or 6G, 4F qualifies 1G, 2G, 3G, 4G, 2F, 3F, 4F</p>	<p>a) Tack welder: 1F qualifies 1F 2F qualifies 1F, 2F 3F qualifies 1F, 2F, 3F 4F qualifies 1F, 2F, 4F 3F, 4F qualifies 1F, 2F, 3F, 4F</p> <p>b) Fillet Welder: 1F qualifies 1F 2F qualifies 1F, 2F 3F qualifies 1F, 2F, 3F 4F qualifies 1F, 2F, 4F 3F, 4F qualifies 1F, 2F, 3F, 4F</p> <p>c) Plate welder: 1G qualifies 1G 2G qualifies 1G, 2G, 1F, 2F 3G qualifies 1G, 2G, 3G, 1F, 2F, 3F 4G qualifies 1G, 4G 1F, 2F, 4F 3G, 4G qualifies 1G, 2G, 3G, 1F, 2F, 3F, 4F</p> <p>d) Pipe Welder; 1G qualifies 1G, 2F 2G qualifies 1G, 2G, 1F, 2F 5G qualifies 1G, 3G, 4G, 1F, 3F, 4F 2G, 5G or 6G qualifies 1G, 2G, 3G, 4G, 1F, 2F, 3F, 4F</p>
<p><b>Tests methods:</b></p> <p>a) Visual;</p> <p>b) Radiography;</p> <p>c) Root and Face bends;</p> <p>d) Side bends;</p> <p>e) Macro-etch;</p> <p>f) Fracture.</p>	<p><b>Tests methods:</b></p> <p>a) Applicable;</p> <p>b) Applicable;</p> <p>c) Applicable – 2 root and 1 face bends;</p> <p>d) Not applicable;</p> <p>e) Applicable – 2 samples;</p> <p>f) Applicable – 1 sample.</p>	<p><b>Tests methods:</b></p> <p>a) Applicable;</p> <p>b) Applicable;</p> <p>c) Applicable – 1 root and 1 face bends;</p> <p>d) Applicable – 2 side bends;</p> <p>e) Applicable – 1 sample;</p> <p>f) Applicable – 1 sample.</p>



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<p><b>Re testing required:</b></p> <ul style="list-style-type: none"> <li>a) Tack welder;</li> <li>b) Fillet welder;</li> <li>c) Plate welder;</li> <li>d) Pipe welder;</li> <li>e) Welding operator.</li> </ul>	<p><b>Re testing required:</b></p> <ul style="list-style-type: none"> <li>a) Not applicable;</li> <li>b) Applicable; retesting required every 2 years.</li> <li>c) Applicable; retesting required every 2 years.</li> <li>d) Applicable; retesting required every 2 years.</li> <li>e) Not applicable;</li> </ul>	<p><b>Check testing required:</b></p> <ul style="list-style-type: none"> <li>a) Not applicable;</li> <li>b) Not applicable;</li> <li>c) Not applicable;</li> <li>d) Not applicable;</li> <li>e) Not applicable;</li> </ul>
<p><b>Exemption from re testing:</b> The Company may demonstrate with applicable NDE results that the welder was involved in production in the last 3 months.</p>	<p><b>Exemption from re testing:</b> Applicable.</p>	<p><b>Exemption from check testing:</b> Not applicable.</p>