




| **cwb**group

A Guide to  
**Welding Inspection  
Certification**

**cwb**group.org





A welder wearing a blue protective suit and a blue welding helmet is working on a metal piece. Bright sparks are flying from the welding point. The background is a workshop setting with various tools and equipment.

## A Guide to Welding Inspection Certification

Introduction:

# What is the CWB Office of Public Safety?

The Office of Public Safety was created to educate and advocate for both public safety and Canadian industry, while ensuring the Canadian Welding Bureau's (CWB) accreditations are maintained and executed to the highest standard.

The CWB Office of Public Safety is also a resource for the public, government, and industry to better understand standards related to welding and construction – and how the effective implementation of these standards can assist industry to become more competitive, maintain the highest quality, reduce risk, and uphold public safety.



## What is welding inspection?

Welding inspection is a review of welds to confirm compliance to customer and/or governing standard requirements. In addition, the inspection process can include verifying items (such as material preparation and joint fit-up) prior to the welding activity. Welding inspection assists in ensuring the quality and safety of welded work in a variety of applications like buildings, cranes, pipelines, ships, aerospace, etc.

Welding inspection is typically done by both the welding fabricator themselves (first-party inspection) or by external, independent organizations or individuals (third-party inspection). Most design or product standards require first-party inspection as a minimum. Third-party inspection is either mandated by the product standard or required by the owner's engineer through contractual requirements.







## What product standards require third party inspection?

CSA Standard S16 “Design of steel structures” and CSA S157 “Strength Design in Aluminum” are examples of design standards that require third-party welding inspection (visual and/ or non-destructive evaluations). These inspections or evaluation are to be conducted by welding inspection organizations to CSA Standard W178.1 and/or by persons certified as a welding inspector to Level 2 or 3 of CSA Standard W178.2 when specified by the owner in the contract documents.

CSA Standard S6 “Canadian Highway Bridge Design Code” is another example of a design standard that requires welding inspectors to be certified in accordance with CSA Standard W178.2.

Although welding inspection might not be directly referenced in the product standard, welding fabrication standards will provide criteria for welding inspection when required by contract. For example, CSA Standard W59 “Welded steel construction (metal arc welding)” stipulates provisions for welding inspection on statically and cyclically loaded steel structures.

For additional details, review the brochure titled *“A Guide to Welding Certification Requirements”*



Visit [www.cwbgroup.org/safety/resource-library](http://www.cwbgroup.org/safety/resource-library) to view information on other CSA standards that require welding inspection.





## What CSA standards have provisions for certification of welding inspection organizations and welding inspectors?

CSA Standard W178.1 “Certification of Welding Inspection Organizations” specifies the requirements for establishing and maintaining the certification of welding inspection organizations, while CSA Standard W178.2 “Certification of Welding Inspectors” provides requirements for certification of welding inspection personnel. Both CSA Standard W178.1 and CSA Standard W178.2 are administered by the Canadian Welding Bureau (CWB).

CWB certification provides an added level of confidence and assurance that both inspection personnel and an organization’s inspection procedures are independently verified against the requirements of the standards, and thereby minimizes liability and public safety risks.

**Visit the "Certification and Qualification" section** of the CWB Group website to see a listing of all organizations that are certified to CSA Standard W178.1 and individuals certified to CSA Standard W178.2.

## What are the requirements for certification of individual Welding Inspectors?

To achieve certification as a Welding Inspector under the CSA W178.2 program, several key requirements must be met. These include:

- Individuals must meet a minimum number of years of experience and/or have completed training programs in accordance to the level of certification sought.
- Individuals must demonstrate specified technical knowledge through completion of both written and practical examinations.
- Individuals must demonstrate specific knowledge of a least one product standard to which they wish to inspect.
- Individuals must meet minimum vision requirements.
- Individuals must demonstrate ongoing involvement in welding inspection activities and an understanding of current product standard requirements.
- Individuals must adhere to a strict code of ethics.





**CSA Standard W178.2 divides the welding inspectors into three different levels:**

- **Level 1** is considered an entry level for welding inspectors. These individuals may independently conduct inspections but must work under direct certified Level 2 or 3 supervision.
- **Level 2** welding inspectors are considered fully competent to inspect without supervision.
- **Level 3** welding inspectors have demonstrated additional technical knowledge and are deemed capable of additional tasks such as inspections and test plan reviews.

**In order to progress to a higher level, CSA Standard W178.2 requires welding inspectors to achieve additional experience in welding inspection for a specified number of years:**

- Two years in order to progress from Level 1 to Level 2
- Four years in order to progress from Level 2 to level 3

A demonstration of the additional knowledge required for these levels through written and practical examinations is required

The figure to the right, illustrates a welding inspector certification card issued by the CWB for any individual that obtains certification as welding inspector.

**A sample of a welding inspector certification card**



**Conditions Of Use**

1. Possession of this card does not imply that the holder represents an organization certified to CSA Standard W178.1, having personnel and procedures approved by the CWB.
2. This card is the property of the CWB and can be recalled at any time.
3. Fraudulent use may involve permanent cancellation.

For any questions regarding this qualification, please contact:

**1-800-844-6790 | [www.cwbgroup.org](http://www.cwbgroup.org)**







As noted above, individuals must demonstrate specific knowledge of at least one product standard which they wish to inspect.

**These product standards include:**

- CSA W47.1/CSA W59 “Buildings, Bridges, Industrial Structures, Machinery, Cranes, Rail and Road Vehicles (Steel)”
- CSA W47.2/CSA W59 “Buildings, Bridges, Industrial Structures, Machinery, Cranes, Rail and Road Vehicles (Aluminum)”
- CSA W59 Annex U “Welding of Fixed Steel Offshore Structures”
- CSA Z662 “Oil and Gas Pipeline”
- ASME “Boiler and Pressure Vessel Code”, Sections VIII-Div.1 & IX
- ASME B31.1 “Power Piping”
- ASME B31.3 “Process Piping”
- API 650 “Welded Tanks for Oil Storage”
- International Association of Classification Societies (IACS)  
“ IACS Unified Requirements: Section W Materials and Welding”







## What are the requirements for certification of Welding Inspection Organizations?


To achieve certification as a Welding Inspection Organization under the CSA W178.1 program, several key requirements must be met.

### These include:

- Inspection must be conducted by competent, certified individuals. This includes both visual welding inspectors and non-destructive evaluation (e.g. ultrasonic, radiography) personnel.
- Inspection operations must be overseen by competent, qualified individual(s), known as the Welding Inspection Supervisor.
- Inspection must follow defined inspection procedures for each of the product categories included in the scope of operations.
- Formal inspection reports, which cover the result of the findings, must be provided to the customer.
- Organizations must demonstrate ongoing compliance to all requirements of the standard by undergoing an annual independent audit by the CWB.

Welding Inspection Organizations are required to have, at minimum, one Level 3 Welding Inspector (Supervisor) that oversees and approves the inspection conducted by Level 2 and Level 1 welding inspectors and/or non-destructive evaluation (NDE) operators.

## Letter of Validation - for welding inspection organizations

 **LETTER OF VALIDATION**

The CWB acknowledges that


**ABC Welding Company**  
123 Main St  
Anytown, ON Canada



is certified to **CSA Standard W47.1**  
**"Certification of Companies for Fusion Welding of Steel"**

**In DIVISION 2**  
for the period **April 04, 2021 to May 03, 2022**  
**Company Code: ABCDE1**  
**Scope:**  
Custom fabrication, structural steel fabrication and industrial maintenance. Custom fabrication at customer request.

Reason for Issue: Renewal Payment Received  
Issue Date: April 23, 2021

For the latest CWB Documents  
and forms and certification terms  
and conditions, please visit  
[www.cwbgroup.org](http://www.cwbgroup.org)

  
Registrar



8260 Parkhill Drive, Milton, Ontario L9T 5V7  
1-800-844-6790 | Tel: 905-642-1312 | Fax: 905-642-1318  
Email: [info@cwbgroup.org](mailto:info@cwbgroup.org) | Web: [www.cwbgroup.org](http://www.cwbgroup.org)

Certification is an ongoing process and Inspection Organizations are required to prove to the CWB through an auditing program that they maintain all certification requirements. A third-party certification by the CWB provides an additional level of assurance that documentation and the competence of welding inspectors and NDE operators is independently verified, which will minimize liability risk.





## **Verification:** How can I verify CWB certification?

Certification is an ongoing process. Care must be exercised to ensure that an organization's or individual's certification is both current and appropriate for the type of work being completed.

Visit the "Certification and Qualification" section of the CWB Group website to search our database of CWB-certified welding inspectors and welding inspection organizations.

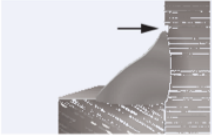
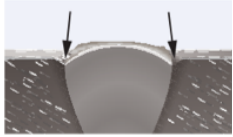
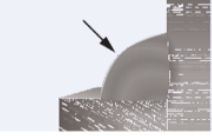

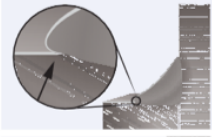
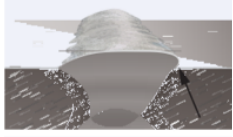

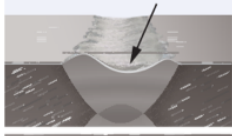
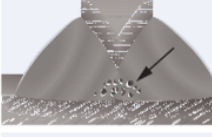




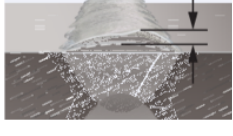
## **How can I get more help from CWB's Office of Public Safety?**

**The CWB is here to help, and can assist Authorities Having Jurisdiction through:**

- Assistance with CWB certification verification
- Response to any aspect of CWB certification requirements
- Job site visits
- Complaints investigation
- Complimentary presentations on CWB certification



## Appendix: Weld Discontinuity

	Fillet	Groove
<b>Undercut</b> Material melted away along the edge of the joint.		
<b>Excessive convexity</b> Excess of weld metal deposited into the joint.		
<b>Overlap</b> Excess of weld metal that exists at the toe of a weld beyond the limits of fusion.		
<b>Insufficient throat</b> A valley between two successive weld beads.		
<b>Porosity</b> Gas pores formed on or below the solidified weld surface.		
<b>Misalignment</b> Occurs when the joint is out of alignment at the root.		
<b>Excessive Reinforcement</b> Weld bead exceeding typical reinforcement thickness.		



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## Get in touch

**Phone:** 1.800.844.6790 ext. 717

**Email:** [publicsafety@cwbgroupp.org](mailto:publicsafety@cwbgroupp.org)

**Online:** [cwbgroupp.org/safety/assistance](http://cwbgroupp.org/safety/assistance)

8260 Parkhill Drive Milton, ON L9T 5V7

**For more information and resources,  
visit us online at:**

[cwbgroupp.org/safety](http://cwbgroupp.org/safety)

[cwbgroupp.org/safety/resource-library](http://cwbgroupp.org/safety/resource-library)

