

# CAN/CSA-S472-04 – Foundations Welding Requirements

This document provides an overview of the requirements of CAN/CSA- S472-04 –Foundations with respect to welding. It is designed to provide guidance for individuals and organizations involved in the design, fabrication, and erection of offshore foundations in Canada.

This document is only for general guidance purposes; reference to the full text of CSA S472 should be made. For further information, please contact the CWB at 1-800-844-6790 or [info@cwbgroup.org](mailto:info@cwbgroup.org).

## Introduction

Welding is a key joining method used in the fabrication of steel structures. To ensure welds of the highest quality and the safety of both the users of offshore structures and the general public, CSA Standard S472 provides specific requirements around the design of offshore foundations and welded fabrication and erection of offshore steel structures that are being part of the offshore foundations.

## Welded Fabrication

CSA S472 provides the following requirements:

### **8.3 Installation**

*Fill structures shall be installed in accordance with Clauses 5.4 and 7.3.*

*Note: The requirements for the design and construction of steel and concrete structures are specified in CSA S473 and S474, respectively. The requirements for the installation of such units are specified in CAN/CSA-S475.*

CSA Standard S473 states that detailed requirements applicable to the welding design, construction, and inspection of steel fixed offshore structures are specified in Annexes A, B, and C, CSA W178.1, and CAN/CSA-W178.2. Also all contractors fabricating steel under this Standard shall be certified to Annex B and CSA W47.1 in the division specified in the contract documents.

Annexes A, B and C of CSA Standard S473 specify supplementary requirements to CSA Standard W47.1 and CSA Standard W59. These additional requirements are related to procedure qualification requirements, toughness testing, hardness testing, and improved welding skills, as they apply to the design, construction, and inspection of steel fixed offshore structures.

CSA Standard W47.1 provides requirements for the qualification of welders and welding operators, welding procedures and welding supervisory and engineering personnel. A company certified to CSA W47.1 Division 1 requires having full time engineer(s) and a company certified to Division 2 requires having retained part time engineer(s).

CSA Standard W59 provides guidance on weld design, fabrication techniques, inspection and other key considerations around welding for steel. CSA Standard W59 requires that contractors performing work under this standard be certified under the requirements of CSA Standard W47.1 unless the Engineer of record approves the contractor for the work to be undertaken.

An organization meeting the requirements of CSA Standard W47.1 will have qualified welders, operators, accepted welding procedures and accepted supervisory/engineering personnel. All elements of the welding operation will be independently verified by the Canadian Welding Bureau on an on-going basis.

Please note that there are no domestic or international equivalents to CSA Standard W47.1. Other national systems, such as that of the American Welding Society (AWS) do not include key concepts such as independent and on-going verification and welding supervisors/engineers. The CWB strongly cautions the reader around accepting substitutions; doing so may contravene the intent of CSA S473 and place public safety at risk.



For a listing of all organizations that currently meet the requirements of CSA Standard W47.1 please see [www.cwbgroup.org](http://www.cwbgroup.org).

### **Welding Inspection**

CSA Standard S473 requires that all welds be visually inspected and must be completed by certified welding inspectors or a welding inspection organization following the requirements of CSA Standard W178.2 or CSA Standard W178.1 respectively. It also requires that CSA Standard W59 and Annex A of CSA standard S473 be followed for the acceptance criteria for all welds. It should be noted that CSA Standard W178.2 has individual “product categories” that inspectors may qualify to CSA Standard W59 and CSA Standard S472.

For a listing of all organizations and individuals who currently meet the requirements of CSA Standard W178.1 and CSA Standard W178.2, please see [www.cwbgroup.org](http://www.cwbgroup.org).

### **Welding Consumables**

CSA Standard S473 requires electrodes and electrode-gas and electrode-flux combinations for the processes listed shall be certified to CAN/CSA-W48. Only welding consumables meeting classifications that have toughness requirements shall be used, except as otherwise approved by the owner. When toughness tests are required, welding consumables shall meet the applicable requirements of Clause 6 and Annex C.

CSA Standard W48 provides requirements for the classification and certification of welding consumables by itself or in conjunction with gas mixtures or fluxes as applicable. Welding consumables certified by the CWB have undergone through periodically testing and acceptance of quality management system of the manufactures.

For a listing of all consumables who currently meet the requirements of CSA Standard W48 please see [www.cwbgroup.org](http://www.cwbgroup.org).

