

# ***CAN/CSA-N287.2-08 – Material requirements for concrete containment structures for CANDU nuclear power plants***

This document provides an overview of the requirements of *Welding Requirements CSA-N287.2 – Material requirements for concrete containment structures for CANDU nuclear power plants* with respect to welding. It is designed to provide general requirements for the materials used in concrete containment structures of containment systems designated as class containment components, parts, and appurtenances in CANDU nuclear power plants.

This document is only for general guidance purposes; reference to the full text of CSA N287.2 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 and concrete containment structures. To ensure welds of the highest quality and the safety of both the users of CANDU power plants and the general public, CSA Standard N287.2 provides specific requirements around the materials used in concrete containment structures, with awareness that the CANDU nuclear plants are used by people.

## **Welded Fabrication**

CSA N287.2 provides the following requirements:

### **6.6 Arc-welded splice materials**

**6.6.1** *Materials used for splicing reinforcing bars by arc welding shall conform to the requirements of CSA W186, except that the reinforcing bar material to be used shall conform to CAN/CSA-G30.18 weldable grade.*

### **9 Metallic materials**

**9.2.4** *Materials for embedded parts, which are connected by welding to class components, shall be compatible with the material as required by the CSA N285.6 Series. The design, fabrication, and testing of the embedded parts shall be in accordance with the requirements of CSA N287.3, CAN/CSA-N287.4, and CSA N287.5, respectively.*

### **9.3 Special requirements**

**9.3.3** *Studs and stud bases shall meet the requirements of Clause 5.5.6 and Appendix H of CSA W59.*

### **9.5 Examination and repair**

**9.5.4** *Material repaired by welding shall satisfy the requirements of CAN/CSA-N287.4.*

### **9.6 Certification**

**9.6.2** *Materials supplied shall be certified in accordance with Clause 9.6.1 of this Standard and in accordance with Clause H3.4 of CSA W59.*

CSA Standard N287.4 requires all fabricators conducting welding of reinforcing bars to be certified to CSA Standard W186 and all fabricators conducting welding on structural components and metallic liners to be certified to CSA Standard W47.1. Also CSA Standard N287.4 states that stud welding shall comply with the requirements of CSA Standard W59 and its additional requirements.

An organization meeting the requirements of CSA Standard W47.1 and / or CSA Standard W186 will have qualified welders, 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.



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. CSA Standard W47.1 provides requirements for the qualification of welders and welding operators, welding procedures and welding supervisory and engineering personnel.

Please note that there are no domestic or international equivalents to CSA Standard W47.1 and / or CSA Standard W186. 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 place public safety at risk.

For a listing of all organizations that currently meet the requirements of CSA Standard W186 and / or CSA Standard W47.1 please see [www.cwbgroup.org](http://www.cwbgroup.org).

### **Welding Consumables:**

#### **10. Welding materials**

*Welding materials shall conform to the requirements of CSA W48, including requirements pertaining to certification\* and testing, marking, and storage, except as otherwise specified by this Standard. \*Certification is normally conducted by the Canadian Welding Bureau.*

CSA Standard W186 and CSA Standard W47.1 require fabricators welding to these standards to use CWB certified consumables to CSA Standard W48 or AWS 5 series in absence of provisions. An organization meeting the requirements of CSA Standard W48 will have all elements of the welding operation independently verified by the Canadian Welding Bureau on an on-going basis.

### **Welding Inspection**

CSA Standard N287.4, CSA Standard W186 and CSA Standard W59 require that all welds be visually inspected. In addition, when required by contract weld inspection 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 W186 and CSA Standard W59 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, including one for CSA Standard W59.

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).

