



Boilers and Pressure Vessels Safety

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GUIDELINES FOR THE REGISTRATION OF BOILERS AND PRESSURE VESSELS MANUFACTURED OUTSIDE CANADA OR USA DESTINED FOR USE IN THE PROVINCE OF ONTARIO

Anyone, or any company, intending to design, fabricate, and install a boiler, pressure vessel, fitting or piping system for installation in Ontario should first refer to the Technical Standards and Safety Act (Act) and Regulations for Boilers and Pressure Vessels (Regulations), which govern such actions. The Act and Regulations require compliance with the applicable CSA Standards, ASME and ANSI Codes and reference should also be made to these standards.

The following notes are intended to interpret and explain some of these requirements. They are not a substitute for the governing documents themselves.

1. All Pressure Vessels and Boilers must be registered prior to commencement of fabrication with TSSA except the following (See Note 1):
 - (a) a boiler that is used in connection with a hot liquid heating system that has no valves or other obstructions to free circulation between the boiler and an expansion tank that is vented freely to the atmosphere;
 - (b) a low pressure boiler that has either a wetted heating surface of 30 square feet (2.79 square metres) or less, or a power rating of 30 kW or less;
 - (c) a boiler having a heating surface of 10 square feet (0.93 square metres) or less;
 - (d) a pressure vessel, that contains a gas, vapour or liquid at a maximum allowable working pressure of 15 psi (103 kPa) or less;
 - (e) a pressure vessel, that contains liquids not more hazardous than water and that operates at a temperature of 150°F (65°C) or less and at a maximum allowable working pressure of 250 psi (1,717 kPa) or less;
 - (f) a pressure vessel for domestic use that has an internal diameter of 24 inches (610 mm) or less for the storage of hot water where the temperature does not exceed 212°F (100°C) and the heat input is 120 kW or less;
 - (g) a pressure vessel that is used exclusively for hydraulic purposes at a temperature no greater than 105°F (65°C);
 - (h) a pressure vessel that has an internal diameter of 24 inches (610 mm) or less that is connected in a liquid pumping system at a temperature that does not exceed 150°F (65°C) and that contains air or an inert gas compressed to serve as a cushion;
 - (i) pressure containers that form an integral part of or that are a component of rotating or reciprocating mechanical devices, including pumps, compressors, turbines, generators, engines and hydraulic or pneumatic cylinders where the primary design considerations or stresses, or both, are derived from the functional requirements of the device;

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- (j) any component or system related to the subject matter of this Regulation that is regulated under any Act or regulation of the Government of Canada unless specifically requested otherwise by the Government of Canada;
- (k) a pressure vessel having a capacity of 1 and one-half (1 ½) cubic feet (42.5L) or less (See Note 2);
- (l) a pressure vessel having an internal diameter of six (6) inches (152 mm) or less (See Note 2).
- (m) inert-gas filled high voltage switchgear and control gear with an internal pressure that does not exceed 150 psi (1030 kPa), rated 15 kW and above that are located within electric utility installation that have controlled access for maintenance or repair and that are not accessible to the public are exempt from Ontario Regulation No. 220/01 at this time.
- (n) pressure vessels regulated under any one of the following:
 - (1) Ontario Regulation No. 210/01 being the Ontario Regulation made under the *Technical Standards and Safety Act, 2000* for Oil and Gas Pipeline Systems,
 - (2) Ontario Regulation No. 212/01 being the Ontario Regulation made under the *Technical Standards and Safety Act, 2000* for Gaseous Fuels,
 - (3) Ontario Regulation No. 211/01 being the Ontario Regulation made under the *Technical Standards and Safety Act, 2000* for Propane Storage and Handling,
 - (4) Ontario Regulation No. 214/01 being the Ontario Regulation made under the *Technical Standards and Safety Act, 2000* for Compressed Natural Gas,
 - (5) Ontario Regulation No. 213/01 being the Ontario Regulation made under the *Technical Standards and Safety Act, 2000* for Fuel Oil,
- (o) a boiler or pressure vessel used exclusively for agricultural purpose,

Notes:

1. A person who submits a design submission for registration may commence construction of the boiler, pressure vessel, fitting or piping before the submission is registered if the person assumes all risks related to the construction, whether for an installation or alteration.
2. Pressure Vessels less than 1.5 cubic feet in volume or 6 inch diameter shall be registered as fittings if they are connected to or are part of a piping system or pressure vessel.

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1. To obtain registration, the design drawings in duplicate must be presented to the Pressure Vessels Safety Program of TSSA, together with one copy of the appropriate design calculations.
2. Design drawings must bear the signature and seal of a licensed professional engineer who is experienced in the design of boilers and pressure vessels, and who is registered or licensed in Ontario.
3. Design drawings shall show as a minimum the following information:
 - a) Substance contained in the Pressure Vessel;
 - b) Maximum allowable working pressure or design pressure;
 - c) Design temperature;
 - d) ASME Code addition and addenda used for the design;
 - e) Material specification;
 - f) Material thicknesses (minimum required thickness including corrosion allowance);
 - g) Corrosion allowance;
 - h) Welding details (symbols);
 - i) Non-destructive examination requirements;
 - j) Post weld heat treat requirements;
 - k) Material impact test requirements;
 - l) Test pressure and temperatures;
 - m) Special service conditions (i.e. cyclic service, etc.).
4. One set of calculations ensuring design adequacy in accordance with the ASME Code must accompany the submittal for registration.

Note: Reinforcement calculations where required by the ASME Code, must be complete and demonstrate the strength of the reinforcement.

5. Approvals:

The data submitted will be reviewed for compliance with CSA and ANSI Standards and the ASME Code as required by Section 4 of the Regulations.

If it is proposed to employ flanges of a type other than those covered by ANSI B16.1 or B16.5, calculations to substantiate their compliance with the ASME Code must be included.

Similarly, details of any proprietary item (e.g. couplings) which are to become an integral part of the vessel, must be included.

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6. Fabrication:

a) General Requirements

Boilers and vessels manufactured in countries outside Canada and USA are required to have their quality program accredited by either ASME or TSSA.

b) Inspections

Inspection during fabrication must be performed by TSSA's accredited agency inspectors (also called "Authorized Inspectors").

Note: A list of accredited inspection agencies is attached.

c) Quality Program

The manufacturer shall have an approved quality program from ASME or TSSA. The provisions of the ASME code for quality programs will be used as a basis for evaluation.

d) Manufacturers

Manufacturers of boilers or pressure vessels destined for Ontario may not commence until the quality program has been accepted by ASME or TSSA and the design has been duly registered (CRN issued).

Fabrication Inspection

Third party inspections will be performed by inspectors of the accredited third party inspection agency. Inspection may include but is not limited to any or all of the following:

- (i) initial material inspection;
- (ii) review welding procedures and welder qualifications;
- (iii) fit-up prior to welding;
- (iv) examination of radiographs or other non-destructive examination records;
- (v) witnessing hydrostatic tests;
- (vi) final inspection;
- (vii) adherence to approved quality program outlined in the company quality program manual.

The Authorized Inspector will conduct inspections as required by the ASME code and will countersign the Manufacturer's Data Report form.

7. When construction of a pressure vessel or boiler is complete, the Manufacturer's Data Report form must be completed, and after being countersigned by the Authorized Inspector, sent to the Pressure Vessels Safety Division of TSSA. It must be received by TSSA before the vessel is shipped into Ontario.
8. Design registration fees are based on design review time with a minimum one hour charge.

THE ABOVE REQUIREMENTS MUST BE FULFILLED PRIOR TO SHIPMENT OF THE VESSEL INTO THE PROVINCE OF ONTARIO