Technical Standards & Safety Authority
345 Carlingview Drive
Toronto, Ontario
Canada M9W 6N9
www.tssa.org

Boilers and Pressure Vessel Safety

GUIDELINES FOR THE REGISTRATION OF NON-NUCLEAR FITTINGS IN THE PROVINCE OF ONTARIO

1. Preamble:

The following notes set out the requirements for the registration and manufacture of non-nuclear fittings in compliance with the Technical Standards and Safety Act, 2000, Regulations for Boilers and Pressure Vessels, and Code Adoption Document and CSA Standard B51. This document is intended to explain these requirements and is not meant to serve as a substitute for the governing documents themselves.

1.1 Fittings used in pressure retaining systems designed for a pressure greater than 15 psi shall be registered. [Reference to the Regulations and Code Adoption Document must be made for other applicable exemptions.]

2. Registration Procedure:

2.1 All Fittings* shall be registered in the name of the Manufacturer** only.

***FITTING**

The term Fitting as used in this document pertains to an item categorized under Appendix "A".

****MANUFACTURER**

Manufacturer is the company or person that manufactures, completely or in part a fitting. The manufacturer completes the product and is responsible for the end product. Evidence that the manufacturer has in place a valid quality control program for the manufacturing of the fitting, and that this program is accepted by the AHJ in the province/territory of manufacture, shall be provided.

Note: Design registration may be completed in the name of an organization other than the manufacturer, refer to CSA B51, Clause 5.4.2.3 for requirements.

*****Authority Having Jurisdiction (AHJ)**

In the province of Ontario, the Authority Having Jurisdiction is the Technical Standards and Safety Authority (**TSSA**), Hereinafter referred to as the **AHJ**

2.2 The manufacturer shall submit a Declaration of Conformity (see Appendix "G" and attached form) electronically.

2.3 The manufacturer shall submit a cover letter with the Fitting registration application (see Appendix "E")

2.4 The manufacturer may, in addition to the Declaration of Conformity form, provide a scope of registration with the fitting registration application. (see Appendix "F", Template)

2.5 Each category of fitting manufactured shall be separately registered by the manufacturer with the AHJ in the province/territory of manufacture or, for installation-specific specialized fitting designs, with the AHJ in the province/territory of installation. Fittings manufactured outside Canada shall be registered initially in the province/territory where they are intended to be used first. (as per B51:24, 5.4.2) (See Appendix "B", Explanatory Note #1).

2.6 The Declaration of Conformity must be accompanied by a copy of the certificate of registration/authorization or correspondence from an organization identified in paragraph 3.2 showing acceptance of the manufacturer's quality program.

2.7 Subsequent to the initial registration with one AHJ, the registration may be accepted by the province of Ontario if the letter is provided with a copy of the declaration of conformity form and the supporting documentation to the Boilers and Pressure Vessels Safety program of TSSA

2.8 Technical information required

1) Standard Fittings
(For Mechanical Pipe Couplings, see Appendix "B", Explanatory Note #2)

- Designation of the Code or Standard
- Material Specifications
- Dimensions from Drawings or Catalogue
- Pressure - Temperature Ratings

2) Non-Standard Fittings
(for Flexible Hose Assemblies, see Appendix "D")

- Designation of the Code or Standard
- Material Specifications
- Maximum Allowable Working Pressure and Temperature
- Overall dimensions and the detailed dimensions of all the pressure parts
- Detailed calculations or copy of the proof test report witnessed by an authorized third-party inspector. (See Appendix "C" for proof test requirements, and "ASME AIA List or NBBI AIA List")

Note : If the material specification is other than ASME or ASTM, the registrant is required to submit the material specification details including mechanical properties at room and design temperatures, and a statement indicating the nearest ASME or ASTM equivalent.

3) Category G-safety valves, relief valves, safety relief valves and rupture discs

- Rating sheets certified by a testing laboratory holding an ASME Certificate of Acceptance for capacity certification of pressure relief devices

- (PRVs) used in CSA B149 series propane service shall be designed, constructed, marked, and listed in accordance with ANSI/UL 132. UL listed PRVs may also be certified to ASME standards.

3. Quality Control Program Requirements:

3.1 The manufacturer shall fabricate the fittings under a quality control program in accordance with the requirements of CSA B51:24, Annex "F". Category "G", primary overpressure protection services must hold one of the valid certificates of authorization from ASME.

Acceptable quality control programs include but are not limited to the following:

1) CSA N299 Series (Minimum level 3)
2) ISO 9001 and CAN/CSA-ISO 9001
3) Category "F": Certified by Underwriter Laboratories
4) Category "G": ASME "UV", "V", or "HV" code symbol stamp holders
5) Category "H": ASME "U" or "UM" code symbol stamp holders

3.2 The manufacturer quality control program shall be audited and accepted by one of the following organizations (see ASME AIA List or NBBI AIA List):

1) Canadian Provincial or Territorial Boiler and Pressure Vessel Jurisdictions
2) US State Boiler and Pressure Vessel Jurisdictions in US
3) US Boiler and Pressure Vessel Insurers in the US
4) ISO 9000 Registrars performing audits to ISO 9000 quality control program standards with the following documentation:
   - Valid quality program certificate issued to the manufacturer for the manufacture of products including those applied for in the registration application;
   - Valid certificate for the registrar identifying accreditation as an ISO 9000 registrar by a national accreditation body that is internationally recognized with a scope of accreditation which would include manufacturers of pressure fittings.
5) Agencies accredited by ASME outside Canada
6) Inspection agencies (see ASME AIA List or NBBI AIA List)

4. Marking

Each fitting shall be marked in accordance with the provisions of CSA B51. The Canadian Registration Number (CRN) shall be identified whenever physically possible.

APPENDIX "A"
CATEGORY OF FITTING
(CSA B51:24, Table 1)

Category	Type of Fitting
A	Piping fittings: including couplings, tees, elbows, wyes, plugs, unions, pipe caps and reducers
B	All flanges
C	Valves: all line valves
D	All types of expansion joints, flexible connections, and hose assemblies
E	Strainers, filters, separators and steam traps
F	Measuring devices and indicating devices, including pressure gauges, level gauges, sight glasses, level or pressure transmitters
G	Certified capacity-rated pressure relief devices acceptable as primary overpressure protection on boilers, pressure vessels, pressure piping and fusible plugs
H	Pressure-retaining components that do not fall into Categories A to G

Note:

1) These categories do not take into account size, materials, end connections, ratings, schedules, and methods of fabrication.

2) Category "H" can include:

a. Small pressure vessels (see Ontario reg 220/01, 2. (2) (q) and (r) for requirements)

b . assembly of components (including piping components), provided that the diameter of any component does not exceed 152 mm (6 in) and the total volume of the assembly does not exceed 42.5L (1.5 ft^3). Such an assembly is considered a single Category H fitting for the purposes of fitting registration; and

c. condenser coils and evaporator coils as defined in CSA B52 and air heater coils, provided the diameter of any component does not exceed 152 mm (6 in) and the design pressure does not exceed 4.4 MPa (600 psi).

APPENDIX "B"

EXPLANATORY NOTE #1: THE REGISTRATION OF CATALOGUES CONTAINING MORE THAN ONE CATEGORY OF FITTINGS.

Some manufacturer's catalogues contain several fitting categories (e.g. flanges, valves and pipe fittings). The following will set out to explain the registration of such catalogues:

1) Each fitting category shall be registered separately.

2) For each category, a Declaration of Conformity shall be submitted electronically.

3) The CRN issued to each category of fitting will have the same number but will identify its own category:

Example

Pipe Fitting	0A0675.5
Flanges	0B0675.5
Valves	0C0675.5

4) The registrant will be invoiced for each CRN issued.

EXPLANATORY NOTE #2: THE REGISTRATION OF MECHANICAL PIPE COUPLINGS

INTRODUCTION

Couplings for grooved and shouldered end type and plain end type couplings are not covered in the ASME or ASNI Codes in terms of a listed standard nor are they covered in detail with regard to design. However, these types of connections are allowed under the category of Proprietary Pipe Joints and may be used subject to certain pressure, temperature and service limitations. These couplings are covered by recognized standards such as CSA Standard B242-M1980 "Groove and Shoulder Type Mechanical Pipe Couplings" and ANSI/AWWA C606-81 "AWWA Standard for Grooved and Shouldered Type Joints".

ASME SECTION I - POWER BOILERS

Mechanical Pipe Couplings shall not be used on piping falling within the jurisdiction of this Code. Mechanical Pipe Couplings may be used on piping systems in conjunction with these boilers but coming under the jurisdiction of ASME B31.1 Power Piping, provided liquid temperature does not exceed 250°F.

Mechanical Pipe Couplings shall not be used on steam.

ASME SECTION IV - HEATING BOILERS

Mechanical Pipe Couplings may be used on external piping which can be considered to fall within the jurisdiction of the ASME Power Piping Codes. Mechanical Pipe Couplings shall not be used on Steam services.

APPENDIX "B" Continued

ASME SECTION VIII - PRESSURE VESSELS

Mechanical Pipe Couplings shall not be used as a closure device, that is a device intended to provide access to a pressure vessel, however, Mechanical Pipe Couplings may be used to connect external piping to the vessel.

ASME B31.1 - POWER PIPING

Use of Mechanical Piping Couplings is limited to a temperature range of -20°F to 350°F. Mechanical Pipe Couplings shall not be used on steam service nor on hot liquid service temperature above 250°F. The use of Malleable Iron products is limited to a maximum working pressure of 350 psi.

Mechanical Pipe Couplings may be fabricated from Carbon Steel, Stainless Steel or Aluminum. This is acceptable provided these couplings meet the design and fabrication requirements of the Code and are used subject to the pressure and service limitations of Chapter III - Materials.

Mechanical Pipe Couplings shall not be used in toxic services nor on systems containing explosive or flammable fluids.

ASME B31.3 - CHEMICAL PLANT AND PETROLEUM REFINERY PIPING

Mechanical Pipe Couplings are limited to a temperature range of -20°F to 350°F. Mechanical Pipe Couplings shall not be used in steam or hot liquid service temperature above 250°F.

Mechanical Pipe Couplings shall not be used in flammable, toxic, or lethal services.

In addition, Malleable Iron and Ductile Iron products shall not be used temperatures below -20°F nor shall Malleable Iron products be used in flammable fluid services temperatures above 300°F or gauge pressures above 400 psi.

ASME B31.5 - REFRIGERATION PIPING

Mechanical Pipe Couplings are limited to a temperature range of -20°F to 300°F.

Mechanical Pipe Couplings made of Nodular Iron are limited to a maximum working pressure of 1,000psi.

Couplings made of Malleable Iron shall not be used on flammable, toxic or lethal fluid services and products made of Malleable Iron shall not be used in Hydrocarbon or other flammable services temperatures above 300°F nor pressures above 300 psi.

APPENDIX "C"
PROOF TEST REQUIREMENTS
(ASME SEC VIII, UG-101)

The proof test shall normally be carried out in accordance with ASME Code Section VIII, Division 1, Paragraph UG-101, and the proof test report shall be signed by an inspector from the Canadian provincial/territorial or the U.S. state jurisdiction, a National Board commissioned inspector, or the inspector employed by the applicant's quality program registrar. Other third parties may be considered and are subject to the approval of TSSA.

As a minimum the following factors of safety shall be used to calculate the maximum allowable working pressure from the burst pressure. The MAWP shall be corrected for the reduction in allowable stress of the material from the proof test temperature to the maximum operating temperature**.**

Factor of Safety

For all materials not listed below	UG-101
Glass	10
Non-metallic, non-automated fabrication process	10

APPENDIX "D"
FLEXIBLE HOSE ASSEMBLIES

This Appendix provides additional detail for design registration of flexible hose assemblies.

Flexible hose assemblies are registered as category "D" fittings per CSA B51. The design registration includes the assembly of the flexible hose material with the attached end fittings or connectors. The flexible hose material is considered material and as such is not registered independently. The manufacturer or registrant of the flexible hose assembly, to be identified on the Declaration Conformity Form is the assembler of the flexible hose and end fittings. The assembler must have an acceptable quality control program that is required for fitting manufacturers.

The registration submission must include the description of the hose material and configuration of the end fittings, and joining method. Verification of the hose assembly must also be provided.

The design of the flexible hose assembly is verified by proof test. Proof tests are conducted as described in Appendix "D" with the exception of "Factor of Safety" which is given as follows:

Factor of Safety

- Non-metallic, hose material (no metallic reinforcement): 10
- Assemblies manufactured in accordance with Hose Handbook (ARPM: IP-2 Tenth Edition: 2019) Published by the (Association for Rubber Product Manufacturers) and all metallic reinforced hose:
    - Liquid, Air or Gas Service: 4
    - Liquid Media that immediately changes into gas under standard atmospheric conditions: 5
    - Steam: 10
- For fully metallic hoses, proof tests shall be performed in accordance with the piping design code. (e.g. ASME B31.1 cl. 104.7.2 and, B31.3 cl. 304.7.2)

The length of hose material to be used in the proof test is 18" - 36" using water as the test medium. During the test the hose should be straight and not kinked.

Caution: Ends should be protected so that a blown out fitting will be stopped and the hose secured to prevent whipping in the event of failure.

Site Assembled – Flexible Hose Assemblies

All technical documentation as required by this guideline including the assembly procedure and witnessed proof test (s), and excluding the Declaration of Conformity form shall be compiled by the responsible party of the site and submitted for design registration. The flexible hose assembly can be included in the registration of the piping system or alternatively, if required for future installations at the site, the flexible hose assembly is registered under a P-STD number. Installations are carried out by appropriately trained personnel in accordance with the documented assembly procedure and in accordance with manufacturers recommendations.

Note: The Act and Regulations exempt compressed air piping systems that are ¾" nominal pipe size and smaller. This exemption would also exempt ¾" nominal pipe size and smaller flexible hose assemblies within this type of piping system**.**

APPENDIX "E"
COVER LETTER

Cover letter will include the following information:

- Design Registration Application Form.
- Declaration of Conformity Form.
- Scope of Registration.
- Design Registration Drawings.
- Design Registration Calculation or documents for Design Validation (e.g. Design calculation/ FEA/ Proof test reports)
- Product Catalog or part of catalog (if Applicable).
- Manufacturer Quality Control Certificate for each manufacturing site listed.
- List of Manufacturing locations.
- Other Provinces Proof of Registration (if Applicable).

APPENDIX "F"
SCOPE OF REGISTRATION TEMPLATE

Product Description	Primary Pressure Baring / Retaining Component	ASME / ANSI Design Standard	Size or Size Range	Design Condition Std Pressure Class or MAWP @ MAX Temperature	MDMT	Actual Wall Thickness vs Min required (if no proof test report)	End Connection and size range	ASME / ASTM Material Specification	Ref. Calculation or Proof test report	Catalog page or Drawing No.
Example: Series AB	Body A	Std B16.4		450 psi @ 240 °F	60 °F	Actual .250" Min .220"	Female NPT XX-YY 9" Female ISO (size Range)	SA-106		Series XZ Catalog Page #

APPENDIX "G"
DECLARATION OF CONFORMITY

1. Declaration of Conformity (DoC)

- The manufacturer shall submit a Declaration of Conformity as part of the fitting registration.
- Each Declaration of Conformity shall be assigned a unique identification number in accordance with the quality manual.
- The declaration shall identify each fitting type or model.
- The declaration shall confirm that the design, construction, certification, and marking of the fitting comply with: CSA B51, and all applicable codes, standards, guidelines, or other referenced documents.

The manufacturer shall perform and document a conformity assessment of the manufacturing process in accordance with CSA B51:24 Clause F.3.2.

2. Conformity Assessment Process

Manufacturers shall implement effective quality control processes to ensure continued compliance of fittings. These processes shall include:

- Verification of compliance with all applicable codes, standards, and regulatory requirements.
- Proper product marking, including visible evidence of manufacturer certification.
- Creation, control, storage, and retention of the original Declaration of Conformity.
- Maintenance of supporting documentation, including:
    - Design documentation,
    - Test reports and inspection records,
    - Personnel qualification and competency records, and
    - Other relevant technical documentation.
- Ongoing verification that fittings, as manufactured, continue to comply with applicable requirements.

3. Review, Re-evaluation, and Record Retention

The Declaration of Conformity shall be reviewed, re-evaluated and submitted for registration (CRN) when:

- Significant changes are made to the fitting design or specifications.
- Supporting documentation is updated or changed.
- There is a change in ownership, or the addition of manufacturing sites
- Any other condition arises that could affect conformity.

Note: ***No change to the declaration of conformity is required for fitting changes that do not require revision to the registered design as per B51:24 Clause 6.2.1.4.***

Record Retention and Good Practice:

The individual reviewing the conformity assessment should be different from the individual signing the Declaration of Conformity.

The Declaration of Conformity and all supporting documentation shall be retained for a minimum of 10 years.

Electronic copies are acceptable.

DECLARATION OF CONFORMITY FORM

(Show facsimile of logo or trademark, as it will appear on the fitting as evidence of certification)

Click Here to Download the Form

DECLARATION OF CONFORMITY
REGISTRATION OF FITTINGS
DÉCLARATION DE CONFORMITÉ
ENREGISTREMENT D'ACCESSOIRES

Declaration No: Unique identifier assigned by manufacturer		**Revision:**	

Manufacturer	(Name and Address)

***Table 1 Scope of Fitting Designs**

Item No.	Type / Model / Size	Product Description	Material of Construction	MDMT	Rated Pressure		References: Catalog (pages) or Drawing(s) (revision level included)
					At Ambient Temperature	At Maximum Temperature	
						at	
						at	
						at	
						at	
						at	

****Table 2 Codes, Standards, Guidelines, and Other Applicable Documents**

Item No.	Title of Code(s), Standard(s), Guideline(s), or Other Applicable Document(s)	Edition / Revision	Item No.	Title of Code(s), Standard(s), Guideline(s), or Other Applicable Document(s)	Edition / Revision
1			4		
2			5		
3			6		

*****Table 3 Quality Program Verification and Manufacturing Sites**

Item No.	Location(s) Plant Name and Address / Site(s)	Quality Program Certificate Number	Expiry Date	Verifying Organization
A copy of the Quality Certificate from each manufacturing site must be included.				

As an official of the manufacturer with authority, and having responsibility for the conformity and regulatory compliance of the fittings, I hereby declare that the information and statements made in this declaration of conformity are true and accurate.

I declare, under our sole responsibility, that the design, construction, certification, and marking of the fitting(s) listed in Table 1*, are subject to a conformity assessment process and quality program that has been verified, as described in Table 3***.

I certify that the fittings (s) listed in Table 1* conform to: the provisions of the acts and regulations of the provinces and territories where the fitting(s) are registered; CSA B51; and the codes, standards, guidelines, or other applicable documents listed in Table 2**.

I further declare that there is a process in place for the retention of this declaration of conformity for not less than 10 years from the issuance of the Canadian Registration Number (CRN).

Signed for and on behalf of _____ , _____ , _____
(Manufacturer) (City) (State / Province / Country)

_____ , _____ _____ _____
(Name, please print) (Function or Title) (Signature of Declarer) (Date)