

TSSA DIGESTER, LANDFILL & BIOGAS APPROVAL CODE TSSA-DLB-2020



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TECHNICAL STANDARDS AND SAFETY AUTHORITY

FOREWORD

The Gaseous Fuel Regulation, O.Reg. 212/01, made under the Technical Standards and Safety Act, 2000, S.O. 2000 Ch. 16, adopt this Code for the Province of Ontario.

Definitions in this Code have the same meaning as those contained in the relevant regulations made under the *Technical Standards and Safety Act, 2000*.

This document adopts either in whole or in part the /CSA/ANSI B149.6-20 Code for digester gas, landfill gas and biogas generation and utilization published in 2020.

This document was developed in consultation with the TSSA Gaseous Fuels Advisory Council and the TSSA Digester, Landfill and Biogas Risk Reduction Group.

In the event of a conflict between this code and Ontario Regulation 212/01 (Gaseous Fuels), the regulation shall prevail.

Inquiries regarding this document may be addressed to:

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1. Scope of Code and Application Procedures

1.1 Scope and Application

1.1.1

This document establishes TSSA requirements for fuel handling equipment at water pollution control plants, landfill sites and biogas facilities to ensure the safe handling of gas and operation of systems where gas is stored, transmitted or utilized. TSSA has jurisdiction over all fuel handling systems, including fuel handling appliances, equipment and associated piping.

1.1.2

This code applies to the storage, handling and use of gas. TSSA does not review, assess or approve the performance of any appliances or equipment, the handling of any waste material or the passive ventilation of the gas.

1.1.3

This Code does not apply to any infrastructure of a landfill upstream of the main inlet valve on the vacuum side of the blower.

1.2 Approval and Variance Requirements

1.2.1

TSSA approval is required for fuel handling systems at new facilities or at existing facilities where such facilities have been modified, upgraded or expanded. This requirement has been in place since 2007. Systems installed prior to 2007 that have not been modified, upgraded or expanded do not require TSSA approval.

1.2.2

Approvals for appliances shall be obtained before the appliance is operated. Approval may be in the form of a certification or TSSA field approval.

1.2.3

Where a deviation from the requirements of this code is required, the party responsible must make a separate application for a variance to the Director. Unapproved equipment appliances or piping cannot be used until a variance is issued.

1.2.4

The approval process includes:

1. submitting the required documentation to TSSA
2. a technical review; and
3. site verification and testing.

1.3 Required Documentation

1.3.1

An application for digester, landfill and biogas approval shall be made to the TSSA and shall include:

- (a) a completed application;
- (b) a description of the scope of work being conducted;
- (c) engineering drawings;
- (d) a list of fuel burning appliances;
- (e) specifications for valves, controls and components; and
- (f) a bill of materials

1.3.2

The Director or an inspector may require an applicant to provide additional information or documentation.

1.4 Technical Review

1.4.1

The purpose of the technical review is:

- (a) to verify that the design complies with this Code and the Regulations;
- (b) to resolve any conflicts or deviations from this Code or the Regulations; and
- (c) to ensure the documentation is complete.

1.4.2

Upon completion of the technical review, a report will be issued to the applicant/owner, technical contact, invoicee and the assigned TSSA inspector. An invoice will be issued to the invoicee for the review time.

1.5 Site Verification and Testing

1.5.1

The purpose of the site verification and testing is to confirm that:

- (a) the facility is constructed in accordance with the reviewed documentation;
- (b) appliances, equipment and piping are installed in accordance with this code; and
- (c) the facility has the required safety functionality and all equipment, appliances and piping is installed in accordance with the applicable codes and standards.

1.5.2

If requested by an inspector, the applicant/owner of the facility shall perform any tests deemed necessary by the inspector to verify that all equipment and appliances are working properly. The applicant/owner shall have the necessary test equipment available at the time of the test.

1.5.3

The inspector may require that a person with particular knowledge and/or familiarity with the facility and installation to be present during site verification and testing.

1.6 Approval Issuance and Fees

1.6.1

Upon successful completion of the approval process, including technical review and site verification and testing, TSSA will issue a written confirmation of approval. Such approval will be limited to the scope of the project included in the technical review and site verification process.

1.6.2

The fees payable by the invoicee to TSSA under this program shall be calculated in accordance with the TSSA fee schedule in effect at the time the relevant activity took place.

1.6.3

TSSA will issue all reports to the applicant (owner of the facility), invoicee and the technical contact.

PART 2: Construction, Installation and Control

2. CSA/ANSI -B149.6;20 entitled "Code for digester gas, landfill gas and biogas generation and utilization" published by CSA Group is hereby adopted with the following amendments:

2.1

Clause 1.1.5 is revoked and the following is substituted for it:

This Code applies to piping systems in which the maximum operating pressures for piping used in digester systems, landfill gas systems, or biogas systems do not exceed 125 psig (860 kPa) for piping installed outdoors or 66 psig (450 kPa) for piping installed indoors.

For applications above these pressures the requirements of high-pressure piping code TSSA-HPP-2020 shall apply.

2.2

Clause 1.1.9 is revoked, and the following is substituted for it:

Renewable natural gas (RNG), a digester gas, biogas, or landfill gas that has been upgraded, dried, or treated to meet the specifications of the receiving utilities, and thus considered "commercial grade or pipeline natural gas", is excluded from this Code.

2.3

Clause 8.1.4 is added:

All above ground pipe and components located in an unheated space shall be protected from freezing where there is a potential for condensate to accumulate and freeze.

2.4

Clause 8.6.11 is revoked and the following is substituted for it:

Buried pipe shall not be installed with threaded fittings or flanges.

Note: *This is a prohibited practice.*

2.5

Clause 16.2.1.1 is revoked, and the following is substituted for it:

When gas blowers are installed indoors in other than **hazardous areas** (e.g., **boiler** rooms), they shall be of the **sealed type**. When open type blowers are installed outdoors, they shall be at least 3 meters from any source of ignition or flammable vapors.

2.6

Clause 18.1.3 is added:

All above ground pipe and components located in an unheated space shall be protected from freezing where there is a potential for condensate to accumulate and

freeze.

2.7

Clause 18.4.6 is revoked.

Rational:

This portion of the system has already been exempted from meeting this code requirements under clause 1.1.3.

2.8

Clause 18.6.6 is added:

Buried pipe shall not be installed with threaded fittings or flanges on the positive pressure side of the system.

2.9

Clause 18.9.6 is added:

Sumps that use pumps to remove condensate shall:

- a) Use intrinsically safe electric pumps or compressed air operated pumps constructed to withstand the corrosive nature of condensate
- b) Be equipped with level controls
- c) Be designed to suit the pressure or vacuum conditions
- d) Be accessible for maintenance

2.10

Clause 27.1.4 is added:

All above ground pipe and components located in an unheated space shall be protected from freezing where there is a potential for condensate to accumulate and freeze.

2.11

Clause 27.6.11 is revoked and the following is substituted for it:

Buried pipe shall not be installed with threaded fittings or flanges.

Note: *This is a listed prohibited practice.*

2.12

Clause 27.8.4 is revoked and the following is substituted for it:

Lubricated plug valves shall be **approved** to CGA 3.11.

2.13

Clause 27.8.5 is revoked and the following is substituted for it:

Non-Lubricated valves shall be approved to CSA 3.16

2.14

Clause 27.8.6 is revoked and the following is substituted for it:

High-performance butterfly valves shall be **approved** to CGA 3.16 and be

- (a) corrosion resistant;
- (b) suitable for the gas composition;
- (c) suitable for the temperatures of service; and
- (d) of full lug design or flanged ends.

When used as **burner test firing valves** or as isolation **valves** on **waste gas burners**, **high-performance butterfly valves** shall also comply with API 607.

2.15

Clause 28.6.1 is revoked and the following is substituted for it:

A *liquid overflow* line shall be provided on each digester. In situations where *liquid overflow* is not practical, alternative methods to reliably control substrate level such as pumps and level transmitters may be used.

2.16

Clause 28.7.1b is revoked and the following is substituted for it:

A pair of *flash-back (flame) arresters* and *pressure/vacuum relief valves* shall be provided on *digesters* and shall be:

- (b) piped in parallel, with a three-way manual change-over *valve* OR interlocking manual shut-off valves installed in the common supply piping, so that there shall be only one of the *flash-back (flame) arresters* and *pressure/vacuum relief valves* in service at all times.

2.17

Clause 28.7.4 is revoked and the following is substituted for it:

Except as noted in clause 28.7.1b, shut-off **valves**, other shut-off devices, and closures and obstructions of any kind, with the exception of the **flash-back (flame) arresters**, shall not be installed in the gas connection between the **biogas** holding space and the digester excess gas **pressure/vacuum relief valve**.

2.18

Clause 28.10.7 is revoked and the following is substituted for it:

A pressure-relief system shall be provided to prevent overpressure in the gas compartment of the membrane gasholder. The connection shall be a direct connection from the membrane gasholder to the relief system through a trans-flow three-way valve OR interlocking manual shut-off valve. The following requirements for the pressure-relief valve also apply:

- (a) It shall be provided with a flame arrestor, with protection from fouling and freezing, unless the pressure-relief valve is designed to meet requirements of Clause 28.7.3; and

- (b) The relief valve shall be accessible for maintenance and the relief pipe opening shall be located such that operating personnel are not injured or otherwise harmed by a sudden release of gas

3.0

Annex D is adopted as a mandatory part of the code.