

Renewable Natural Gas (RNG) Pipeline Gas Quality Specifications

Purpose

This document outlines gas quality specifications for the composition of renewable natural gas (RNG) for injection into the Enbridge gas distribution system. These specifications ensure that RNG to be injected into the system is within expected operating parameters and interchangeable with natural gas.

This document is intended to be used as a guide for evaluating RNG business opportunities or contracting new RNG supply.

Scope

This document covers the pipeline gas quality specifications for RNG for injection into the Enbridge gas distribution system, without respect to biogas sources.

It does not include procedures or standards for designing, constructing or operating biogas or biomethane facilities.

Specifications

RNG composition must meet the specifications outlined in Table 1. The values shown in Table 1 represent maximum levels, unless a range of values is indicated. Minimum and maximum pressures will be set for each RNG facility on a case-by-case basis.

In summary, in order to be injected into the Enbridge gas distribution system, RNG must:

- Not contain any contaminants, particles, or other impurities at a concentration that are known as a threat to the integrity of the system, human health, or the environment.
- Have an energy content no lower than 36.0 MJ/m³ and no higher than 41.3 MJ/m³.
- Have a Wobbe Index during normal operation no lower than 47.2 MJ/m³ and no higher than 51.1 MJ/m³.
- Not contain more than 2% by volume of carbon dioxide.
- Not contain more than 0.4% by volume of oxygen.
- Not contain more than 4% by volume of total inerts.
- Not contain more than 35 mg/m³ of water content.
- Not contain more than 0.1% by volume of hydrogen.
- Not contain more than 6 mg/m³ of hydrogen sulphide.
- Not contain more than 23 mg/m³ of total sulphur.
- Not contain more than 3 mg/m³ of ammonia.
- Not contain more than 1 mg/m³ of total siloxanes.
- Not contain more than 10 mg/m³ of halocarbons and organochlorinated compounds.
- Be technically free of volatile organic compound, bacteria, particles, and dust.
- Not form liquid hydrocarbons at temperatures of -10°C or higher at the delivery pressure.
- Be delivered at a maximum temperature of 30°C.



Table 1: Renewable Natural Gas – Pipeline Gas Quality Specifications

		Value	Unit	Monitoring Frequency*	Recommended Test
Heating Value	HV	36.0 to 41.3	MJ/m ³	Continuous	D1945 / D7164
Wobbe Index	WN	47.2 to 51.1	MJ/m ³	Continuous	D1945 / D7164
Carbon Dioxide	CO ₂	2	% vol	Continuous	D1945
Oxygen	O ₂	0.4	% vol	Continuous	D1945
Total Inerts		4	% vol	Continuous	D1945
Water Content	H ₂ O	35	mg/m ³	Continuous	D1142 / D5454 / D3588
Hydrogen	H ₂	0.1	% vol	Periodic	D1945
Hydrogen Sulfide	H ₂ S	6	mg/m ³	Continuous	D4084 / D6228 / D4468 / D5504 / D7166
Total Sulphur	S	23	mg/m ³	Periodic	D4084 / D6228 / D4468 / D5504 / D7166
Ammonia	NH ₃	3	mg/m ³	Periodic	D1945
Siloxanes	Si	1	mg/m ³	Periodic	E.g., Gas Chromatography (ELCD, AED, MS)
Halocarbons and organochlorinated compounds		10	mg/m ³	Periodic	E.g., Gas Chromatography / Electrolytic Conductivity Detector
Volatile organic compound	VOCs	Site-specific		Periodic	E.g., Gas Chromatography / Mass Spectrometry (GC/MS)
Bacteria		Technically free of		Periodic	E.g., Most Probable Number Determination of Total Live Bacteria (MPN), others
Particles, dust, etc.		Technically free of		Continuous	E.g., Environmental recommendations 0.1µm filters
Hydrocarbon Dew Point		-10	°C	Continuous	D5504 / D1142
Delivery Temperature (plastic pipe)		< 30	°C	Continuous	

* In this document, continuous monitoring means real-time or near-real time. Periodic monitoring could be seasonal, semi-annually, or annually. Final monitoring frequency will be defined for each RNG facility.



Control and Maintenance

For document control and maintenance purposes, the following table captures important information related to this document.

Owned by	Engineering.
Review	Annually or as needed.
Distribution	Enbridge Gas Distribution employees.
Regulations	N/A
Related Documents	N/A

History of Changes

Changes made to this document are tracked in the following table.

REVISION DATE	SUMMARY	PREPARED BY	APPROVERS
2017-Apr-26	V1.0	Johana Gomez, Sr. Engineering Project Manager	Roddi Bassermann, Manager, Stns Telemetry & Controls Gonzalo Juarez, Manager, Engineering Construction and Maintenance Michael Wagle, Chief Engineer