SLOVENSKI STANDARD
kSIST-TP FprCEN/TR 17238:2018

01-februar-2018

Predlagane mejne vrednosti za onesnaževala v biometanu na podlagi kriterijev zdravstvene presoje

Proposed limit values for contaminants in biomethane based on health assessment criteria

Vorgeschlagene Grenzwerte für Verunreinigungen in Biomethan auf Grundlage von Gesundheitsgefährdungskriterien

Valeurs limites proposées pour les contaminants dans le biométhane sur la base de critères d'évaluation de la santé

Ta slovenski standard je istoveten z: FprCEN/TR 17238

ICS:

27.190	Biološki viri in drugi alternativni viri energije	Biological sources and alternative sources of energy
75.060	Zemeljski plin	Natural gas

kSIST-TP FprCEN/TR 17238:2018 en

TECHNICAL REPORT

RAPPORT TECHNIQUE

TECHNISCHER BERICHT

FINAL DRAFT
FprCEN/TR 17238

December 2017

ICS

English Version

Proposed limit values for contaminants in biomethane based on health assessment criteria

Valeurs limites proposées pour les contaminants dans le biométhane sur la base de critères d'évaluation de la santé

Vorgeschlagene Grenzwerte für Verunreinigungen in Biomethan auf Grundlage von Gesundheitsgefährdungskriterien

This draft Technical Report is submitted to CEN members for Vote. It has been drawn up by the Technical Committee CEN/TC 408.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

Warning : This document is not a Technical Report. It is distributed for review and comments. It is subject to change without notice and shall not be referred to as a Technical Report.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Ref. No. FprCEN/TR 17238:2017 E

Contents

Page

European Foreword

This document (FprCEN/TR 17238:2017) has been prepared by Technical Committee CEN/TC 408 “Natural gas and biomethane for use in transport and biomethane for injection in the natural gas network”, the secretariat of which is held by AFNOR.

This document is submitted to the Vote on TR.

Introduction

This standard was prepared by CEN/TC 408 in response to the European Commission standardization mandate M/475.

The Mandate asks for the development of a set of quality specifications for biomethane to be used as a fuel for vehicle engines and to be injected in natural gas pipelines (network).

However, the scope of the standard was widened according to BT decision C109/2012 that redefined the scope of CEN/TC 408: "Standardization of specifications for natural gas and biomethane as vehicle fuel and of biomethane for injection in the natural gas grid, including any necessary related methods of analysis and testing. Production process, source and the origin of the source are excluded".

One of the aims of European policy in the field of energy is to increase the security of energy supply in the EU as well as to contribute to reduce the emission of greenhouse gases accepted by the EU at Kyoto. In this context a special focus is given to the development and use of energy from renewable sources.

Directive 2009/28/EC on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC stipulates clear aims regarding the percentage of renewables in EU energy consumption and states the related need to support the integration of energy from renewable sources into the energy networks including the establishment of appropriate technical rules in line with Directive 2003/55/EC (Article 6) replaced by 2009/73/EC (Article 8) for the realization of the competitive single European Gas Market and the technical interoperability of gas networks, (network connection, gas quality, gas odorization and gas pressure requirements).

Supporting the EU policy and therefore the maximization of the production and use of biomethane and considering the absence of standards the European Commission DG ENER has included the injection of biomethane in natural gas pipelines in Mandate M/475. Biomethane in this context can be produced from biological (fermentation, digestion …) and thermochemical processes and shall be appropriate to be used as a blending component to natural gas.

1 Scope

This document explains an approach for assessment of limit values for contaminants that may be found in biomethane. Limit values are generally required as an adjunct to a biomethane specification (such as parts 1 and 2 of EN 16723, or an equivalent National specification) or as part of a Network Entry Agreement for injection of biomethane into gas networks.

The methodology employed will permit derivation of limit values based solely on consideration of potential for impact on human health and does not consider other impacts, such as integrity and operation of plant and pipelines used to convey biomethane or appliances involved in its combustion or other regulations like CLP regulation. Where consideration of such impacts would result in proposing lower limit values than those based on health impacts, then the lowest limit values should generally be proposed.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 16723-2:2017, *Natural gas and biomethane for use in transport and biomethane for injection in the natural gas network - Part 2: Automotive fuels specification*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp

3.1
biogas
gas, comprising principally methane and carbon dioxide, obtained from the anaerobic digestion of biomass

3.2
biomass
biological material from living, or recently living organisms, typically this may be plants or plant-derived materials

3.3
biomethane
gas comprising principally methane, obtained from either upgrading of biogas or methanation of bio-syngas

3.4
bio-syngas
gas, comprising principally carbon monoxide and hydrogen, obtained from gasification of biomass

3.5
contaminant
chemical with undesired properties which may be present in biomethane at a low concentration and for which no maximum concentration is specified in EN 16723

3.6
Chemicals Of Potential Concern
(COPC)
chemicals that may present a risk to the environment directly or after combustion

3.7
Health Criteria Value
(HCV)
generic term to describe a benchmark level of exposure to a chemical derived from available toxicity data for the purposes of safeguarding human health. They are defined for instance by US EPA (US), ANSES (FR), Environment Agency (UK), RIVM (NL), ARPA (IT). The unit is mg/m^3

3.8
limit value
maximum concentration of a contaminant that is allowed in a gas quality specification

3.9
natural gas
complex gaseous mixture of hydrocarbons, primarily methane, but generally includes ethane, propane and higher hydrocarbons, and some non-combustible gases such as nitrogen and carbon dioxide

Note 1 to entry: Natural gas can also contain components or contaminants such as sulphur compounds and/or other chemical species.

3.10
natural gas network
transmission network or local distribution system

3.11
non-threshold effect chemical
chemical that may theoretically pose a risk at any level of exposure

3.12
(Health) Risk
possibility that a harmful event (death, injury or loss) arising from exposure to a chemical or physical agent may occur under specific conditions

3.13
threshold effect chemical
chemical which might be present in such concentrations that it might initiate a health risk of concern

3.14
upgrading of biogas
removal of carbon dioxide and contaminants from biogas

4 Symbols, units and abbreviated terms

4.1 Cg: maximum acceptable concentration in biomethane (mg/m^3)

4.2 Cexp: exposure concentration

4.3 M: multiplier in the exposure model

4.4 CAS number: Unique numerical identifier assigned by Chemical Abstracts Service

5 Global Approach for assessment of limit values

The approach described in this technical report is similar to that commonly employed in environmental health risk assessment, an example of which can be seen at the US Dept. of Energy's Risk Assessment Information System (RAIS) website [9]**Error! Reference source not found.**.

Conventional health risk assessments aims to assess and quantify the health risk presented by a particular activity. If the risk exceeds a maximum acceptable value, then mitigation actions are assessed and implemented. In conventional risk assessment, therefore, the *output* is a (quantified) level of risk associated with the process. However, in the context of specifying limit values for contaminants in biomethane the *INVERSE* of this risk assessment procedure is followed: an acceptable level of risk is agreed and the activity (in this instance injection of biomethane into natural gas grids) is modified by implementing an appropriate gas quality specification. In this situation, the acceptable level of risk is an *input* to the risk assessment procedure and the *output* is a gas quality specification. Such a specification will contain limit values for content of those contaminants that are likely to be present.

Note The contaminants that are likely to be present that can present a risk to the environment are commonly called "Chemicals of Potential Concern" (COPCs).

Similar approaches have been previously employed for development of gas quality specifications for biomethane: in 2008 in France (Afsset [1]) and in 2012 in the UK (UK Environment Agency [7]). This approach may be used whenever compounds of interest are added in the list of data. In addition, several realistic scenarios should be assessed in order to identify the worst case that will lead to the most appropriate limit value.

These scenarios depend at least on these elements:

- The national laws and regulations,
- The conceptual model designed,
- The national practices,
- Specific assumptions.

The procedure for assessing limit values in this Technical Report can be summarized in following scheme (Figure 1):