SLOVENSKI STANDARD
SIST EN 16723-1:2017

01-januar-2017

Zemeljski plin in biometan za uporabo v prometu in biometan za dodajanje v omrežje zemeljskega plina - 1. del: Specifikacije za biometan za dodajanje v omrežje zemeljskega plina

Natural gas and biomethane for use in transport and biomethane for injection in the natural gas network - Part 1: Specifications for biomethane for injection in the natural gas network

Erdgas und Biomethan zur Verwendung im Transportwesen und Biomethan zur Einspeisung ins Erdgasnetz - Teil 1: Festlegungen für Biomethan zur Einspeisung ins Erdgasnetz

Gaz naturel et biométhane pour utilisation dans le transport et biométhane pour injection dans les réseaux de gaz naturel - Partie 1 - Spécifications du biométhane pour injection dans les réseaux de gaz naturel

Ta slovenski standard je istoveten z: **EN 16723-1:2016**

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

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English Version

Natural gas and biomethane for use in transport and biomethane for injection in the natural gas network - Part 1: Specifications for biomethane for injection in the natural gas network

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This European Standard was approved by CEN on 17 September 2016.

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This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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European foreword

This document (EN 16723-1:2016) has been prepared by Technical Committee CEN/TC 408 “Natural gas and biomethane for use in transport and biomethane foe injection in the natural gas network”, the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by May 2017, and conflicting national standards shall be withdrawn at the latest by May 2017.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association.

EN 16723 consists of the following parts, under the general title “Natural gas and biomethane for use in transport and biomethane for injection in the natural gas network”:

— *Part 1: Specifications for biomethane for injection in the natural gas network*

— *Part 2: Automotive fuel specifications*

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: 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, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

This European 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".

NOTE The CEN Technical Board (CEN/BT) is responsible to coordinate the work between technical bodies in order to achieve a coherent set of standards and to avoid overlaps.

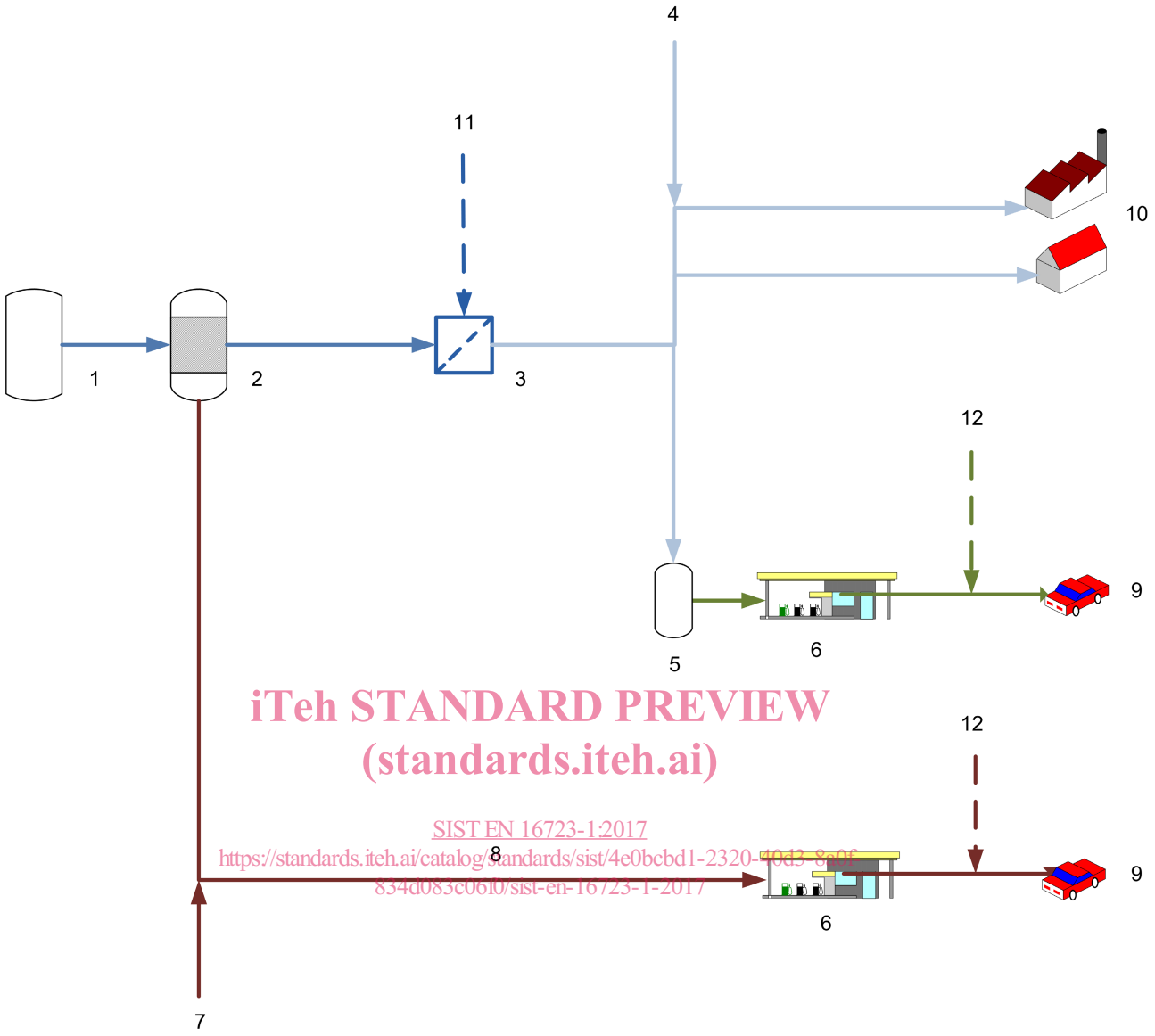
One of the aims of European policy in the field of energy is to increase the security of energy supply in the EU as well as to contribute to reduce the emission of greenhouse gases accepted by the EU at Kyoto. In this context, a special focus is given to the development and use of energy from renewable 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 processing of biomass and is appropriate to be used as a blending component to natural gas. A special focus is given to the development and use of energy from renewable sources of biological and non-biological origin. Other gases complying with this standard can be injected.

Figure 1 provides a visual representation of some applications of biomethane.

Mandate M/475 indicates that the requirements for natural gas quality for injection in the natural gas network are developed by CEN/TC 234 in answer to Mandate M/400 on natural gas quality. CEN/TC 408 should consider the work of the pending mandate M/400 on gas quality, and should refer to the parameters as defined and specified in EN 16726. This standard should exclude the definition of any parameters or substances that are addressed in EN 16726. However, it may specify more strict limits for parameters or substances unique to biomethane if deemed technically necessary. If needed, additional parameters or substances should be defined.



Key

1	biogas from digestion or thermos chemical process	7	non-grid sourced natural gas
2	upgrading	8	local dedicated infrastructure
3	injection into the gas grid	9	automotive use
4	natural gas grid	10	domestic and industrial use
5	conditioning	11	Part 1: grid specification
6	refuelling station	12	Part 2: automotive specification

Figure 1 — Representation of some flows and uses of biomethane and natural gas

1 Scope

This European Standard specifies the requirements and test methods for biomethane at the point of entry into natural gas networks.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 16726:2015, *Gas infrastructure - Quality of gas - Group H*

EN ISO 10715:2000, *Natural gas - Sampling guidelines (ISO 10715:1997)*

EN ISO 13443:2005, *Natural gas - Standard reference conditions (ISO 13443:1996 including Corrigendum 1:1997)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 16726:2015 and the following apply.

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
gas infrastructure
pipeline systems including pipework, underground gas storages and their associated stations or plants for the transmission and distribution of gas

3.6
hydrocarbon dew point temperature
temperature above which no condensation of hydrocarbons occurs at a specified pressure

3.7
lower heating value
amount of heat that would be released by the complete combustion with oxygen of a specified quantity of gas, in such a way that the pressure at which the reaction takes place remains constant, and all the products of combustion are returned to the same specified temperature as that of the reactants, all of these products being in the gaseous state

3.8
methane number
MN
rating indicating the knocking characteristics of a gaseous fuel

Note 1 to entry: MN has a similar use as the octane number for petrol.

Note 2 to entry: MN expresses the volume percentage of methane in a methane/hydrogen mixture which, in a test engine under standard conditions, has the same tendency to knock as the gaseous fuel to be examined.

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 sulfur compounds and/or other chemical species.

3.10
natural gas network
either transmission network or local distribution system

3.11
non-grid sourced natural gas
natural gas non coming from the natural gas network

3.12
odorization
addition of odorants to gas (normally odourless) to allow gas leaks to be recognized by smell at trace levels (before accumulating to dangerous concentrations in air)

3.13
syngas
gas, comprising principally of carbon monoxide and hydrogen, obtained from gasification of fossil fuel

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

3.15
water dew point temperature
temperature above which no condensation of water occurs at a specified pressure

3.16
Wobbe index
volumetric-basis heating value, at specified reference conditions, divided by the square root of the relative density at the same specified metering reference conditions

4 Parameters and test methods

4.1 General

This section deals with the various parameters for which requirements are given.

Natural gas, biomethane and blends of those intended for injection into natural gas networks shall be free from any constituents or impurities other than the ones described in this standard, to the extent that it cannot be transported, stored or utilized without quality adjustment or treatment. In the case of such other constituents and/or impurities, it may be necessary to obtain an approval from the competent and legitimate authority to define the acceptable risk in the territory of the injection point.

4.2 Standard reference conditions

Unless stated otherwise, all volumes are for the real dry gas at ISO Standard Reference conditions of 15 °C and 101,325 kPa.

Unless stated otherwise, all calorific values and Wobbe index are for the real dry gas at ISO Standard Reference conditions of:

— 15 °C (combustion);

— and 15 °C and 101,325 kPa (metering).

In assessing compliance with this European Standard, parameters should be determined directly at ISO standard reference conditions. If the properties are only available at other reference conditions and the actual gas composition is not known then conversion to ISO standard reference conditions shall be carried out using the procedure described in EN ISO 13443.

4.3 Applicable requirements and test methods for biomethane for injection in the natural gas network

Biomethane shall meet the requirements of EN 16726 for common parameters and Table 1 only for parameters specific to biomethane. Health criteria assessment for biomethanes is complex and dependent upon the biogas feedstock and upgrading and purification process. As a result, it is recommended that contaminants to be specified and limits to be applied are assessed at national level using an appropriate methodology. An example of such a methodology is provided in CEN/TR, *Proposed limit values for contaminants in biomethane based on health assessment criteria* (WI 00408007)[1)].

Table 1 provides common requirements for injection into H and L gas systems.

For injection into L gas systems, national requirements for Wobbe index, relative density, and CO_2 shall be applied when appropriate.

1) This CEN/TR is currently in development.

Table 1 — Applicable common requirements and test methods for biomethane at the point of entry into H gas and L gas networks

Parameter	Unit	Limit values[a]		Test method (Informative)
		Min	Max	
Total volatile silicon (as Si)	mgSi/m³		0,3 to 1[b]	EN ISO 16017-1:2000 TDS-GC-MS
Compressor oil		[c]		ISO 8573-2:2007
Dust impurities		[c]		ISO 8573-4:2001
Chlorinated compounds		-	[d, e]	EN 1911:2010
Fluorinated compounds			[d]	NF X43–304:2007 ISO 15713:2006
CO	% mol	_	0,1[f]	EN ISO 6974- series
NH3	mg/m³		10	NEN 2826:1999 or VDI 3496 Blatt 1:1982–04 NF X43–303:2011
Amine	mg/m³		10	VDI 2467 Blatt 2:1991–08

[a] Limit values are absolute, the number of the decimal places shall not imply the accuracy of the test methods.

[b] A range of limit values for siloxanes is proposed for this standard. Studies have demonstrated that continuous exposure to 100 % biomethane for 15 years should require a specification as low as 0,1 mg Si/m3. However, a limit set at this level would present difficulty in terms of analytical measurement (current quantification limits are at best 0,10 mg Si/m3, which would imply setting a limit of 0,30 mg Si/m3). Moreover, this would not recognize the mitigating effects of dilution of injected biomethane by natural gas. It is therefore suggested that the limit value to be applied [in a Network Entry Agreement] should be agreed between biomethane producer and gas transporter [grid operator] taking into account both performance of current analytical methods and dilution opportunities through, e.g. capacity studies. See Annex C for further guidance on monitoring regimes.

[c] The biomethane shall be free from impurities other than “de minimis” levels of compressor oil and dust impurities. In the context of this European Standard, “de minimis” means an amount that does not render the biomethane unacceptable for conveyance and use in end user applications.

[d] See CEN/TR, *Proposed limit values for contaminants in biomethane based on health assessment criteria* (WI 00408007).

[e] Alkyl halides are a leading substances in the sense that the given limit value to halides provides automatically a satisfactory limit value of fluorine, chlorine containing compounds – the measure is made on halides.

[f] The 0,1 % limit was taken from the CLP-Regulation (EC) No 1272/2008.

Test methods other than those listed in the relevant standards column in Table 1 may be applied, provided their fitness for purpose can be demonstrated and validated.

Some test methods have not been validated for biomethane or mixtures with natural gas, however further work is undertaken towards validation.

Additional information on the components listed in Table 1 can be found in Annex A and Annex B for sulfur. Additional information on compliance schemes can be found in Annex C.