

Carbon Specification Proposal



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Contents

1. Introduction	2
2. Quality Specification	2
3. Operating Conditions	4

Disclaimer

The specifications for carbon presented in this document are reflecting the best knowledge available at the moment of their publication. These gas quality specifications are subject to evolution, in line with the results of upcoming test and research programs as well as the publication of European gas quality standards. The information contained in this document reflects the point of view of Fluxys Belgium SA at this stage and is publicly disclosed for information purposes only and without any commitment whatsoever from Fluxys Belgium SA.

1. Introduction

The development of a carbon transmission infrastructure requires the right coordination between all relevant stakeholders in the value chain, from the emitters to the storage or utilization sites. One of the most important building blocks to make such cooperation successful consists in characterizing the carbon dioxide that shall be transported through the pipelines.

The general principles that generally govern gas quality specifications in gas networks are to :

- ensure that infrastructures are fit for purpose for transporting gases
- protect the infrastructures (e.g. from corrosion) by limiting free water, liquid dropouts and acid components
- safeguard safety of operations and end-use by limiting toxic components
- ensure interoperability with adjacent systems

2. Quality Specification

The quality specifications for the carbon transported in the carbon transmission network operated by Fluxys Belgium are listed in the table below. These requirements are applicable at the points where the carbon is entering and leaving the transmission network.

These gas quality specifications are, to the extent possible,

- Aligned with published specifications of carbon storage sites ;
- Taking into account feedback from the market received in the framework of the Request For Information

Constituents	Units	Requirements	Note
CO ₂	% mol	> 95	(1)
H ₂ O	ppm mol	< 40	(1)
H ₂	% mol	< 0,75	(1)
N ₂	% mol	< 2,4	(1)
Ar	% mol	< 0,4	(1)
CH ₄	% mol	< 1	(1)
CO	ppm mol	< 750	(1)
O ₂	ppm mol	< 40	(1)
H ₂ +N ₂ +Ar+CH ₄ +CO+O ₂	% mol	< 4	(1)

Total aliphatic hydrocarbons (C2-10)	ppm mol	< 1200	(1)
Total aromatic hydrocarbons (C6-10, incl. BTEX)	ppm mol	< 0,1	(1)
H ₂ S	ppm mol	< 5	(1)
SO ₃	ppm mol	< 0,1	(2)
SO _x	ppm mol	< 10	(1)
S _{TOT} (COS, DMS, H ₂ S, SO _x , Mercaptan)	ppm mol	< 20	(1)
NO _x	ppm mol	< 5	(1)
Dewpoint (for all liquids)	°C on whole operating pressure range	< -10	(1)
NH ₃	ppm mol	< 3	(2)
Total volatile organic compounds (excl. methane, total aliphatic, HC C ₂ to C ₁₀ , methanol, ethanol, and aldehydes)	ppm mol	< 10	(2)
Total aldehyde compounds	ppm mol	< 10	(2)
Ethanol	ppm mol	< 20	(2)
Methanol	ppm mol	< 620	(2)
Total carboxylic acid and amide compounds	ppm mol	< 1	(2)
Total phosphorus - contained compounds	ppm mol	< 1	(2)
Hydrogen cyanide (HCN)	ppm mol	< 2	(2)
Mercury (Hg)	ppm mol	< 0,03	(2)
Cadmium (Cd) + Thallium (Tl)	ppm mol	< 0,03	(2)
Total amine compounds	ppm mol	< 1	(2)

- (1) Compounds that shall be measured on a continuous basis at entry points
 (2) Compounds that do not have to be measured on a continuous basis at entry points. However, the producers need to demonstrate that they respect the requirements in the table :

- either by providing sound technical evidence that certain compounds cannot be present in their hydrogen stream,
- either by providing regular spot measurement results from a mutually agreed laboratory

In addition, the carbon delivered does not contain other elements or impurities (solid, liquid or gaseous) that might interfere with the integrity and operation of the downstream pipeline network infrastructures (f.i. glycol).

3. Operating Conditions

At injection points, emitters inject their carbon in vapor form (free of any liquids and solids) at the local operating conditions of the network as stipulated below:

Parameters	Units	Operating conditions
Operating pressures	barg	from 20 up to 33 ¹
Temperature	°C	20 – 40

¹ Variable, defined by the network operator and depending on network conditions