



Open Season for a Hydrogen transport infrastructure

16th of June 2022



Open Season for the construction of a hydrogen transport infrastructure in the Valenciennes region and an interconnection with Belgium

Hydrogen Specifications Proposal

Disclaimer

The hydrogen specifications presented in this document (the “**Hydrogen Specifications Proposal**”) reflect the best knowledge available at the time of publication. These gas quality specifications are subject to change, depending on the results of future testing and research programmes and the publication of European gas quality standards. The information contained herein reflects the current viewpoint of GRTgaz S.A. and is for information purposes only. It does not constitute any commitment on the part of GRTgaz S.A., and should not be viewed as giving rise to any contractual relationship whatsoever between GRTgaz S.A. and any interested party.

Introduction

Hydrogen specifications exist in the same way as for the transport of natural gas. These are needed to ensure the safe operation and interoperability of future hydrogen transport networks.

The purpose of these specifications, on the one hand, is to preserve the integrity of transport structures with regard to the risks of chemical reactions and changes to the physical characteristics of their constituent materials; and, on the other, to guarantee the transport to end-consumers of a hydrogen that meets their overall needs.

Any gas introduced into the hydrogen transport network proposed in this Open Season must therefore comply with hydrogen specifications in terms of:

- Hydrogen quality;
- Pressure and temperature conditions.

Hydrogen quality

Hydrogen quality specifications will apply to hydrogen production for injection into the transport infrastructure, as well as to redeliveries to end consumers.

The gas sector is currently working to produce standardised hydrogen specifications at the European level.

To this end, technical recommendations for the quality of hydrogen, as detailed in the reference document "CBP-H2", were proposed by EASEE-gas and published at the following link:

https://easee-gas.eu/download_file/DownloadFile/36/cbp-2022-001-01-hydrogen-quality-specification

These recommendations considered:

- The nature of H2 production capacity by 2030
- The nature of the main uses by 2030 and their possible constraints
- Possible desorption in the converted pipes, in the absence of feedback.

GRTgaz is one of France's contributors to this European project. It plays an active role in drafting these CBP-H2 recommendations for organisations representing producers and users, as well as infrastructure operators.

A technical specification is being developed within CEN TC 234 WG11. The parameters and limits defined and discussed in this specification are essentially based on CBP-H2. This technical specification is not a European standard.

As things stands, GRTgaz proposes using these "CBP-H2" recommendations for information purposes (summarised in the table below), as those which will apply to the proposed transport infrastructure. These may be subject to change, according to advances in the sector's technical knowledge and the regulatory requirements currently being defined.

Parameter	Unit	Minimum	Maximum
Hydrogen ¹	% mol	98.0	-
Carbon monoxide	ppm mol	-	20
Total sulphur ^{2,3}	mgS/m ³ (n)	-	21
Carbon dioxide	ppm mol	-	20
Total hydrocarbons (including CH ₄) ³	% mol	-	1.5
Inert compounds (Nitrogen, Argon, Helium)	% mol	-	2.0
Oxygen ^{4,5}	ppm mol	-	10
Total halogenated compounds	ppm mol	-	0.05
Water dew point	°C to 70 bar (a)	-	-8
Hydrocarbon dew point ³	°C from 1-70 bar (a)	-	-2

¹ Does not take into account any odorant

² Limit content calculated under normal conditions (1.01325 bar(a) and 0°C)

³ Limit values defined during a transitional period in which the composition of hydrogen may be influenced by the presence of compounds relating to natural gas

⁴ Expressed as a moving average over 24 hours

⁵ The maximum oxygen content can be increased to 1,000 ppm mol if the flows are not intended for a sensitive facility

Summary table of "CBP-H2" hydrogen quality recommendations

Pressure and temperature conditions

The operating conditions of the infrastructure, and in particular the minimum and maximum pressures and temperatures, will be defined in subsequent phases of the Open Season. This will be done in consultation with participants and according to the technical specificities provided by producers and consumers.

For information purposes and as a preliminary step, GRTgaz plans to study a maximum operating pressure of between 30 and 66 bar. This maximum operating pressure will be assessed more precisely according to the environment and the system's operating conditions, which will be defined in the subsequent stages of the Open Season.