Hydrogen network Project

Hydrogen Specification Proposition



Disclaimer

The hydrogen specifications presented in this document (the "Proposed Hydrogen Specifications for Alsace and Baden-Württemberg") reflect the best knowledge available at the time of publication. These hydrogen quality specifications may evolve in light of the results of forthcoming testing and research programmes and the publication of European hydrogen quality standards. The information contained in this document reflects the current position of NaTran, terranets bw and Badenova Netze and is made publicly available for information purposes only, without any commitment on the part of NaTran, terranets bw, Badenova Netze and shall not be construed as establishing any contractual relationship between NaTran, terranets bw, Badenova Netze and any interested party.

Introduction

Hydrogen specifications, like those applicable to natural gas transmission, are necessary to ensure the safe operation of future hydrogen transmission networks and to secure interoperability between those networks.

These hydrogen specifications must, on the one hand, preserve the integrity of transmission facilities against risks of chemical reactions and changes in the physical properties of their constituent materials and, on the other hand, ensure that hydrogen delivered to end consumers meets end-use requirements.

Any gas injected into the hydrogen transmission network proposed in this Call for Expressions of Interest must therefore comply with hydrogen specifications concerning:

- Hydrogen quality;
- Pressure and temperature conditions.

Hydrogen Quality

Hydrogen quality specifications will apply both to hydrogen produced for injection into the transmission infrastructure and to hydrogen delivered to end consumers.

In November 2023, the European Committee for Standardization (CEN) published European Technical Specification XP CEN/TS 17977 on hydrogen quality.

This specification defines the quality of gaseous hydrogen (i.e. its parameters and limit values) intended for safe transmission, injection into storage, withdrawal from storage, distribution and use in fully and/or partially converted gas infrastructure, as well as in connected applications.

At this stage, NaTran, terranets bw and Badenova Netze propose, on an indicative basis, to adopt hydrogen quality specification XP CEN/TS 17977, summarised in the table below, as the specification applicable to the transmission infrastructure described in this Call for Expressions of Interest.

This specification may evolve in light of further European standardisation work currently underway and advances in the sector's technical knowledge.

In particular, CEN TC 234 WG11 began developing a draft standard on hydrogen quality in the fourth quarter of 2026. The provisional timetable envisages a European public consultation in 2027, followed by publication of the standard in late 2028.

As a member of CEN TC 234 WG11, NaTran is contributing to the development of this draft standard on hydrogen quality.

Parameter	Unit	Value
Hydrogen	mol-%	≥ 98
Wobbe index	MJ/m³ (15°C/15°C)	42,0 – 46,0
The content and composition of the further quality parameter (e.g sum of inerts) shall satisfy the Wobbe Index value above.		
Water	µmol/mol	≤ 250 ≤ 60 (a)
Hydrocarbon dew point (HCDP) (b)	°C	< -2 °C at 1 < p < 70 bar
Sum of inerts (N_2, He, Ar)	mol-%	≤ 2
Gaseous hydrocarbons (b)	mol-%	≤ 2
Oxygen (O_2) (c)	mol-% µmol/mol	≤ 0,1 (d) ≤ 10
Carbon monoxide	µmol/mol	≤ 20
Carbon dioxide	µmol/mol	≤ 20
Total Sulfur (b)	µmol/mol	≤ 7 (e)
Ammonia	µmol/mol	≤ 13
Halogenated compounds	µmol/mol	≤ 0,05
Max particulate concentration (b)	mg/kg	Technically free
Contaminants	The gas shall not contain constituents other than listed in this table at levels that prevent its transportation, storage and/or utilization without quality adjustment or treatment	

(a) 250 µmol/mol at MOP less or equal to 10 bar, 60 µmol/mol at MOP over 10 bar.
(b) These components most likely have their source in the previous use of the pipework.
(c) Rolling 24h average.
(d) Max 0,1 mol-% in grids with no exit point to UGS or to sensitive customers, otherwise max 10 µmol/mol.
(e) Non-odorised hydrogen.

Summary table of technical specifications XP CEN/TS 17977

Pressure and Temperature Conditions

The infrastructure's operating conditions, particularly minimum and maximum pressures and temperatures, will be defined in subsequent phases of the Call for Expressions of Interest, in consultation with participating stakeholders and based on the technical requirements gathered from producers and consumers.

On an indicative and preliminary basis, NaTran intends to study a maximum operating pressure for the pipeline of between 30 (subject to Client expectation) and 51 bar (due to repurposed pipeline in France). This maximum operating pressure will be assessed more precisely considering the network's environment and operating conditions, to be defined in subsequent stages of the Call for Expressions of Interest.