



Standardization & Certification

WP4

Workshop 31-03-2021

WP4 – CERTIFICATION & STANDARDIZATION

The main goal is to:

- **evaluate** the **current certification and standardization framework** for **residential & commercial gas appliances** with respect to the use of H₂NG blends with possibly fluctuating H₂ concentrations;
- **recommend test programs/conditions** allowing to assess new gas appliances properly on satisfying the applicable essential requirements with respect to the use of H₂NG blends with possibly fluctuating H₂ concentrations;
- **respecting the existing approach** except if change required due to H₂ presence in NG.

The expected deliverables are:

D4.1	overview of the current standardization/certification framework and description of the identified issues
D4.2	overview of relevant existing testing/certification experience
D4.3	description and justification of the proposed test procedure
D4.4	overview of the results of the application of the proposed test procedure

CONSIDERATIONS REGARDING GAR AND OTHER APPLICABLE LEGISLATION

- H₂ and H₂NG are **in the scope of Gas Appliances Regulation (EU) 2016/426**
- H₂NG supply may **compromise an existing appliance's conformity to a significant number of essential requirements**
- **existing appliances** did not have to be designed for H₂NG supply ⇒ **H₂NG supply cannot be considered as 'normal use'** ⇒ no product liability by manufacturer
- appropriate **H₂ concentration ASAP** to be adopted in quality specifications for distributed gases (cf. annex II of GAR) for which new appliances need to be designed

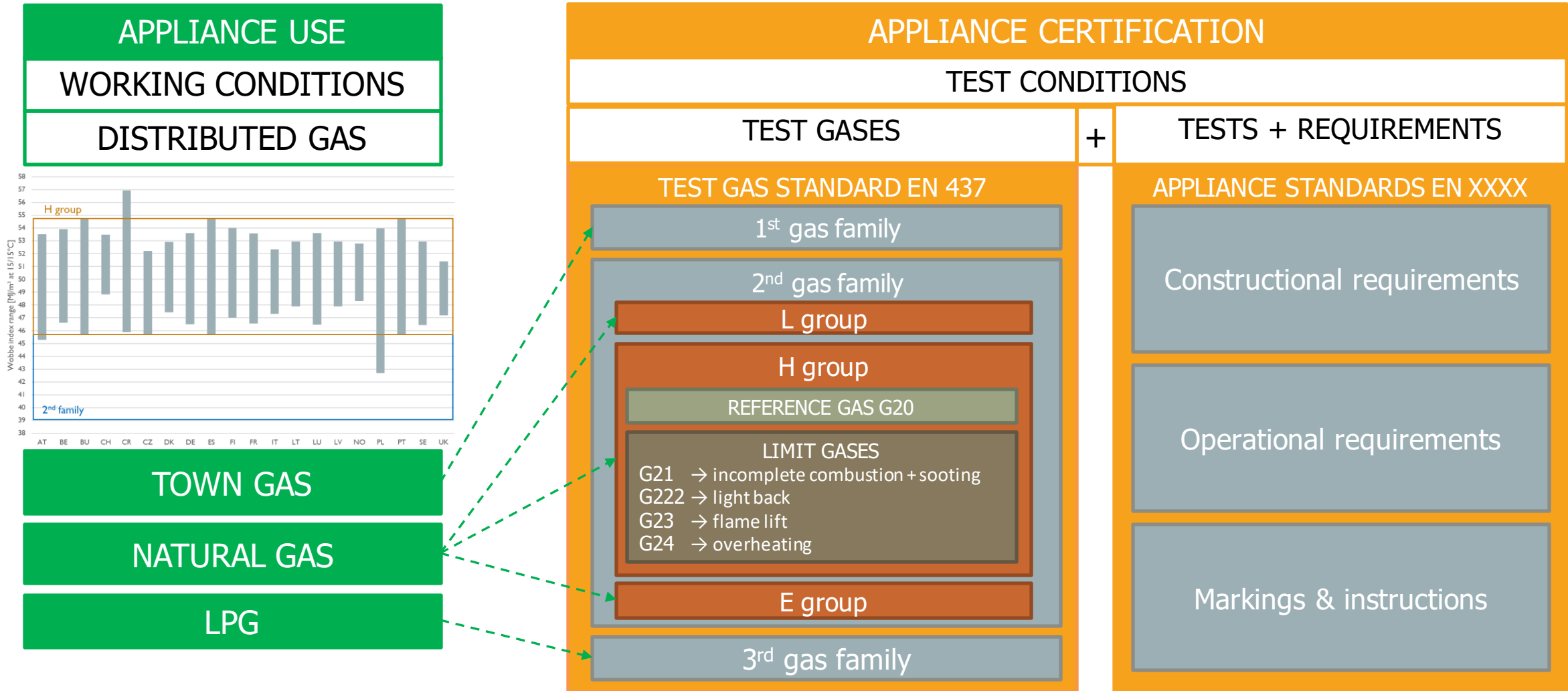
Country	Vol% H ₂
DE	≤ 10
FR	< 6
ES ¹	≤ 5
AT	≤ 4
LT	≤ 2
others	no information, not regulated, not measured

H₂ concentrations communicated by MS in GAR annex II framework.

- **other applicable legislation also to be evaluated** on impact of H₂NG

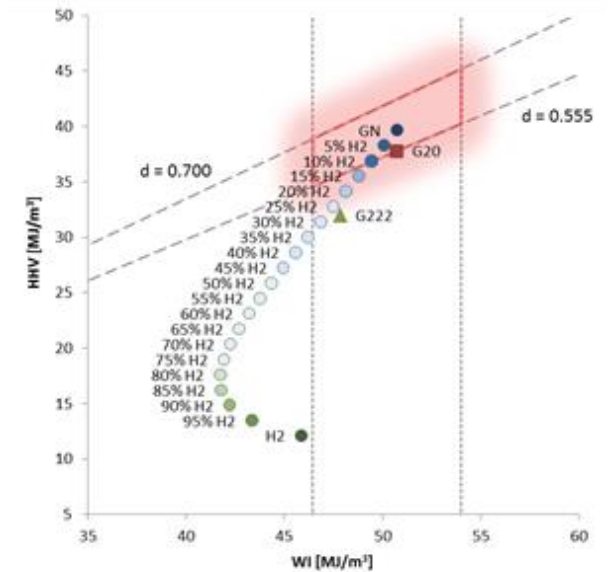


CURRENT APPLIANCE CERTIFICATION APPROACH



CONSIDERATIONS REGARDING TEST GASES

- defined by **EN 437** elaborated by CEN/TC238
- gas family** = group of **gaseous fuels** with **similar burning behaviour** linked together by a **range of Wobbe indices**
 - similar burning behaviour → H₂ significantly different from CH₄
 - range of Wobbe indices → H₂ can lower W of NG beyond lower limit of H group (i.e. 45,7 MJ/m³)



Objective	Name	Composition	W _s	H ₂ NG
Reference	G20	100 % CH ₄	50,72	2nd reference gas needed ?
Incomplete combustion + sooting	G21	87 % CH ₄ + 13 % C ₃ H ₈	54,69	no changes needed ?
Light back	G222	77 % CH ₄ + 23 % H ₂	47,87	to be adapted to max. H₂ concentration, but from worse perspective
Flame lift	G23	92,5 % CH ₄ + 7,5 % N ₂	45,66	H ₂ lowering risk → no changes needed ?
Overheating	G24	68 % CH ₄ + 12 % C ₃ H ₈ + 20 % H ₂	52,09	H ₂ concentration to be adapted in function of max. H ₂ concentration ?
?	?	?	?	any new limit gas to cover any new or impacted risk ?

CONSIDERATIONS REGARDING TESTS + REQUIREMENTS

- **Many CEN product standards** covering different types of gas appliances (e.g. central heating boilers, water heaters, cookers, catering equipment, radiant heaters, air heaters, etc.)
- A lot of similar tests (related to combustion) in all of these gas appliance standards adapted specifically to the concerned type, but are **existing tests, test conditions** and **requirements adapted to the presence of H₂** ?
 - e.g. what about
 - **gas leakage** inside the appliance ?
 - **unburned gas accumulation inside** the **appliance** and **mechanical resistance to delayed ignition** (cf. wider explosion limits, lower ignition energy and temperature) ?
 - **integrity of materials** (cf. chemical impact) ?
 - proper **functioning of safety devices** (e.g. flame supervision by electrode or by UV cell, safety times of burner controls, TTB, ...) ?