

Heating Systems (R122)

Proposal for a new Annex on H2 Combustion Heaters, based on existing Annex 8 on LPG Heaters

I. Proposal

New Annex Title, to read:

SAFETY REQUIREMENTS FOR **H2** COMBUSTION HEATERS AND **H2** HEATING SYSTEMS

New Paragraph 1., to read:

1. **H2** heating systems for road use in motor vehicles and their trailers
- 1.1. If an **H2** heating system in a motor vehicle or trailer can also be used when the vehicle is in motion, the **H2** combustion heater and its supply system shall comply with the following requirements
 - 1.1.1. The **H2** combustion heater shall comply with the requirements of the harmonized standard **xxxxx**
 - 1.1.2. In cases of a permanently installed **H2** container all components of the system that are in contact with **H2** in the liquid phase (all components from the filling unit to the vaporiser/pressure regulator) and the associated liquid phase installation shall comply with the technical requirements of **Regulation UNECE R134 or EU 2021/535. However, the installation of a LPG container in vehicles of category O shall comply with the technical requirements of the harmonized standard EN 1949:2011.Paragraph 8, amend to read.**
 - 1.1.3. The gaseous phase installation of the **H2** heating system in a vehicle shall comply with the requirements of the harmonized standard **yyyyy**.
 - 1.1.4. The **H2** supply system shall be so designed that the **H2** is supplied with the required pressure and in the correct phase for the installed **H2** combustion heater. It is permitted to withdraw **H2** from the permanently installed **H2** container simultaneously in either gaseous or liquid phase. There shall be no connection of the gas installation between motor vehicle and trailer.
 - 1.1.5. The liquid outlet of the permanently installed **H2** container to supply **H2** to the heater shall be provided with a remotely controlled service valve with excess flow valve as required in **paragraph 5 of Regulation No. 134**. The remotely controlled service valve with excess flow valve shall be controlled such that it is automatically closed within five seconds of the vehicle engine stopping, irrespective of the position of the ignition switch. If within these five seconds the on-switch of the heater or **H2** supply system is activated, the heating system may stay in operation. The heating can always be restarted. **This paragraph does not apply to trailers. Trailers shall have a label in the vicinity of the filling point which states to switch off the heater while refilling the permanently installed LPG container.**
 - 1.1.6. If the **H2** is supplied in the gaseous phase from the permanently installed **H2** container or separate portable **H2** cylinder(s), appropriate provisions shall be taken to ensure that:
 - 1.1.6.1. No liquid **H2** can enter the pressure regulator or **H2** combustion heater. A separator may be used, and
 - 1.1.6.2. No uncontrolled release due to an accidental disconnection can occur. Means shall be provided to stop the flow of **H2** by installing a device directly after or in a cylinder or container mounted regulator. If the regulator is mounted remote from the

cylinder or container, a device shall be installed directly before the hose or pipe from the cylinder or container (high pressure protection) and an additional device shall be installed in, or after the regulator if needed for protecting the low-pressure part of the installation (low pressure protection).

- 1.1.7. If the **H2** is supplied in liquid phase, the **vaporiser** and pressure-regulator unit shall be heated as appropriate by a suitable heat source.
- 1.1.8. In motor vehicles that use **H2** in their propulsion system, the **H2** combustion heater may be connected to the same permanently installed **H2** container that supplies **H2** to the engine, provided that the safety requirements of the propulsion system are met. If a separate **H2** container is used for heating, this container shall be provided with its own filling unit.

II. Justifications

Work is on-going in WP 15 in order to define the needed ADR update in order to allow the certification of new energy vehicles (BEVs, FCEVs and other). As part of this work, we have checked the Heating Systems requirements of UN R122.

Some Heating technologies are already covered adequately:

- Electric heaters
- Heat pumps

These technologies are foreseen for the majority of BEVs and FCEVs.

However, we can also anticipate the need for H2 combustion heaters, for vehicles equipped with H2 combustion engines.