
Changes to legislation: There are outstanding changes not yet made to Regulation (EC) No 79/2009 of the European Parliament and of the Council. Any changes that have already been made to the legislation appear in the content and are referenced with annotations. (See end of Document for details) [View outstanding changes](#)

Regulation (EC) No 79/2009 of the European Parliament and of the Council of 14 January 2009 on type-approval of hydrogen-powered motor vehicles, and amending Directive 2007/46/EC (Text with EEA relevance)

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ANNEX V

Applicable test procedures for hydrogen components, other than containers, designed to use compressed (gaseous) hydrogen

HYDROGEN COMPONENTS	TYPE OF TEST					
	Material tests	Corrosion resistance test	Endurance test	Pressure cycle test	Internal leakage test	External leakage test
Pressure relief devices	↘	↘	↘	↘	↘	↘
Automatic valves	↘	↘	↘	↘	↘	↘
Manual valves	↘	↘	↘	↘	↘	↘
Non-return valves	↘	↘	↘	↘	↘	↘
Pressure relief valves	↘	↘	↘	↘	↘	↘
Heat exchangers	↘	↘		↘		↘
Refuelling connections or receptacles	↘	↘	↘	↘	↘	↘
Pressure regulators	↘	↘	↘	↘	↘	↘
Sensors for hydrogen systems	↘	↘	↘	↘		↘
Flexible fuel lines	↘	↘	↘	↘		↘
Fittings	↘	↘	↘	↘		↘
Hydrogen filters	↘	↘		↘		↘
Removable storage system connectors	↘	↘	↘	↘		↘

Subject to specific requirements for any of the hydrogen components, the test procedures to be applied for the type-approval of hydrogen components, other than containers, designed to use compressed (gaseous) hydrogen must include:

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1. Material tests:
 - 1.1. Hydrogen compatibility test set out in point (j) of Annex III.
 - 1.2. Ageing test: the purpose of the test is to check whether the non-metallic material used in a hydrogen component can withstand ageing. No visible cracking of the test samples is allowed.
 - 1.3. Ozone compatibility test: the purpose of the test is to check whether the elastomer material of a hydrogen component is compatible with ozone exposure. No visible cracking of the test samples is allowed.
2. Corrosion resistance test set out in point (e) of Annex III.
3. Endurance test set out in point (c) of Annex III.
4. Pressure cycle test set out in point (i) of Annex III. The hydrogen components must not show visible signs of deformation or extrusion and must fulfil the requirements of the internal and external leakage tests.
5. Internal leakage test: the purpose of the test is to provide evidence that the specified hydrogen components are free from internal leakage. In order to prove this, the hydrogen components are pressurised under different temperature conditions and observed for leakage. The hydrogen components must stay bubble free and must not leak internally at a higher rate than a specified number.
6. External leakage test set out in point (b) of Annex III.

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Changes and effects yet to be applied to the whole legislation item and associated provisions

- Signature words omitted by [S.I. 2022/1273 reg. 52\(8\)](#)
- Art. 2(1) words substituted by [S.I. 2022/1273 reg. 52\(2\)](#)
- Art. 11(1)(a) words omitted by [S.I. 2022/1273 reg. 52\(4\)\(a\)\(iv\)](#)
- Art. 11(3)(a) words omitted by [S.I. 2022/1273 reg. 52\(4\)\(c\)\(iv\)](#)
- Art. 12(e) word omitted by [S.I. 2022/1273 reg. 52\(5\)\(b\)](#)