

	<b>Certification program for compatibility and permeation properties of elastomer materials for seals and membranes in gas appliances and systems with regard to hydrogen for a content of up to 100% by volume H2 ZP 5101</b>	55101-01-N -DE	
		Doc. type ZP	
		Author DVGW CERT GmbH	
		see standard	07.12.2021

**Purpose:**

- This certification and test basis describes the requirements, motivation and tests to characterize elastomer materials for seals and membranes in gas devices and systems for use with up to 100% by volume hydrogen (H<sub>2</sub>) with regard to the permeation of H<sub>2</sub>. The permeation properties can be used for the choice of material and for the design of molded parts in an application.
- The object of this certification program are material tests on elastomer materials that have already received DIN-DVGW certification according to DIN EN 549 or DIN EN 682.
- The basic material compatibility of elastomer materials with hydrogen is verified using the materials table in DIN EN ISO 11114-2. The DVGW research project G 201615 [1] also used this standard along with other sources for the compatibility classification. In DIN EN ISO 11114-2, findings regarding service life, durability and long-term behavior of various material groups of plastics and elastomers have been incorporated. The compatibility data contained therein relate to individual gases, but can also be used to a certain extent for gas mixtures. This also applies to the elastomers tested and certified according to DIN EN 549 or DIN EN 682 with regard to the gases of the 2nd and 5th gas families defined in DVGW worksheet G 260 [1]. This ZP supplements the application instructions for elastomer materials according to DVGW G 481 [3].
- However, it is expressly pointed out that DIN EN ISO 11114-2 only treats the subject of permeation qualitatively. This standard can therefore only serve as an aid for assessing the compatibility of gas/material combinations. Only the effect of the gas on changes in the material properties (e.g. due to a chemical reaction or changes in the physical state) is taken into account. The basic material properties required for design purposes, such as e.g. Mechanical properties, for example, are usually provided by the material supplier and are not taken into account in DIN EN ISO 11114-2.