

Hydrogen is regarded as the ideal energy carrier of the future and is an elementary component of the necessary energy transition. Hydrogen is very flexible and can be widely used in the industrial, transport, electricity and heating sectors. Fuel cells and piston engines are particularly suitable as drive concepts for hydrogen-powered vehicles.

As the most common element, hydrogen is available in almost unlimited quantities and can be produced, transported, stored and used in gaseous or liquid form. Its very high energy density and usability in bound form make it an attractive energy carrier, but it is not unproblematic and very demanding to handle.

Due to its low density and small molecular cross-section, hydrogen diffuses easily and quickly through solid materials. This leads, for example, to hydrogen embrittlement in metallic materials and thus to a strong reduction of the material strength.

Mechanical material testing is an important component for the characterization and development of new materials that must function safely and over the long term under the influence of hydrogen.

In the lecture, we will present various application examples and show testing solutions that make an important contribution to the further development of materials and components.