

HYDROGEN READY?!

BALL VALVES, WELLHEADS AND TESTS FOR HYDROGEN APPLICATIONS

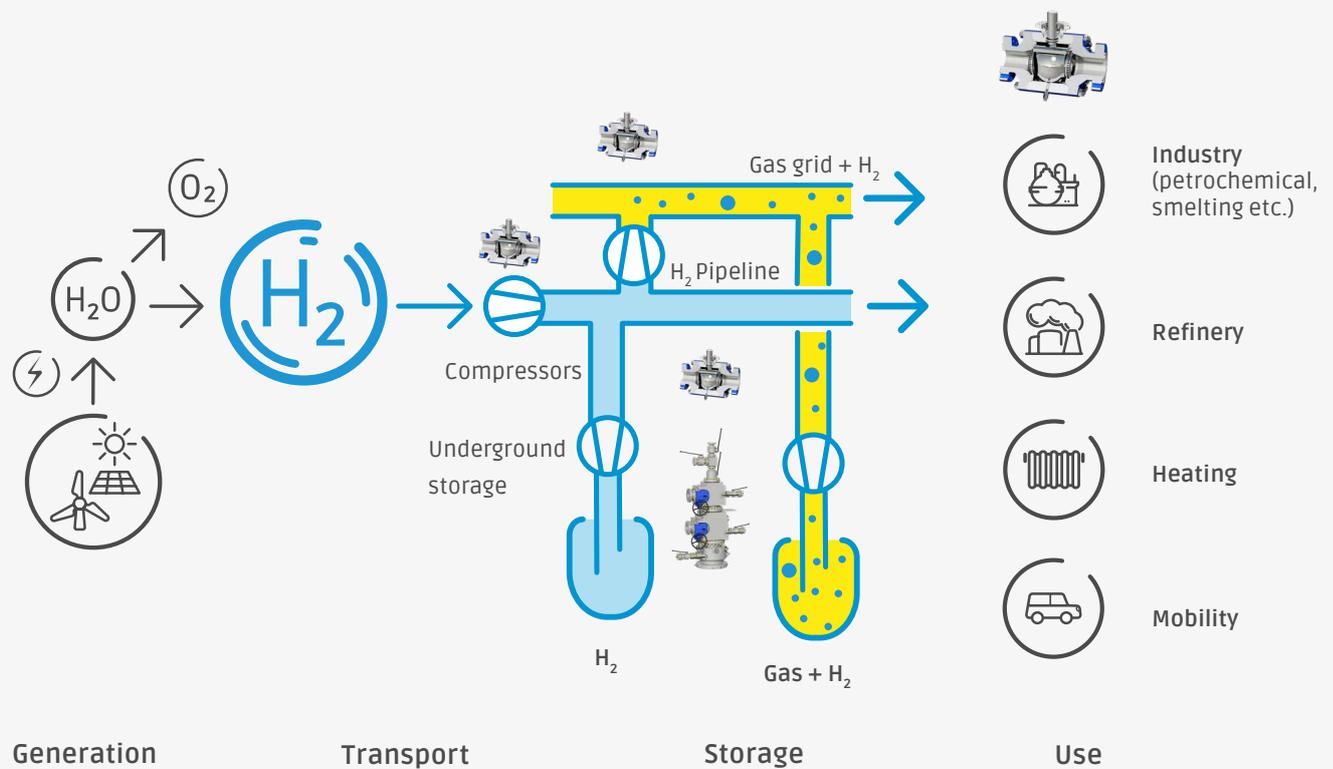
The right selection of materials and reliable leak-tightness tests ensure safety



AREAS OF APPLICATION

Special valves, which have evolved for the demanding hydrogen medium, have been used in the petrochemical industry for many decades. With energy transition, hydrogen will be found increasingly in other fields of application – from electricity generation (such as power-to-gas), through transport (in natural gas grids or hydrogen pipelines), to processing and mobility.

The underground storage of hydrogen in salt caverns constitutes an environmentally friendly and safe solution for storing large amounts of energy to balance between power generation and demand.



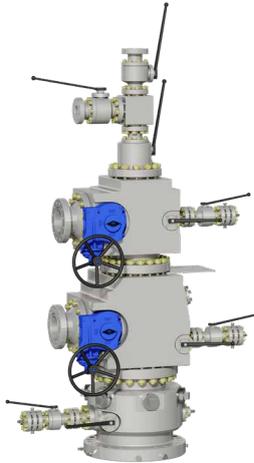
SOLUTIONS



BALL VALVE

Durable special valves provide a reliable shut-off

- True metal-to-metal seal between ball and seat ring
- Gas-tight, even at high pressures up to 690 bar
- Special design for temperatures up to 550°C
- High cycles up to 200,000 per year
- Two independent barriers – Double Isolation and Bleed (DIB)
- Test in the pipeline – Double Block and Bleed (DBB)
- Triple sealing technology



WELLHEAD

Secure interface with underground storages

- Ball valves acc. to API 6A with DIB in large diameters up to 13-5/8"
- Doubled sealing at the flange connection
- Integration of several components in one block (fewer flange connections)
- Metallic seals at the wellhead
- Special designs for:
 - Control lines
 - Load measurement using strain gauges
 - Electric pumps

REFERENCES



Power-to-Gas
DN 25 (1") PN 100 (ANSI 600)
OP: 63 bar at 40°C



Petrochemical
DN 200 (8") PN 420 (ANSI 2500)
OP: 184 bar at 380°C



Petrochemical
DN 600 (24") PN 420 (ANSI 2500)
OP: 191 bar at 426°C

HYDROGEN TESTS



In future the challenging medium hydrogen will be utilised across increasing fields of application. All components in direct contact with hydrogen must be suitable and tested leak-tight in order to guarantee safe operation. Hydrogen valves and wellheads must therefore meet the design criteria and metallurgy for a leak-tight and secure hydrogen application.

Hartmann offers two hydrogen tests for both Hartmann ball valves and wellheads as well as for the products of other manufacturers (based on documentation).

MATERIAL SUITABILITY TEST

Molecular hydrogen H₂ is comparatively stable and marginally reactive, therefore corrosion in the conventional sense is unlikely. So-called hydrogen embrittlement, i.e. hydrogen induced stress corrosion (see image), presents a risk for highly stressed pressurised components which requires particular consideration. Within the scope of the material suitability test, the material selection is comprehensively tested for hydrogen application.



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The test is performed on the basis of the following standards:

- Pressure Equipment Directive 2014/68/EU (DGRL)
- API 6A, API 6D, ASME
- NACE MR175 / DIN EN ISO 15156

The following criteria are considered:

- Hardness
- Surface hardness
- Ductility
- Heat treatment and structure



TEST FOR HYDROGEN LEAK-TIGHTNESS

Being a small molecule, hydrogen can migrate through sealing elements. A comprehensive seal test provides assurance that the threshold values are adhered to and fugitive emissions are minimised.

- The measurement of external leak-tightness is by means of mass spectrometer
- Forming gas in accordance with DIN EN ISO 14175 is used as the test medium
- The leak-tightness is measured based on DIN EN ISO 15848 (with appropriate threshold values)



YOUR BENEFITS

These hydrogen tests performed individually or combined save you time and effort with in-house testing and provide operational safety:

- Confirmed hydrogen compatibility of the metallic materials
- Achievement of the highest leak-tightness requirements through standardised tests
- Upgrading of inventory valves by Hartmann experts
- Long service life, even at high pressures



VERIFIED SUSTAINABILITY

QUALITY MADE IN GERMANY

We start where the range of standard products ends: Hartmann develops tailor made high performance components of the highest quality. Safe. Reliable. Long-lasting.



INDIVIDUAL DESIGN

Our sales and design engineers eagerly await your enquiries from the high performance sector. In close collaboration we develop suitable components for your special applications.



SOLUTIONS FOR EXTREME AREAS

Hartmann ball valves and wellheads are designed for pressure classes up to 690 bar, temperatures from -200 to +550°C as well as for high cycle operations and media of all types.



QUALITY THAT PAYS

Durable and low maintenance products reduce the life cycle costs of your plants. This is why we develop, assemble and test exclusively in Germany.



EXPERTISE & CONSULTATION FROM A SINGLE SOURCE

You profit from more than 70 years experience during all project phases. We provide you with support, from consulting, development right through to installation and maintenance service.

HARTMANN VALVES & WELLHEADS

The family-owned Hartmann Valves GmbH is one of the leading manufacturers of special ball valves, scraper valves and wellheads. Our high performance components are installed all over the world - in the crude oil, natural gas, (petro)chemical industry as well as in power plant technology, geothermal and other renewables such as power-to-gas.

All products are designed to individual requirements and equipped with our metal-to-metal sealing system. Design, assembly and tests are carried out solely in our factories in Celle and Burgdorf-Ehlershausen. Hartmann is now run by the third family generation and have developed into an international system supplier that today employs over 170 people.

A GLIMPSE INTO OUR PRODUCTION

www.hartmann-valves.com/en/film

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