



## Hartmann Valves & Wellheads: Tailor-made solutions for extreme conditions

Hartmann Valves & Wellheads does not only manufacture high-performance ball valves, but also scraper valves, wellheads and x-mas trees. More importantly: they are globally known for offering tailor-made solutions that have an entirely metallic sealing system. The company is worldwide present in the crude oil, natural gas, petrochemical, chemical, and life science industry as well as in power plant technology, geothermal and other renewables such as power to gas. By combining the principles of tradition and innovation, Hartmann have developed into an international system supplier that today employs over 150 people at the German Celle and Burgdorf-Ehlershausen sites. Managing Aging Plants had the pleasure to speak with Werner Hartmann, Managing Director with Hartmann Valves GmbH.

*By Jolanda Heunen*

### Starting with the customer

Soon after founding the company in 1946, Werner Hartmann Senior invented and patented a spherical ball valve geared toward the oil & gas industry. As this industry grew steadily so did Hartmann Valves GmbH. Over the years product development has

stayed oriented towards the need of the customer, thus driving constant innovation in the high-performance sector. "We don't manufacture standard products; every product which is delivered is customised for specific needs in a specific situation," Mr. Hartmann tells.

Hartmann's products are especially designed for extreme conditions including very high temperatures, very high pressure, aggressive media or extremely high cycles. "Often it is also a combination of these challenges," Mr. Hartmann explains. "We always start with what the customer is looking for

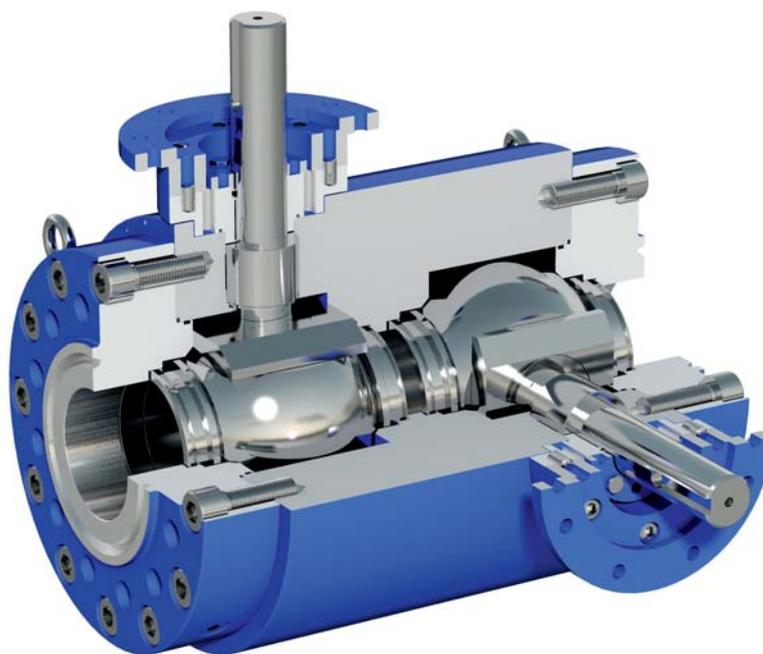
in his special use case, which is overall a very special and reliable high-performance product that can't be found on the market or a specific replacement need in non-changeable situations." Right from the start, Hartmann's engineers think together with the customer towards the construction. "We work very closely to get to the appropriate tailor-made product and develop this here in Germany where we also build the product with European-sourced materials and finish with some manual work, such as grinding in order to guarantee a perfect fit."

### Metal-to-Metal sealing system

With the "bubble-tight" metal-to-metal sealing between the ball and seat ring Hartmann Valves has been able to gain a special position in the market. "Thus our ball valves are more robust and durable than PMSS or soft sealing systems and gate valves. The system requires less maintenance because it makes the ball valves more resistant to abrasion and erosion," explains Werner Hartmann. "Looking for reliable solutions which assure a maximum availability and require only little maintenance and operational costs, more and more customers recognise that investing in long-lasting, high-quality valves pay back after a short period of use. For example, Hartmann developed an 8" valve for abrasive media such as titanium dioxide, which is used for portioning the oxide. With the ball valve, inspection intervals could be extended from a few weeks to fifteen months during which time the high performance valve undergoes about one million cycles. Other ball valves (12" PN50) guarantee the highest possible, trouble free system availability for several years, while completing approximately 400,000 cycles in degreasing media at approx. 200°C.

### Maintenance & Overhaul

In addition to the design and manufacture of tailor-made products, Hartmann runs an integrated Service & Maintenance Department. This enables the provision of 24/7 support to customers worldwide, both during construction and overhaul. "For us it is important to really be there for the customer when a challenge arises," Mr. Hartmann emphasizes. Experience collected during this close cooperation has influence on new develop-



*By using the Hartmann Twin Ball Valve the operational safety can be raised by factor 4 compared to a standard valve*

ments and lead to a steep learning curve."

### Case Study: Innovative conversion of ammonia factory

A few years ago Yara Germany realized a comprehensive process optimization at their ammonia plant in Brunsbüttel. In this plant both gasification lines can be run either on natural gas or oil. One component are the 5" shut-off ball valves from Hartmann, which are especially designed for the challenging combination of pure oxygen, high temperatures and steam. Already during the specification phase it was clear for Yara that the conversion

was only possible when the shut-off valve would be able to handle the extreme requirements. For this purpose Hartmann designed five true metal seated 5" shut-off ball valves (DN 125 PN 160) made of Inconel 625<sup>®</sup> (solid material): absolutely gastight (DIN 3230), max. temperature +400 degrees Celsius, nominal pressure 160 bar / working pressure 64 bar, closing time approx. 20 seconds. Implemented as singles, the valves would provide two barriers and seal 100% in emergency situations. With the additional Twin Ball Valve (see below for more information), both seals could be tested while the valve was installed. For Yara this design

#### Overview: Hartmann Ball Valves for challenging applications

<b>Nominal diameters:</b>	DN8 to DN1000 (1/2" to 40")
<b>Pressure rating:</b>	up to 700 bar (10,000 psi)
<b>Temperatures:</b>	- 200 to + 550°C
<b>Media:</b>	Mineral oil, natural gas, sour gas, brine, oxygen, hydrogen, steam, thermal water, abrasive and degreasing media
<b>Characteristics:</b>	metal-to-metal sealing system, gas-tight, split body design, customer-specific products, low maintenance
<b>Functions:</b>	Double-Block and Bleed (DBB), Double Isolation and Bleed (DIB), Fire-safe and many more
<b>Standards and regulations:</b>	API 6A, API 6D, ASME, PED, DGRL, DIN ISO, and others



The four reactors of the POX-gasification plant at Yara Brunsbüttel with their gastight and metal-to-metal sealing ball valves - a customized Hartmann design for high temperatures, steam and pure oxygen.

proved completely in line with the technical guidelines with all specifications being met. Werner Döring, Head of Projects and Availability with Yara Brunsbüttel GmbH, stated: "Unreserved recommendation! Hartmann was always accessible regarding our needs and fast on the spot. Beyond the delivery we have been assisted with dedication and great know-how."

**Maximizing safety in aging industrial facilities**

Strict security requirements pose an additional challenge for companies worldwide, especially for those in the chemical and petrochemical industry. "Many of the plants are running since many years, sometimes decades, and in several cases replacement is really necessary to provide more security, both for the personnel and for the environment," Werner Hartmann states. "Together with our customers we look for the best way to maximize security in the processes of existing plants." Just one example hereof is the Twin Ball Valve which was designed for applications with especially high safety requirements. This solution consists of two integrated ball valves, which can be equipped with two independent barriers each; thereby the safety can be raised by factor 4 compared to a standard valve. "With the Double Isolation and Bleed function, each ball valve seals both at the upstream and downstream

side," Mr. Hartmann tells. With its so-called 'studded' design – meaning a closed flange form – the valve has the length of a standard valve and affords a compact and economic alternative for the application of multiple valves.

**Case Study: Customized Twin Ball Valve for space limitations**

Also in gas storage a very high level of safety and plant availability are crucial and pose a high demand on assets. In the deepest gas storage in Europe, the upper



Plant Manager and Hartmann Manager at the DEA Gas storage facility where 800 Hartmann metal-to-metal sealing ball valves ensure high safety requirements.

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Bavarian DEA facility Wolfersberg near Munich, approximately 800 Hartmann gas-tight ball valves are implemented. For maximizing safety about forty TBV models have been utilised, equipped with a double barrier and two distinctly independent isolating mechanisms in one body. An extra compact special design of the TBV was created when an old isolating section of the main injection line had to be renewed. It consisted of a welded and a flanged ball valve and exchanging the welded valve would have led to a long downtime. Thus Hartmann engineered a TBV version DN 250 PN 250 with the same length of the original standard valve. Following a successful proving period extra compact Twin Ball Valves of exact dimensions as the original valves have also been installed in other facility parts.

### **New hydrogen ball valve**

The new Hartmann hydrogen ball valve combines various characteristics aimed at maximum leak-tightness, safety,



*The new hydrogen ball valve from Hartmann Valves is FDA compliant and is fitted with a metal-to-metal sealing system.*

and durability. It was developed for a specific application of a customer, who was looking for a valve that met a specific combination of requirements – for hydrogen, completely tight, with metal to metal sealing, and it also had to be FDA compliant – and couldn't find this on the market. Within the course of manufacturing a special solvent medium, soft sealing shut-offs could no longer guarantee hydrogen leak-tightness on contact with solids. Fitted with a metal-to-metal sealing between the ball and seat ring, the hydrogen valve fulfils a leak rate of A

or 0 and also complies with the high level purity requirements of the Food & Drug Administration (FDA). The double piston design in the upper seat ring which constitutes a second barrier provides additional safety.

A leak-tightness check can be made at any time in the installed state by means of an integrated drain valve and injections are also possible by this means. "This was the first time we developed and approved this type of valve and now we can offer this design to other customers – of course adapted to their special needs," Werner Hartmann tells.

### **Toward the future - Third Hartmann generation**

At the beginning of 2018, the management of Hartmann Valves GmbH changed and the company is now run by the third generation of the Hartmann family. As of January 1, the brothers Christian, Werner and Martin Hartmann (from left to right) have taken over the executive



management. Over recent years the brothers have already been able to initiate several optimization projects throughout the company. "These will continue to be strengthened within the scope of the joint company leadership," says the new managing director Werner Hartmann. "By optimising processes, technology and materials, we want to establish standards in order to generate competitive advantages, and to remain globally competitive as a German mid-sized company. Our aim is to maintain the diversity of customer-specific solutions, always considering national and international regulations and directives." Production as well as engineering will remain in Germany, whilst projects are conducted all over the world. In the coming years Hartmann Valves will keep utilizing their expertise to provide and transfer the best possible tailor-made solutions for extreme conditions. "For example: we have equipped a lot of petrochemical plants in Asia with high performance valves and want to transfer this know-how to the European market," Werner Hartmann concludes. "We will refrain from mass production or manufacturing products that can be produced anywhere in the world. One of our big advantages is that we can do everything in-house and we will continue to be the company that customers can rely on for customised solutions."

### **More information**

For more information, contact Hartmann Valves GmbH directly:  
 Headquarters: Ströherstrasse 1 – 3, 29229 Celle, Germany  
 Phone: +49 5085 9801 0  
 Email: [info@hartmann-valves.com](mailto:info@hartmann-valves.com)  
[www.hartmann-valves.com](http://www.hartmann-valves.com)

Hartmann Valves & Wellheads is an exhibitor atACHEMA 2018, (Hall 8, booth D23) which is held in Frankfurt, Germany from 11–15 June.