Towards the future with the ball valve

Starting out as a small engineering office during the post-war period, Hartmann Valves has grown to become a globally active systems supplier with around 200 employees and has now been in family ownership for three generations. The key to success was then and still is the development of new products from the first ball valve patents to wellheads for demanding conditions and tailor-made high-performance valves for challenging media such as hydrogen and oxygen. This year the company celebrates its 75th birthday. In an interview with the German technical journal "Industriearmaturen" the three managing directors and brothers Christian, Martin and Werner Hartmann reveal the contribution a medium-sized family run company is making to the energy revolution with its products and what steps they are undertaking to this end.

This year you celebrate the company's 75th anniversary jubilee. Can you describe roughly what steps were especially important for the growth of your company?

Werner Hartmann: Seen historically, we come from the oil industry which at that time and still is centred here in our Celle region in Germany. The first crude oil was extracted here over 100 years ago which also brought its challenges, however. One of the problems was the leak-tightness of the gate valve with which one hitherto shut off the extraction points. Our grandfather consequently developed a hitherto entirely novel shut-off valve which was the birth of the ball valve. With the filing of various patents and also by licensing to other manufacturers our grandfather was

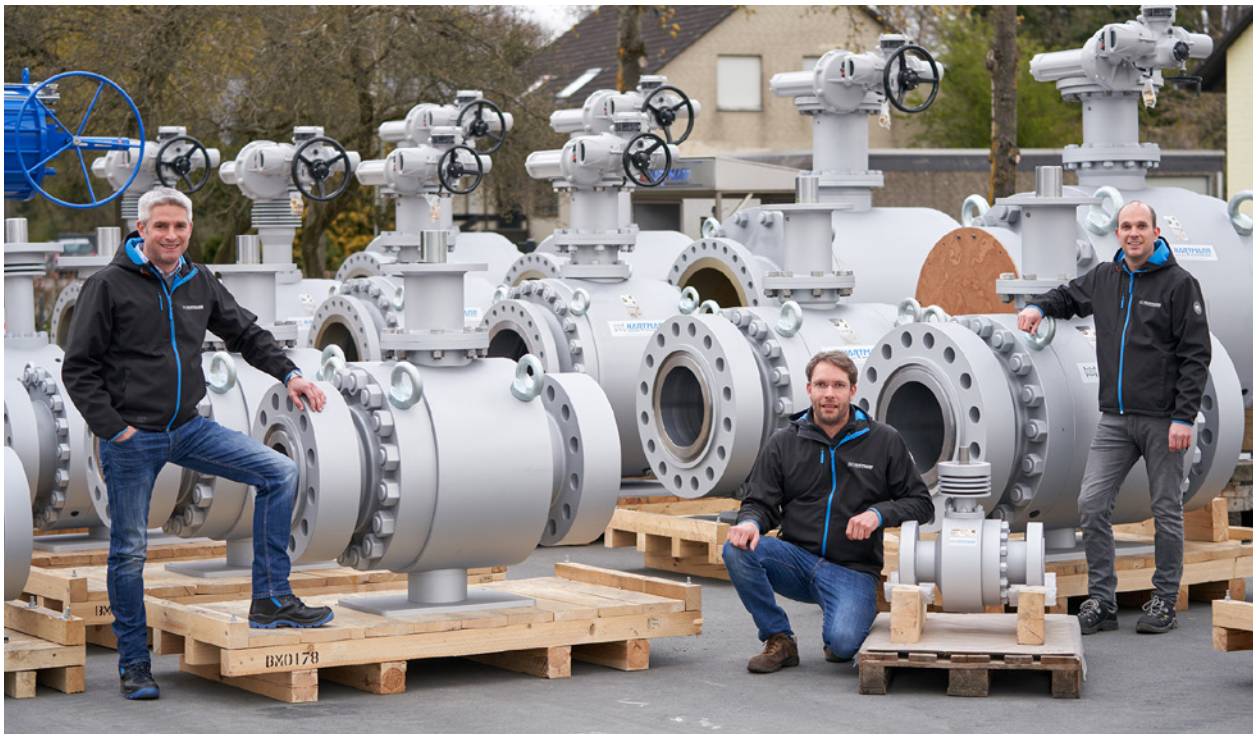

Image 1: Werner Hartmann (left) answers for the areas of sales, marketing, service and quality assurance. Christian Hartmann (centre) is responsible for design, research & development, purchasing, personnel and finance. Martin Hartmann (right) coordinates all production related departments in addition to process optimisation and IT.

Image 2: At the largest German geothermal project by SWM (Munich public utilities), six Hartmann wellheads with ball valves provide a secure shut-off.

very soon able to supply large quantities of these valves. Production then was at the founding site at Ehlershausen between Celle and Hannover. A further USP then came later through the takeover of the Celler Maschinenfabrik in the 1990's in the form of wellheads with which the operators of oil extraction fields or underground gas storages received complete systems for safely shutting off their boreholes. A speciality because Hartmann now simply equipped these wellheads with ball valves in place of stead of spade valves. A very important technical innovation especially for the gas industry as the design with ball valves is significantly more leak-tight and thus more reliable and lower on maintenance than the classic gate construction – even at large nominal diameters. The safety, or the integrity, of the wellheads was raised to a considerably higher level through the ball valve's double barrier.

Christian Hartmann: And as the technical requirements on the components which are deployed on the boreholes to great depths – regardless of whether it's crude oil, gas or even hot water – are the same as laid down by the American Petroleum Institute (API), we were able to equip the first geothermal borehole as early as the end of the 1970's. However, the subject of geothermal energy only started to gain real traction at the start of the 2000's.
Since then we are now providing guidance on numerous large projects throughout Europe, for example with SWM (Munich public utilities), and are constantly growing in this area. And because the worldwide demand is ever increasing, this is therefore a strong growth market for us. Besides, the technology for deep geothermal energy is developing even further.
An exciting and new approach is for instance, in addition to energy generation, to use the water itself from these boreholes and, with the aid of special processes, to extract lithium. An important raw material for the field of electromobility. If that is successful, geothermal energy will be given additional boost. But one way or another we will also be on board because that which comes to the surface runs through our wellheads and must be shut off safely.

Is lithium extraction also possible in Germany?

Werner Hartmann: Yes. That, of course, depends on the location. Take the Munich molasse basin as an example here: The water which comes from deep down here is really easy to handle – clean, so to speak. However, the mineral content here is not as high as in the Rhein Rift Valley where one doesn't even need to drill so deep although relatively large amounts of associated substances are entrained in the water thereby being well suited to lithium extraction..

That sounds like you would be grappling with your customers' applications in quite some detail…?

Christian Hartmann: That's right, and also a key to our success. But as a provider of solutions we want to help our customers with their problems for which there is no catalogue product. You won't find one with us either. We specialise in solving highly complex tasks and supplying our customers with the appropriate individual, quasi tailor-made, valve which fulfils all the technical requirements.
Werner Hartmann: As a system supplier we are directly involved at the commencement of the project when it's about the consultation and the engineering. That applies in the case of geothermal energy even to the extent that we also take in to account the power supply for the pumps or the possibility of a development of the pumps. Once everything has been planned we design the product and subsequently install it on site through our service department which then remains available for maintenance and servicing. So for the customer an all-round carefree package.

Your family run company sets great store on training and technical innovation which certainly to some extent runs through your history like a scarlet thread. What is the secret to implementing new ideas time and again?

Christian Hartmann: Every medium-sized company will of course give you the answer: short paths to decision making and a flat hierarchy. That's us in a nutshell. Above all we give the young engineers who started out with us the chance to implement their own and new ideas.

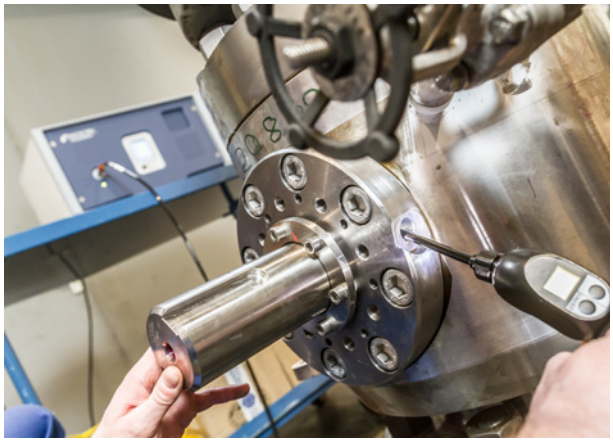

Image 3: Hartmann provides expert hydrogen leak-tightness and material suitability tests both for their own valves as well as the products of other manufacturers.

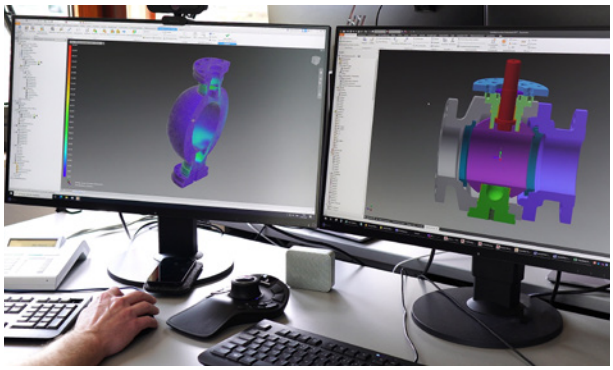

Image 4: New components are subjected to an FEM analysis in the research and development department. As in 1950, Hartmann is still filing patents today.

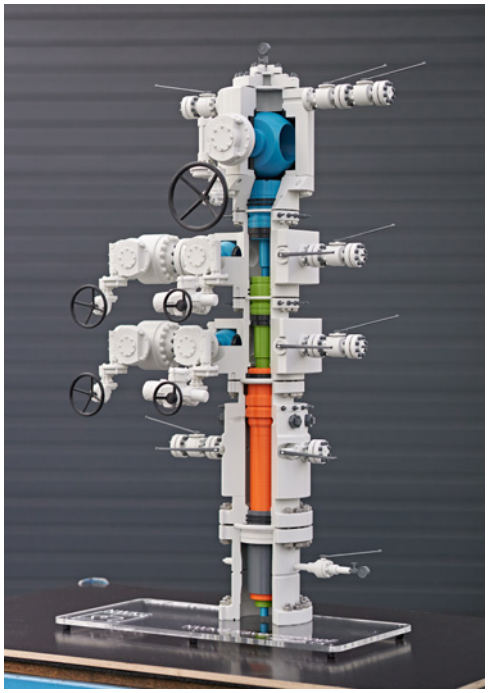

Image 5: 3D printed models as illustrative study objects appropriate to the customer-specifically developed product.

The vast knowledge of our experienced employees, who got to know us brothers here about the place as kids, helps us maintain a good balance in this respect. The interaction between old and young functions very well with us and it's fun to create new things.
As a young executive management we are, of course, conversely dependant on this motivation of our team – ultimately we can't do everything ourselves (laughs).

Martin Hartmann: In this respect the training with us can also be seen in two ways: on the one side, young educated people come to us whom we try to cultivate further with the know-how of the older employees – during Covid, for example, we produced our own training videos for each department – and on the other the apprentices who pass once through each department here in the company and contribute enthusiastically. This dynamic of newcomers and the wealth of experience of longstanding colleagues is what distinguishes us.

Older employees also know that the medium hydrogen has already been deployed in the chemical industry for a long time. With the national hydrogen strategy, hydrogen is currently getting a lot of attention, even in the public eye. Hartmann has also adopted the topic in recent times – see the article in the technical journal Industriearmaturen 01/2020. What excites you about hydrogen?

Werner Hartmann: That is a very important future market for us. Because with renewable energy, for instance with wind power or solar energy, we often have the problem that it's not available when needed and a great deal is available at times when there is no need, to some extent even an excess – hence the classic problem of balance between the need and supply. In this context hydrogen is a very good feasibility for storing energy. It works like this: when a lot of energy is produced, for example in summer with photovoltaics, hydrogen is produced with this energy by means of electrolysis which can then, similarly to gas, be temporarily stored in underground caverns. With our wellheads for gas caverns we have here such a wealth of experience that it makes sense in any case to come to Hartmann on matters of hydrogen storage.

Christian Hartmann: And that's happening currently in practice. Which means there are already ongoing orders and it's not just a big government image campaign.
We have of course previously supplied ball valves to the chemical and petrochemical industries, also for hydrogen. But for nearly two years now we have had the additional

capability of performing expert tests on our materials and valves with hydrogen directly in our own company.
So we can confirm the material suitability and leak-tightness for hydrogen to the customers not only based on our experience but with the aid of modern test procedures and formulated criteria.
In so doing, for example, the metallic materials are evaluated in terms of possible hydrogen embrittlement and the leak-tightness of the elastomers, i.e. seals.
We also offer this service for products of other manufacturers and of course for the inventory components of our customers who want to get their plants into shape.

You already indeed gave the company a kind of birthday present in the last year with a new research and development (R&D) department: What exactly have you in mind here, were you not previously researching or developing?

Christian Hartmann: Yes indeed. Actually, we always did have a department for research, development and design – it just wasn't ever so explicitly named. Besides, the staff – at least over 10 percent of all employees – were still always involved in the operational area. But we have now hived off R&D as a standalone department simply because we want to focus even more strongly on new topics and promote innovation. The first months have shown that it was a very good idea – we have already filed a few new patents.

The list for the future won't get any smaller, will it?

Christian Hartmann: Precisely. In the coming months we will also be pushing ahead with further solutions for customers but also our own and even applying for patents. And yes, it also has to do with hydrogen (laughing).

Sounds a bit like Q's workshop in James Bond?

Martin Hartmann: Yes, well. In any case it's just fun discovering new paths and trying things out without the pressure of day-to-day business. Take the additives production, for example. This is not in fact located directly with us in the R&D department, but this department feeds our 3D printer with new ideas. Especially with our individual valves such methods can make absolute sense.

Christian Hartmann: That's true. So you can see we're well up to capacity at present. What we are particularly pleased about, and now consciously embrace are the umpteen funding opportunities with which we can advance new ideas and processes. One example is the Central Innovation Programme for small and medium-sized enterprises (ZIM).

THE COMPANY

Hartmann Valves GmbH is globally active as a supplier of special ball valves and wellheads. Around 200 personnel are currently employed at the Celle and Burgdorf locations in Germany.
Valves:
Shut-off ball valves, Twin Ball Valves, pigging valves, multi-way ball valves, heating jacket ball valves, flow control ball valves, drill string ball valves;
Pressures up to 1,035 bar
temperatures up to + 550 °C
Media: Crude oil, natural gas, acid gas, syngas, oxygen, hydrogen, helium, steam, thermal water, coal dust, slurry, slag and ash, polymers, cellulose, miscellaneous solids (also corrosive /abrasive), ethylene, liquid sulphur, PE / PP.

Final question: What's your view on digitalisation? Who's driving it, CTO or Covid 19??

Martin Hartmann: The coronavirus pandemic is of course a factor which shouldn't be underestimated. And necessity is the mother of invention. Therefore, quite pragmatically, we have built our own wireless connection between our two locations at Ehlershausen and Celle so that we can work at the two sites within the same network. The existing lines were inadequate for that. Or equipped our staff with cameras and microphones in the "home office". So in the event, a very rapid digitalisation. On the whole I would say that digitalisation isn't "introduced" as an intervention but rather that a digitalised company resorts to an entire bundle of digital options. Be it the 3D printing, our ERP system or other themes. Thanks to our young crew and our inventive talent, we see ourselves very promisingly situated in this regard.

Contact:
HARTMANN VALVES GMBH
31303 Burgdorf (Germany)
Telephone: +49 50 85 / 98 01-0
info@hartmann-valves.com
www.hartmann-valves.com