

valvescommunity

Information for customers and partners

Title

How inert gases are produced

Interview

Many new jobs in 2008

International

China, Dubai, South America

Research

Flow simulation for safety valves still at the larval stage



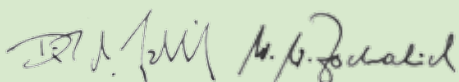
Editorial



Dear readers,

Their advantages shine out impressively, especially now in the winter season: the xenon headlights in vehicles, with which you can simply see better. How the inert gas xenon is produced, and what role HEROSE plays in that production, is the subject of our title story. Good prospects are also in sight in the valve branch. An interview looks at what HEROSE is planning for the future. Incidentally: If you didn't get any cards for the European football championships this year, you can console yourself with a goal wall for your desktop - we are giving away five!

Enjoy your read!



Dirk M. Zschalich, Wilfried W. Zschalich
Managing partners

Industry cannot survive without inert gases

Inert gases are essential for our everyday life. Companies such as Air Liquide gain them from air separation. HEROSE supplies the valves

Let there be light! Increasing numbers of vehicle manufacturers are using the so-called xenon light in the headlights of their models, especially the larger models, so that the driver has a better view in the dark. Xenon light is the use of a gas discharge lamp instead of a halogen bulb in the dipped beam or high beam headlights. The inert gas xenon is used as the start gas in the headlight, which otherwise consists of a high-pressure mercury vapour plasma lamp. Xenon is a part of the inert gas group which includes, amongst others, helium, neon and argon.



HEROSE valve type 01420 is used in air separation

There is hardly a branch that does not use noble or technical gases in their production chains. Technical gases include the above inert gases as well as nitrogen and oxygen obtained from air. Hydrogen, carbon monoxide, carbon dioxide, helium and numerous special gases cannot be obtained from the air.

The "air gases" can only be produced economically in high purity and large quantities with the help of cryogenic air

separation. The air is fractionated into its individual components by rectification, a thermal separation process. The main producers are the companies Air Liquide, Linde, Air Products, Praxair and Messer.

Various control and globe valves are used in the cold box of a cryogenic air separation system where rectification is carried out.

more on page 2

The air separating plant from Air Liquide



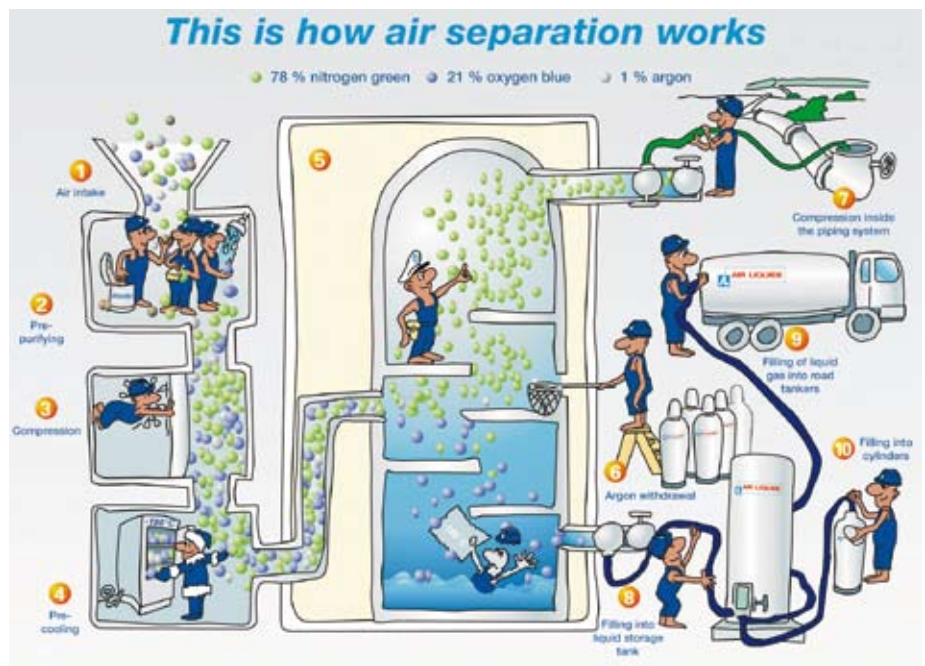
Source: AIR LIQUIDE Deutschland GmbH

HEROSE has been active in this business area for many years now. Various nominal sizes of the valves type 01420 are used.

The globe valves are located inside pipes which in turn are always laid inside the cold box close to the outer covering. This means: The actual valves are located within the insulated covering - and only the handwheels or drives are located outside the cold box. This arrangement ensures that the operator has free access to the valves for operation or maintenance. This means, for the construction of globe and control valves, that the valve disc and the fit (of control valves) must be removable from above when in the installed condition. Based on the function principle, these valves are called top-entry valves.

How does air separation function? First of all, air from outside is sucked in ①. Before the gases in the air are separated into their constituent elements, interfering components such as hydrocarbons and moisture must be removed ②. They are filtered out, chemically bound to surfaces or frozen out. The sucked in air is compressed to approx. 6 bar ③. This produces heat (just as a bicycle pump generates heat when used). The compressed air is pre-cooled to minus 180°C ④. It cools down even more when released into the separating column. Parts of the air liquefy. The air is separated into its constituent components in the separating column ⑤.

The liquid product mixture drops down through the rising gas stream. The liquid



Source: AIR LIQUIDE Deutschland GmbH

collects at the sieve base of the separating column and is aerated by the steam bubbles. Oxygen, with its higher boiling point, condenses mainly from the gas stream. The lower boiling point of nitrogen means it vaporises from the liquid droplets. Gaseous nitrogen therefore collects at the head of the separating column, while liquid oxygen collects at the base. The process is continued by vaporising the oxygen at the base and adding liquid nitrogen at the head until the required purity is reached.

The separating column is equipped with additional equipment for the production of inert gases. In a modern air

separating system with an output of 45,000 m³/h approx. 1700 m³ argon and 91 m³ of other inert gases such as neon and xenon are produced each hour, and 60 to 85 % of these products can be filtered out as pure gases in practice ⑥. The air gases oxygen and nitrogen are fed in gaseous form at 40 bar into a pipe network ⑦. A part of the air gases oxygen, nitrogen and argon are liquefied, conveyed into tanks ⑧, tank trucks ⑨ or vaporised with pumps at 300 bar and filled into steel cylinders ⑩.

The generation of liquid products requires another cold stage which has been omitted in the above diagram.

Top perspectives for the entire branch - and many new jobs in 2008

The start of a new year is a good opportunity to reflect. To sum up and cast a glance into the future. In this interview, the managing partners at HEROSE, Wilfried and Dirk Zschalich, not only put forward a positive balance of achievements so far, but are also optimistic about the chances for their company and the branch which is already in a growth phase

What was 2007 like?

Wilfried Zschalich: In one word: good. I would give it a school B grade. We achieved a turnover of around 32 million Euro, with 29 million from our in-house production and 3 million from trade. The workforce was expanded by 22 new employees.

When you bought the company in 1996, these figures looked a bit different...

Wilfried Zschalich: You can say that again. Our turnover then was equivalent to eight million Euro. But it is more important that we have managed to completely rework our product range over the past twelve years. Back then we were almost exclusively active in the gunmetal and bronze area and in ship construction, but since then we have made a name for ourselves with our fittings and valves in the areas of low temperature and security. This is also the reason why our earnings situation has been on track again since 2004.

... and you have made the company fit for globalisation.

Dirk Zschalich: I have to disagree a little with that. Globalisation already began for HEROSE back in the Sixties. This was therefore no new challenge. But globalisation has accelerated even for the medium-sized business. This can be seen for example in the export percentage of our products which has more than tripled since 1996 from 19 percent to approximately 66 percent now.

What are your main markets?

Wilfried Zschalich: Around 80 percent of our products are sold in Europe and 50 percent of that in Germany. The rest of Europe is headed by France, followed by the Czech Republic and UK. Outside of Europe, 10 percent of our products go to Asia and 6 percent to the USA.



Wilfried (r.) and Dirk Zschalich interviewed by editor Carsten Wurr (l.)

What do the coming years hold?

Dirk Zschalich: The market for industrial gases will continue to increase in double figures at least until 2012. This is a great chance for us, but also a challenge. Becoming the global market leader in terms of quality is difficult enough - maintaining this technological leadership is even more difficult.

In which areas will technical gases grow in particular?

Dirk Zschalich: In steel production, the medical sector and in the food industry. In addition, demand in the electronic sector, for example in the production of flat screens will continue to increase.

What is your turnover aim for 2008 - and will you be hiring new employees?

Wilfried Zschalich: We want to increase our turnover in 2008 by 10 percent. As far as new employees are concerned: We have the rule that we need five new employees for every additional million Euro turnover. That means we will have as many new jobs available as in 2007.

Can you still find qualified employees in the currently good economic situation?

Dirk Zschalich: It has actually become more difficult in the past months, especially in the CNC sector. But we are optimistic. The good reputation of HEROSE will certainly help us. Every new employee has a good chance of staying with us until retirement. Company loyalty within the employees is a high priority.

Have you already considered moving production to another country?

Dirk Zschalich: No. We believe our high quality requirements can only be ensured by production in Germany.

What differentiates HEROSE from its competitors?

Wilfried Zschalich: Very good quality, short delivery times and delivery competence. An example for our good work is the extremely low complaints rate, which lies in the parts per thousand range.

China: Where joggers run backwards

Michael Bentz, technician and sales clerk, went for three months to the Chinese city of Hangzhou to coach the HEROSE employees sited there. The aim: getting even closer to the customer in future and develop new business relationships. Despite the heavy workload, Michael Bentz had time to get to know the foreign culture

You can mail and telephone as much as you like: Personal contact simply cannot be replaced. Especially when the employee is working thousands of miles away from headquarters. For this reason, Michael Bentz spent three months in Hangzhou, where he supported the HEROSE employee Zhou Guoyong in his daily work at the office of the WTSH (Business Development and Technology Transfer cooperation of Schleswig-Holstein). Bentz: "This was not just about making him more familiar with the processes and requirements at headquarters, but also to give him the feeling of belonging to the large HEROSE family."



Zhou Guoyong (centre) monitoring the installation work at an LNG station

... all over th

Zhou has been working for HEROSE in China for 2 1/2 years and supports 30 customers there. His workplace is in the WTSH office, where 9 employees market products from Schleswig-Holstein (northern province of Germany) throughout China - products ranging from Lübeck marzipan to the HEROSE valves.

Since the first contact six years ago, business in China has grown strongly for HEROSE. Michael Bentz: "My visit to Hangzhou was therefore even more important because our employee can in future control far more on site. Short routes and personal contacts are extremely important for customer maintenance and expansion of business relationships – it is not enough to sit in Bad Oldesloe on the telephone and PC. Especially when you also consider the time difference in China."



Michael Bentz got to know the metropolis of Shanghai during our fair appearance at the IG China and during several visits to customers

During his three months in Hangzhou – a city with around 6.5 million inhabitants – Michael Bentz also got to know the country and the people.

"It was very interesting", said the father of two, who was put up at the "Business-Hotel Long Hill". "It sounds good", said Bentz, "but it was fairly simple. Only the fridge had 4 stars here." Because the entertainment options in Hang-zhou, based on Western tastes, are limited, Michael Bentz spent most of his leisure time with sport. "I jogged a lot around the West Lake - similar to the Alster lake in Hamburg." Every excursion there was an experience. Michael Bentz: "You really realise that you are in a completely different culture. Sunday mornings at 7 saw whole families walking around the lake, all dressed up to the nines. Others jogged backwards - and many pairs

Dubai: Conference of gas producers

The two-day trade conference in Dubai was attended by the HEROSE Vice President Dirk Zschalich and Keith Stewart, HEROSE Director from UK, who oversees the market in the Near and Middle East

"Middle East – The Final Frontier" was the name of the conference where the journal "Gasworld" invited people to Dubai. The 150 participants came mainly from the sector of gas producers and container manufacturers, and included the HEROSE Vice President Dirk Zschalich and Keith Stewart, HEROSE Director from UK, who is responsible for the mar-

ket in the Near and Middle East. Stewart held a highly regarded presentation about the selection and handling of low temperature valves. In this context, he described what could happen if the wrong valve was selected or incorrectly operated and summed up that a high quality valve is an important quality feature in plant construction.



Keith Stewart during his presentation

The foundation of a gas industry association for the region was also discussed intensively in Dubai.

These two days were very interesting and extremely intensive", said Dirk Zschalich after his return from Dubai. "There was no time for touristic activities, we simply shuttled between the hotel and the congress centre." The HEROSE CEO summed up quite clearly: "The Near and Middle East will develop into an increasingly interesting market, especially in the sector of petrochemical processes, by 2020."



The Gasworld conference was held at the Jumeirah Beach Hotel

e World

South America: Five countries in 15 days



practised Western ballroom dancing to music from ancient cassette recorders.

Another experience was the trip to a fair in Shanghai: "That is a fascinating metropolis." Michael Bentz needed a good hour for the trip in a highly modern train - and paid the equivalent of just 5 Euro. What are the prices like in comparison to Germany? Bentz: "Life in China is far more economic for us. In the transport sector you pay about a tenth at the most - and for food you can calculate about 20% of our prices."

Michael Bentz and Zhou Guoying during a visit to the company Chart, where they were greeted by Susan Shi

Five countries in 15 days – a lot of miles were covered by Volker Maass, deputy sales manager at HEROSE, in October.

The target of his business trip was South America - a market that HEROSE is planning to expand in over the coming years. Maass looked up old contacts, but was also confronted with the specific difficulties inherent in a continent that has no common economic zone like the EU

In 80 days around the world? The journey that Volker Maass, deputy sales manager at HEROSE, made in October was not quite as opulent as that. But five countries in 15 days are also worth talking about. The aim of his business trip was South America. A market that HEROSE

will be paying more attention to in future. The stops along the way were in Brazil, Argentina, Chile, Ecuador and Peru. Volker Maass also refreshed old contacts that he had made between 2000 and 2003. Maass worked at the time for a different Germany valve manufacturer in Rio de Janeiro.



Volker Maass at the equator – in Ecuador

During his stay, he visited, amongst others, the South American branch offices of globally active gas companies such as Air Liquide, Linde and Praxair, with whom good business contacts are already in place in other parts of the world. "They already know what we can do and that we are reliable partners."

Maass continued: "South America is an attractive market, but we need to be represented here with our own sales offices and warehouses, just to ensure rapid deliveries." Another problem: "South America is not an economic union like the EU for example", said Maass "A central warehouse makes no sense, even because of the customs borders."

But, based on the motto "difficulties are there to be got rid of", Maass will travel once again to South America in April to push the business forward.

Until then he is learning Spanish in the company with other colleagues - with his Portuguese he can only get along in Brazil....

Experimental tests are still the measure of all things

The first edition of the HEROSE valvescommunity reported extensively about the new testing lab and the expanded test bench capacity.

In addition to these necessary experimental tests, HEROSE is also testing the use of flow simulation programs (CFD = Computational Fluid Dynamics) as development tools. The aim is here to determine, e.g. cone forces in safety valves or Cv values in flow valves by computer simulations in three-dimensional models. In addition, it can also be recognised whether the geometry of the valve is flow-favourable. Corners and edges can, e.g. generate turbulences and lead to performance losses in the valve.

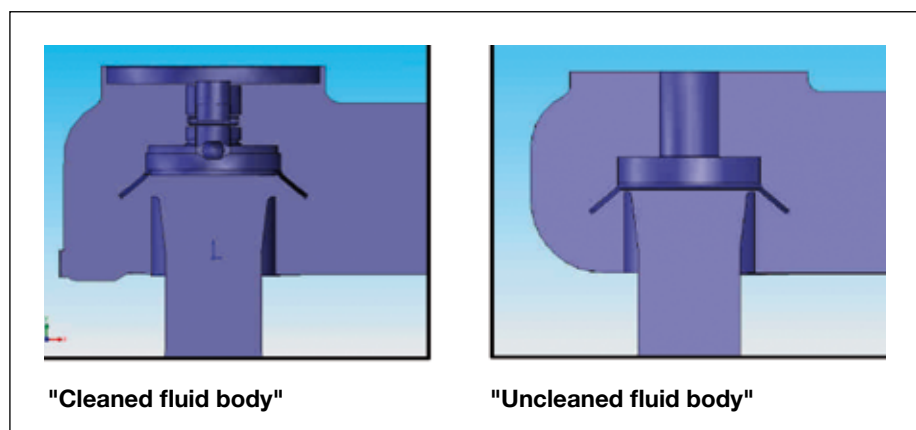
The advantage of this procedure is clear - at least theoretically. The development time can be significantly reduced, as the expected performance parameters are already present before a prototype is produced.

But which is the best software? What tool is best suited to the requirements of a middle class industrial valve manufacturer?

companies in the valve sector took part in the project. There are numerous programs available on the market which can be used for simulations. These include the so-called CFD codes (Computational Fluid Dynamics), which are very complex and which can be used for almost every flow-technical problem thanks to the numerous setting options. These codes require a high level of know-how from the user. There are also the so-called EFD codes (Engineering Fluid Dynamics), which are designed to allow the development engineer to carry out a simulation of the construction almost as a side issue.

The research project tested one CFD code (Fluent) and two EFD codes (FloWorks and FloWizard). To check the validity of the simulation results, experimental values were determined.

To check the suitability of the code independent of the valve type used, the tests were carried out on two flow valves, a closing valve and a safety valve, both with water and with air. Contoured, V-port, switching and ported cones were used in the flow valves.



The images show a cross-section of a safety valve. On the left a model as drawn from the construction in CAD. To carry out the subsequent simulation calculation, the model must be cleaned up. All contours and dead space not relevant to the simulation are deleted and the model is greatly simplified as can be seen in the image on the right

With this question in mind, HEROSE participated in a research project at the Technical University Darmstadt, which was initiated and managed by the valve trade association in the VDMA (German Engineering Federation). In total, eleven

The results obtained during the project have shown that both the CFD code and the EFD code can be used as a development tool and contribute to a better understanding of flows. It was however also noted, specifically in the develop-

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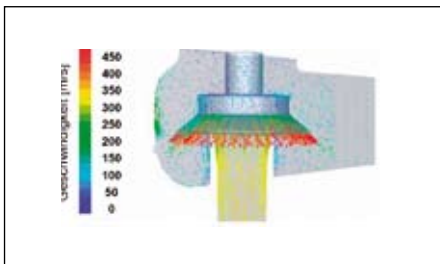
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HEROSE



The research project was managed by Olaf Schulenberg. The chartered engineer is active since 2006 at HEROSE and as "Project manager"

ment of safety valves, that the calculation of the cone forces is possible, but the error rate, compared to experiments, was not up to requirements with 5 % for the EFD codes and 1.5 % for the CFD code. It was also noted that the calculation time for the determined cone force was over-proportionally high compared to the experiment (approx. five hours compared with five minutes).



Visual depiction of the speed and direction of a flow generated through a safety valve

A critical evaluation of the simulation results is still essential in every case.

The project is completed with the final report. HEROSE will continue to keep an eye on the developments in improvements of the software available on the market, especially the increase in computational speeds and so remain up to date.

HEROSE Agency Hangzhou (China)

Guoyong Zhou, 35, is responsible for our sales activities in China. He has been working since the 1st September 2005 for HEROSE. The trained air-conditioning and refrigeration engineer was previously employed in an air separation plant and in refrigerating plant construction. The leisure time of the proud father belongs to his family, and above all his little daughter, as well as football.

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Agency in Turkey



The company CEFIP sells HEROSE products in Turkey. In addition to branches in Istanbul and Izmir, there is also an office in Herne. CEO of CEFIP is Necdet Özcan. The 46 year-old electrical and industrial engineer employs 25 people. HEROSE is one of his biggest suppliers.

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Vice President Necdet Özcan
(3rd from l) and Team



News

● The company Franz Gysi AG in Suhr was named as the new authorised workshop in Switzerland ● The GOST certification for Russia has been extended by another 3 years for all safety valves and closing valves ● Audit carried out for first-time China certification of all safety valves, final certification expected February 2008 ● Our apprentice Henrik Goldenbaum passed the examination in January for lathe operators as one of the regional best in Schleswig-Holstein (northern Germany)

Fair calendar

WIN

Istanbul, Turkey, 07. to 10.02.2008

AIIGMA

30th National Seminar on Industrial Gas, Bhubaneswar, India
23. to 24.02.2008

10th Cryogenics 2008

Prague, Czech Republic,
22. to 25.04.2008

Congratulations to

Celebrating 25 years of service:



Ingo Rothenpieler
on 03.01.08



Bernt Ohlow
on 01.04.2008

Celebrating 10 years of service:

Thomas Symanski on 5.01.2008

Matthias Witting on 5.01.2008

Andreas Ollmann on 23.03.2008

Marcus Reimers on 1.04.2008

Jens Sahling on 1.04.2008

Antonio Garcia Cuenda on 14.04.2008

Masthead

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Air Products conference at HEROSE



Meeting at HEROSE, standing from left: Dirk Redzich, Wilfried Zschalich, Detlef Bennewitz, Elmar Meier, Christian Knieling; sitting: André Struckmann, Frank Burmester

Three to four times a year, employees from the gas producer Air Products department of Installation & Maintenance meet up to exchange information about current and future projects. For the first time, this meeting took place at an Air Products supplier - at HEROSE. "This can clearly be understood as a compliment for HEROSE," said Frank Burm-

ester, Central I & M Manager manager at Air Products, "We are of course very satisfied with our long-standing connection." HEROSE President Wilfried Zschalich used this meeting to guide the guests around the factory, which was expanded last year (**valves**community article), and to talk about joint development projects with them.

One of us: Thorsten Cordes

He is head of quality management at HEROSE: Thorsten Cordes, 40, with the company since 1985. The trained technical draughtsman is a perfect example of how far one can go with further education. At evening classes, this father of two children first gained his qualification as a certified technician, following this up with "Management in quality management" and training as a welding specialist.



Cordes is, amongst other things, responsible for the certification of the company to ISO 9001, which is checked annually by the TÜV. This important certification certifies that HEROSE has installed an acknowledged quality management in-house. How does Thorsten Cordes use his already restricted leisure time?

Correct: with further education. This time it is evening classes for business management.

5 EM 2008 goal walls to be won!

For gas production, the air is pre-cooled...

- A** to minus 90 °C
- B** to minus 180 °C
- C** to minus 270 °C



Send the correct solution by fax or by mail

win@valves-community.com Fax: +49 4531 / 509 120
or on the website valves-community.com

Deadline for answers is 15th April 2008. No right of appeal.

The winners of the iPod Shuffles:

Johannes Milius, Aerzener Maschinenfabrik GmbH, **Claudiu Muntean**, LINDE GAZ ROMANIA SRL, **Sören Thele**, HEROSE GMBH