

EXPECT
STORIES FROM THE
AVK WORLD

Expect... **AVK**

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FRONTPAGE PICTURE

The image illustrates Niels Aage Kjær in the 1960's and – after six decades and vast company growth – in 2023.

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DEAR READER

Green transition, new technology, and water

It is well-known that water is important for a wide range of global challenges, but now a new player has entered the game – AI.

Did you know that one question to ChatGPT can be up to 50 times worse for the environment than asking Google?

American researcher and professor Kate Crawford from USC Annenberg (University of South Carolina, USA) has investigated water consumption in connection with the use of artificial intelligence, specifically ChatGPT.

In a radio podcast about AI, Kate Crawford elaborates on her considerations:

“Every time you ask a question to ChatGPT, it leaves a climate footprint due to the large amount of water consumption. In fact, several billion litres of water are used per year,” says Kate Crawford in the interview, and continues: “There is a misconception that artificial intelligence is an intangible technology that is just algorithms in a cloud. In reality, it is enormously energy and water intensive – and especially generative AI like ChatGPT.”

In her research, Kate Crawford has found that ChatGPT's water consumption is so large that it is better to search traditionally on Google than to ask ChatGPT about something. So, for a simple question like “What is the distance to the moon?” the difference between ChatGPT and Google is that ChatGPT uses up to 50 times more water than Google. Kate Crawford previously told the newspaper El Pais that it costs a large bottle of water per prompt or question asked to ChatGPT.

According to the AP, Microsoft has stated that their water consumption increased by 34% from 2021 to 2022 – corresponding to a total of over 6.4 billion litres of water. This happened around the same time that ChatGPT-4 was launched. The water is used as cooling water for the huge servers that host the software behind ChatGPT and that generate answers to the questions asked. At a data centre in the state of Iowa, USA, there is a supercomputer used in connection with ChatGPT, which must be cooled with water to prevent overheating.

But it is not only the use of ChatGPT that has a major impact on our water resources. The green transition has revealed new challenges that can have major consequences for

our water. Mining of new minerals such as lithium, cobalt, graphite, and rare earths, which are used in the manufacture of computers and batteries for electric cars, is often associated with pegmatite (a coarse-grained igneous rock) which can have a high volume of radioactive content and be associated with radon and arsenic, which, in connection with the mining itself, can contaminate groundwater.

The green transition is good for both the climate and nature, and new and modern technologies help improve society, but this does not happen without affecting other areas, such as water.

In this issue you can read about many different projects, both where our products have helped make a difference, but also about product optimisation and new initiatives.

Enjoy reading.
Michael Ramlau-Hansen



THE AVK GROUP'S ACQUISITION STRATEGY IS ONCE AGAIN GENERATING GOOD RESULTS

GLOBAL



Press Release by AVK Holding

Acquisitions secure double-digit growth for AVK despite challenges in the markets.

In 2023/24, acquired companies contributed 13.0% of the AVK Group's total revenue, which increased by 13.7% to DKK 9.0 billion. Profit for the year increased by 9.5% to DKK 501 million, and the Group considers the result satisfactory. The AVK Water business unit drove growth with an increase of 28%, while AVK Industrial and AVK Advanced Manufacturing were affected by continued slowdown and reduced activity in their markets.

The first half of the year was generally characterised by a continued slowdown in the economy in several of the Group's markets, while the second half of the year was characterised by improvements and a positive trend in order intake.

"Behind the overall results, however, are significantly different market conditions for the Group's three business areas," says Lars Kudsk, CFO of AVK.

AVK Water did a great job and contributed significantly with a growth of 28%, which can primarily be attributed to the successful integration of French Bayard and Spanish Belgicast – two companies that were acquired in October 2023. However, it was also a contributing factor that the United States, the United Kingdom and the Middle East in particular developed positively.

"AVK Industrial's sales declined after the previous very positive year, but the order intake has developed positively towards the end of the year. AVK Advanced Manufacturing experienced a negative development in sales, caused by the squeezed European economy and, not least, a low level of activity in the wind turbine industry. On the positive side, however, was a significant growth in the production of pallets based on recycled plastic from household waste. In 2023/24, pallets were produced based on more than 30,000 tonnes of recycled plastic," adds Lars Kudsk.

Investment in production in the USA

Throughout the year, investments were at the same high level as in previous years. Thus, DKK 432.7 million was invested across the Group in optimisation and expansion of production facilities, automation, energy optimisation, product development, and much more.

"These focus areas will be maintained in next year's investment program, which will be the largest ever in AVK's history," points out Bo Johansen, COO at AVK.

The programme includes an expansion of AVK's facilities in the United States.

"The U.S. is increasingly protectionist, and full local sourcing is required in federal projects. The U.S. is an important market for AVK, and to maintain our strong position, we are investing in production facilities that cover the entire supply chain, including a foundry and production of rubber components," says Bo Johansen.

Expects organic growth of 5-7% in 2024/25

The outlook for the financial year 2024/25 is characterised by considerable optimism. AVK expects revenue growth of 5-7% and a positive development in profit based on positive contributions from all business areas. This will primarily be organic growth, as AVK does not foresee significant acquisitions in the financial year.

"Overall, our markets are characterised by increasing activity, with a greater focus on the challenges within water supply and wastewater management. This is expressed in concrete terms through major investments in water projects in many emerging markets, such as India, South Africa, and the Middle East," says Lars Kudsk.

The Group's largest order to date

"In recent years, AVK has expanded our product range within large valves, which are used for transmission lines for water, among other things. A current example of this is the delivery of several valves with a diameter of more than two meters for a gigantic irrigation system in Egypt and for water supply to Egypt's new capital, both orders of record size for AVK," says Søren Kjær, Technical Director at AVK.

AVK is also growing successful with Smart Water solutions, where intelligent monitoring and control can ensure an optimisation of water supply and systems for irrigation.

"Smart Water solutions are increasingly being integrated into more and more water projects, providing a better use of water resources with all the benefits that this entails. In Italy and India, among others, AVK's Smart technology helps to ensure efficient control of irrigation systems, which are being heavily invested in both countries to ensure food production also in dry areas," Søren Kjær continues.

Massive investments to become CO2 neutral by 2030

The Group's focus on ensuring greater sustainability has intensified throughout the financial year.

"We want the Group to be CO₂ neutral by 2030," says Søren Kjær. "For example, we work systematically with the products' life cycle assessment (LCA), and in continuation of this, the ambition is to certify the products according to EPD (Environmental Product Declaration), which is a precise calculation of a product's CO₂ emissions throughout the value chain. We received the first EPD certification last year, and in 2023/24, no less than 15 products are EPD certified," states Søren Kjær.

The Group's increased level of activity meant that the average number of employees grew by 462 to 5,342, of whom 797 are employed in Denmark.

Scan to read more and download AVK key figures 2023/24



AVK SUSTAINABILITY REPORT 2023/24

GLOBAL



We are pleased to present our latest sustainability report which reflects our commitment to sustainability and responsible governance. This report is a testament to our efforts to integrate environmental, social, and governance principles into our business strategy.

*By Niels Aage Kjær,
Chairman of the AVK Holding board
and owner of AVK*

During the past year, the global economy has faced several challenges that have significantly impacted our business. Geopolitical tensions increased uncertainty and disrupted global supply chains, while persistent inflation in many countries has driven up raw materials and energy costs. Changes in interest rates have reduced investments, and regulatory shifts have affected our operations. Additionally, extreme climate events and a growing demand for sustainable practices have further complicated the landscape.

In response, we are investing in local production and supply chains to maintain a strong presence in key markets. Despite these challenges, we have achieved satisfactory results this year, focusing on long-term, sustainable investments that benefit

our company, employees, customers, and the environment.

Founded in 1941, AVK is built on the core values: quality, innovation, reliability, sustainability, and customer service. Thus, sustainable development is a cornerstone of our business strategy.

In October 2023, Niels Aage Kjær stepped down as CEO of the AVK Group after 53 years, passing the leadership to the new Executive Directors. At the same time, a Group Executive Board was established, with the overall responsibility for the Group. Here the Chairman of the three business units along with AVK Holding directors and the Executive Directors are represented. Niels Aage Kjær has assumed the role as Chairman of the Board, ensuring our



continued commitment to sustainable development.

Also in October 2023, we made our largest acquisition to date, welcoming over 500 new colleagues from the companies Bayard and Belgicast into the AVK Group.

AVK's purpose is to develop, produce, and market high-quality, long-lasting products essential for vital infrastructure, including water supply, wastewater management, and energy supply, as well as various industrial applications. These efforts contribute to a sustainable development, public health, and a better environment.

AVK operates globally through three business units: AVK Water, AVK Industrial, and AVK Advanced Manufacturing. Our companies provide diverse solutions, including innovative products like PolyAl, made from recycled drinking cartons, which we incorporate into our plastic pallets. This report highlights how our products support sustainable development across multiple sectors.

We are committed to optimising processes and reducing our environmental impact. Significant investments in automation across our manufacturing units have enhanced quality and productivity as well as work processes. This year, we were honoured with the DIRA Automation Award 2024, recognising our long-term commitment to advanced automation.

In the 2023/24 financial year, we have initiated a strategic implementation of the EU Corporate Sustainability Reporting Directive (CSRD). As part of the process, AVK has initiated a double materiality assessment. The purpose of the double materiality assessment is to identify and prioritise our most significant impacts, risks, and opportunities and highlight materiality topics and areas we need to focus on.

We are focused on environmental efforts, having obtained several Environmental Product Declarations (EPDs) that calculate CO₂e emissions throughout our value chain for a given product, during the last year. We aim to minimise energy consumption while increasing our use of green energy sources through investments in solar panels and low-energy solutions, and we are phasing out fossil fuel-powered passenger cars. In addition, we focus on waste management and the use of recycled materials in the production of high-quality products.

With operations in various countries, our diverse workforce is a strength that enhances our local and global development. We embrace this diversity, fostering a dynamic and enriching work environment. AVK is committed to being a healthy, professionally challenging, and safe workplace, actively working to reduce work-related accidents.

AVK operates in several business areas that are pivotal to driving sustainable development worldwide. In recent

years, there has been an increasing focus on the management of drinking water and wastewater, which has an enormous impact on health and quality of life, as well as energy consumption and climate.

This past year, AVK has demonstrated resilience and a strong commitment to sustainability amid challenges. Our leadership transition and recent acquisition position us for future growth, enhancing our capabilities and market presence.

We remain dedicated to our core values, ensuring our products benefit both customers and the environment. By fostering a diverse and safe workplace, we empower our employees to drive innovation.

As we look ahead, we are excited about the opportunities to continue leading in sustainability and excellence. Thank you for your support as we move forward together.

Read more and download the Sustainability report here.



AVK INTERNATIONAL WINS THE DIRA AUTOMATION AWARD 2024

DENMARK

Congratulations to AVK International who has been awarded the DIRA Automation Award 2024 for its fully automatic robot solution.

By Marie Korsgaard,
Global Marketing and Communication
Coordinator,
AVK Holding



Lars Christiansen, Plant Manager, and Production Engineers Jan Reinholdt Jensen and Christopher Rytter accepting the award together with our partners at Kilde Automations.

The award is a recognition of the company's pioneering efforts in automation, robotic technology, and long-standing commitment to innovation. It marks an important milestone for AVK in its efforts to strengthen efficiency and sustainability in production.

The robot solution not only automates complex tasks like pressing, threading, and screwing but also enhances product quality and eliminates repetitive, heavy lifting – improving both efficiency and working environment.

An impressive, fully automatic robot solution

30 years ago, AVK International got their very first robot. And they're certainly not done finding new opportunities for automation.

Recently, they have invested in a fully automatic robot solution that handles, installs, and controls 31 different varieties of valves for drinking water, weighing anywhere from 3.6 to 54 kilograms. The solution includes several robotic arms, advanced vision systems, and quality testing via pressure testing. In fact, there are as many as 16 processes gathered in one robot solution.

Previously, the production of valves for drinking water at AVK International was done manually. But with the new fully automated robot solution, that's history. The solution has made it possible for AVK International to scale the production of the valves for drinking water up and down as needed.

"It is an impressive automation solution, AVK International has implemented. And the company's journey is also remarkable. They started with one thing and have ended up in a larger and more thorough process that has made them look at larger parts of production. AVK International is thus a good example of how automation



can help move the entire company and raise the bar,” the jury says.

A shared effort

The robot system has been designed in cooperation with AVK Holding (Production & Supply Chain Department), AVK International and the automation company Kilde Automation, who has supplied the robots and software and set up the solution. In addition, several employees have played a major role in the development of the robot solution, sharing their knowledge and inputs to get the best possible solution for AVK. The project has been managed in cooperation with AVK Holding and AVK International.

Bo Johansen, COO in the AVK Group, says: “It has been an exciting process for the whole team, and thanks to the enthusiasm and great effort from all team members the development of the robot system has been a great success.”

The good cooperation between Kilde, AVK and not least the many AVK employees has resulted in AVK not only increasing the efficiency and quality of the production, but also eliminating a lot of heavy lifting and one-sided, repetitive work, which makes AVK more competitive and strengthens the working environment for employees.

“We have raised the quality of the valves, removed much of the one-

sided, repetitive work, and eliminated some heavy lifting. At the same time, the company has become more competitive,” says Lars Christiansen, Plant Manager, AVK International.

Contributing to a sustainable future through technology

With automation solutions that include advanced robotic technology, AVK International has secured its production for the future. The automation has not only contributed to increased efficiency, but also to a significant reduction in waste and energy consumption, which supports our objectives to reduce our environmental impact and strengthen sustainable development.

The award recognizes AVK International's hard work and ability to combine technological innovation with our core values. Automation is a crucial part of AVK's strategy to remain competitive in a global industry, strengthen our production, and contribute to a sustainable future.

The DIRA Automation Award is proof that AVK International not only lives up to, but also sets new standards for how companies can use automation to create value, both for the company, the employees, and the environment.

A huge congratulations to AVK International with the DIRA Automation Award 2024!

About the DIRA Automation Award

The DIRA (Danish Industrial Robot Association) Automation Award is given each year to a company that has shown exceptional results through the use of automation and robots.

With the DIRA Automation Award, the hope is that other companies, individuals, or institutions can be inspired to use robotic technology in their industry, so that we can maintain Danish competitiveness, retain Danish jobs and, not least, improve the working environment for employees who have to handle physically hard and repetitive work every day.

And AVK International is a clear example of just that.



FOCUSING ON INCLUSION AND DIVERSITY CREATES GREAT VALUE

NORWAY

Welcoming new colleagues from different countries can indeed bring significant benefits to a company.

*By Frode Amundsen,
Lean Coordinator, Management,
Furnes Jernstøperi A/S*

&

*Oddbjørn Maurdalen
Managing Director,
Furnes Jernstøperi A/S*



At Furnes Jernstøperi we are proud to have received the annual Integration Award from Stange Kommune, the local municipality. This award acknowledges our efforts in promoting integration and confirms the value of our long-term commitment to creating an inclusive work environment.

The value of investing in diversity, communication, and unity is evident. Through internal Norwegian courses and training in the foundry trade, the aim is to give all the employees the opportunity to participate actively in the company's development.

The Integration Award is an annual award that honours individuals, organisations, or companies that have made significant contributions to promoting the inclusion and integration of minority language and multicultural individuals in the workforce and local community. This award has been presented every year since 2007.

Today, Furnes Jernstøperi consists of 137 employees with 13 different nationalities, and 38% of them are new compatriots that come from countries outside Norway.

The award inspires us to keep investing in diversity and inclusion. We strongly believe that by creating a workplace where everyone feels seen and heard, we build a stronger and more forward-thinking company.

One of our visions is involvement, and this applies on several levels. An accomplishment we can be proud of!

EASY VALVE MONITORING WITH VIDI POSITIONER

BELGIUM

What is needed to fit a VIDI Positioner on a gate valve buried in the ground? As recently discovered by water utility Farys, which delivers water to +1 million residents in Belgium, it is handled with a few easy steps.

*By Stijn Meirlevede,
Technical Manager,
AVK Belgium NV*



To monitor important emergency zone valves in one of the water network's district metering areas (DMA), Farys decided to use 5 VIDI Positioners.

In just a few steps, the new extension spindle and VIDI Positioner were installed and ready to transmit the open/close position of the gate valve.

From now on, no need for manual inspections. A smart step forward for DMA management, and for Farys!

Products delivered to the solution:

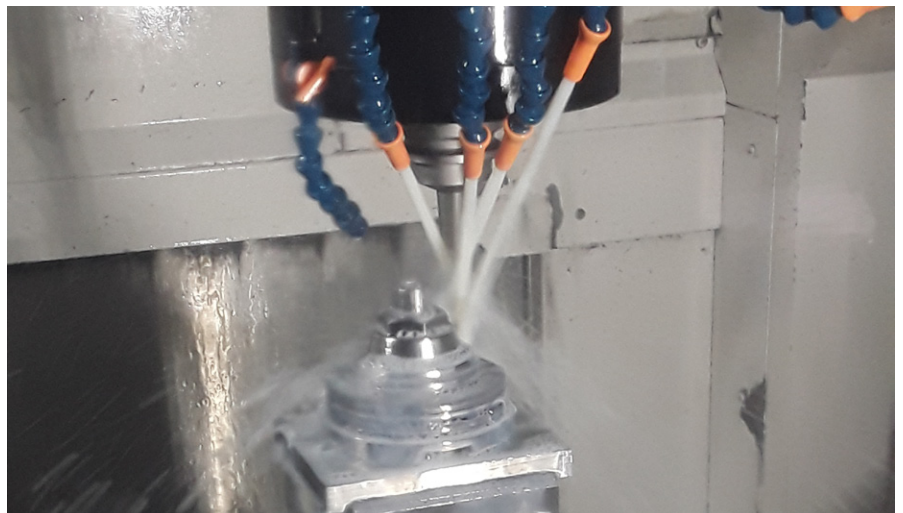
- VIDI Positioner
- AVK extension spindle, variant 04/02-001
- AVK support tile, variant 80/46-001
- AVK streetcover, variant 80/40-000

GREATER CONTROL IN PRODUCTION AND HIGHER QUALITY WITH METAL 3D PRINTING

DENMARK

3D printing technology has helped producing a part where machining is unnecessary, given us complete control over our process and increased the quality.

*By Marie Korsgaard,
Global Marketing and Communication
Coordinator,
AVK Holding*



We innovate to make a difference

Every day, AVK solutions help deliver clean water and sustainable energy to millions of people in households and industries all over the world.

Innovation is essential to AVK and one of our five core values that act as our guiding principles and set the direction for how we run our business. We focus on innovation and development of new and optimised products of high quality and with a long lifespan.

With an innovative approach to the development and design of our products and solutions, we remain adaptive to current and future market demands.

Recently, when we had to update some plastic moulds for some of our existing products, the Tech department in AVK Holding A/S together with AVK International A/S and AVK Plast A/S wanted to investigate how we could update the design.

“The product we looked at regarding 3D printing is the service valve serie 16 POM valve. It is a product used for service outlets towards end customers, running on the shorter pipe lengths in the supply that go directly to the customers,” says Tonny Sprogø, Product Manager, AVK International A/S.

There was a lot of machining of the top of this product which we believed should be unnecessary. So that was the challenge we needed to solve.

“3D printing technology has helped us solve the challenge of producing a part that is precise enough that machining is not necessary. Being able to avoid machining means we avoid a lot of clamping in production where you have to take into account the variance of the parts. And furthermore, it actually also allows us to start automating some more processes,” says Michael Mortensen, R&D Manager, AVK Holding A/S.



channels allow us to blow cold air through the part, lowering the temperature. Additionally, an insulating layer surrounds the central inlet where the hot plastic flows, ensuring that the plastic in the inlet does not cool and solidify before reaching the mould.

Easing processes today – Influencing tomorrow

By means of 3D printing we can now control the heat development in the tool, we have complete control over the process and, in the end, we achieve a higher quality.

In the future, it is likely that a larger amount of the technical internals in an injection moulding tool will be 3D printed, as it is gradually becoming price competitive, because you get more details.

Scan to watch videos



How AVK benefits from metal 3D printing

Better injection moulding with 3D printed tools

The component we have used 3D printing for in this case is an internal structure in a larger injection moulding tool, which ends up injection moulding a part that has a critical internal structure. And it is the entire inner core of this critical internal structure we have chosen to 3D print. The 3D print is produced by the Danish Technological Institute.

“We have used 3D printing in our moulding tool, where we knew that we would face some challenges with cooling in the tool. There is very little space in the part. We inject internally to get the right part quality, and it is very important that we control the temperature precisely in that area,” explains Bo Eric Jacobsen, Manager Project and Tooling, AVK Plast A/S. AVK Plast A/S primarily deals with injection moulding and supply parts internally for AVK’s products, mainly valves.

Because we have so little space, 3D printing can help us make some cooling channels exactly where we need them to be as well as channels for sensors, so we have complete control over the temperature, where it is most important to get the right part quality.

“The reason we chose to use 3D printing for this specific component is that there are some challenges, where we need to place an inlet inside the part, and that function means that we end up struggling with some energy that we can’t remove without having a cooling system located inside the block. So, we need a cooling function between some heat and some external part, which we would not be able to create in any other way than by using 3D printing,” explains Nils Paaske, Tooling Engineer, AVK Holding A/S.

To regulate the temperature, the core was designed with built-in cooling channels running like a metro system under the part’s surface. These



Better injection moulding with 3D printed tools

SUPPLYING THE MARKET'S LARGEST BUTTERFLY VALVE TO DATE

VIETNAM

To demonstrate our promised value, we invited our customers to experience both the product and workflow up-front. The largest butterfly valve to date is now successfully installed at the Thu Duc water treatment plant.

*By Chuong Ngoc Anh (Amy)
Internal Sales and Marketing Manager
AVK Vietnam*



Experiencing our value first-hand

Scott Cook, director of eBay, once said: "A brand is no longer what we tell the consumer it is – it is what consumers tell each other it is." So, how can we at AVK present our brand and our strengths? One effective approach is to let our customers experience it first-hand.

A unique invitation

To bring this vision to life, we at AVK Vietnam invited representatives from the Thu Duc water treatment plant (a member of Saigon Water Cooperation, SAWACO), to visit the largest factory within the AVK Group: The AVK Valves manufacturing unit in Anhui, China. The visit featured a Factory Acceptance

Test (FAT) on the DN2400 butterfly flanged valve and an immersive factory tour.

Delivering the market's largest butterfly valve

The DN2400 valve, which is the largest size AVK has ever supplied to the Vietnam market, is now installed as part of a comprehensive solution for the new construction of storage tank No. 5 at the Thu Duc water treatment plant. This solution was tailored to meet the customer's requirements for quality, reliability, technical specifications, and compatibility with the existing installation space. As one of the largest valve sizes ever supplied for SAWACO, the project

owner imposed strict standards for its installation and performance. AVK Vietnam's Sales and Technical team collaborated closely with the consultant, the contractor, and SAWACO to ensure that every aspect of the valve met strict durability and efficiency standards. This installation not only reflects AVK's commitment to excellence but also strengthens our position as a trusted partner in delivering innovative solutions to complex infrastructure projects.

At AVK Vietnam Co. Ltd., we always pay close attention to our clients' needs and demonstrate our commitment to supporting projects



with the highest quality products and services.

About AVK's manufacturing unit in Anhui

Our AVK Valves manufacturing unit in Anhui was established in 2001 and is a 100% owned subsidiary of AVK Group. It has now developed into the Group's largest overseas production base, with three production workshops: a large valve factory, a small valve factory, and a machining factory. The unit produces several product lines, such as gate valves, butterfly valves, check valves, air valves, control valves, fire hydrants, pipe fittings, etc.

The unit is recognised globally, with product certifications and approvals such as WRAS, DVGW, NSF, GSK, LR, DNV, ABS, CCCF, WaterMark & StandardsMark, Kitemark, and SGS. It is certified for ISO 9001, ISO 14001, and ISO 45001.



DANISH WATER COOPERATION ESTABLISHED IN DUBAI

DENMARK



Dr. Asma Nizar Taissir Idlebi, CEO, Be Pro Training Institute, Dubai and Jakob Beck Wätjen, CEO, Ferskvandscentret signing the MoU agreement at AVK Academy and Visitor Centre in Galten, Denmark.

*By Michael Ramlau-Hansen,
Public Affairs,
AVK Holding*

Challenges with water have led the city government in Dubai to contact the Danish Water Summer School with the aim of setting up a similar initiative locally. In September, representatives from Dubai and Danish actors signed the MoU agreement to secure the new collaboration.

Water has a decisive influence on health, energy, food production, and the development of our society. In the United Arab Emirates, all fresh water is based on desalinated seawater – an expensive and resource-intensive way of obtaining drinking water. In addition, the Emirates want to increase the production of their own food, because approx. 80% of the current food quantity is imported.

Even more freshwater is therefore needed, and together with a disproportionately high leakage rate in



Omar Ahmad Maarouf, NIRAS - Astrid Svitzer Ching Nielsen, Regional Teamleader Water & Environment, Trade Council Dubai - Dr. Mohamed Saleh Fawy Khalifa, Advisor, Be Pro Training Institute, Dubai - Michael Ramlau Hansen, Public Affairs, AVK Holding A/S - Dr. Maamoun Issa, Special advisor, Be Pro Training Institute, Dubai - Dr. Asma Nizar Taissir Iddlebi, CEO, Be Pro Training Institute, Dubai - Jakob Beck Wätjen, direktør, Ferskvandscentret - Frank Borch-Olsen, bestyrelsesformand, Ferskvandscentret - Charlotte Frambøl, Kursuschef, Ferskvandscentret - Pia Jacobsen, Head of Global Innovation, Water Valley Denmark

the water distribution network, this puts the current system under pressure.

Therefore, the city government in Dubai has been inspired by the Danish Water Summer School Advanced Water Cycle Management Course (AWCMC) and now wants to enter into a cooperation agreement to set up a similar education.

The Danish Water Summer School is a partnership between Grundfos, Kamstrup, DHI, Niras, IGIS, Clean, Aarhus University, WATEC Aarhus University Centre for Water Technology, Aarhus Vand, Danida Fellowship, Water Valley Denmark, and AVK.

Danish Middle East Water Academy

The purpose is to establish a Danish-Middle Eastern education collaboration, initially with a focus on Dubai. The new partnership is named the Danish Middle East Water Academy and will be developed in close collaboration between Be Pro Training Institute LLC in Dubai and Ferskvandscentret in Denmark together with a strong Danish setup of Danish companies and organisations including AVK. WEMA

(Water Efficiency Middle East Alliance) is a supporting collaborator as well.

"The idea of a partnership to transfer knowledge from the Danish water industry and companies to the Middle East came from the Danish Water Summer School, held at AVK every summer in cooperation with other Danish companies and government authorities. This is in line with AVK's values of being close to our customers and our drive to focus on sustainability," says Ole Hedegaard, Regional Managing Director, AVK in the Middle East.

The Danish Consulate General in Dubai has played a decisive role in facilitating the partnership, which was formally entered into on 26 September at AVK in Denmark with the signing of the MoU agreement.

"This partnership strengthens the strategic cooperation between Denmark and the Emirates, where Danish companies can also contribute expertise and technology in sustainable water management to Dubai and the Middle East," says Astrid Svitzer Ching Nielsen, Regional Teamleader Water

& Environment, Danish Consulate General in Dubai.

"In Water Valley Denmark, we are happy to continue the good cooperation from the Danish Water Summer School partnership in the Danish Middle East Water Academy. The initiative provides the opportunity to contribute with solutions in places in the world with critical water challenges and at the same time enter new knowledge sharing partnerships. In addition, it provides a good opportunity to share the many success stories about Danish water technology solutions," says Ulla Sparre, CEO at Water Valley Denmark about the upcoming collaboration.

Ferskvandscentret in Denmark will be the coordinator of the project to ensure a well-defined entry into the large setup of Danish partners in the collaboration. Course manager Charlotte Frambøl says:

"We are proud to be part of a strong collaboration that will contribute to the green transition in the Middle East via competence development. Challenges linked to climate change with too little and too much water must be understood globally, but most often solved locally. This is why this international collaboration on continuing education in water makes such good sense."

At the MoU signing, NIRAS, GRUNDFOS, Danfoss, Water Valley Denmark, and The Danish Consulate General in Dubai were also present. We are currently in the process of forming the exact group of companies and institutions who want to contribute to the academy.

Danish Middle East Water Academy is initially for employees in Dubai, but later the idea is that the initiative should be extended to the whole of the Middle East.



NEW RECORD VALVE ORDER FOR AVK GULF

EGYPT

For the New Capital Transmission Line Project in Cairo, AVK valves will help to ensure the needed water supply.

*By Rahees Usman
Regional General Manager
AVK Gulf DMCC*

We are excited to announce that AVK Gulf has been awarded a major contract, worth USD \$20M, as part of the transmission line to the New Administrative Capital's (NAC) water treatment plant located approximately 45 kilometers east of Cairo.

The NAC is one of Egypt's most ambitious projects, designed to reduce Cairo's congestion and prepare for future growth. Spanning 700 km², the new city will house over six million people. It is being constructed in phases, and the plan is that it will host the country's government, ministries, and foreign embassies, making it a strategic administrative hub for Egypt. It will also feature residential districts, parks, hospitals, and schools, positioning it as a key part of Egypt's future urban landscape.

AVK's contribution will help ensure that the new city has a sustainable water supply to support its many residents, facilities, and businesses.

Behind the Scenes: From project tenders to securing the final order

Our journey began more than three years ago during the pre-tender bid phase, where we provided technical support to the consultant, Hydro, and



to the Administrative Capital for Urban Development (ACUD), the state-owned enterprise managing the NAC.

AVK's selection as a preferred supplier reflects our reputation regarding excellent customer service, product quality, and reliability. Our track record is built on successfully delivering projects such as the "Future of Egypt" and has given us a competitive advantage in securing this order.

Teamwork is key

Behind every major project win is a dedicated team working hard behind the scenes to meet the customers' expectations. Winning this project wouldn't have been possible without the coordination and leadership of several key players across the company.

The collaboration between AVK Gulf, AVK Anhui, ACOMO, and AVK International was key in providing ACUD with the needed support. Our suggested products received full approval from Hydro's consultant, thanks to our agent's invaluable

support and the technical leadership and presentations delivered by Rahees Usman and Ole Hedegaard. The successful outcome is a testament to the commitment between our sales teams and factories to ensure that communication flowed efficiently between departments and with our customers in Egypt.

Expect quality in every step

Delivering to this project is a long-term commitment, and reliability is crucial. The order includes butterfly valves from AVK Anhui, nozzle check valves from ACOMO, and gate valves from AVK International. The valves will be supplied over a 12-month period, ensuring that each phase of the water transmission line is equipped with top-quality products.

Securing this major contract shows the strength of our team's technical expertise, our commitment to quality, and our ability to work together across regions. As we continue to deliver to the project, we look forward to more opportunities to support Egypt's ambitious development goals.

SUPPLYING MELBOURNE WATER'S ADDITIONAL UV DISINFECTION PLANT

AUSTRALIA

Melbourne Water's Winneke Water Treatment Plant supplies fully treated water from the open catchments. The treatment process has additional steps to filter out the impurities before water is disinfected. This project is an additional UV disinfection plant to increase the plant's capacity.



*By Royce Paul,
Business Development Manager,
AVK Industrial Pty Ltd*

AVK Industrial was awarded the supply of 15 DN1200 butterfly valves and stainless-steel pipe couplers in November 2022. The project is a John Holland-KBR joint venture.

AVK proposed the Desponia centric lined butterfly valves manufactured by the AVK Group company InterApp in Spain. InterApp Spain is an accomplished manufacturer with many years of experience in the water and wastewater industry. The manual operated valves were mounted with a Rotork gear box and the actuated were mounted with Limitorque actuators. These valves were FAT tested and inspected locally. The DN1200 SS Repico Coupler was manufactured by



AVK Netherlands. The supply of valves and couplings was closely coordinated.

AVK has many years of experiences in designing and manufacturing valves worldwide. AVK Industrial, Australia acts as an international solution provider for most demanding

applications and projects locally. Utilising our extensive technical expertise, we support local projects from inception to final commissioning.

Products delivered to the project:

- 15 pcs butterfly valves, DN1200

CELEBRATING 80 YEARS OF EXCELLENCE: NIELS AAGE KJÆR'S REMARKABLE JOURNEY

DENMARK



*By Marie Korsgaard
Global Marketing and Communication
Coordinator
AVK Holding A/S*

A legacy of vision and leadership

On December 13, 2024, Niels Aage Kjær celebrated his 80th birthday, marking not only a personal milestone but also decades of transformative leadership at AVK.

Born in Galten, Denmark, in 1944, Niels Aage has spent a lifetime cultivating the vision that turned his father's small local machine shop into a global group employing more than 5,000 employees.

From local roots to global heights

In 1970, at just 25 years old, Niels Aage took the helm of Aage V. Kjær's Maskinværksted following the sudden passing of his father. At that time, the local machine shop that Aage Valdemar Kjær established in 1941

employed only five people including Niels Aage and his mother, who managed the accounting. There was a modest annual turnover of DKK 400,000.

Within a year, he developed the first AVK valve for drinking water supply and established the company's first valve factory in Galten. This marked the beginning of AVK's transformation into a company synonymous with quality, innovation, and sustainability.



Privately, Niels Aage is married to Ellen Margrethe since 1967. Together they have four children, 11 grandchildren, and one great-grandchild. Golf, history, and art are his preferred pastimes—passions he pursues with the same vigour he brought to AVK.

A future rooted in heritage

After more than 53 years as CEO for the AVK Group Niels Aage decided to retire from the Executive Director role in October 2023, and stepped up as Chairman of the AVK Holding Board, ensuring his vision continues to guide the company.

As he looks to the future, his ongoing projects include establishing an AVK heritage museum in his childhood home – a testament to his enduring commitment to preserving the legacy he has built.

As we celebrate Niels Aage Kjær's 80th birthday, we honour not just a remarkable businessman but a visionary who has left an indelible mark on the global stage.

By the end of the 1970s, despite challenges such as the energy crisis, AVK had grown to employ 100 people with an annual turnover of DKK 25 million.

Today, AVK operates over 100 companies worldwide and generates an annual revenue of nearly DKK 8 billion (2022/2023).

This incredible journey of growth and innovation can be credited to Niels Aage Kjær's relentless drive, entrepreneurial mindset, and exceptional leadership. Under his leadership, AVK has become a global leader in the development and production of valves and components for water supply, wastewater treatment, fire protection, irrigation, and a wide range of industrial applications.

An entrepreneurial spirit recognised

Niels Aage's entrepreneurial drive has earned him numerous honours over the years, including the Order of Dannebrog in 2010 by the Queen of Denmark and the prestigious EY Entrepreneur of the Year award in 2023. His ability to balance innovation with tradition has been central to AVK's enduring success.

Reflecting on his career, Niels Aage Kjær shares: "Success is built on dedication, teamwork, and a clear set of values. At AVK, our core values – quality, innovation, reliability, sustainability, and customer service – have guided us every step of the way."

Passion beyond business

Beyond the boardroom, Niels Aage is deeply committed to environmental matters. He has worked actively with WWF to address pressing issues like plastic waste and recycling, integrating these priorities into AVK's agenda. His appreciation for art and culture is equally notable, with AVK supporting numerous artistic initiatives, including AroS, Museum Jorn, and the local Sculpture City in Galten.



Thank you, Niels Aage, for inspiring generations to dream bigger and achieve more. Congratulations on a life well-lived and a legacy that will undoubtedly endure.

Birthday reception

On his birthday Friday, 13 December, we celebrated Niels Aage Kjær at a reception held in AVK's Visitors Centre.

More than 160 family, friends, business associates, and colleagues participated in the birthday celebration.

Niels Aage would like to personally thank everyone who contributed to his 80th birthday:

"I would like to express my heartfelt gratitude for the overwhelming and warm attention so many people have shown me on my 80th birthday.

Thank you to everyone who took the time to send me greetings and participate in my reception, thanks to everyone who brought presents and who have donated to WWF.

Likewise, I would also like to thank all the employees and colleagues who made me a birthday video greeting from all over the world.

I greatly appreciate all your kind words and consideration. Thank you all for your support and for making this day exceptional and unforgettable."



BETTER LEAK DETECTION = LESS WATER LOSS

DENMARK

AVK's longtime partner, Aarhus Vand, has established a leak detection field to showcase the many efficient digital solutions available. In August, we attended the grand opening of the field.

*By Lone Aagaard Østerbøg,
Sustainability Communications
Specialist,
AVK Holding*

The purpose of the field is to train and educate the water operators of the future in finding leaks on water pipes. The field also serves as a test and demonstration for Danish water technology.

AVK is one of the partners in the project and sees great opportunities in the field.

"At AVK, we work focused to reduce water loss in water distribution to be part of the solution to ensure clean drinking water for everyone.

Our global focus goes hand in hand with the strong collaboration with



AVK, Kamstrup and Aarhus Vand jointly turned the T-key to officially declare the field as open

Aarhus Vand, Kamstrup, and others on the establishment of the leak detection field at Aarhus Vand.

The leak detection field is a great opportunity for us to showcase and test our digital solutions to monitor the water network, lower Non-Revenue Water and ultimately ensure lower energy consumption for water distribution," says Anders Garde Thomassen, market director, AVK Danmark.

Real-life challenges can be reproduced and managed

"Water is a valuable resource that we all need to take good care of. I hope that many will gain new knowledge and new skills right here, so we will become even better at finding leaks and contribute to reducing water loss at Aarhus Vand, in Denmark – yes, preferably worldwide," says Karina Topp, CEO, Aarhus Vand.

National and international water operators will face all the challenges that reality can present in relation to leak detection.

Small "pitfalls" have been incorporated in the form of leaks of different sizes and locations. The leak detection field is located under grass, gravel, asphalt, and tiles. Likewise, water pipes in different materials have been used. Hence, the challenges of finding leaks will vary and a benefit is that operators in the water supply with different experience can use the field.

In the real world, we sometimes don't know where water pipes are located. The track is therefore designed so that training in identifying the location of a water pipe is also possible. It is hoped that operators from Denmark and abroad will use the field and become better at finding leaks and thus reducing water loss.

"The leak detection field is an opportunity for AVK to show our customers how they can detect leakages in their water supply network and that at AVK we can help them find and close the leaks and run their water supply in an efficient manner. I strongly encourage our sales organisation to use this opportunity when we have visiting customers," says Michael Ramlau Hansen, AVK – Public Affairs.

Concept for the field can be used internationally

The design and concept can also be used elsewhere. In Ghana, Aarhus Vand is thus building a leak detection field at the Ghana Water Institute, which educates people in leak detection for the whole of Ghana. Here, the water loss is around 50% and therefore the prospects for training are great.

The partners in the project are Aarhus Vand, Water Vally Denmark, Kamstrup. Grundfos, HeyPipe, City of Aarhus, and AVK.



SHOWCASING SMART WATER AT THE 2024 TAIWAN IWW EXHIBITION

TAIWAN

Taiwan International Water Week (TIWW) 2024 had spotlight on the latest advancements in water management with its new theme: Automation, Process Control, Digitalisation and IoT. Among the exhibitors were the team covering AVK Hong Kong, Macau and Taiwan with our very own AVK SMART Water booth.



*By Stig Th. Bondrup
General Manager,
AVK Hong Kong, Macau & Taiwan*

Over the past year, the team covering Hong Kong, Macau and Taiwan has established a foothold in the Taiwanese market, becoming a known player in the market within valves, hydrants, and fittings. Recognising Taiwan's need for innovative solutions to enhance water distribution efficiency, it was decided to launch SMART Water at the 2024 TIWW exhibition. Therefore, this exhibition provided an excellent platform for us to demonstrate our innovative solutions to enhance water management.

The 2024 TIWW event marks a milestone, as it was the first time Smart Water technology was showcased in Asia by AVK. This presentation attracted a large audience, eager to explore the transformative potential of AVK Smart Water's IoT devices. Attendees included companies and officials from all over Asia as well as other AVK companies and their customers from around the region. AVK's participation in TIWW 2024 underscores the commitment of AVK to innovation and excellence in the water industry. As we continue to grow and gain recognition, our presence at the exhibition is expected to create increasing interest from government officials, industry leaders, and key stakeholders.

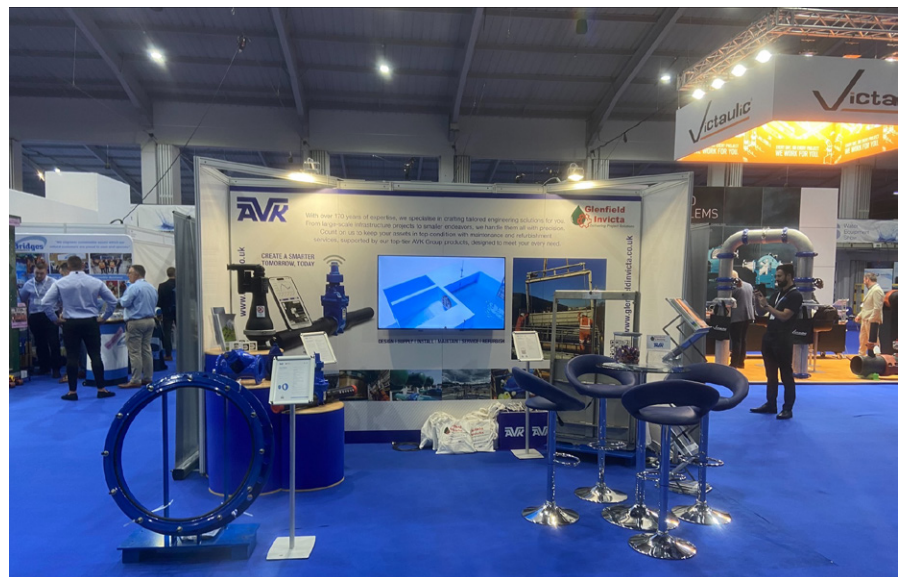
Our team showcased engaging presentations aimed at highlighting the technology's capabilities, along with demonstrations of its real-time data monitoring features on a pipeline with live pressure.

The interactive nature of the display allowed attendees to experience first-hand the benefits of AVK SMART Water management, fostering a deeper understanding of the technology's potential impact across hundreds and thousands of valves installed in Taiwan. The response from visitors was positive, with many expressing great interest in not only the AVK SMART Water solution, but also AVK's entire product portfolio, which has led to fruitful meetings with both the Taiwan government as well as key players in the valve market.

PROUD TO EXHIBIT AT THE WATER EQUIPMENT SHOW 2024

UNITED KINGDOM

*By Wilson McPhail,
Head of UK Project Sales,
Glenfield Invicta*



Glenfield Invicta was thrilled to showcase our latest valve and penstock solutions at the Water Equipment Show 2024 alongside our trusted partner, AVK UK.

The event, which was held in Telford, England, offered a fantastic opportunity to engage with industry experts, share insights, and present our innovative engineering solutions across water and wastewater projects.

Our collaboration with AVK allows us to bring a unique offering to every project, supported by leading products and expertise. Thank you to everyone who visited our stand – we look forward to building on these connections and driving industry-leading standards together!



AVK BRASIL RECEIVES ESG GOVERNANCE AWARD

BRAZIL



AVK Brasil was present at FENASAN 2024, the largest sanitation and environmental event in Latin America, promoted by AESabesp – Sabesp Engineers Association. The event took place on October 22-24, in the Green and Red Pavilions of Expo Center Norte, São Paulo, bringing together 350 exhibitors and attracting more than 34 thousand visitors.



By Juliana Cristine Celestrim,
Marketing Coordinator,
AVK Válvulas do Brasil

At our stand we registered 961 visits, meaning an average of 320 daily interactions.

In this edition of the event, the main theme was “Environmental Sanitation: A Fundamental Condition for Confronting Climate Change”.

The AVK Group works actively with the UN Sustainable Development Goals (SDGs) and ESG principles, and at the AVK Brasil stand we took the opportunity to discuss our local actions by promoting an enriching dialogue on sanitation, the environment, and sustainability, as well as facilitating the sharing of specialised knowledge.

The event was attended by experts from various fields, including engineers, chemists, biologists, technicians, researchers, students, managers, and entrepreneurs committed to advancing technological innovations and engineering practices in the sanitation sector. The exhibiting companies, distributors and service providers

formed a collaboration network that is vital for the development of the sector.

Recognition for sustainable practices

This year, 19 companies were awarded for their good ESG and SDG practices. AVK Brasil won the Bronze Award in the Governance category. This recognition, granted by AESabesp through the Ecoeventus® Project, is the result of the evaluation of companies based on ISO standards (ISO 9001, ISO 14001, ISO 45001, and ISO 14064) and award criteria such as PPQG and PNQS. This was the third consecutive edition in which AVK Brasil stood out, having also been awarded in 2022 and 2023.

Award-winning aspects of AVK Brasil

In the first phase, before the start of the event, we sent a form prepared by the organiser, entitled "Self-Declaratory Report for Exhibitors". In it, we had the opportunity to highlight our initiatives and actions, including the AVK Group's goals which aim to reduce carbon emissions by up to 60% by 2027. We also shared what AVK Brasil is doing locally to achieve these goals.

We informed that we are in the process of implementing ISO 45001 and ISO 14001 certifications, which require several improvements and adaptations both internally and in the practices of our indirect suppliers. Everyone must align their activities with sustainability in their processes.

Also, we highlighted our rainwater harvesting project and the use of forklifts with lithium batteries.

In the second phase, the event committee held a face-to-face interview at our stand, with AVK Brasil's marketing department, with the support of our quality department (remotely) where we went into more detail about these initiatives.

We received the news about our award on the last day of the event, which brought immense joy to us all.



Products and equipment on display

The AVK stand featured the participation of the brands VCVW, Fusion, Orbinox, and Repico, highlighting diversity and innovation in the sector, and promoted the following series:

- Gate Valves, Series 06 and 36
- Butterfly Valves, Series 926 and 931
- Needle valve, Series 872
- HDPE Circuit Kit, FUSION
- Ball Valves, Series 850 and Series 85 (PA12)
- Slip Type Couplings, Series 745
- Hinge Type Repair Couplings (RH), Series 747
- FS10 Type Repair Clamps, Series 748
- Electrofusion Reducing Tee, Series 1205
- Check Valves, Series 53 (Ball), Series 927 (Swing) and Series 928 (Disc)
- Eccentric plug valve, Series 764
- Air Valves, Series 851
- Dual door swing check valve, Series 932
- BR Knife Gate Valve, ORBINOX
- EX Knife Gate Valve, ORBINOX

Setting the stage for future improvements

FENASAN 2024 not only celebrated past achievements, but also laid the foundations for a sustainable future, reaffirming the importance of environmental sanitation in the fight against climate change.

It was a valuable moment for us to meet in person with our customers, with whom we often communicate only by phone and e-mail. It was also an excellent opportunity to introduce our brand to new customers, explore new businesses and an opportunity to showcase the wide range of AVK Group products.

VALVE REFURBISHMENT IS OFTEN A COST-EFFECTIVE SOLUTION

UNITED KINGDOM

Two gate valves, probably manufactured around 1902, have been removed from the line and placed in a nearby field alongside Munnoch Reservoir in Scotland. The valves were cleaned, disassembled, and all components were subjected to a detailed condition assessment.

*By Greg Morris,
Business Development Manager,
Dams, Reservoirs & Hydropower,
Glenfield Invicta*



Based on the recommendations of the condition assessment report, Scottish Water decided to refurbish the two valves such that they could be returned to service. The condition assessment and refurbishment works were undertaken by Glenfield Invicta's engineers at the company's engineering workshops in Kilmarnock.

Benefits of valve refurbishment, when compared to new replacement valves, include considerable carbon emission savings, lower costs, and faster turnaround. Also, returning a refurbished valve to its original location and function ensures the dynamics

of the pipework/system configuration remain unchanged.

Probably +100 years of operation

Munnoch Reservoir is a small 0.25 km² service reservoir located around 50 km southwest of Glasgow. The reservoir was decommissioned in 2008. In 2022, George Leslie, a Scottish Water framework contractor, worked on the site to lower water levels and rewild the surrounding area. The reservoir now acts as a flood prevention measure.

When the conservation works were being undertaken, two DN60 metal seated gate valves were found hidden

in dense undergrowth. Although nobody can say for sure, it is possible that the valves were removed when the reservoir was decommissioned in 2008. The original use of the valves is likely to have been scour protection or reservoir drawdown.

Inspecting, refurbishing, and testing Scottish Water contacted Glenfield Invicta and agreed on a two-phase approach. Firstly, the valves were to be stripped down to their component parts, and subjected to a condition assessment, with Glenfield Invicta submitting a report to Scottish Water containing recommendations on how to best proceed. If, upon analysing the report, refurbishment was the ideal course of action for Scottish Water, Glenfield Invicta was to refurbish the valves so they could return to operational use.

George Leslie transported the valves to Glenfield Invicta's engineering workshop in Kilmarnock. Before assessment could begin, a substantial amount of mud and soil was carefully removed.

Whilst the valves carried the Glenfield mark, there was no date on the casting to identify when it had been manufactured. However, the flange configuration and the use of coach-type bolts indicated that the valves were probably the originals installed when Munnoch Reservoir was constructed in 1902.

Once cleaned, the valves were disassembled into their component parts which, on visual inspection, seemed to be in good overall condition. A detailed condition assessment was then completed by Glenfield Invicta's engineers. Scottish Water decided to accept the condition assessment report's recommendation that the valves and their gearboxes were in a condition which indicated refurbishment was a cost-effective solution.

The refurbishment process took six weeks. Firstly, the valves' castings were shotblasted and spray coated with consecutive protective layers of paint – the same that is used on our current valve range. Also, the seat rings were cleaned manually.

During reassembly, the original fasteners were replaced with new, as were the non-metallic seals and packing.

The valves' open top gearbox design was slightly unusual, as it had dual inputs. One shaft had a high ratio teeth setting, whereas the other had a low ratio. This meant the engineer opening or closing the valve could choose which input to use depending on the torque required.

Once the valves had been reassembled, they were hydrostatically tested to ensure the gate bedded correctly and there were no leaks.

Refurbishment can save time, costs, complexity and emissions

There are several benefits when refurbishing valves. The most obvious is of course the sustainability gains that can be achieved through refurbishment rather than procuring new replacement valves. For this project, the refurbishment of the two gate valves will result in a saving of over 4.5 tonnes of CO₂ emissions.

Also, significant time and cost savings can be gained through refurbishment. A valve refurbishment project will usually take between four to six weeks, dependent on condition. As each new reservoir valve is bespoke to its intended application, lead times for new valves are typically around 24 weeks.

The cost of refurbishing a valve can be considerably lower than buying a new valve. Furthermore, if a refurbished valve is being returned to its original location and function, the installation is relatively straightforward. For example, there are no flange compatibility issues to resolve as could be the case if a new valve is being fitted into existing pipework. This can make the installation of a refurbished valve quicker and more economical than a new valve.

In engineering terms, a refurbished valve ensures the dynamics of the original pipework configuration/system are not disturbed. It will continue to perform as it was originally designed to.

The Munnoch Reservoir valves refurbishment project clearly shows that even valves that may initially appear to be in a poor physical state are worthy of further investigation.

Next up for the Munnoch Reservoir gate valves

Given the new function of the Munnoch Reservoir as a flood prevention measure, it is unlikely that the refurbished valves will be used on the same site. But there are numerous other reservoirs across the Scottish Power estate that date from the late 1800s and early 1900s. It is possible that the refurbished valves will be used as replacements, temporarily or permanently, for other gate valves.

Initially, one fully refurbished valve will be shown alongside another valve that has not been refurbished and this will be displayed at the George Leslie Innovation & Sustainability Day in September 2024.



NEEDLE VALVE REFURBISHMENT ENSURES ANOTHER 50 YEARS OF OPERATION

UNITED KINGDOM



*By Greg Morris,
Business Development Manager,
Dams, Reservoirs & Hydropower,
Glenfield Invicta*

For Sloy Hydroelectric Power Station, Glenfield Invicta was awarded a contract by Dales Engineering Services Ltd for overall client Scottish and Southern Energy (SSE) to refurbish two needle discharge valves.

UK's largest hydroelectric power plant

In May 1945 the construction of the Sloy Hydroelectric Power Station was initiated on the banks of Loch Lomond in Scotland. The power station was completed five years later and was opened in October 1950 by the late Queen Mother. To this day, it is the largest conventional hydroelectric power plant in the UK.

The Loch Sloy Dam, which was built as part of the project, is 56 m high, 357 m long and raised the surface level of the loch by 47 m. The resulting Sloy Reservoir has a 17 km² direct catchment area, although various pipes and intakes provide a further 63 km² of the indirect catchment area.

The total volume of water held in the reservoir by the dam is approaching 36 million m³, and a 3 km long tunnel takes water from Loch Sloy to a valve house positioned almost 200 m above the tank. From the valve house, four DN2000 steel pipes carry the water down into the powerhouse that is situated on the west coast of Loch Lomond.

The refurbishment in detail

The two valves are of the sizes DN300 and DN1200. Jim McAllister, Project Manager for the project, explained about the valves and the company's involvement:

"The needle discharge valves are the original ones fitted in the 1960's by Glenfield Valves, and it is their first major refurbishment. We still have the original drawings in our extensive drawings library that enabled us to understand what was needed for their refurbishment."

The valves were originally removed by Dales Engineering Services Ltd and



were delivered to the Glenfield Invicta workshop.

From there, the Glenfield Invicta engineering team were able to remove and replace the bronze seat and face rings on both valves. The most challenging aspect of replacing the seat and face rings is ensuring that the bedding or "lapping" between the seat and face rings was accurate. This is done by hand and is a highly skilled

process; a process that is fundamental to successful and cost effective valve refurbishment.

Also, Jim explains:

"During the assembly, we have to rebuild all the gearing within the valve and replace the bronze piping for the grease lubricating pipe.

We then have to undertake the "lapping" element to match the seat faces - this is also carried out by hand. It entails introducing a marking dye on one surface and then closing the valve until the two surfaces are engaged. This indicates the high points on the surface that have not been dyed. It is then that the most intricate and skilled aspect of the works takes place. The engineer fitter has to file or grind the surfaces by hand until they are completely engaged and drop tight – no leakage at all.

The valves are then fully assembled, painted and hydrostatically tested. We received a visit from the Dales Engineering Services Limited and SSE Engineers who witnessed the successful testing of the valves post refurbishment. The SSE engineer commented that he looked forward to another 50 years of successful operation."



REFURBISHED AIR VALVE REINSTALLED IN THE BALMORE TUNNEL

UNITED KINGDOM



*By Wilson McPhail,
Head of UK Project Sales,
Glenfield Invicta*

Glenfield Invicta successfully completed a comprehensive refurbishment of an air valve at Balmore Tunnel for client George Leslie. The project included a removal of the air valve from its fixed position, full refurbishment, installation of new internals, complete shot blasting, application of new paint coatings internally and externally, and finally a complete testing.

The Balmore Tunnel is an essential component of the regional water infrastructure, and The Balmore line is the main pipeline that feeds into Glasgow, Scotland's largest city by population. The pipeline is responsible for a large portion of Scotland's water supply, and it is crucial that all work caused no issues on site. The tunnel on the pipeline was introduced in the year 2000 and draws some of its supply from Loch Lomond.

Over time, the air valve within the tunnel had become worn and degraded, necessitating a refurbishment to ensure continued reliability and performance. Glenfield Invicta was chosen for their expertise in water infrastructure solutions and their ability to deliver high-quality refurbishment services.

Benefits of valve refurbishment, when compared to a new replacement valve, include considerable savings. And for an air valve at Balmore Tunnel in Scotland, which was no longer performing optimally, it turned out to be the best option.

Confirming refurbishment as the best option

From the initial inspection of the valve in situ, it was clear that the cast iron body was in decent condition albeit extremely weathered from decades in a chamber. A thorough inspection of the air valve confirmed that refurbishment was a viable option. A detailed refurbishment plan was developed, considering the specific requirements of the Balmore Tunnel infrastructure.

Once the valve was removed from its position safely and brought to the Glenfield Invicta facility, the internal components of the valve were carefully extracted. Advanced shot blasting techniques were used to remove old paint, rust, and other contaminants from the air valve surface, achieving a clean and smooth surface ready for new coatings.

A full new set of internal components designed to enhance the performance and longevity of the air valve were installed, using high-quality materials to ensure durability and reliability. High-performance paint coatings were applied internally and externally, selected for their resistance to corrosion and ability to withstand the environmental conditions.

Rigorous testing of the refurbished valve was conducted to verify functionality and performance, ensuring all components met required

specifications. After testing, the valve was safely reinstalled into the Balmore Tunnel, ensuring a secure and effective installation worthy of another 50 years of service.

A reliable and cost-efficient solution

Refurbishment of this air valve for the Balmore Tunnel significantly improved the reliability of the valve system, reducing the risk of future failures and maintenance issues.

High-quality materials and coatings extended the operational life of the valve, providing long-term value to the water supply network. The new internals and coatings optimised the performance of the valve, ensuring efficient air release and pressure management. Returning a refurbished valve to its original location and function ensures that the dynamics of the pipework and the system configuration remain unchanged.

By refurbishing the valve instead of replacing it, substantial cost savings were achieved without compromising quality or performance. George Leslie, the client, was pleased with the successful refurbishment, which met their goal of maintaining the existing infrastructure while avoiding the higher costs and longer lead times of a replacement.

Andy MacLeod was the Senior Site Agent from George Leslie, involved in this project:

“For the refurbishment project the key factors regarding the decision were:

- Glenfield Invicta advised that the base materials was in reasonable condition and suitable for refurbishment,
- short turnaround time was offered, and
- that the carbon savings of refurbishing versus installing new valves.

We were also happy that there would be the same performance from the new valves, and it also meant we did not require to modify any existing pipework in what were two very tight chambers to access. The valves we also awkwardly positioned at the top of a hill, next to the John Muir Way (very busy) and right next to a critical valve chamber with limited access possible for plant or equipment. So, it was not just the valves themselves, but the ancillary works that were avoided in terms of pipework modifications.

Great service from Glenfield Invicta, and Wilson managed to get himself very dirty in the process!”



SUPPORTING INTEGRATION STRATEGY WITH EFFICIENT WATER RESOURCE SOLUTION

CHINA



For a crucial water conservancy project in the Henan province, AVK Shanghai has delivered large butterfly valves and control valves to the crucial water supply solution.

*By Ken Yan,
BD & Marketing Director,
AVK Shanghai*

The Zhengzhou-Kaifeng Integration is an important strategy in the plan for Territorial Space of Zhengzhou City, which is ongoing and will run from 2020-2035. The strategy aims to promote the integrated development of the cities of Zhengzhou and Kaifeng, situated in the Henan province, China.

Especially the construction of the Demonstration Zone which covers the area that lies between the two cities, where new and pioneering systems



and policies will be explored. As part of the integration strategy, the Eastern Water Supply project was initiated.

Securing sufficient and proper water supply

Eastern Water Supply is a major water conservancy project which makes full use of China's ambitious South-to-North water diversion strategy, which attempts to address the major contrast in water resources between northern and southern China. The project aims to fundamentally alleviate the contradiction between water supply and demand in Zhengzhou and Kaifeng, and it will help to improve the quality of water for the two cities' many residents.

This cross-regional water diversion strategy has effectively enhanced the water resource carrying capacity of Zhengzhou and Kaifeng, providing a strong guarantee for the sustainable economic and social development of the two cities, and is of great strategic significance for the high-quality development of the Zhengzhou-Kaifeng Integration.

Durable valves for crucial purposes

For the Eastern Water Supply project's first phase, AVK has provided a broad solution of super-large diameter valves for the renovation of the 20th Xiaoheliu outlet as well as the raw water trunk pipeline in the eastern part of Zhengzhou.

The solution includes electric double-eccentric butterfly valves with diameters ranging from DN1200 to DN3200, ensuring no leakage or damage during long-term operation, demonstrating excellent durability, and sealing performance.

Also, the solution includes actuated control valves with diameters ranging from DN1400 to DN2200, which help maintain the stability of pressure and flow in the pipeline by linearly and accurately adjusting the valve opening, ensuring the safety and efficiency of the water transmission process. These high-performance valves are not only easy to operate and maintain, but also ensure the efficient operation and long-term stability of the entire project with their excellent performance.

Facing the urgent schedule of this project, AVK promptly responded by fully coordinating supply chain material preparation and formulating a comprehensive production plan. With efficient execution and a deep understanding of customer needs, AVK saved valuable time for the customer and ensured the smooth progress of the project construction.

Efficiency and quality in manufacturing

AVK's production base located in Anhui, China, is equipped with advanced production lines and efficient production processes, enabling them to swiftly tackle large-scale tasks and ensure the timely and reliable product supply, thereby providing their customers with seamless supply chain assurance. They perform rigorous quality control from raw material selection to final product delivery, ensuring high standards and exceptional performance.

High-quality and fully functional valves play a pivotal role in building a better urban life. They serve as a solid foundation for the efficient utilisation and distribution of water resources. Recognising the significance of corporate social responsibility, AVK remains committed to integrating sustainable development principles into our design and production processes. By offering advanced technologies and solutions, AVK can contribute to cities' green, low-carbon, and environmentally friendly development goals, thereby contributing to the construction of even better urban life and infrastructure.



OPTIMISING WASTEWATER MANAGEMENT IN RIGA

LATVIA

A new wastewater pumping station is a crucial part of the modernisation of Riga's water infrastructure. The station significantly reduces water and energy consumption and improves reliability through automation.



*By Jurgis Trams,
Product & Promotion Manager,
The Baltic States,
AVK International*

A crucial part of Riga's infrastructure upgrade

The construction of a new wastewater pumping station in Riga, Latvia, began in spring 2021 and was completed three years later, in spring 2024. The €13.4 million project replaces an outdated station that had been operating for 30 years. The upgrade was an essential part of the modernisation of the city's water infrastructure and addresses the limitations of the prior system.

Substantial resource savings

A noteworthy improvement is the new pumping station's ability to reduce the consumption of resources significantly. To cool the pumps, the old facility consumed 300,000 m³ of water every year, which was water taken from the drinking water network. The new pumping station eliminates the need for water cooling, resulting in remarkable water savings.



Energy consumption is also significantly reduced. According to Riga Water, the new station uses 55% less electricity compared to the prior, saving approximately 2.5 million kWh. Altogether, the operational costs are reduced by approximately EUR 500,000 every year.

Automation boosts safety and precision

Automation at the new pumping station plays an important role in improving the station's operational safety and precision. Fully automated processes ensure that the system adjusts to demand in real time, thus reducing the risk of human errors and increasing the overall performance and reliability.

The new pumping station is an important part of the modernisation of Riga's water infrastructure, preparing the city for future demands. We are proud to have contributed to this innovative project, and that our high-quality products will help ensure long-lasting efficiency.

AVK products supplied for the project

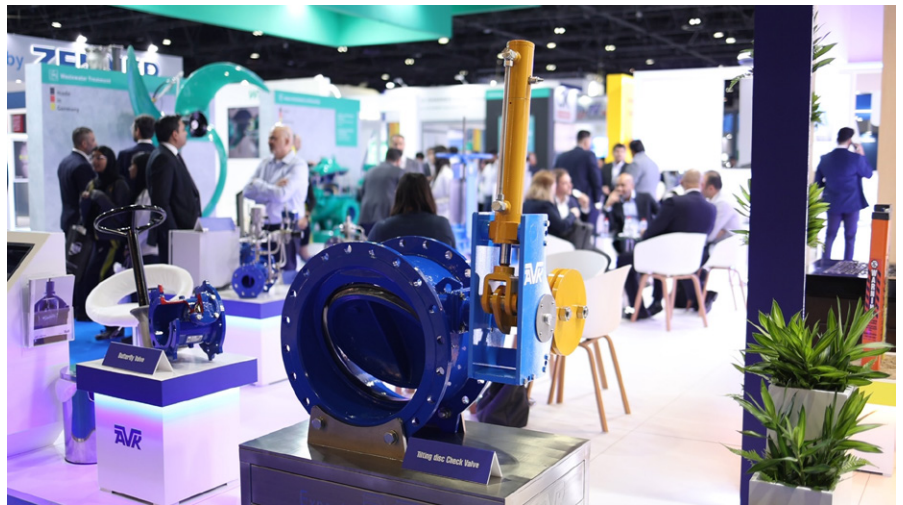
- Resilient seated gate valves DN600-1000, actuated by AUMA electrical actuators
- Metal seated gate valves DN1200, actuated by AUMA electrical actuators
- Dismantling joints DN800-1000
- Check valves DN600-700

DRIVING WATER CONSERVATION THROUGH NON-REVENUE WATER AWARENESS

UAE

By Anurima Roy
Regional Marketing Manager
AVK Middle East

AVK was present at the WETEX 2024, which was visited by more than 50,000 visitors.



Dubai Electricity and Water Authority (DEWA) organised the 26th Water, Energy, Technology and Environment Exhibition (WETEX) from October 1-3 at the Dubai World Trade Centre. The event is in line with Dubai's vision to build a sustainable future for the Emirate.

For this edition of WETEX, we decided to support the vision by focusing on the importance of selecting the right valves and accessories, and on how utilising pressure management solutions can help water utilities manage their networks more efficiently. This will help them reduce water loss, thereby contributing to local water conservation, paving the way forward towards a sustainable future in line with Dubai's.

Expect global leadership and local commitment

We presented a variety of solution-based products, with a special highlight on our control valve solution. Also at the forefront was our tilting disc

check valve with high-performance external damper unit, which is developed and manufactured in-house by AVK Anhui. It has been tailored to meet the specific requirements of the Dubai Electricity and Water Authority (DEWA) and the regional market.

Additionally, we featured a range of pressure management products, including the pilot operated needle valve and pressure reducing valve from ACMO in Italy, along with a specially customised Smart diaphragm control valve for DEWA. Our exhibit also included water supply products such as swing check valves and butterfly valves.

A dedicated wastewater section was crafted to present our wastewater treatment solutions, featuring a DN500 knife gate valve and penstock under the theme of "Valves for Wastewater that Withstand the Toughest Conditions."

With products flown in from Anhui, Italy, Spain, and India, we reflected the "Act Local, Think Global" approach, all achieved within a remarkable time through solid teamwork.

During the three-day event, we engaged in meaningful conversations with our esteemed clients, including DEWA, RAKWA, SEWA, and customers from Kuwait, Jordan, Egypt, and Oman, focusing on potential collaborations for upcoming projects across the region.

Thank you to everyone who contributed to this successful exhibition. Your efforts and teamwork were instrumental in our achievements at WETEX 2024.

UPGRADED FIRE PROTECTION SYSTEM IN THE PORT OF ROTTERDAM

THE NETHERLANDS



*By Han van 't Zand,
Project Manager,
AVK Nederland BV*

ProRail, the organisation managing the Dutch railway infrastructure, has invested significant effort in building and maintaining advanced fire protection systems across multiple industrial zones within the port of Rotterdam.

Working in collaboration with DNM Industrial Firefighting, AVK was engaged early on in the design process. This partnership led to the development of customised product specifications for hydrants and valves, ensuring they meet the rigorous quality standards necessary for such a demanding and corrosive environment. As part of the upgraded fire protection system along the railway, AVK delivered over 500 above-ground fire hydrants and gate valves. After detailed discussions with ProRail, AVK's

series 27 hydrants, certified with UL/FM approvals, were selected. These hydrants are specifically designed for corrosive environments and are constructed with premium materials. For instance, the spindle and coupling are made from stainless steel 318, and the pins from Inconel 718. Additionally, the coating adheres to GSK standards and includes a UV-resistant topcoat. All pressure tests were conducted at 35 bar, following UL/FM guidelines. The AVK gate valves provided for this project also met ProRail's stringent requirements. The spindle is constructed from aluminium bronze, while the other components are made from stainless steel 316. Corrosion protection is ensured through a powder epoxy coating, applied according to GSK regulations. Furthermore, AVK's rubber factory supplied advanced vulcanized wedges to enhance valve performance. We take pride in contributing to these complex projects. Partnering with AVK means receiving top-tier products, expert guidance, and a cooperative approach that ensures success.

Products delivered to the project:

- +500 hydrants and gate valves



CROSS-BORDER COLLABORATION FOR SUSTAINABLE WATER SOLUTIONS

KENYA



Proud engineers at the pumping station

Kenya is facing severe challenges regarding access to clean and safe drinking water, climate change, and a high level of non-revenue water. And given AVK's experience and know-how within efficient water management, we mutually agree on the benefits of potential cooperation.

*By Jan Ketley,
Area Sales Manager, Africa
AVK International*

Early November, we had the honour of welcoming Kenya's Cabinet Secretary for Water, Sanitation and Irrigation, Mr. Eric Murithi Mugaa, to our AVK Academy and Visitor Centre. With him was a Kenyan delegation of directors from central government agencies and major utilities.

The visit was part of the Strategic Sector Cooperation, SSC Water Kenya, between Denmark and Kenya driven by the Danish Environmental Protection Agency, Miljøstyrelsen, and funded by the Ministry of Foreign Affairs of Denmark. The aim is to drive sustainable water supply and climate adaptation initiatives.

Critical need for solutions

Kenya is facing major challenges related to non-revenue water, and our technologies and high-quality valves



can really make a difference. Due to our longstanding relationship to the African water industry, the visit to Denmark was a perfect opportunity to invite the delegation to AVK for a discussion about their challenges and potential cooperation opportunities.

Given the Danish Strategic Sector Collaboration with Kenya and Danish Industry's strong focus on the water sector, it is only natural that we join forces. Therefore, following the delegation's visit, we from AVK International went to Kenya for a

week of meeting people in the field, water boards, water utilities, our Kenyan partner APEX Piping Systems, consultants as well as contractors working in the country to secure the precious water resources.

We did the same in July, and in total we have had more than 250+ engineers around the table for presentations, training, knowledge-sharing and inspiring discussions. As a result, we now have very good insights into the current challenges in Kenya.

We visited numerous water boards and utilities, as well as the cities Tatu and Kisumu.

Already proven AVK solutions in Kenya

Tatu City is a 5,000-acre new city with homes, schools, offices, a shopping district, medical clinics, nature areas, a sports and entertainment complex, and manufacturing area for more than 250,000 residents and tens of thousands of day visitors.

At Tatu City, they already know AVK and the high quality of our products. As of today, they manage a non-revenue water level of only 4-6%, which is more than acceptable. Currently we are working on a solution to their intake from the main pipeline, which might be involving a needle valve.



At NIA, National Irrigation Authority



Site visit in Tatu City for the ongoing project

At AVK, we have vast experience with efficient solutions to reduce non-revenue water levels.

Besides the benefits of quality product features, AVK also provides loads of valuable information and documentation through the website platform. This includes of course the vital product documentation such as datasheets, manuals, maintenance instructions etc., but also more overall insights and guides such as “How to select the correct gate valve”, “10 steps to bring down NRW levels”, and case stories about solutions within numerous applications. This was pointed out as very helpful for the engineers and consultants.

All in all, another great visit to Kenya discussing challenges, solutions, building network, making friends, and meeting so many interesting and skilled people.

Sharing our decades-long knowledge and expertise

Non-revenue water (NRW) is basically produced, cleaned water, which is lost somewhere in the water distribution system, never reaching the consumers. This is a waste of precious water resources, and water that is produced and lost without generating any revenue has negative financial as well as environmental impact.

The production costs and the energy used to produce and distribute the water are wasted. And when a significant amount of water is lost, it means that more water needs to be produced and once again be distributed. NRW could be leakages and pipe bursts, inadequate water management, and unauthorised consumption, just to mention a few.

CAREER OPPORTUNITIES, VALVES, AND WATER ON THE AGENDA

GLOBAL

*By Katrine Klejnstrup Larsen Flecha,
PIM Manager,
AVK Holding*

Once a year, we are taking part in the national campaign “Science Day”, which aims to promote career opportunities within the educational fields of science, technology, engineering, and mathematics (STEM).

In the beginning of October, we welcomed 120 students from nearby schools for two full days of career presentations, fun, learnings, and hands-on tasks at our AVK Academy and Visitor Centre.

Why choose a technical career?

The students were introduced to AVK, our products, local and global water challenges and our work to make a difference in the world by Lars Enevoldsen and Michael Ramlau Hansen.

At AVK, we have a broad and differentiated group of employees, where many of them have an educational background and/or lots of experience within the fields of STEM.

Therefore, we had invited some of our employees to give a short presentation about themselves, their background and their daily work life here at AVK, to inspire and encourage the young people to consider a future within the fields of STEM.

They had the pleasure of meeting Nicole from our Group IT department, who gave an inspiring introduction to her own considerations as a student, and how she ended up selecting an education within IT, communication, and organisation. Today, she works as a Project Manager, leading some of our many IT infrastructure projects.

They also met Nils and Laura, who work in our AVK Tech Toolshop, where they are drawing and creating the moulds for use in our production. Besides an introduction, the students got the opportunity to join them "behind the scenes", where they could experience some of the processes in action.



Getting to know the world of AVK

After the career presentations, the students went for an interactive product hunt in our showroom full of AVK products. They got a short introduction to five of our key products, and should then identify some of them, by scanning the correct QR code. There were lots of great energy and, of course, a lot of good questions from the students.

After lunch, the students got to work with some practical challenges, where they should come up with a feasible, sustainable solution in the form of either:

- A safe water supply solution, that takes flooding, dry periods and pollution into account
- A model that describes how to avoid pollution of lakes and rivers through wastewater discharge
- A circular system that takes advantage of water's natural journey through society

We hope we have inspired just a few of the students, and that they have learned a thing or two about water, valves, and global challenges, and how they can be overcome using proper water management solutions.



What is Science Day?

The campaign is a yearly event which aims to inspire more young people to choose an education in the field of science, technology, engineering, and math. It is established by The House of Natural Sciences which is a private, non-profit organisation that bridges the gap between schools and companies and support teachers in the development of inspiring and application-oriented teaching.

COMPETITION



We are happy to announce that the winners of the competition in AVK InterLink no. 66 are:

- Patxi Ortega, Quality Controller, Belgicast
- Mille Sveje Bøjgaard, Project Manager, AVK Holding A/S
- Marko Petrovic, Trainee, AVK International A/S

The correct answer was: 683 AVK PREMIUM 100 gate valves

Gifts are on their way.

New competition:

Which technology has helped AVK gain greater control over the manufacturing process, thereby also resulting in a higher quality?

Send an e-mail with the correct answer in which you state your address and the gift you would like to receive – if you win.

E-mail to: kakl@avk.dk

Choose between:



Beach towel with AVK valve



Picnic grill in a cooler bag



Ocean bottle

AVK Holding A/S

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