

Sustainable water infrastructure

**Water saving technologies
for the water industry**





Advanced solutions to fight water scarcity

The water industry faces several critical issues, with increasing urbanization and global warming resulting in one of the biggest concerns, namely water scarcity. Also, regulations on water discharge are getting stricter, commodity prices are rising, and infrastructure is aging in the developed world. Furthermore, providers are under pressure to keep up with digitization, aiming to have a competitive advantage in the industry of the future.

Water impacts the bottom line of any industrial sector. It is used to wash, rinse, dilute, as an energy carrier, or as an integral part of the final product. The water sector may barely represent 1% of the global GDP (Gross domestic product) directly, but it impacts the other 99% in every process*. Also, climate change brings several challenges; there is a potential for extended periods of limited rainfall, heatwaves, droughts, and periods of heavy rain and floods. Increasingly stringent environmental quality standards will also pressure companies to enhance and further develop their water and wastewater treatment processes. On the flip side of that same story, industrials now have a strong incentive to engage in a virtuous cycle of water and resource reuse and recovery.

GF Piping Systems steps up to these challenges with cost-effective and sustainable water solutions that make it easy to connect, monitor, and manage your field devices with our state-of-the-art technology and a wide range of comprehensive materials offering of pipes, fittings, valves, and ideal jointing technology as well as an optimally adapted selection of components for automation technology. Innovative plastic systems help to warrant the best cost of ownership and the lowest maintenance costs during operation. Thanks to outstanding flow performance and smooth inner surfaces, plastic components contribute to an increased flow rate and reduced energy requirement. These factors result in a positive impact on the carbon footprint.

* UNESCO World Water Assessment. Water in a changing world: the United Nations world water development report 3, 2009

Main benefits

Higher efficiency around the water cycle



Ensured safety

Precise measurement, leak-tight and corrosion-resistant components, and best-in-class jointing technologies help ensure high water quality. Our solutions are long-lasting, even in harsh environments or when aggressive chemicals are transported. An unequalled level of engineering services completes the package.



High process and energy efficiency

Integrating energy and process data, plant automation, and optimization significantly reduce energy consumption while increasing operational and production efficiency.



Water saving technologies

Easy system integration for more efficiency in the work process with minimal manual intervention, faster set-up times, and easy diagnosis.



Sustainable process management

Plastic piping systems are corrosion-free and low-maintenance, which reduces downtime and repair costs. Smooth inner surfaces provide excellent flow rates and no deposits.



Less maintenance costs

With reduced need for maintenance, operations are much more efficient. Process Automation solutions that make it easy to connect, monitor, and manage your field devices with our state-of-the-art technology.



Lightweight

Lighter materials and the lowest pressure drop on the market mean reduced energy requirements and a positive impact on the carbon footprint.

Sustainable solutions for water industries

GF Piping Systems develops application-oriented system solutions that enable profitable operations and are ideally suited for the water industry. We support our customers in implementing sustainable, future-oriented and well-designed plant concepts with state-of-the-art planning techniques to optimize the economic efficiency of processes.

Industrial Water Treatment

High water purity is a critical requirement and an absolute necessity for production processes, feed boilers, and cooling systems in today's industry. Applications such as deionization, electrodialysis, and new membrane-based solutions avoid contamination, scale formation, and corrosion. At GF Piping Systems, we offer a wide range of products, automation options, and comprehensive solutions for all applications, from chemical dosing systems and media filtration to ion exchangers.

Wastewater Treatment

Wastewater treatment plants are rapidly becoming water resource factories. This commands new advanced treatments and process intensifications, such as membrane and physicochemical treatments. This also places the automated sewage handling on the critical path for operators to lighten the burden on their shoulders, an area where GF Piping Systems gladly helps. Membrane technology, chemical dosing systems, and polymer preparation are applications that require efficient water conveyance systems. GF Piping Systems products are designed for maximum uptime reliability and maintenance simplicity with our Process Automation solutions and a minimum of energy consumption during operation.

Drinking water

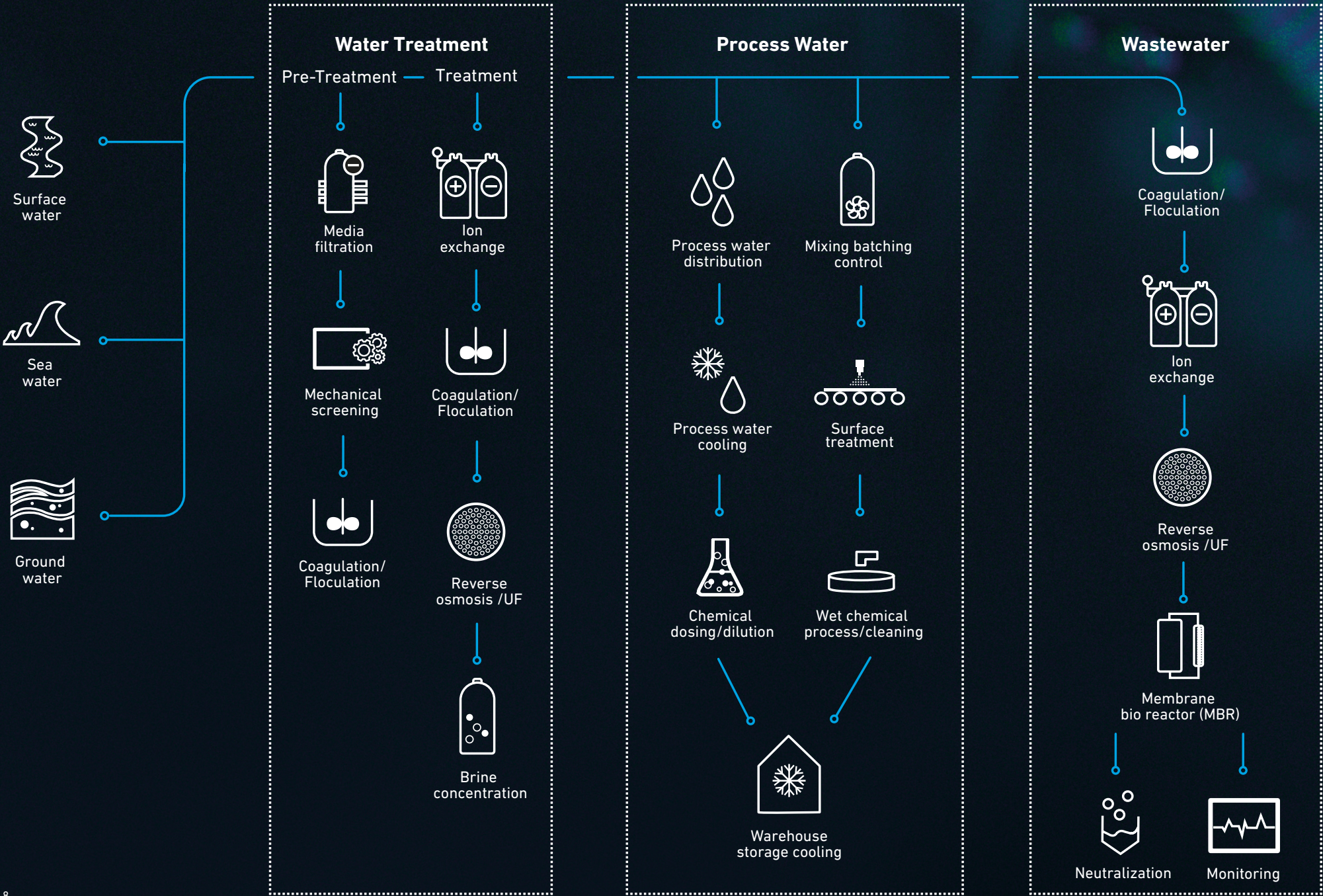
Drinking water will increasingly need to be produced closer to where it's used, which requires decentralization and distributed treatments. In this new realm, reliability and Process Automation are essential to reduce operation and maintenance burdens. GF Piping Systems has a proven track record in helping with this. With the high-quality system solutions of GF Piping Systems - offering pipes, fittings, automation, and instrumentation from one source - the optimal compatibility of all components is warranted.

Desalination

Wherever groundwater is difficult or even impossible to reach, other ways must be found to make water available in the right quantity and quality. GF Piping Systems technology helps to reliably desalinate seawater or brackish water and use it as drinking water or for industrial use. Here, the corrosion-free characteristic of thermoplastic piping systems is essential to expand the lifetime of the system. The leading technology for desalination plants is reverse osmosis, a filtration process that is used for the purification of water. Solutions for Process Automation from GF Piping Systems such as valves, actuators, measurement, and control help to ensure the failsafe operation of desalination plants.

Efficient water management

Managing the water cycle has become increasingly important and complex. Intelligent Process Automation technologies and products of highest reliability make valuable contributions to the future. GF Piping Systems offers comprehensive solutions for all applications throughout the water cycle, from chemical dosing systems and media filtration applications to ion exchangers.

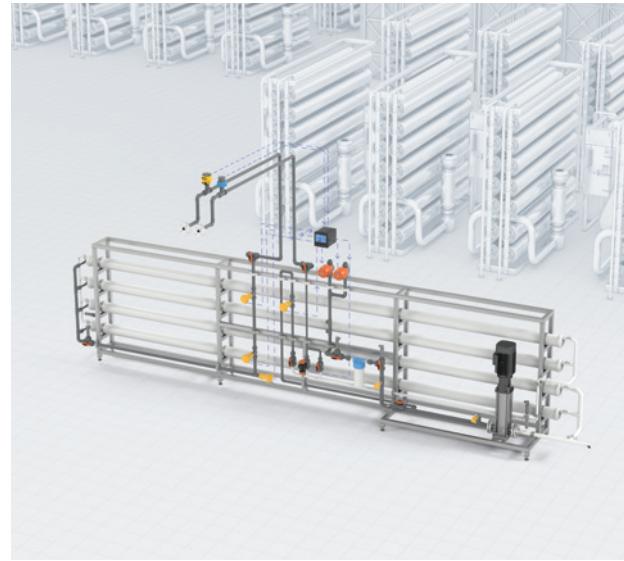


Improving water quality with sustainable Process Automation solutions

At GF Piping Systems, we offer a holistic portfolio of valves and actuation, measurement, and control solutions for various water and chemical applications. The modular and interoperable field-level devices allow flexible installation to fit every installation. Combined with numerous available materials and jointing technologies, we offer solutions for various possible applications.

Competitive advantage in the industry of the future

Improving the quality of water in order to reduce its impact on processes and the environment is always a challenge. GF Piping Systems steps up to these challenges with a comprehensive system offering of pipes, fittings, valves and the ideal jointing technology as well as an optimally adapted selection of components for automation technology.



Reverse osmosis

Reverse Osmosis technology is a filtering method in which contaminated water passes through a semi-permeable membrane under high pressure and removes nearly all water pollution, such as minerals, bacteria, and particles. Because it needs no chemicals, energy consumption is low, and handling is easy.



Ion exchange

Demineralization units such as deionization, reverse osmosis, and distillation techniques secure the production of pure, high-quality process water in the industrial environment. Water purification, separation, and decontaminating aqueous and other ion-containing fluids characterize applications in that water treatment area. In this context, ion exchangers can absorb unwanted ions in the water, thanks to selective synthetic resin beads, and release them during a regeneration process. The compact construction of ion exchange plants requires flexible piping solutions and components.



Filling of tanks

Tanks are required to store liquid media in manufacturing and processing plants. GF Piping Systems offers fast, reliable, and safe tools for filling and emptying tanks. Our range comprises a wide spectrum of piping systems, including measurement and control technology, automatic and manual valves, and an extensive array of valves for demanding applications.



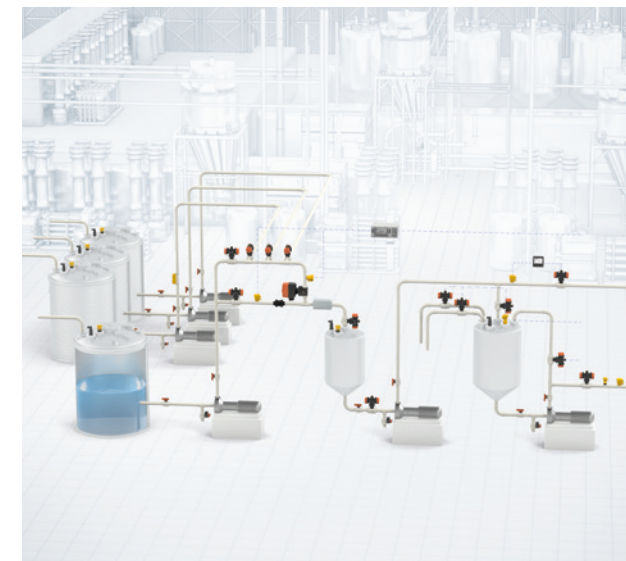
Media filtration

In the multi-level filtration processes, anthracite or stones, as well as sand, are used to remove particles up to 10-15 µm from fluids. Due to the need for several operation modes, the process requires cleaned piping systems, numerous valves and bypass actuators, and adapted measurement and control technology.



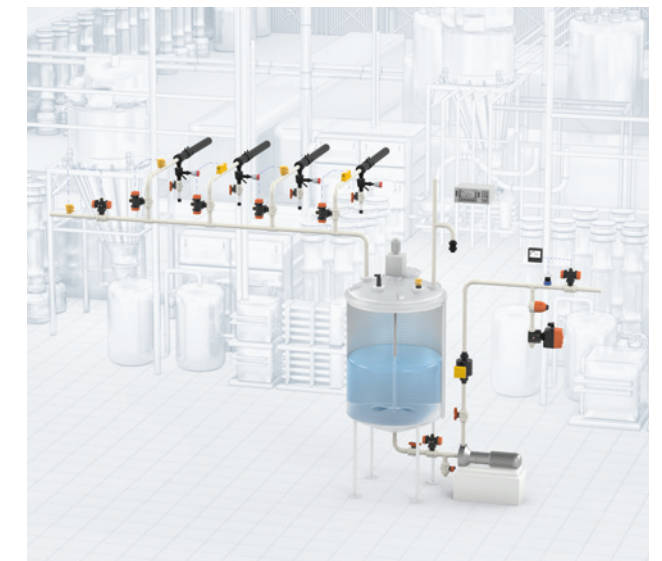
Neutralization

In nearly every water treatment process, the water is to be pH adjusted to meet the treatment requirements, whether it is wastewater for public wastewater treatment plants, drinking water produced by reverse osmosis, or alkaline or acidic wastewater. All those operations are to be properly monitored and controlled by a measurement and control setup. We offer high process reliability and cost optimization in this cost-intensive area.



Dosing / Dilution

Dosing and/or diluting chemicals requires highly specialized and reliable workflows, especially with aggressive chemicals. Concentrated chemicals in small amounts are dosed in-line or through a static mixer that ensures correct dilution in the process. A plastic system can be easily constructed to meet customer specifications by selectively combining pressure control valves, flow meters, and control instrumentation.



Mixing / batching control

Choosing the right dosing system requires careful thought. GF Piping Systems has a comprehensive line of products that comply with the respective health, safety, and wastewater regulations. Our measurement and control technology ensures precisely controlled batch processes. The product range includes materials and technology specially designed for numerous process applications.

Decentralized water treatment solutions

Portable and sustainable water treatment thanks to Process Automation

Water treatment provider Ekopak makes industrial companies more sustainable with solutions by GF Piping Systems.

The Belgian company Ekopak is specialized in portable water treatment and recycling. With its concept "Water as a Service" (Waas), it offers customers solutions such as containerized reverse osmosis systems which produce sustainable and clean water for industrial processes. The interoperable Process Automation solutions are provided by GF Piping Systems.

Project background

Companies in the manufacturing and production industries rely on large amounts of potable water for their processes. In order to treat this valuable resource as carefully as possible, Ekopak has developed containers that enable decentralized water treatment on site at the customer's facilities. That not only preserves the environment but also gives companies full control over their water supply.



A water treatment skid is prepared by Ekopak in Belgium.

Selected technical solution

Ekopak chooses to implement complete solutions by GF Piping Systems, consisting of valves, controllers, actuators, and measuring technology. The company has two major requirements for the systems in the containers: Firstly, they have to guarantee a consistently high water quality under all circumstances – even if the quality of the supplied water varies strongly. Thanks to process automation, it is possible to control actuators remotely and to collect and analyze data. At the same time, the systems need to be compact and light enough to be transported to the customer in a container. By using modern plastics, the solutions by GF Piping Systems make an important contribution.

Achieved improvement

With in-depth experience in the field of Process Automation, GF Piping Systems offers a broad range of components that close the control loop and lead to more efficient systems as well as more sustainable processes. This way, Ekopak can monitor and control the water quality of their customers round the clock. In addition, the valves and controllers made of plastic are lightweight and long lasting which reduces the logistical effort and the impact on the environment. As the piping systems are sourced from one provider, planning is kept simple, and GF Piping Systems can assist Ekopak in optimizing their containers.

Benefits

- **Complete systems:** GF Piping Systems offers modern solutions for the entire control loop, from valves and actuators all the way to measuring technology and controllers.
- **One provider:** With a broad range of products and many years of experience, GF Piping Systems is a reliable partner who can assist throughout all phases of a project.
- **Sustainable projects and sustainable materials:** Piping systems made of plastic are corrosion-free, require little maintenance, and are cost-effective.



Where next?



Watch video

Revolutionizing production of L-lactic acid

Increased efficiency and reduced wastewater discharge in l-lactic acid production

Over 5,000 valves across 7 parallel ion exchange systems.

Qinggang County is often referred to as the “Land of Chinese Corn”. It is also the place where Tianjin OMZ and GF Piping Systems realized a super project improving the production of L-lactic acid. This powerful compound serves as a key raw material for biodegradable products like polylactic acid (PLA), which is used in the production of biodegradable plastic bags, straws and other eco-friendly products. The 5,000 m2 facility primarily engages in the production of L-lactic acid through corn starch fermentation, with an annual output of 50,000 tons.

Project background

The continuous ion exchange technology based on valve arrays is used in starch sugar production and other food processes as well as in biopharmaceutical industries. GF has been working closely with its partner Tianjin OMZ for more than ten years to develop highly automated ion exchange systems. Over the past decade, GF has supplied over 100,000 valves for such projects. This fifth-generation ion exchange system implemented by OMZ boasts a superior resin distribution effect. For this latest project, GF has delivered 5,000 pneumatic diaphragm and ball valves, as well as a significant number of manual valves. The implemented Process Automation solutions ensure the flawless operation of the system.



Over the past decade, GF has supplied over 100,000 valves for similar projects.

Selected technical solution

Thanks to the innovative flow channel design of GF solutions, it was possible to use smaller valve sizes for equivalent flow capacity. The unique design of these valves allows the transition from the outdated weir style structure to the current saddle type configuration. In addition, the full plastic design ensures leakage-free performance even during temperature fluctuations thanks to a uniform expansion and contraction. There are no concerns about screws loosening over time, which reduces maintenance requirements. The deployment of 5,000 valves across 7 parallel ion exchange systems has elevated our customer's production to a smarter, more dependable, and highly efficient level.

Achieved improvement

GF pneumatic diaphragm valves, with the notable feature of ample flow capacity and minimal pressure loss, constitute the core components of the entire valve array continuous ion exchange system. The innovative ion exchange system has elevated resin utilization efficiency by over 30% for the customers. Furthermore, it has substantially curtailed acid and alkali consumption, resulting in a reduction of wastewater discharge by over 40%. This not only aligns with the national energy-saving and emission reduction policies but also substantially reduces operational costs for our clients.

Benefits

- **Easy installation and space savings** in the compact valve-array design thanks to the lightweight plastic valves with exceptional flow capacity and minimal pressure loss.
- **Maximum safety and optimal durability** thanks to the PVC-C material which provides outstanding chemical resistance to high acidic and alkaline liquids.
- **Increased production efficiency** thanks to the leak-free performance of GF plastic valves leading to minimal maintenance efforts.
- **One solution provider and global expertise** with exceptional service during all project phases optimizing efficiency while providing peace of mind.

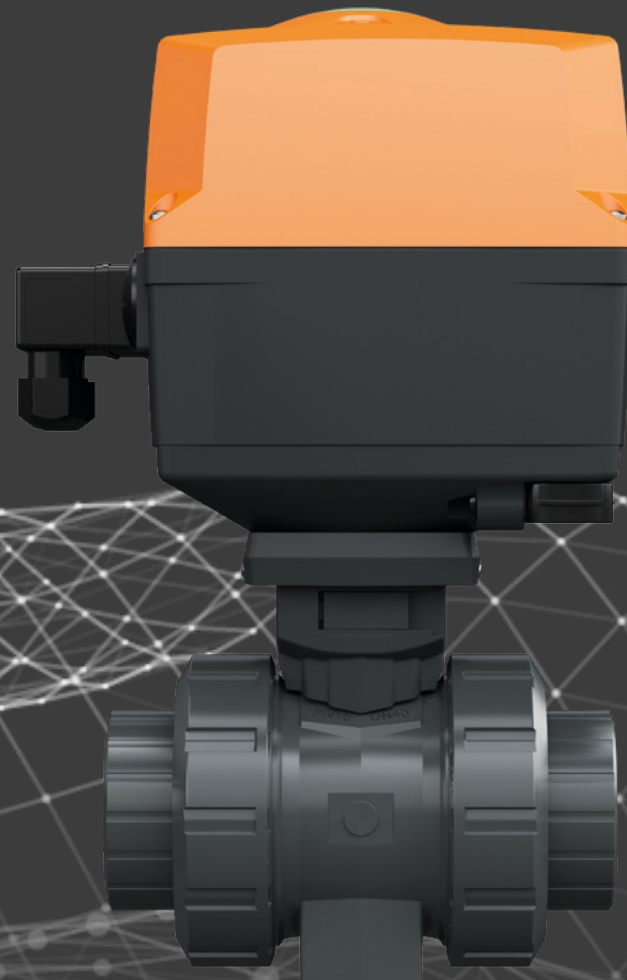
Where next?



Visit our website

Seamless connectivity

Leading-edge field devices are intelligent and have a vast amount of relevant process and device data available. Connectivity technologies unlock this data, leading to increased efficiency in daily operation and maintenance.



We help our customers tackle the complex challenges they face on projects worldwide by providing connectivity technologies that fit their system environments, going from analog to the new digital age.

Our solutions allow for the automation of processes that provide remote access, high data transfer rates, and real-time diagnostic insights, giving users access to all relevant device parameters 24/7, 365.



EtherNet/IP



Supporting future-proof Industrial Ethernet protocols



State-of-the-art network technology

- Seamless access to field device data without complex, expensive, and error-prone protocol conversions
- Flexible network topology concepts for any kind of plant environment



Up to 40% more efficient in commissioning and maintenance

- Remote access to field devices for simple parameterization and commissioning
- Real-time insights into device health, preventive maintenance and diagnostics for troubleshooting
- Plug&Play device exchange with automatic re-configuration of a new device



Up to 30% increase in operational performance

- Digital data transfer leads to accurate process values
- Devices offer multiple process variables
- Trend monitoring of any process variable for continuous process optimization and preventive maintenance
- High availability of a plant by robust communication

Where next?



Visit our webpage

Together as one

We make Process Automation easy

The water treatment market faces several critical issues: increasing urbanization and global warming resulting in one of the biggest concerns, namely water scarcity. Process Automation has an integral role in the growing needs of water conservation.

GF Piping Systems offer deep application knowledge of the entire process within the water treatment industry. Depending on the application area, there are different water treatment process challenges, ranging from guaranteeing high water qualities and providing reliable measurements to assuring stringent regulations. Plastic piping solutions from GF Piping Systems provide higher efficiency around the water cycle with increased productivity and lower operational and overall costs.

- Non-corrosive solutions
- Higher efficiency around the water cycle with increased productivity
- Lower operational and overall costs



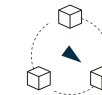
One user experience across the whole control loop

GF Piping Systems is your experienced partner with a full portfolio of measurement, control, and actuation components, which are easy to install and use and have local support through all project phases. We offer the full package with our products and solutions, providing top-quality installation, a highly skilled team of experts standing by our customers' side every step of the way worldwide, and digitalized services ensuring a project is at the forefront of the market.



Design (Planning phase)

Easy planning thanks to application-specific solutions making an effortless combination around the complete control loop.



Select (Ordering phase)

Easy to select and order via configurators and matching components throughout the whole portfolio.



Install (Building phase)

Easy planning thanks to application-specific solutions making an effortless combination around the complete control loop.



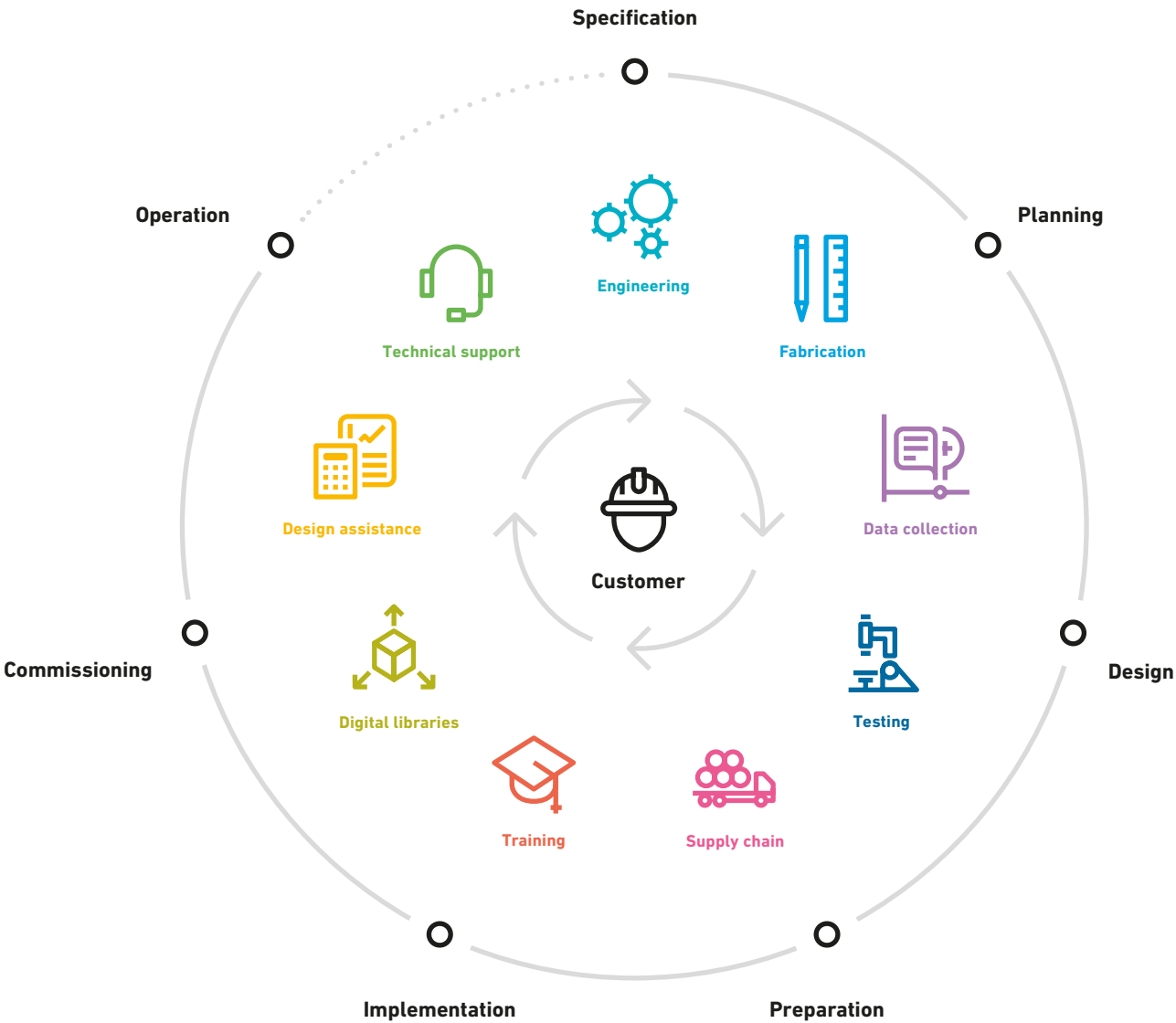
Own (Operation phase)

Easy monitoring once installed, including spare part availability. Long lifetime and low maintenance make for low downtimes.

More information at
www.gfps.com/processautomation

Ready when you are

With Specialized Solutions, the global leader GF Piping Systems provides project support every step of the way to achieve construction excellence. Allowing owners and planners to concentrate on their daily business without interruption.



Custom product design and prefabrication

Having your individual needs and application in focus, our customizing teams forge the solution that fits you best, developing custom-made parts to complete systems or special solutions produced in small series, individual consulting and off-site prefabrication.



Digital libraries

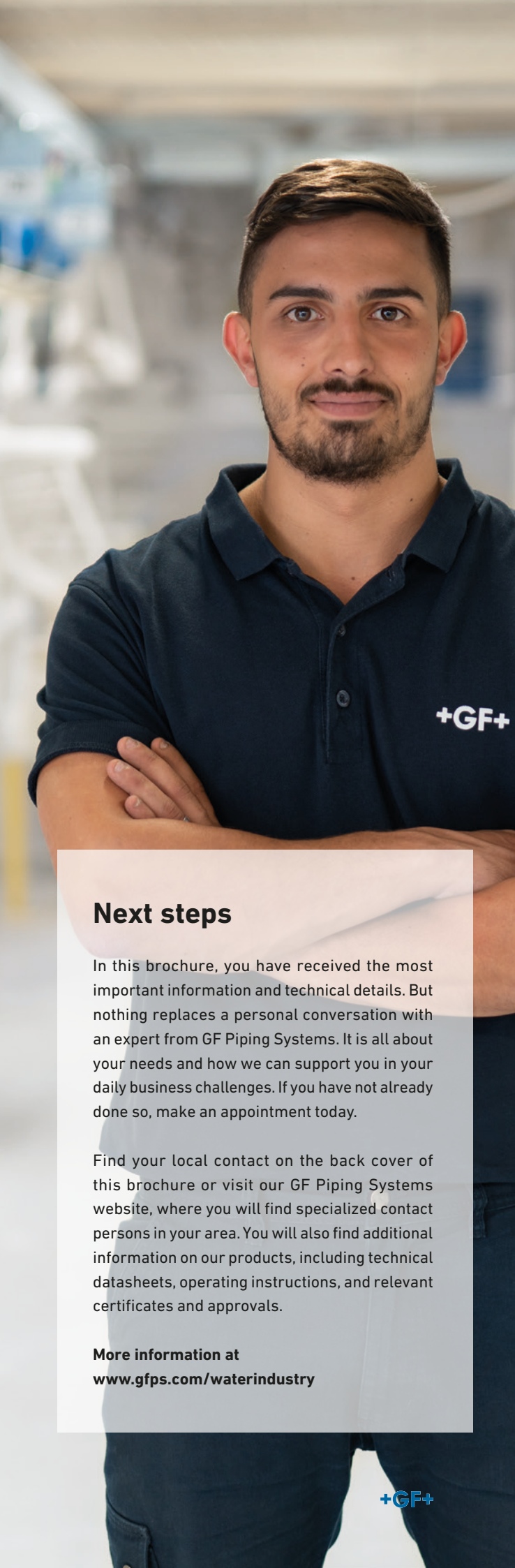
The libraries cover three key areas for the design, creation, and maintenance of a project: Building Information Modeling, the Plant Design Software, and the CAD Library, helping you reduce costs and construction times.



Engineering

Increase the efficiency of your project with the tailor-made analysis packages from GF Piping Systems and decide which offer is right for you according to your needs. You have the choice between Project Analysis and Advanced Engineering, thus always receiving the appropriate support in every phase of your project. Established knowledge, guiding you through.

www.gfps.com/specialized-solutions



Next steps

In this brochure, you have received the most important information and technical details. But nothing replaces a personal conversation with an expert from GF Piping Systems. It is all about your needs and how we can support you in your daily business challenges. If you have not already done so, make an appointment today.

Find your local contact on the back cover of this brochure or visit our GF Piping Systems website, where you will find specialized contact persons in your area. You will also find additional information on our products, including technical datasheets, operating instructions, and relevant certificates and approvals.

More information at
www.gfps.com/waterindustry

Local support around the world

Visit our webpage to get in touch with your local specialist:

www.gfps.com/our-locations



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