

Your Water Treatment system solution

Drinking & Process Water
Municipal & Industrial Waste Water



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Imprint

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Ebnatstrasse 111, Postfach, CH-8201 Schaffhausen, 2015

Printed in Switzerland

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Board of Directors: Pietro Lori, Dr. Roland Abt, Mads Jørgensen

Commercial Register of the Canton of Schaffhausen

Switzerland: CH-290.3.002.309-7

VAT registration number: 290.019

The best choice for you

Corrosion and chemical resistant system solutions

+ Georg Fischer

Georg Fischer focuses on three core businesses: GF Piping Systems, GF Automotive and GF Machining Solutions. The industrial corporation founded in 1802 headquarters in Switzerland and operates approximately 130 companies with more than 14 000 employees across 30 countries.

GF Piping Systems is a leading supplier of plastic and metal piping systems with global market presence. For the treatment and distribution of water and chemicals, as well as the safe transport of liquids and gases in industry, we have the corresponding jointing technologies, fittings, valves, automation products and pipes in our portfolio.



GF Piping Systems headquarters in Schaffhausen, Switzerland.

+ Our market segments

Being a strong partner, GF Piping Systems supports its customers in every phase of the project. No matter which processes and applications are planned in the following market segments:

- Building Technology
- Chemical Process Industry
- Energy
- Food & Beverage / Cooling

- Microelectronics
- Marine
- Water & Gas Utilities
- Water Treatment

+ Global presence

Our global presence ensures customer proximity worldwide. Sales companies in over 26 countries and representatives in another 80 countries provide customer service around the clock. With 48 production sites in Europe, Asia and the USA we are close to our customers and comply with local standards. A modern logistics concept with local distribution centers ensures highest product availability and short delivery times. GF Piping Systems specialists are always close by.

+ Complete solutions provider

Our extensive product range represents a unique form of product and competence bundling. With over 60 000 products, allied with a broad range of services, we offer individual and comprehensive system solutions for a variety of industrial applications. Our automation offering perfectly fits into our complete system approach and is thus an integral part of our portfolio. Having the profitability of the project in focus, we optimize processes and applications that are integrated into the whole system.

Continually setting standards in the market, we directly provide our customers with technological advantages. Due to our worldwide network customers benefit directly from over 50 years of experience in plastics.

From start to finish, we support our customers as a competent, reliable and experienced partner, actively contributing the know-how of an industrial company that has been successful in the market for over 200 years.

Water Treatment

Mankinds biggest challenge in the years to come

Since the late '90s, the water treatment market has been in continuous growth, subject to changes such as the boom of membrane-related technologies. In water scarce countries, it is even regarded to be the most investment-intensive and important industry sector for the next decades. Depending on the application area, our customers have to face different challenges in water treatment processes ranging from securing high water quality, providing reliable measurements to meet stringent regulations.

+ Long lasting solutions

Corrosion-free systems made of plastic provide long-lasting solutions even in harsh environments or when aggressive chemicals need to be conveyed.

+ High process and cost efficiency


Innovative plastic systems warrant the best cost of ownership and the lowest maintenance costs during operation. By providing a wide range of high automated products GF Piping Systems allows both economical operation and safe processing.

+ Sustainable process management

Thanks to outstanding flow performance and smooth inner surfaces, the use of plastic components contributes to an increased flow rate and reduced energy requirement. These factors result in a positive impact on the carbon footprint.

+ System approach

Offering more than 60 000 standard products, GF Piping Systems is able to provide the most adapted and complete system solutions for all applications in water treatment.

A high-speed photograph of water splashing into a pool of water. The water is captured in mid-air, creating a dynamic and energetic scene. The background is a soft, out-of-focus light blue, which makes the dark, clear water stand out. The lighting highlights the individual droplets and the overall flow of the water.

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.

Application Areas

Drinking Water

Intelligent technologies and products of absolute reliability make valuable contributions to the future

The shortage of drinking water and the subsequently valuable nature of the resource, gives high significance to an efficient purification process. Several sources for the production of drinking water - varying from groundwater and sea water through surface or brackish water - have been exploited over the years, demanding diverse treatment efforts. In this context, legal and normative standards, together with specific requirements of the distribution grids, give direction to the design of the processes. With complete solutions made of plastics, we offer an extensive product portfolio, serving the increasing demand for potable water worldwide.

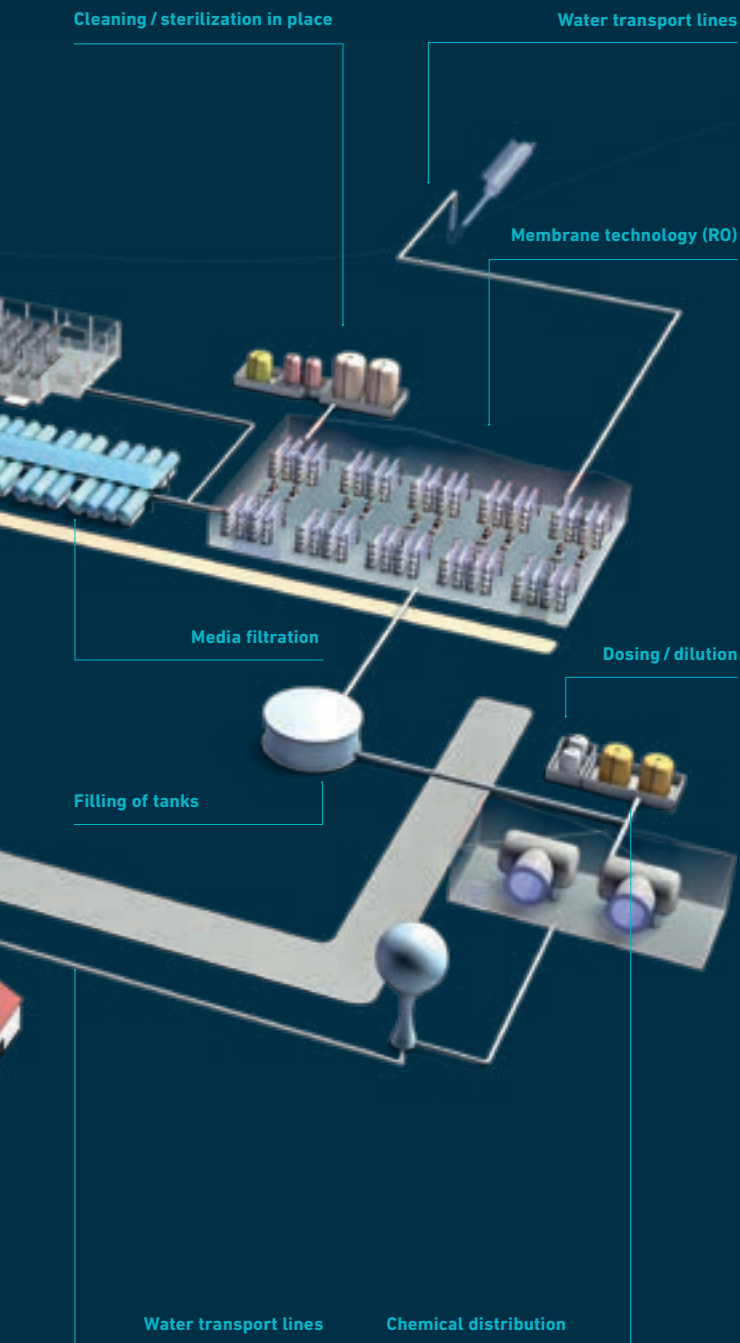


Potable water plant, City of Akron, Ohio USA.



Innovative solutions for a continuously growing market

Ensuring drinking water supply worldwide is one of the key challenges today and therefore one of the most important and fastest growing industry sectors. Systems for water intake, production, purification and distribution need to adapt to the diverse regional conditions. Despite the differences, a constant high water quality is required throughout the whole process, which places high demands on the system solution.



Applications in drinking water production

GF Piping Systems offers the optimal system solution behind the scenes

Producing drinking water is a demanding challenge which requires the right systems behind the scenes. Depending on the application area, the choice of plastic material for pipes, valves and fittings - according to their chemical and mechanical properties - is essential for a long-lasting system. By choosing the appropriate instrumentation for measurement, control and chemical dosing processes, a constant water quality can be ensured. Furthermore, the automation and technology setting is one of the decisive aspects to optimise total cost of ownership. 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.

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Product quality combined with outstanding service

The products of GF Piping Systems provide maximal operational safety, quality and reliability. Together with worldwide support, individual services and expert teams on site, GF Piping Systems offers a valuable all-in-one solution for the water treatment industry.

Added value for our customers

With system solutions comprised of high-quality components from GF Piping Systems, our customers profit sustainably from:

- Reliable and safe operation
- High compatibility

- Competent project support
- Simple, fast and high-quality installations
- Long lasting systems
- Very economical solutions

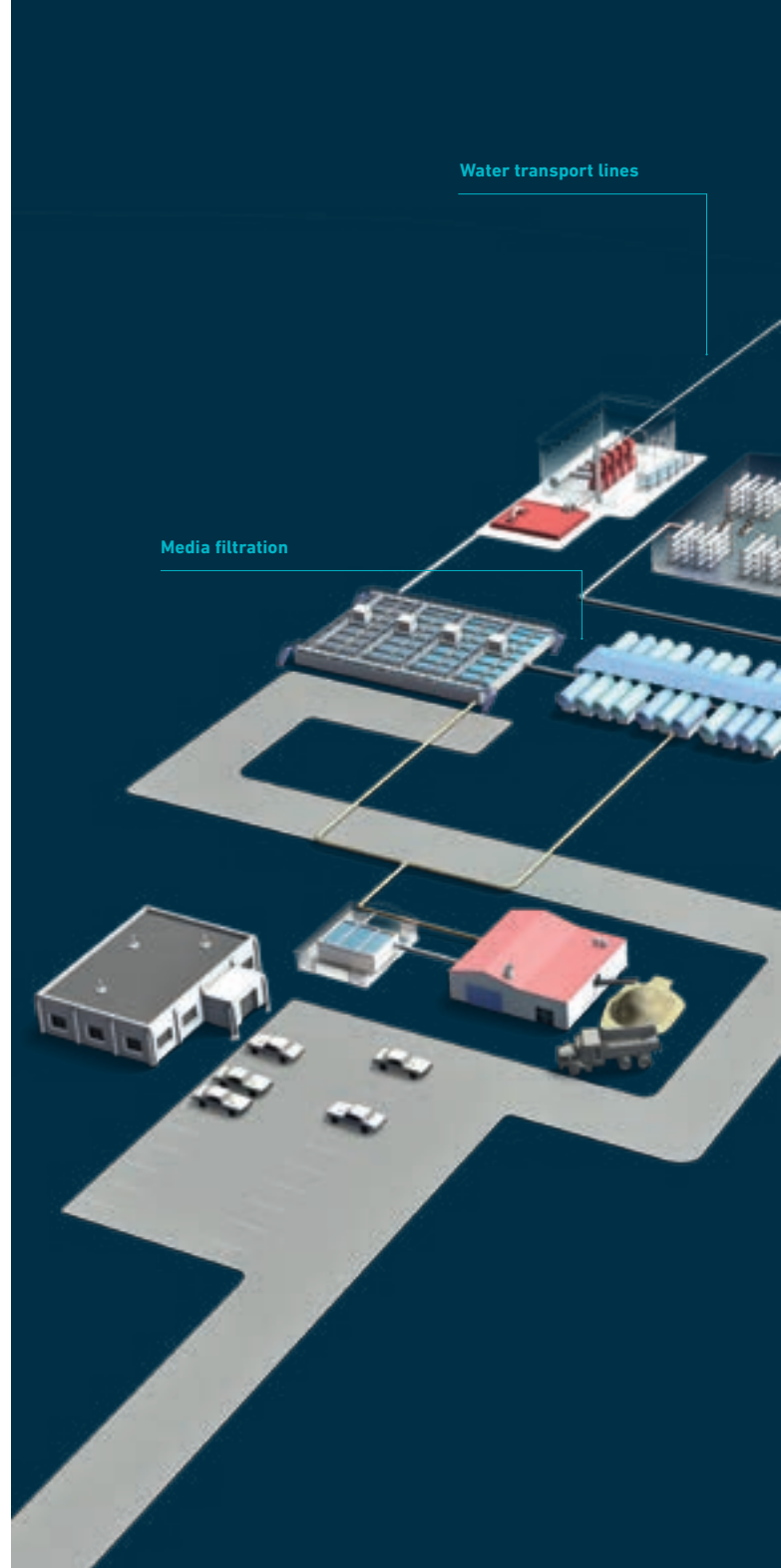
Plastic systems - covering every single sub-process of drinking water production - offer a not only equal, but also more economical solution compared to the conventional metal solutions. Therefore plastics play an important and continually growing role in the technology and process design of future projects in the potable water sector.

Industrial Process Water

Solutions from GF Piping Systems exceed the high quality requirements the industry puts on industrial water treatment

Water is an essential and indispensable element in nearly all industrial processes. In sectors such as food and beverage or pharmaceutical production, water is either used as a primary product or in the area of cooling, steam generation or boiler feed systems. Using water in the industrial environment requires consistently high water quality, namely precisely defined physical parameters like ion purity, acidity or conductivity.

Process water plant, petrochemical industry, Germany.



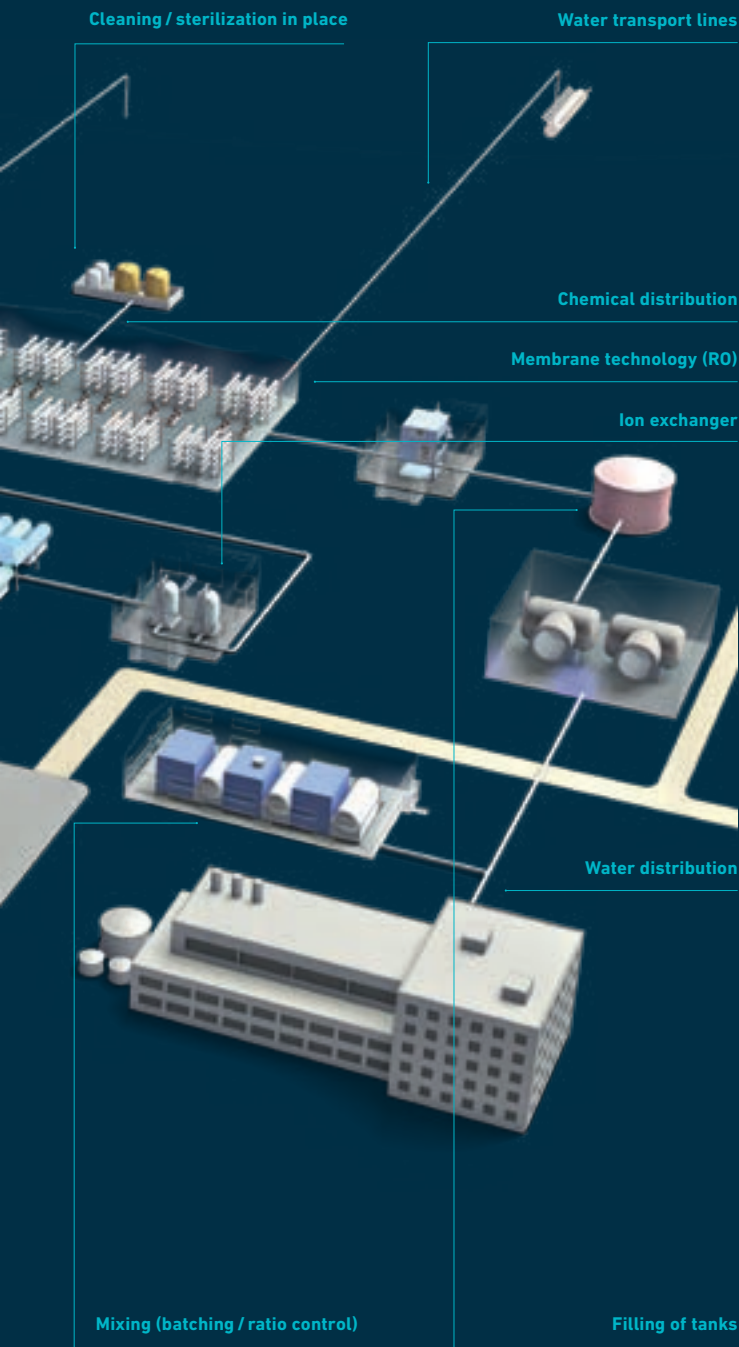
Covering the entire process

High water quality is required throughout the entire industrial production environment and is therefore a complex and demanding segment of water treatment. GF Piping Systems, with its wide range of products for every process step, offers comprehensive solutions for all applications from chemical dosing systems and media filtration applications to ion exchangers.

Applications in industrial process water

Long lasting solutions with a focus on high water quality and purity

High water quality in terms of purity for feed boilers, production processes and cooling systems is the key requirement and an absolute necessity for industry today. Avoiding any form of contamination, scale formation and corrosion is achieved through applications such as deionization, electro dialysis and new membrane-based solutions. The plastic products and additional technologies provided by GF Piping Systems support the industry in designing an efficient, reliable and cost-effective water treatment system. High quality valves, plastic materials such as ecoFIT (HDPE), PROGEF (PP) and PVC-U as well as instrumentation technologies warrant a long service life, regardless of how challenging the specific needs for pure industrial process water may be.



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Application-oriented systems for maximum efficiency

Regarding process water applications, plastic offers the most qualified material properties. Thanks to the pure material characteristic of PROGEF (PP) and SYGEF (PVDF) systems, water purity can be ensured throughout the entire process. The unique system life time - calculation factor based on 25 years operation - along with simplicity and robustness of welding and installation allows a cost-efficient and economic usage.

Added value for our customers

GF Piping Systems complies with the high and specific requirements of the industry, providing reliable quality systems characterized by:

- High efficiency over the entire operation lifetime
- Ease and robustness of welding and installation
- Corrosion resistance
- High purity systems
- On-site support
- Long service life
- Cost-efficiency

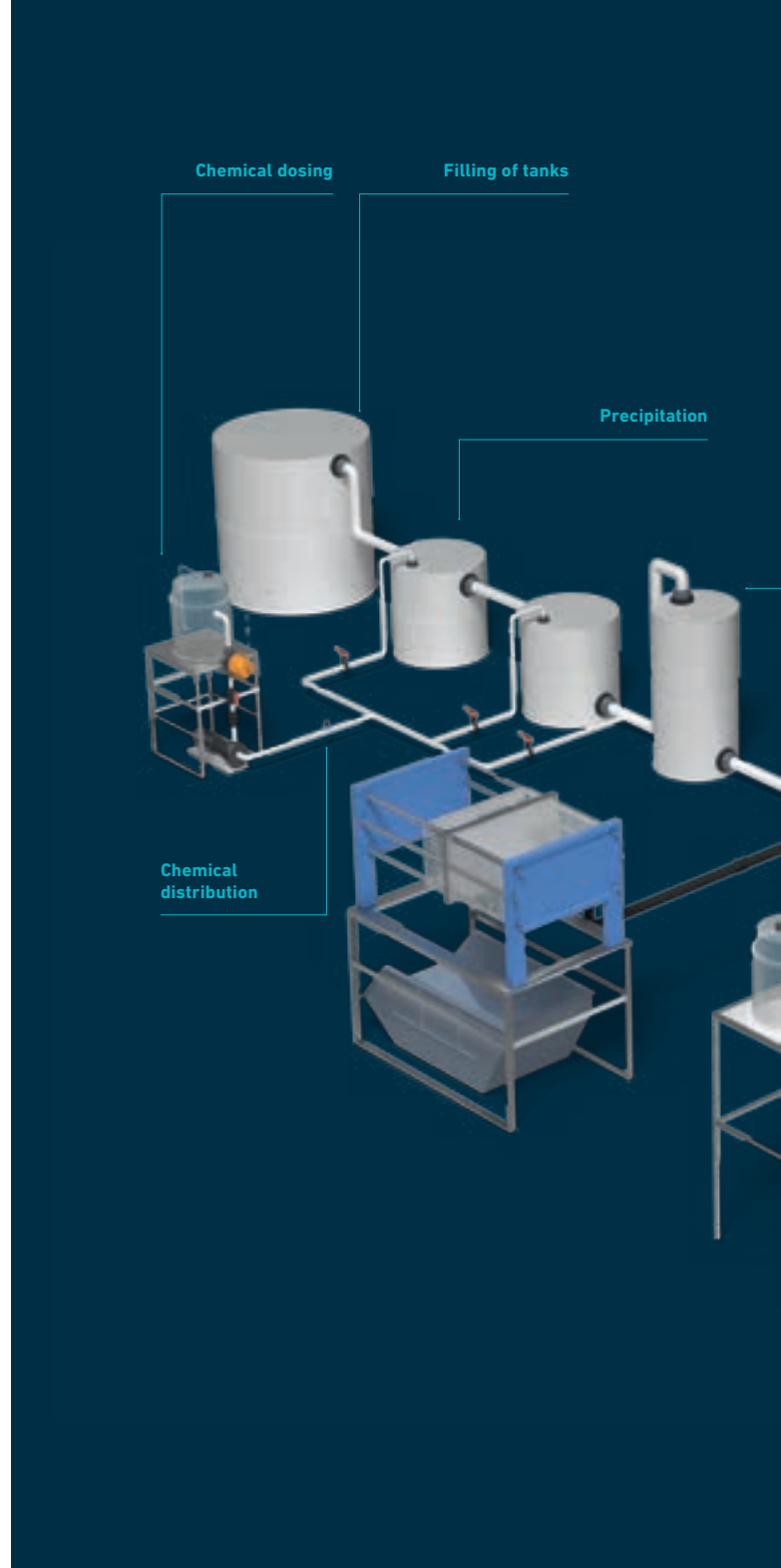
Application Areas

Industrial Waste Water Treatment

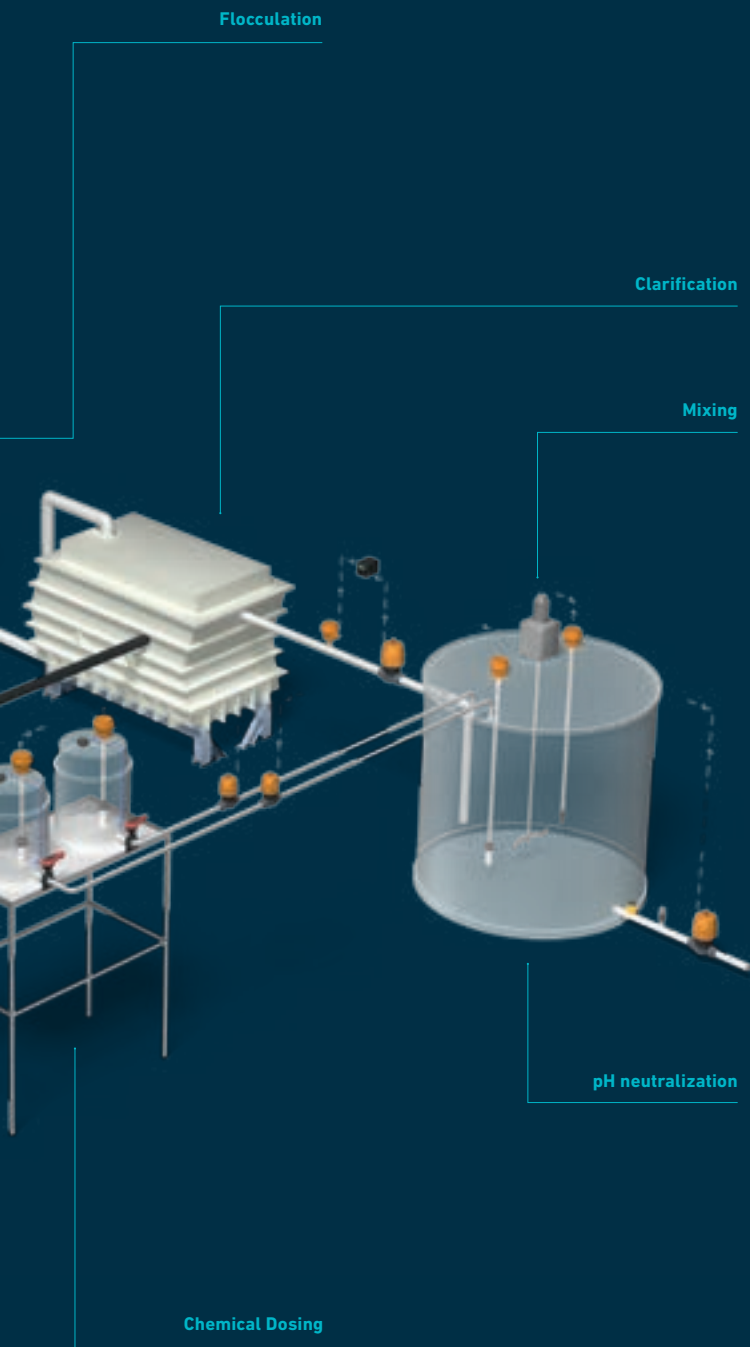
Diminishing water quality of Earth's rivers and lakes – GF Piping Systems helps preserving them with high grade equipment for industrial waste water treatment plants

Power plants, petrochemical complexes, steel mills, ore processing facilities and many, many other water intensive industries are increasingly forced by authorities to clean their waste water before disposal into rivers and lakes.

Heavy metal waste water treatment plant, electroplating company, Germany.



GF Piping Systems provides a large variety of products for safe transport of high toxic and corrosive waste water streams from any kind of industries. Besides process pipes we have a fully integrated solution for any other pipe requirements on waste water treatment plants such as for media like compressed, air flushing water, drinking water etc.



Treatment of inorganic waste streams

Cost effective solutions from GF Piping Systems for safely conveying corrosive fluids even at elevated temperatures

Waste water treatment plants for inorganic caustics and acids are small chemical plants themselves. Corrosion resistance and staff safety are the top priority issues for waste containing piping systems. GF Piping Systems' philosophy for safe transport of liquids and gases meets these advanced process needs. GF products are designed for a maximum of uptime reliability and maintenance simplicity and a minimum of energy consumption during operation.

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Enclosing industries waste streams

Common to nearly all types of industrial waste water is that they are either environmentally toxic or dangerous for operator staff on site. In order to avoid any contact for environment and operators with the industrial waste streams GF Piping Systems develops reliable plastic piping products and the complying jointing methods as well.

One stop shop provider

From the vessel over the pump up to the discharging basin - GF Piping Systems is a real one stop shop provider for the different needs in transport of waste water. Following our customers' requests to have any required equipment for a

complete piping solution we have included instrumentation and automation technology into our focus.

Added value for our customers

From the earliest beginning of the plant design we support our customers with our know how and experience in design and execution of piping solutions.

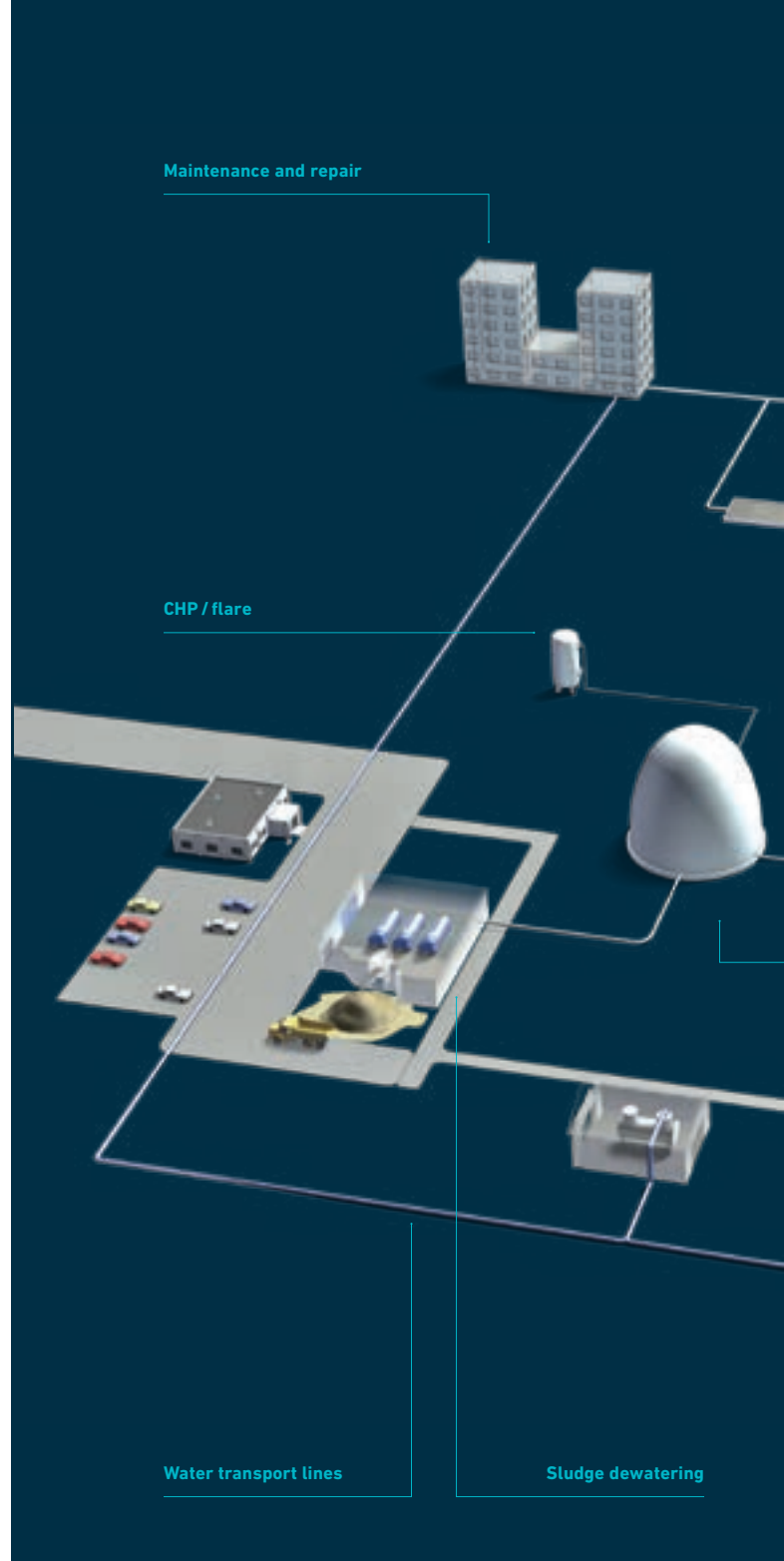
Municipal Waste Water Treatment

Advanced solutions from GF Piping Systems give an answer to one of the world's most urgent water challenges

Installation of efficient and environmentally-friendly methods for municipal waste water treatment plants is one of the main challenges of our time. Key developments such as the combination of waste water treatment plants with water recycling processes aim for optimization regarding quality, life-cycle costs and environmental requirements. Instead of discharging the treated effluent into a receiving water, reuse systems arrange further purification steps until the waste water reaches either potability status or fulfils an industrial specification. Advanced plastic solutions meet those challenges, allowing significant process optimization at the same time.



Wastewater treatment plant, ARA Bülach, Switzerland.



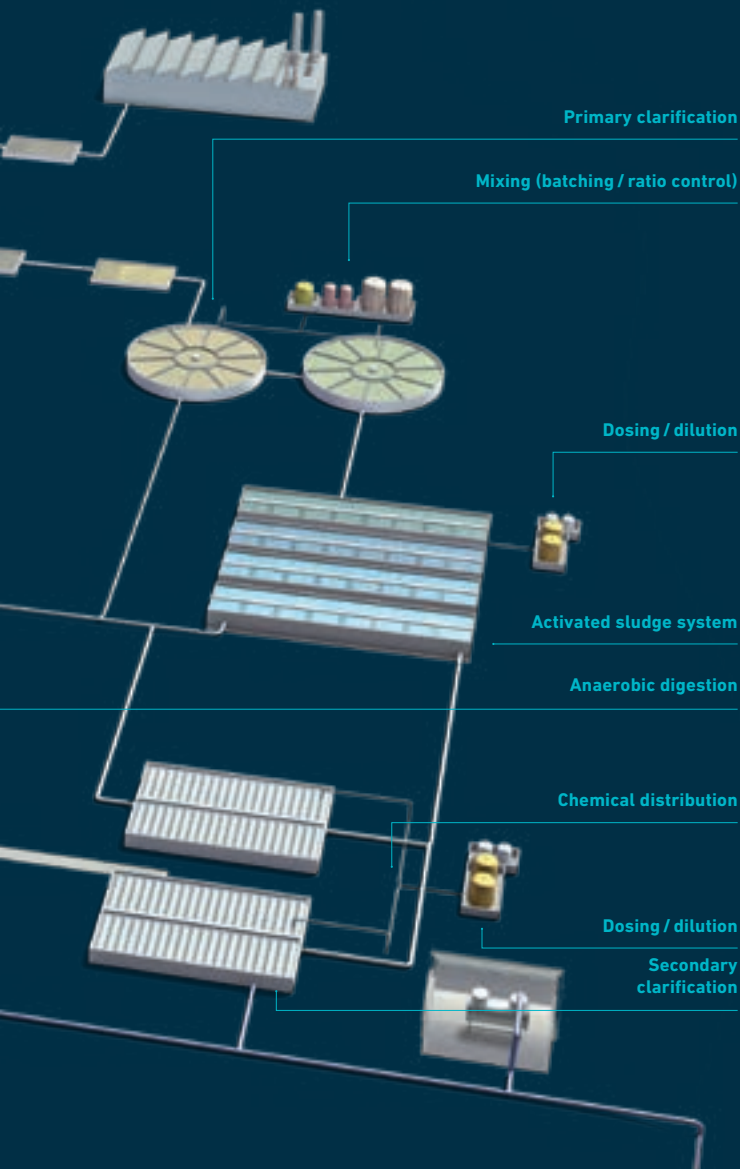
Strengthening sustainable water treatment

Waste water treatment consists of a combination of physical, chemical and biological processes to remove solids or organic matter from waste water, allowing water discharge or sustainable water recovery. Local regulations monitor the discharge and recycle processes by carefully checking the outfall water quality. Systems for waste water treatment operations - supplied by GF Piping Systems - optimise the fluid transportation and treatment, consequently encouraging today's higher environmental awareness.

Applications in biological waste water treatment

State-of-the-art systems from GF Piping Systems for efficient and environmentally-friendly waste water treatment

Stringent regulations and binding laws demand state-of-the-art technologies in sewage plants today. Membrane technologies, chemical dosing systems and polymer preparations are only some of the applications that require efficient and safe water conveyance systems. Meeting high requirements in terms of process quality and safety as well as concerning environmentally relevant factors needs to be warranted. With its complete and dedicated range of products, GF Piping Systems offers reliable and innovative solutions for the waste water treatment process. Combined with the appropriate automation technology, proven plastic systems like ecoFIT (HDPE), PROGEF (PP) or PVC allow entire water reclaim applications to optimize their efficiency and their safety along with a long system life cycle.



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Highest safety in focus

Plastic systems combined with the right jointing technology and the appropriate measurement and control devices guarantee safe operations, handling waste water itself or chemicals within the process. Many approvals and certifications confirm the fact, making GF Piping Systems a reliable and professional partner in waste water treatment.

Added value for our customers

If total life cycle costs are considered, GF Piping Systems scores with low initial and running costs, offering the best economical solutions for waste water treatment. Besides valuable cost-efficiency aspects, the products of GF Piping Systems offer an optimum of control, safety and reliability to fulfill binding regulations:

- Less maintenance costs
- Leak- and corrosion-free systems without incrustations
- Less labour costs
- Lower energy consumption for water transportation
- Long system life cycle
- Highest process safety

Membrane Technology

Membrane technology is a future-oriented technology and includes diverse filtration techniques that are all based on different degrees of membrane porosity. This technology is increasingly being implemented to harvest drinking water and process water from surface water and seawater. This is an ideal application area for corrosion-free piping components made of plastic. Complete solutions from GF Piping Systems offer a maximum of security and profitability for efficient processes, for instance by eliminating maintenance costs caused by rust and deposits. Furthermore, GF Piping Systems provides a limited 25-year warranty on the whole piping system.

Main benefits

Safety	Many material approvals
Simplicity	Customization on site possible
Efficiency	Compact design
Environment	The carbon footprint is 25 percent lower compared to metallic systems

Key products in membrane technology

+ Safety



Diaphragm valve, pneumatic type DIASTAR Ten

Ideal for all standard applications up to 10.0 bar that require integration of accessories. With the corresponding interface, it is easy to connect it into the system control. The DIASTAR Ten also offers the option of having a PTFE membrane.

+ Simplicity



DryLoc® pH/ORP sensor electrode type 2750

The electronics offer automatic temperature compensation as well as automatic configuration for pH or ORP operation. The sensor electrodes are available for integrated in-line assembly as well as for submersible installations and have a 4-20 mA output.

Multiparameter controller
type 8900

Diaphragm valve, pneumatic
type DIASTAR Ten

Ball valve, manual
type 543

Variable area flow meter
type 335 / 350

DryLoc pH / ORP sensor electrode
type 2724 including preamplifier
type 2750

Conductivity electrode
type 2850

Flow sensor
type 2536

Electromagnetic flow sensor
type 2551

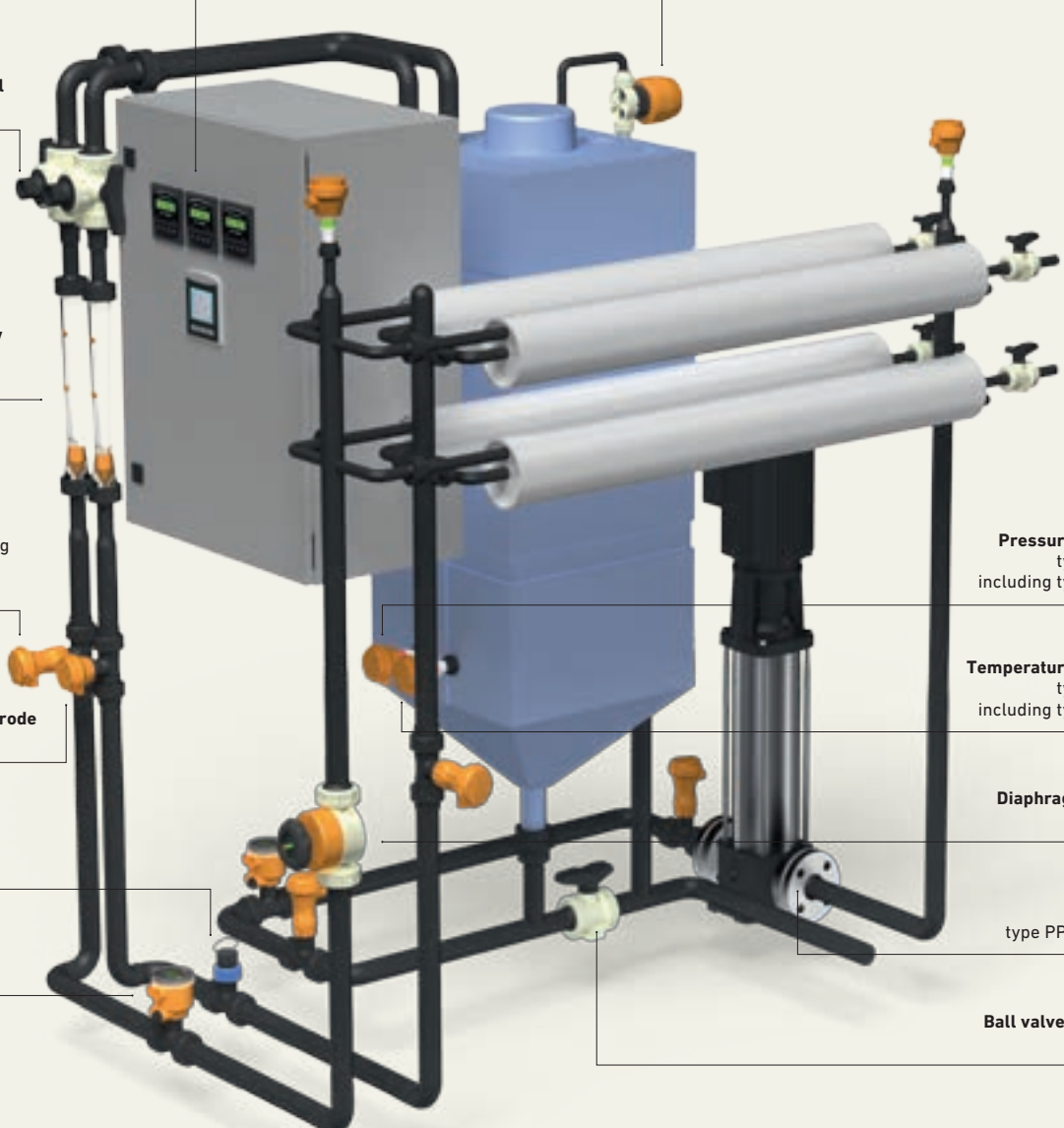
Pressure sensor
type 2450
including type 8050

Temperature sensor
type 2350
including type 8050

Diaphragm valve
type 514

Flange
type PP-V, DN32

Ball valve, manual
type 546



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+ Efficiency



Conductivity electrode type 2839-2842

The product range includes conductivity electrodes with four cell constants from 0.01–10.0 cm⁻¹. They are suitable for monitoring high-purity water qualities and for deionization regenerating. The 316 SS electrodes are fitted with injection-molded PEEK™ process connections and insulators.

+ Environment



3-way ball valve type 543

The valve for all mixing and diverting processes, offering highest quality, operational flexibility and safety in any application. Available in horizontal or vertical configurations, and operated manually, pneumatically or electrically, the 3-way ball valve allows a wide range of options.

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.

With a selective combination of pressure control valves, flow meters and control instrumentation, a plastic system is easily constructed to customer specifications.

Main benefits

Safety	Fully automated process
Simplicity	CAD data for easy planning
Efficiency	High dosing precision, using fewer chemicals
Environment	Energy savings thanks to smooth surfaces (no incrustation)

Key products in dosing / dilution

+ Safety



Pressure relief valve type 582 / 586

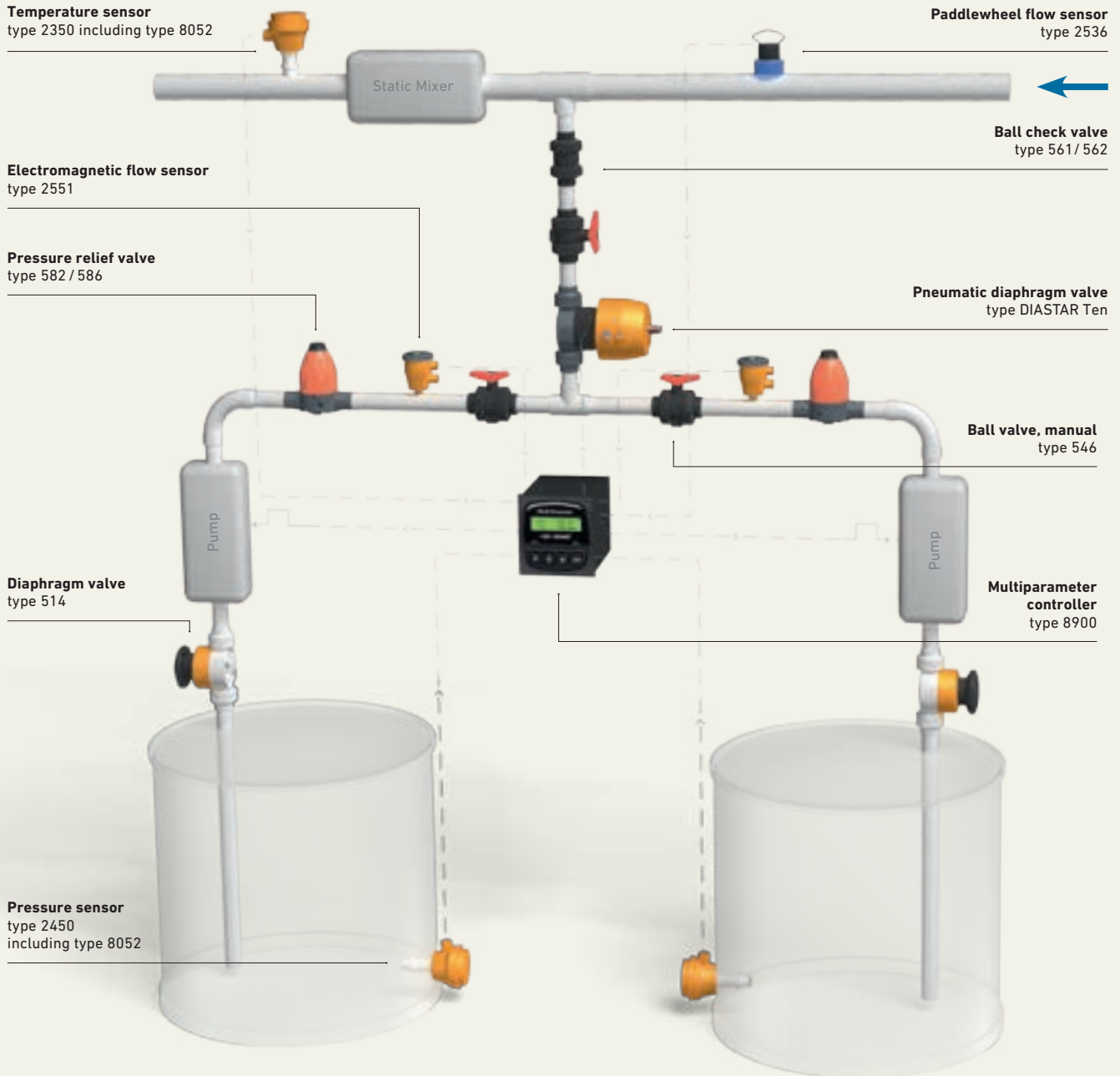
Pressure relief valves types 582 / 586 serve to monitor working or system-related pressure, to equalize pressure pulses and to reduce pressure peaks with good control characteristics. The optional available pressure gauge simplifies the start-up of the system significantly.

+ Simplicity



Ball valve type 546

Quality, design and innovative features make this ball valve unique. A modular system and compact design with many connection options ensure maintenance-free operation. Furthermore, two O-rings on the stem giving added safety features.



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+ Efficiency



Diaphragm valve type 514

The optimal flow geometry provides twice the flow with the same amount of energy. Installation dimensions identical to previous models allow easy backward compatibility. Innovative body design with no metal fasteners.

+ Environment



Temperature sensor type 2350

The Signet temperature sensor's PVDF housing is injection molded in one piece and has excellent chemical resistance. It withstands aggressive media considerably longer than metal sensors.

Neutralization

In many water treatment processes, the water needs to be adapted to a pH-value that complies with treatment specifications. For example, waste water must be neutralized before it is fed into public treatment plants. Alkaline or acidic waste water is regulated by adjusting the pH-value. For alkaline neutralization, several chemicals like caustic soda are generally used direct or in combination with a precipitation of soda solution. Sulphuric acid, hydrochloric acid or carbonic acid are often used as acids in a batch process. GF Piping Systems, with its custom-made solutions in measurement and control technology, offers high process reliability and cost optimization in this cost-intensive area.

Main benefits

Safety	Fully automated process
Simplicity	Only one controller required
Efficiency	Reduced chemical requirement
Environment	Less waste water

Key products in neutralization

+ Safety



Multiparameter controller type 8900

The Signet multiparameter controller has perfected the concept of modularity. It is equipped with the combination of inputs, outputs and relays specified by the user. The unit accepts up to six input devices to measure flow rate, pH value, conductivity, pressure, level and temperature.

+ Simplicity



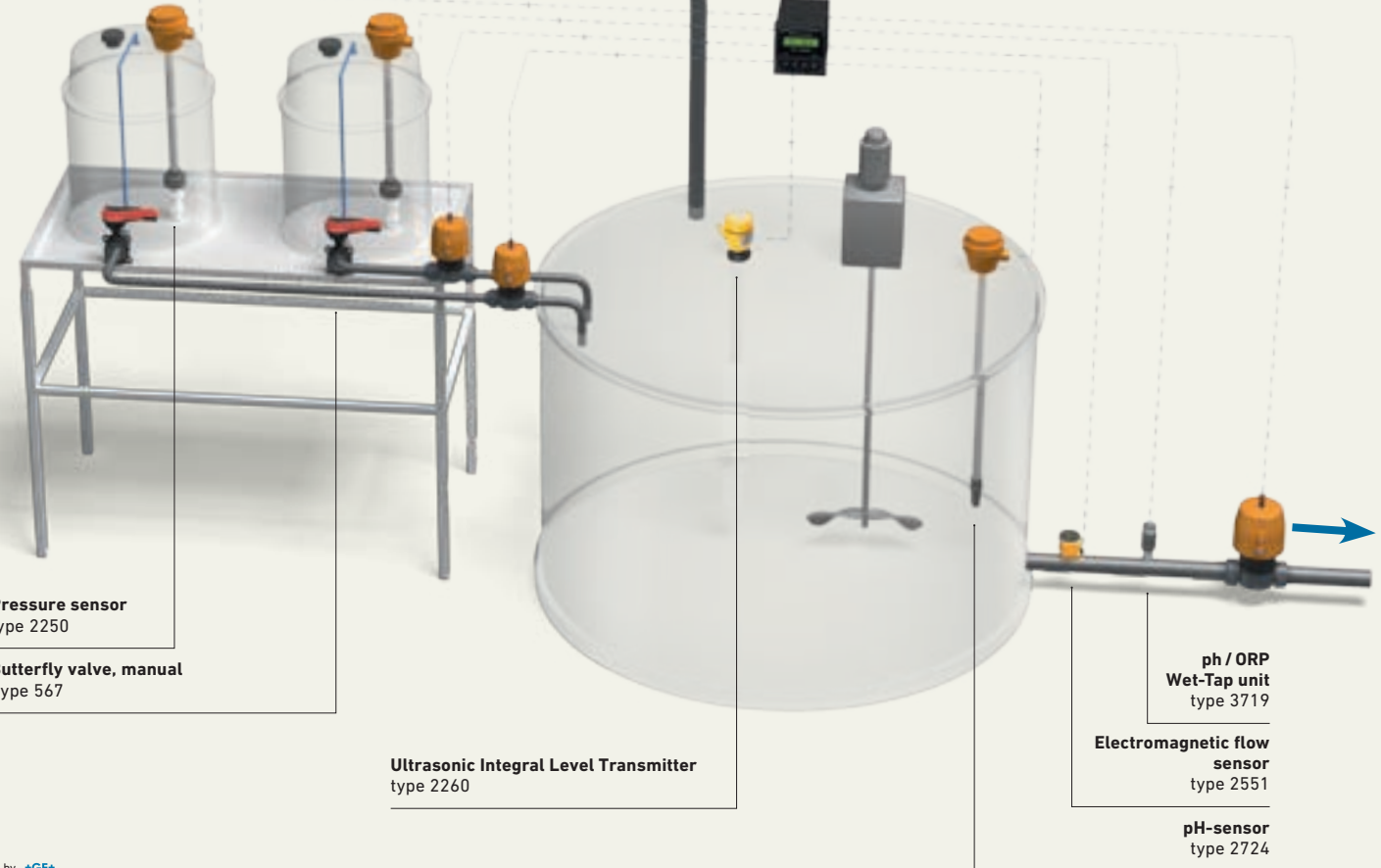
Electromagnetic flow sensor type 2551

The patented magnetic flow sensor type 2551 (size range: DN15–900 mm) is an insertion sensor without moving parts. All versions are corrosion-resistant to ensure a long service life and minimal maintenance costs. The sensor is also available as a metal version, type 2552 (up to DN2550 mm - 102").

Pneumatic diaphragm valve
DIASTAR Six

Multiparameter controller
type 8900

Temperature sensor
type 2350 including type 8052



Pressure sensor
type 2250

Butterfly valve, manual
type 567

Ultrasonic Integral Level Transmitter
type 2260

**pH / ORP
Wet-Tap unit**
type 3719

**Electromagnetic flow
sensor**
type 2551

pH-sensor
type 2724

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+ Efficiency



Pneumatic diaphragm valve type DIASTAR Six

The cost-efficient solution with long service life for elastomer diaphragms up to 6 bar. It unites high quality with the basic functions of a pneumatic actuator. Optimal flow geometry provides twice the flow with the same amount of energy. Backward compatibility to previous models is also warranted.

+ Environment



pH / ORP Wet-Tap unit type 3719

With the pH / ORP Wet-Tap unit type 3719, pH or ORP electrodes can be installed or removed during routine maintenance work and electrode calibration without switching off the process. Two O-rings on a special, compact pull-back unit ensure process isolation – without a separate valve.

Media Filtration

Despite new developments in the pre-treatment area, the classical sand filtration also called media filtration is still very much in use in water treatment processes. Pressurized water typically flows top down, passing several material layers while leaving suspended particles in the process. In the multi-level filtration processes, anthracite or stones are used as well as sand to remove particles up to 10-15 µm from fluids. Due to the need of several operation modes, filters require numerous valves, bypass actuators as well as adapted measurement and control technology. Application-oriented system solutions from GF Piping Systems help to achieve these processes efficiently.

Main benefits

Safety	High reliability and process safety thanks to over 50 years experience
Simplicity	Complete fieldbus compatibility
Efficiency	Pre-assembling of critical pipelines for fast installation
Environment	Lower carbon footprint compared to stainless steel

Key products in media filtration

+ Safety



3-way ball valve type 543

The valve for all mixing and diverting processes, offering highest quality, operational flexibility and safety in any application. Available in horizontal or vertical configurations, and operated manually, pneumatically, or electrically, the 3-way ball valve allows a wide range of options. Integrated tools and fixing systems simplify installation and removal.

+ Simplicity



Butterfly valve type 140

Easily adaptable to a variety of conditions or applications and available in several materials, the electrically actuated butterfly valve offers highest operational flexibility. With the optional electric positioner, it goes from being a simple on/off valve to a precise flow control device, integrated into systems such as PLC controlled systems.

Gauge guard
type Z 700

Multiparameter controller
type 8900

Swing Forks
type 2280

Butterfly valve, electric
type 140

Electromagnetic flow sensor
type 2551

Flange
PP-V, DN50

pH Sensor
type 2724 / 2750

ORP Sensor
type 2725 / 2750

3-Way ball valve
type 543

Pressure sensor
type 2450

Ball valve, manual
type 546

Cone check valve
type 561 / 562

DryLoc® conductivity sensor
type 2850

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+ Efficiency



Swing Forks type 2280

Vibrating fork level switches are suitable for level detection of liquids or granular, powdered solids. Mounted on tanks filling / emptying can be controlled using these devices just as well they can generate failsafe alarms providing overflow- or dry run protection.

+ Environment



Pressure sensor type 2450

The 2450 Signet pressure sensor has a one-piece injection molded PVDF body and a ceramic diaphragm for superior compatibility and highest precision, especially in corrosive liquids. Built-in temperature compensation provides outstanding accuracy over wide temperature ranges. It is available with digital or field scaleable output.

Ion Exchanger

Demineralization units (deionization, reverse osmosis, distillation techniques) secure the production of pure high quality process water in the industrial environment. Water purification, separation and decontamination of aqueous and other ion-containing fluids characterize applications in that water treatment area. In this context, ion exchangers are used to 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. GF Piping Systems provides complete solutions of high-quality piping systems warranting a maximum of flexibility while ensuring an entirely safe plant operation with a maximum up time.

Main benefits

Safety	Product lifespan of 25 years
Simplicity	In-house customizing
Efficiency	Compact skids for fastest installation processes
Environment	Lowest carbon and water footprint compared to steel systems

Key products in ion exchanger

+ Safety



**Ball valve
type 546**

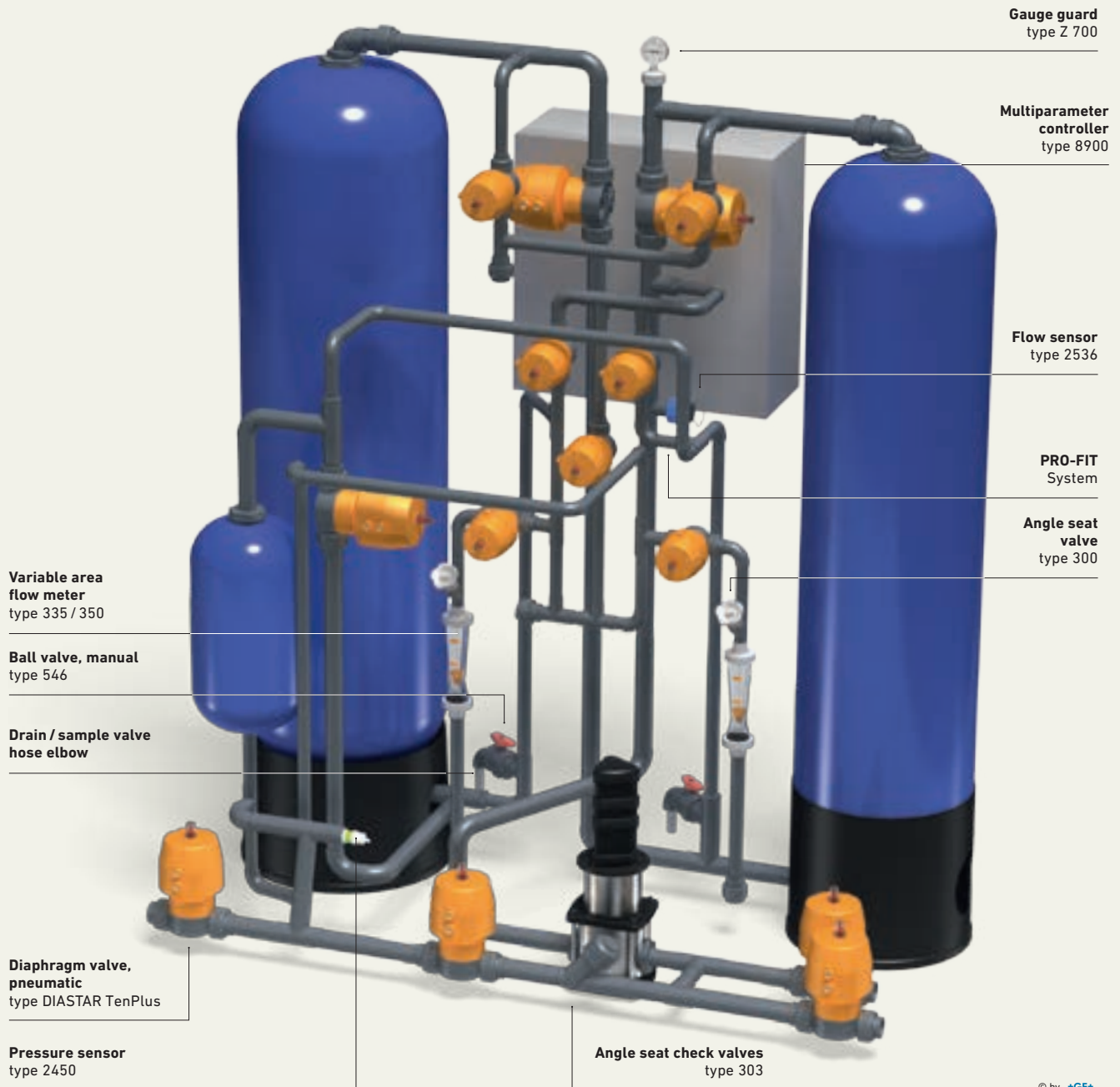
Quality, design and innovative features make this ball valve unique. A modular system and compact design with many connection options ensure maintenance-free operation. Furthermore, two O-rings on the stem giving added safety features.

+ Simplicity



**Pneumatic diaphragm valve
type DIASTAR TenPlus**

This type has the strongest actuation and the highest closing forces. It is implemented wherever high line pressure, up to 10 bar, needs to be reliably controlled. Together with a maximum of operational safety, efficiency and flexibility are valuable characteristics.



© by +GF+

+ Efficiency



PRO-FIT System

The innovative and unique socket-spigot system saves labour time, space as well as material and installation costs. Its compact design with up to 20 percent closer spacing in axial distances, less cementing effort and reduced material requirements through direct transitions are main advantages resulting in maximum of efficiency.

+ Environment



Variable area flow meter type 335 / 350

The large range of these radially dismountable measurement devices opens the way for a wide array of uses with diverse media. For example, the type 350 is available in the installation length 350 mm. The great advantage is the easy-to-read measured value without electrical connections.

Chemical Distribution / Conveyance

To transport chemicals from a storage tank to the areas of use, we need pumps and pipe systems. The material selected for the transport lines, storage and measurement of a chemical must be compatible with the chemical's properties. All chemicals must be handled in such a way as to minimize the probability of stress cracking in plastic piping. Double containment systems and special jointing technologies, such as infrared and bead- and crevice-free fusion, are additional parameters that should be taken into consideration when selecting the right system. The expert teams at GF Piping Systems advise our customers, at their request, on how to configure the individual system and support them in developing customised solutions.

Main benefits

Safety	Double containment piping system is an option
Simplicity	Easy to retrofit
Efficiency	Fast, easy and safe installation
Environment	Leakproofness with reliable connections prevents failures

Key products in chemical distribution / conveyance

+ Safety



Double containment system CONTAIN-IT Plus

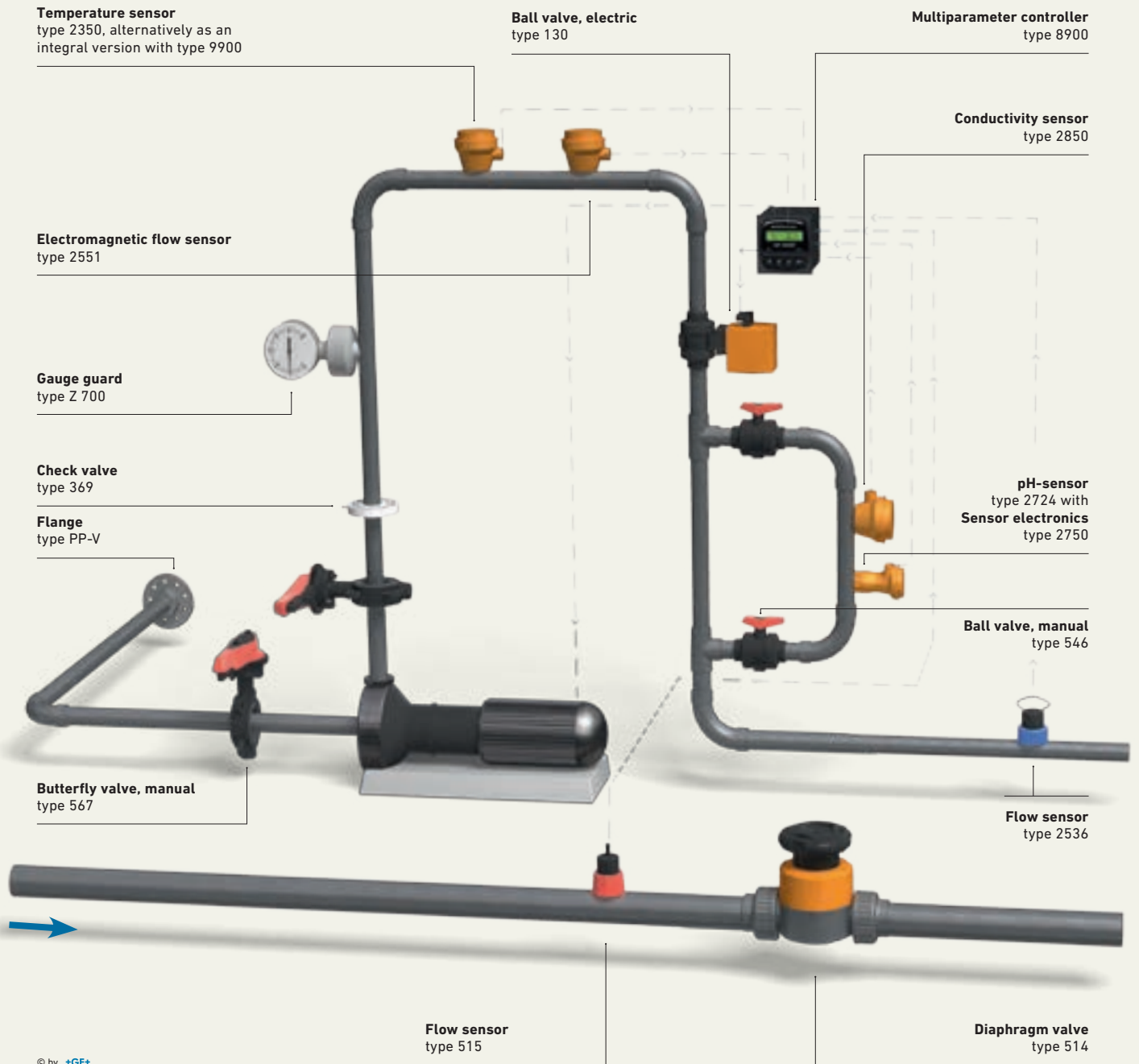
Wherever environmentally hazardous media is transported, double containment piping systems and leak monitoring can be implemented to virtually exclude the risk of accidents. The innovative technology permits laying the inner and outer pipeline separately. Pressure testing is done before final jointing is carried out.

+ Simplicity



Temperature integral system, sensor type 2350 & type 9900

The Signet sensor has a one-piece PVDF injection molded housing that is ideal for use in high purity applications. In aggressive liquids it is superior even to metal sensors and eliminates the need for expensive immersion sleeves. The system is also available as a blind version.



+ Efficiency



Butterfly valve type 567/578

The double eccentric operating principle of the butterfly valve type 567/578 guarantees good friction behavior and therefore less wear and tear compared to conventional centric butterfly valves.

A high level of security against water hammer is thus provided.

+ Environment



Paddlewheel flow sensor type 2536

The robust paddlewheel flow sensor with highest repeat measurement accuracy is easy to install and offers exceptional added value with little to no maintenance required.

The type 2536 has an open collector output with a flow value range of 0.1 – 6.0 m/s.

Further Applications

Further applications in water treatment

For over 50 years, GF Piping Systems has enjoyed considerable success in developing application-oriented plastic system solutions for the water treatment 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 technical and economic efficiency of processes. When planning and implementing our individual solutions, factors such as flexibility, quality and reliability particularly set apart our services and guarantee added value for our customers.

Water distribution



Connecting mains, supply pipes and hydrants safely and reliably is crucial for water distribution. GF Piping Systems offers a comprehensive package of products that includes typical diameters of 355 mm as well as larger dimensions with an average pressure of 6.0 bar, but which can reach 25.0 bar or higher.

Filling of tanks



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

Mixing (batching and ratio control)



GF Piping Systems has a comprehensive line of products complying with various health, waste water and safety regulations. Our measurement and control technology ensures precisely-controlled batch processes. In addition, ratio control devices - used when mixing and blending liquids - assure that process variables are kept at the same ratio even if they are changing in value.

Sludge dewatering



Dewatering the separated solids from the liquid phase is a central process in water treatment. GF Piping Systems provides easy to install and robust systems for conveyance of both thickened sludge and clear water from dewatering units.



Seam gas / LNG



During gas extraction and distribution, a number of challenging processes exist. Products and systems from GF Piping Systems offer intelligent solutions to tackle many of these demanding operations, enabling efficient and safe processing in key application areas such as water treatment, distribution, chemical dosing and compressor stations.

Water transport lines



Water transport pipelines convey water from the source to the point of use. Plastic pipelines are an optimal solution here because they are laid quickly and are also safe and corrosion-free. All the components from GF Piping Systems can be joined together reliably and in a cost-effective way.

Water and gas - maintenance and repair



It is estimated that 20 to 30 percent of water production is lost or cannot be accounted for. For older networks, the losses could be up to 50 percent. The reasons for these losses are leaks, measurement errors, pipe cleaning or theft. GF Piping Systems offers innovative products for fast repair and dependable monitoring and maintenance of the water network. Solutions to repair up to 2800 mm available.

Cleaning in place / sterilization in place



Cleaning and sanitizing are among the most critical aspects to ensure a hygienic water production environment. With the emergence of membrane technology in water production, the need of higher efficiency increased. GF Piping Systems offers innovative and modular CIP solutions, giving our customers a competitive edge in terms of technology, handling, sustainability and cost effectiveness.

Further Applications

GF Piping Systems develops application-oriented system solutions that enable profitable operations and are ideally suited for the water treatment industry.

The specific value-adding services that complement our solutions are as diverse as our customers and their individual requirements.

Ballast water treatment on ships



In the future, proper treatment of ballast water in worldwide maritime traffic will be handled more stringently by the IMO. A new regulation will assign the retrofiting of vessels with approved ballast water treatment systems. With plastic solutions from GF Piping Systems, characterized by chemical and corrosion resistance, customers successfully face the aggressive marine environment.

Swimming pools



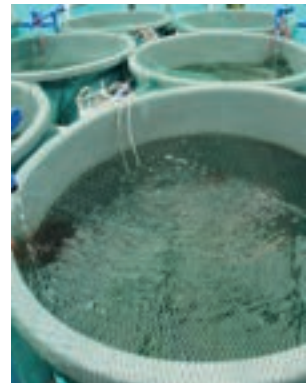
In large cities or tourist facilities, water parks can be referred to as standard. Light-weight plastic solutions from GF Piping Systems allow easy installation of the big dimensioned systems. Low leak rates combined with excellent chemical resistance against disinfectants are making our products to the State of the Art in swimming pool technology.

Asset flow measurement



Water, the most vulnerable world resource, represents an asset that must be managed carefully. The wide instrumentation range from GF Piping Systems for in-pipe, insertion or ultrasonic measurement covers all aspects of asset management, supporting water production and treatment plants in the optimization and control of flow, accuracy and leak detection.

Aquaculture



Advanced water processing solutions are required in modern marine life applications and ocean aquacultures, demanding high quality conditions in off-shore water tanks. GF Piping Systems meets economic, environmental and technological challenges by offering leak-proof pipeworks, control valves of highest reliability and outstanding accuracy of water sensors (e.g. flow, pH, turbidity).

Reference

Drinking Water

PVC-U products of GF Piping Systems replacing 30 year old carbon steel piping on drinking water plant in Croatia.

The city of Virovitica in Croatia is located near to the Hungarian border. Its water works company Virkom serves approximately 20.000 people daily with drinking water. In order to assure required European potable water standards, Virkom decided in 2008 to replace the existing old sand filtration units (total flow rate approx. 320 m³/h) by new ones.



Project Background

After 30 years of operation the old sand filtration units with carbon steel piping faced severe corrosion and incrustation problems. In order to secure the drinking water supply Virkom had to react. First it was planned to install stainless steel pipes and valves for the new filters. Croatian long term GF Piping Systems partner PTMG convinced both end customer and engineering company of the significant advantages of plastics versus a metal piping solution. PTMG suggested to split up the project in two phases in order to prove the reliability of PVC-U products. In a first step three of the sand filters have been executed in 2008. Due to the high quality and simply to install solution, Virkom decided in 2010 to do the remaining six filters with PVC-U products from GF Piping Systems as well. Having made good experiences Virkom decided in 2012 to execute a third extension phase of the plant with additional five sand filtration units in PVC-U.

Chosen technical solution

State-of-the-art sand filters require robust and long lasting piping solutions. Due to different operation modes for filtration and back flushing numerous automated valves are generally required to operate these type of water treatment units securely. PVC-U pipes and fittings from GF Piping Systems showed considerably lower pressure drop and less tendency for incrustation than common metal pipes. Additionally GF Piping Systems' automated butterfly and ball valves with a warranted minimum open-close cycle performance of at least 50000 actuations show better long-lasting performance than comparable metal valves.

System and product selection

- PVC-U pipes and fittings d20-d255 approx. 300 m
- PVC-U ball valves manually (type 546 – 56 pieces and electrically (type 130 – 14 pieces) operated
- PVC-U butterfly valves manually (type 567 – 28 pieces) and electrically (type 140 – 70 pieces) operated



Sandfilter drinking water plant, Virovitica, Croatia.

Main benefits for the customer

- **Easy and time saving detail design based on availability of CAD files for all PVC-U products**
- **Simple installation procedure compared to stainless steel piping systems**
- **Better pressure loss performance and lower tendency for incrustation compared to metal pipes**
- **Significant lower capital invest than stainless steel whilst all required certificates for drinking water in the European Union are available**
- **On site training support by PTMG for installing staff combined with good availability of GF Piping Systems products in Croatia due to close cooperation between GF Piping Systems and PTMG**

Reference

Industrial Process Water

Whereas GF Piping Systems' high quality scheduled PVC-U products serve the required pretreatment steps.

1 300 m³ / d pure water system for European life sciences production. US industrial water purification specialist MECO Inc. (Mandeville, Louisiana) designed, manufactured and pretested a biotech process water plant based on their patented Master Pure Process Technology.



MECO Inc. (www.MECO.com) was awarded the complete customized solution for a pharmaceutical process water plant including softening, ultrafiltration, carbon filtration and their patented GII Centurbo Vapor compression system for the generation of high quality FDA compliant pure water. The five vapour compression units are able to deliver each 3 000 gph pure water.

Project Background

Life science companies have highest requirements on product quality and process safety. Compliance with international standards as e.g. WFI (Water for Injection) standard is a must. Plant suppliers herefore on the one hand have to deliver high quality equipment and on the other hand to follow the stringent regulations concerning manufacturing, FAT (factory acceptance tests), SAT (site acceptance tests) and documentation. Our plastic products for pharmaceutical process water pretreatment help our customers to meet these high requirements whilst simplifying their internal proceedings as much as possible.



Chosen technical solution

MECO Inc. relies on GF Piping Systems' scheduled PVC-U piping systems because of their proven long term durability and high production quality. The system is simple to install reducing prefabrication costs for the customer.

System and product selection

- PVC-U scheduled 80 pipes and fittings
- PVC-U manual and pneumatically operated ball valves type 546 and 230



MECO UF system with GF Piping Systems PVC-U scheduled piping

Main benefits for the customer

- Availability of scheduled PVC-U products via local distributor Corr Tech Inc.
- Long term customer relationship for similar projects
- Proven quality standards
- One stop shop for all required items of a complete PVC-U scheduled piping system

Reference

Industrial Process Water

Renewal of cooling water blow down system at petrochemical complex in South America.

The thermal production processes in petrochemical plants generate huge amounts of waste heat. Consequently it is mandatory for these plants to have a continuously secure operating cooling water system.

Refineries and chemical plants produce waste heat which is generally transferred via a cooling water system and cooling towers to the atmosphere. State of the art petroleum refineries with a crude processing capacity of about 40 000 metric tons per day have a required flow rate of cooling water of approximately 80 000 l/h . The main challenges in operating such huge cooling water systems are to avoid corrosion, microbiological growth and formation of deposits in the pipes at same time.

Project Background

The existing cooling water carbon steel piping system in a South American refinery was facing severe corrosion problems. This led frequently to operational problems with the cooling of the whole plant. Additionally the refinery was forced by authorities to treat oily water from the truck tank washing facility. Due to that it was decided to solve both issues with the installation of a new water treatment system executed in HDPE.

Chosen technical solution

The solution for the refinery was to switch from carbon steel to an HDPE piping system. GF Piping Systems South America provided the complete scope of HDPE piping products which consisted of standard ecoFIT butt fusion and ELGEF electrofusion fittings. In order to set up the most economical solution for the customer the HDPE 100 pipes have been sourced locally so that consequently transportation costs could be reduced considerably.



Thermal production processes in petrochemical plants, South America



System and product selection

- HDPE ecoFIT butt fusion fittings d63-d355
- HDPE ELGEF electrofusion fusion fittings d63-d355

Main benefits for the customer

- Corrosion proof HDPE piping system for indoor and outdoor installation
- Proven GF Piping Systems HDPE butt fusion jointing technology warranting industrial standards
- Intelligent combination of local sourced products and Swiss made high quality PE100 fittings

Reference

Industrial Waste Water Treatment / ZLD

In aluminum anodizing or painting lines the removal of fluorides and sulphates is the key for successful direct reuse of waste water.

Factories for the surface treatment of metals are traditionally one of the main industrial water consumers producing heavily polluted waste streams. With rising fresh water tariffs and higher restrictions regarding waste water disposal, advanced waste water and reuse treatments are increasingly important for the factories to be competitive on globalized markets.



Project Background

In 2013 C.I.E. s.r.l., an Italian water and waste water treatment specialist for metal finishing industries, has executed its innovative PURAL process technology combined with a following ZLD system in order to treat the waste water from the coil lines of a Greek aluminium company. The plant has the capacity to treat approximately 750 m³/d waste water which can be reused directly at the factory's production. The advantage of the PURAL process is that both sulphates and fluorides are removed in a combined chemical-physical step down to concentrations which allow the further use of state of the art membrane systems for the generation of high quality process water. The concentrates from the membrane units are treated with an evaporation crystallization system.



ZLD plant for aluminium coiling company in Greece.

Chosen technical solution

The PVC-U system combines excellent chemical resistance properties against a wide range of chemicals with long term mechanical durability. Both are features on which C.I.E. s.r.l. relies on in their heavy duty treatment plants. Both additives in the aluminum coil production lines and chemicals for the different steps of the water treatment may change, but the performance of the installed piping systems has to stay the same. In order to meet these customers' requirements GF Piping Systems provides and continuously develops piping and jointing technologies for its complete PVC-U product range.

System and product selection:

- PVC-U standard and fittings d20-d75
- PVC-U ball valves type 546 manually operated
- PVC-U diaphragm valves type 514 manually operated
- PVC-U diaphragm valves type DIASTAR pneumatically operated
- PVC-U check valves 303
- Flowmeters type 335
- Signet Flowmeters, pH and conductivity sensors and 9900 transmitters

Main benefits for the customer

- **Easy to install PVC-U dryfit system – allows the check of dimensions before installation**
- **GF Piping Systems product life time warrant on PVC-U range**
- **Simply and easy to execute: no machines for installations required reducing installation costs to a minimum**
- **Higher than average design safety factors combined with special GF Piping Systems raw material recipe results in a longer life time**
- **Complete product range offering pipes, fittings, valves and instrumentation that always matches leaktight together**

Benefits of plastics

A lifetime of consistent performance

The big advantage of plastics compared to metals is that there is no electro-chemical corrosion. In addition to this, plastic is lighter than other materials. Moreover, the outstanding chemical resistance of plastic, especially when conveying highly aggressive or pure media, has a positive impact. The «Total Plastic Solution» from GF Piping Systems ensures safety in all applications. Safe and reliable processes and workflows achieved through the use of plastic piping systems translate into consistently high efficiency for our customers over the entire lifetime of their operations.



Metal pipes

High density

- Crane required to position
- Pipe brackets far apart
- High anchoring forces, strong supports

Thermal conductivity

- Insulation required for preventing energy loss
- Condensation causes corrosion

Electrical conductivity

- Risk of contact corrosion

Chemical resistance

- Poor resistance to acids necessitates use of alloys – costly

Plastic pipes

Low density

- Up to d110 can be carried by hand
- Short distances between brackets
- Low anchoring forces, easy and economical

Low thermal conductivity

- Low heat conductivity due to thermal insulation
- Low condensation build-up and high chemical resistance prevent corrosion

No electrical conductivity

- No corrosion

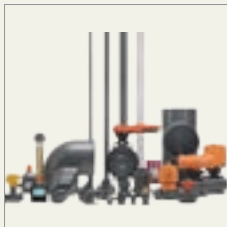
High chemical resistance

- In combination with the right jointing technology, a minimum service lifetime of 25 years is realized

System overview

Our products build complete system solutions for your applications

Plastic piping systems are ideal for use in water treatment. Plastics do not form galvanic elements and are not conductive. GF Piping Systems with its comprehensive product range offers its customers high product reliability in combination with jointing technologies proven over time in practice. Customized solutions are also available on request.



PVC-U System

Solvent cementable plastic, universal use, good chemical resistance, easy to join with special adhesives.

Dimensions 6–400 mm / ¼ –24 inch*
Temperature 0 °C – + 60 °C / 32 °F – + 140 °F*



PVC-C System

Solvent cementable plastic, universal use, good chemical resistance, easy to join with special adhesives.

Dimensions 16–225 mm / ½ –24 inch*
Temperature 0 °C – + 80 °C / 32 °F – + 210 °F*



PROGEF (PP) System

Polypropylene, socket, butt and BCF- / IR-Plus fusion.

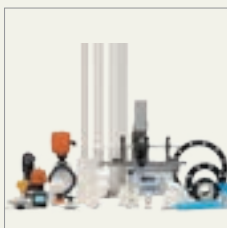
Dimensions
 PROGEF Standard 16–500 mm
 PROGEF Plus 20–315 mm
 PROGEF Natural 20–110 mm
Temperature 0 °C – + 80 °C



ecoFIT (PE) System

Fuseable plastic (butt, socket, electro, and IR-Plus fusion), UV and impact resistant.

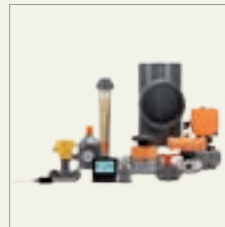
Dimensions 20–1 200 mm
Temperature -50 °C – + 60 °C



SYGEF (PVDF) System

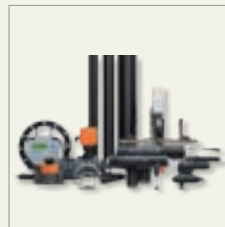
Polyvinylidene fluoride, (butt, socket, IR-Plus and BCF-Plus fusion), excellent chemical resistance.

Dimensions
 SYGEF Standard 16–315 mm
 SYGEF Plus 16–450 mm
Temperature -20 °C – + 140 °C



Automation

A broad range, especially designed for harsh environments, consisting of sensors, transmitters, actuators and controllers, which is simple to use and highly reliable.



CONTAIN-IT Plus System

(CONTAIN-IT Containment System)**

Double containment piping system for extra protection when hazardous media is conveyed.

Dimensions 20 / 50–225 / 315 mm
Temperature -50 °C – + 140 °C



Double-See

Solvent cementable plastic double containment system for extra protection when hazardous media is conveyed.

Dimensions ½" x 2" / 6" x 10"***
Temperature (PVC-U) 0 °C – + 60 °C / 32 °F – +140 °F (PVC-C) 0 °C – + 80 °C / 32 °F – + 210 °F



MULTI / JOINT System

Mechanical solutions for pipelines. The only restraint wide-range fitting for above and below ground applications.

Dimensions DN50 to DN400: restraint wide-range fittings
 DN450 to DN600: non restraint wide-range fittings
Temperature -5 °C – + 50 °C

* Sch80

** CONTAIN IT System: Containment piping system for existing single wall system containment.
 Dimensions: 4 inch and 6 inch
 Inner pipe containment range: 1/2 –4 inch IPS and copper, 20 mm – 110 mm
 Temperature: 32 °F – + 140 °F (0 °C – + 60 °C)

Joining methods

Material, application and medium are key criteria for selecting your joining technology.

Main benefits of Joining technology

Solvent cementing – the fast connection

The simple and reliable joining. No machine is needed, only gap filling Tangit cement and a few simple tools.

Electrofusion – the easy connection

State-of-the-art semi-automatic technology, combined with a low weight, make the MSA-Plus machines perfect for on-site fusion.

Socket fusion – the strong connection

The strong, fast and easy solution to produce heavy-duty connections, in the workshop or on the field.

Butt fusion – the economical connection

Economical and flexible fusion especially for bigger diameters. From manual machines to full CNC control with traceability.

IR-Plus (Infrared) fusion – the clean connection

Fast, repeatable and clean welds via non-contact heating. Full traceability of the welding process, with user guidance.

BCF-Plus (Bead and crevice free) fusion – the smooth connection

Bead and Crevice Free joining with high welding factor, low stress, completely smooth with no intrusions in the fusion zone.

Mechanical joints – the quick connection

Fast exchangeability, detachable, customizing, transitions and washing are just a few of the benefits.

Joining technology

Joint cross-section

Macro-image



For more information about training courses from GF Piping Systems please contact our local sales companies.

Chemical Resistance

For your operational safety

Thermoplastics – high quality materials



Professional material technology

Chemical resistance at 20 °C (Applications can be very dependent on the concentration)		Partially crystalline thermoplastics			Amorphous thermoplastics		Stainless Steel	
		PE	PP	PVDF	PVC-U	PVC-C	1.4401 316	1.4301 304
Media	Chemicals							
Oxidizing Acids (HNO ₃ , H ₂ CrO ₄ , H ₂ SO ₄ , etc.)	HNO ₃ ≤ 25 %	o	o	+	+	+	o	o
	25 % ≤ HNO ₃ ≤ 65 %	o	-	+	o	+	o	o
	H ₂ CrO ₄ aqueous solution	o	o	+	o	o	o	o
	H ₂ SO ₄ ≤ 70 %	+	+	+	+	+	-	-
	70 % ≤ H ₂ SO ₄ ≤ 96 %	-	-	+	+	+	-	-
Non Oxidizing Acids (HCl, HF, etc.)	HCl ≤ 30 %	+	+	+	+	+	o	-
	HF ≤ 40 %	+	+	+	+	-	o	-
	40 % ≤ HF ≤ 75 %	+	+	+	-	-	-	-
Organic (formic acid, acetic acid, citric acid, etc.)	HCOOH ≤ 25 %	+	+	+	+	+	o	-
	25 % ≤ HCOOH ≤ tech. pure	+	+	+	+	-	o	-
	CH ₃ COOH ≤ 50 %	+	+	+	+	+	o	-
	50 % ≤ CH ₃ COOH ≤ tech. pure	+	+	+	o	-	o	-
	C ₃ H ₄ OH (COOH) ₃	+	+	+	+	+	o	-
Bases	Inorganic (NaOH, KOH, etc.)	+	+	-	+	o	+	+
	Organic (amine, imidazole, etc.)	+	+	-	o	-	o	o
Salts	NaCl, FeCl ₂ , FeCl ₃ , CaCl ₂ , etc.	+	+	+	+	+	o	o
Halogens	Chlorine, bromine, iodine, (no fluorine)	-	-	o	o	o	o	-
Fuels / Oils	Aliphatic hydrocarbons	o	o	+	+	o	+	+
	Aromatic hydrocarbons	-	-	+	-	-	+	+
Solvents	Chlorinated hydrocarbons	-	-	o	-	-	o	o
	Ketones	+	+	o	-	-	+	+
	Alcohols	+	+	+	o	-	+	+
	Esters	o	o	o	-	-	+	+
	Aldehydes	+	+	-	-	-	+	+
Phenols	Phenol, Cresol, etc.	+	+	+	-	-	+	-

+ resistant o conditionally resistant, please consult us - not resistant

Please note: The above list is only intended as a guideline and does not replace an indepth review of material suitability for the particular application. The information is based on our experience and is state of the art. These data are general indicators only. In practice, however, other factors such as concentration, pressure and jointing technology must also be taken into consideration. The technical data are not binding and are not expressly warranted characteristics of the goods.

Please contact us for help in selecting the right materials.

Additional Information

Worldwide at home

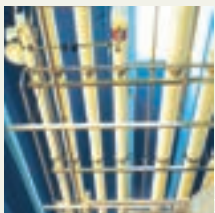
Products and systems are ideally adapted to customer needs

The name Georg Fischer stands for innovation, reliability and longevity – and has done so for over 200 years. Our global presence ensures customer proximity worldwide. Our sales subsidiaries and partners in over 100 countries offer complete solutions from one source, which include technical advice and planning services as well as training.

Our distribution centres have built up an organized network over the years and customers highly appreciate our on-time deliveries. As a system provider, we are also glad to develop individual solutions for our customers. On request, our global customizing teams put together tailor-made, individual piping components according to customer specifications – whether as a small series or one-off production.

Everything from one source

Individuality – from the planning stage to installation



Pipes



Fittings



Manual valves



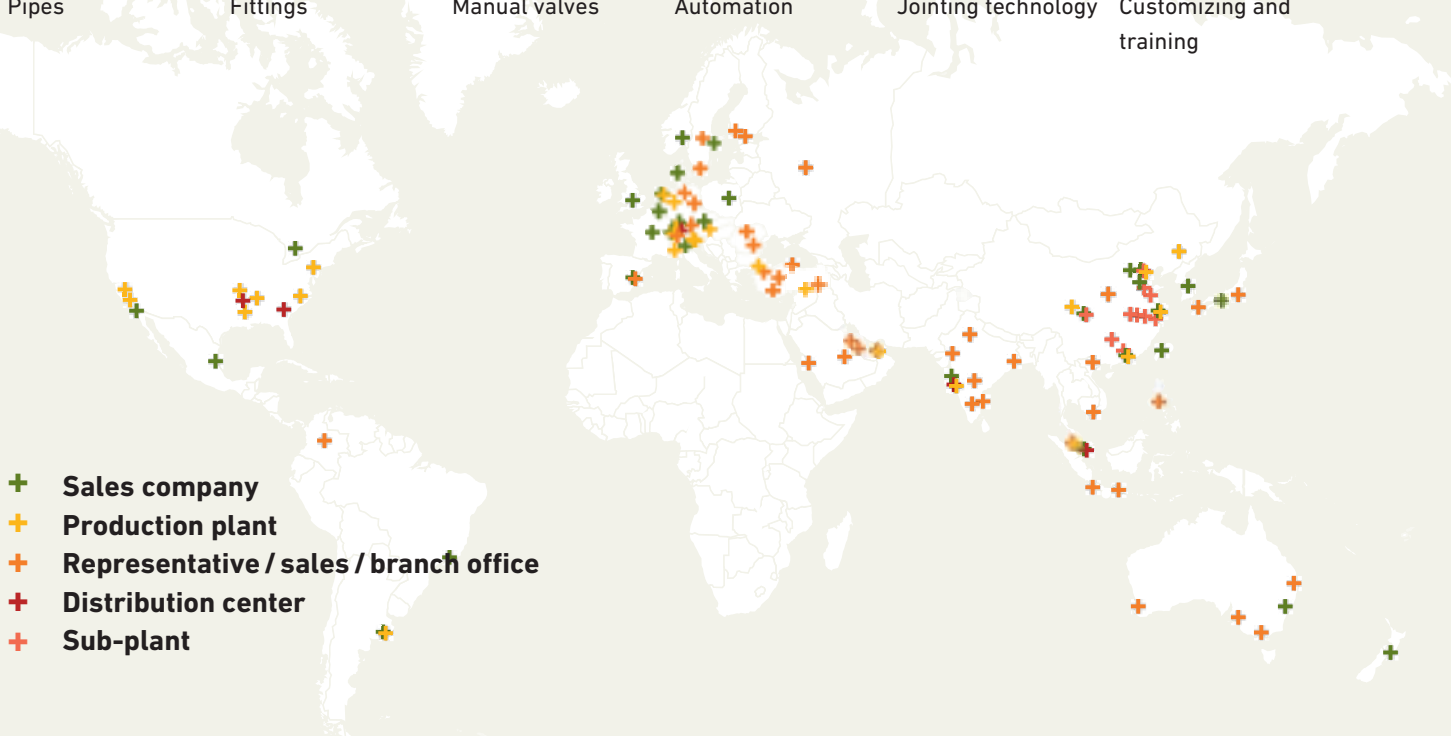
Automation



Jointing technology



Customizing and training



Value added services

From planning support to implementation – our specialists are always close by

As a leading provider of piping systems in plastic and metal, we offer our customers not only reliable products, but also a large package of services. Our support ranges from a comprehensive technical manual or the extensive CAD library to an international team of experts, who work closely together with local sales companies. And when it comes to implementing a project, our customers additionally benefit from a wide range of training courses, either on site or in our modern training centres world-wide.

Generating a genuinely individual added value for our customers is our ultimate goal when implementing our tailor-made solutions. With our application knowledge and product expertise, we support our customers during the planning process, the sustainable realization of the projects and the provision of services. Our expertise in developing and producing piping systems, combined with our profound industry and market knowledge, based on longstanding experience, makes us a qualified and professional partner for our customers.

1 Chemical resistance

Our specialist teams have decades of experience in the area of chemical resistance. They can offer individual support and advice in selecting the right material for the corresponding system solution. On request, a team will examine and select the appropriate material for special applications.

2 CAD library

The extensive CAD library is the most frequently used planning tool at GF Piping Systems. The database comprises over 30 000 drawings and technical data regarding pipes, fittings, measurement and control technology as well as manual and actuated valves. The big advantage of the CAD library is that the data can be integrated directly in CAD models.

3 Technical support

Technical support and material selection are key factors for a successful installation. A team of specialists headquartered in Switzerland is available to support the GF Piping Systems sales companies around the world. For technical advice or for general information, our customers are supported individually by the specialist team in the corresponding sales company.

4 Online and mobile calculation tools

Our numerous, multilingual online calculation tools are very useful for configuring and calculating. By means of pressure/temperature diagrams, the pressure of liquid media recommended for pipes and fittings at various temperatures can be easily defined. FlowCalc App, the mobile application of GF Piping Systems, is an on-site planning tool for pipe diameter and flow velocity calculation to select the right dimension of piping systems when no expert is near by.

5 On-site training

Our experts are available to support our customers locally and conduct training in diverse fusion and jointing techniques on location. The duration and structure of the training depends on the project and the system being installed.

6 Customizing

The customizing teams at GF Piping Systems work closely together around the globe. The focus of these teams is to manufacture custom parts for special systems. In addition, a variety of special solutions can be produced in small series. Standardized processes warrant the highest level of quality for the individual solutions of our customers.



7 Technical manual

For our customers, we have documented the extensive know-how of GF Piping Systems in planning and installing plastic piping systems in our technical manual. This detailed documentation is available in both printed and digital version. The established reference book is helpful in planning large and small projects.

8 Training courses

GF Piping Systems offers a wide range of training courses that allow participants to gain confidence in working with our products and proven jointing technologies. The practical training is clearly defined, structured and adapted to the various levels of participants' experience.

Worldwide at home

Our sales companies and representatives ensure local customer support in over 100 countries

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