

GF Piping Systems



Future horizons

Efficient water solutions
for Offshore Energy



Harnessing the power of wind

As global demand for renewable energy soars, offshore wind is becoming crucial in the energy transition. Floating structures provide a solution for harnessing wind energy far off the coast in deeper waters, whilst traditional fixed offshore wind continues to grow globally, and developments for monopolies for 100m water depth are on the horizon. The industry is known for innovation, geared towards lowering the LCOE & delivering a sustainable, long-term offshore energy network. Despite the cost of capital and supply chain constraints, offshore wind capacity globally should reach 53 GW by 2030¹.

GF Piping Systems is a global leader in providing sustainable, safe fluid transport solutions, with a strong presence in 33 countries and 40 production sites worldwide. As the offshore wind industry grows, ensuring reliable, efficient, and low-maintenance systems in harsh marine environments becomes increasingly critical. GF Piping Systems meets these demands with innovative piping solutions that improve offshore energy reliability while reducing environmental impact.

Floating Turbines

One key challenge in floating offshore wind is operating in deep waters where traditional fixed foundations are impractical and maintenance access is limited. Floating assets require stability, corrosion resistance, and minimal maintenance. GF Piping Systems solves these issues with lightweight, leak-free products like ecoFIT and the fully plastic Butterfly Valve 565, which reduce overall project costs (CAPEX, OPEX) and minimize CO² emissions while ensuring long-term performance in demanding marine conditions.

Offshore Support, Construction and Accommodation Vessels

Offshore support vessels are constantly exposed to corrosive saltwater, which can lead to frequent maintenance and operational delays. GF Piping Systems' marine-approved, corrosion-resistant piping systems solve this by eliminating leakage risks and reducing the need for repairs, ensuring vessels can operate efficiently for construction, maintenance, and transport tasks in offshore wind projects.

Substations

Unmanned offshore substations present unique challenges in terms of reliability and safety, as any system failures can be difficult to address remotely. GF's high-performance plastic piping systems are designed to withstand the harsh offshore environment, enabling uninterrupted, leak-free operations that improve the safety and dependability of HVAC and HVDC transmission systems.

Wind turbines and Nacelles

As wind turbines grow in size and are positioned further offshore, the need for durable, lightweight, and reliable solutions becomes essential. Traditional piping systems often struggle with corrosion and aren't built to withstand the dynamic movement of turbine towers, leading to frequent inspections and maintenance. GF Piping Systems offers flexible, corrosion-resistant solutions for venting, cooling, and humidity control that enhance the lifespan of turbines, reduce weight, and minimize operational costs.

¹ Williams, R. and Zhao, F., 2024. Global Offshore Wind Report 2024. Presented at: Global Wind Energy Council, June 2024



Efficient water solutions for Offshore Energy



100% corrosion-free

Plastic piping systems and process automation are maintenance-free and offer long-term durability for 25 years and more. They do not require regular painting or coating to prevent corrosion, reducing the risk of leakage to a minimum and helping to save maintenance costs and downtime.



Reduced OpEx

Supply chain constraints, coupled with global economic uncertainty and local conflicts have increased the cost to build and maintain an offshore wind farm. Sweating the asset for longer than 25 years mitigates that increased investment cost. GF Piping Systems' high-performance thermoplastics have an expected service life of 25 years, making replacements during the lifetime of the asset redundant.



One-stop shop

Fabrication yards can leverage the expertise and comprehensive support provided by GF Piping Systems. By offering a wide range of lightweight materials, automation solutions, jointing and tools, and services, the collaboration can help you overcome technical challenges, ensure compliance, and streamline the procurement and logistics processes.





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60% lighter than steel

Due to their lightweight nature, flexibility, easy jointing technologies, and prefabrication options, plastic piping systems offer ease of installation. Plastic systems weigh up to 60% less than metal solutions, and they are faster to install on-site or during the onshore prefabrication.



Reduced carbon footprint

Thanks to their material characteristics and the use of renewable and recyclable raw materials, for example, for the production of our bio-attributed PVC, GF Piping Systems' solutions have a reduced environmental impact than metal solutions. By providing Environmental Product Declarations (EPD) of our piping systems and valves, we enable transparent planning and help developers, TSOs, and the entire Tier 1 and Tier 2 supply chain to reduce GHG emissions during operation.

We provide 100% corrosion-free piping solutions for the maintenance-free and automated operation of floating wind turbines, substations, and offshore vessels.

Performance materials for Offshore Energy applications

With an extensive product portfolio of more than 60'000 products, consisting of pipes, fittings, valves, sensors, sealing materials, and related jointing, as well as automation technologies, engineering, and prefabrication solutions, GF Piping Systems offers unlimited capabilities for a multitude of applications onshore and offshore.



Pneumatic and electric actuators

Pneumatic and electric actuators are an economical solution for installations with a high number of actuated valves. They are fast, adjustable, and have a fail-safe mode.

Butterfly valves

Butterfly valves by GF Piping Systems are modular, which allows them to be combined with a wide range of actuators and accessories.

Materials

Quality raw materials are used to improve your overall system safety and reduce installation costs. GF Piping Systems offers a wide range of performance materials for demanding environments, such as PVC, Polypropylene, Polyethylene, Polybutene, ECTFE, and PVDF.

Joining technologies

GF Piping Systems provides a range of fast, reliable joining solutions tailored to your needs, including electrofusion, infrared fusion, butt fusion, socket fusion, cementing methods, and mechanical connections like flange connections.

Ball valves

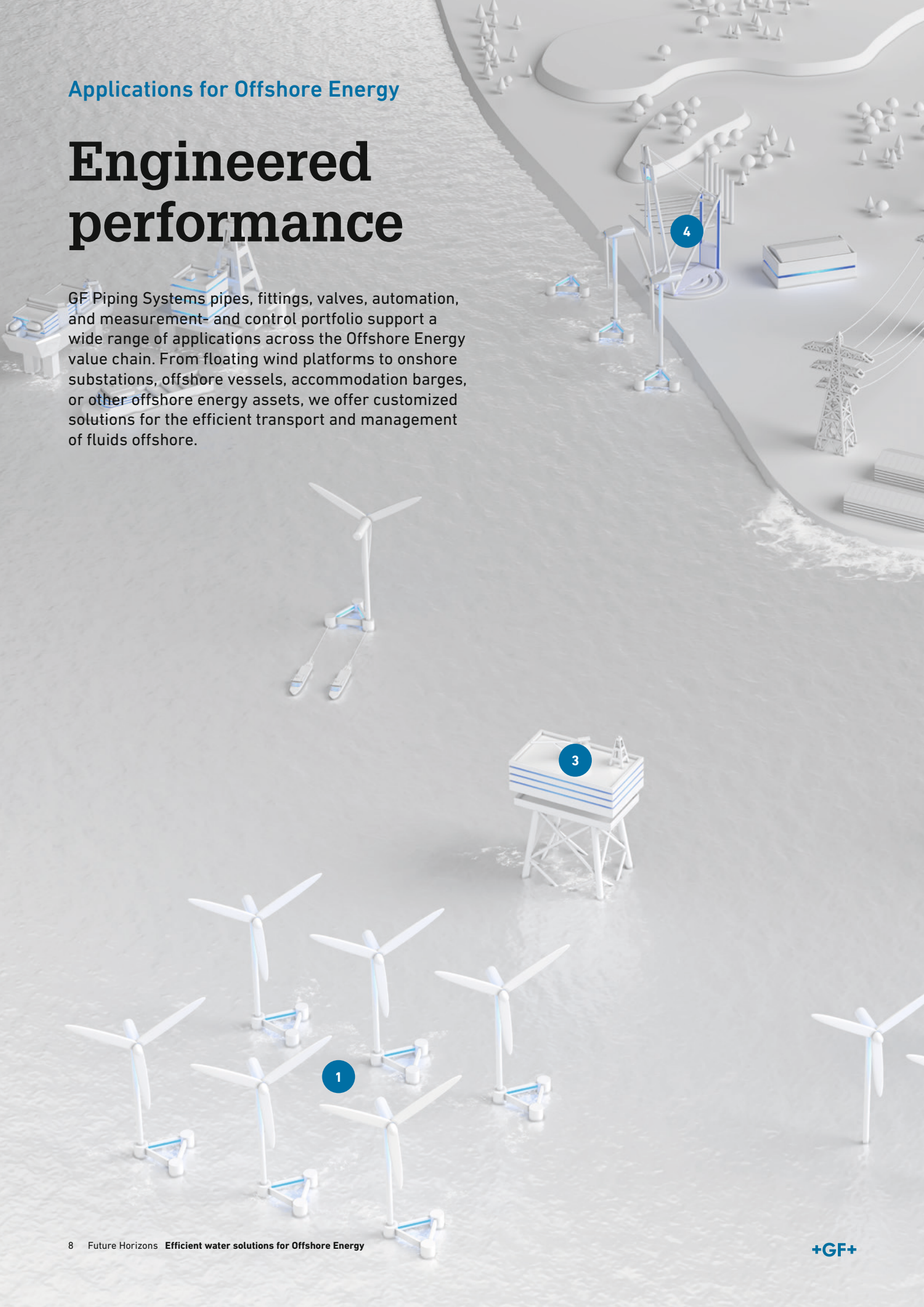
The wide range of materials, dimensions, and end connections make the Ball Valve 546 Pro the perfect solution for various applications.

Measurement and control

Transmitters and controllers help to control and monitor your process data.

Engineered performance

GF Piping Systems pipes, fittings, valves, automation, and measurement- and control portfolio support a wide range of applications across the Offshore Energy value chain. From floating wind platforms to onshore substations, offshore vessels, accommodation barges, or other offshore energy assets, we offer customized solutions for the efficient transport and management of fluids offshore.





1. Floating Wind Platforms

Whether barge, semi-sub, TLP, or Spar, most designs use (active / passive) ballast water systems to ensure operational stability and efficiency, for which the well-proven brand ecoFIT (PE100), combined with thermoplastic valves and automation, is ideal. Our leakage-free solutions are ideal in multiple applications, such as ballast, bilge, compressed air, venting, and many more. Plastic piping systems are maintenance-free and reduce the need for inspection and repair, helping with uninterrupted operations offshore. GF Piping Systems provides installation training, design assistance, non-destructive testing and weld-bead inspections to ensure reliable lifetime operation of the systems.

2. Offshore Vessels

Vessels play an integral part in installing and operating wind turbines. GF Piping Systems provides lightweight and corrosion-free solutions for safe and sustainable fluid handling on board CTVs, HLVs, CSOVs, Survey vessels, accommodation barges, and more. Applications range from essential applications like ballast water and ballast water treatment, engine cooling to potable water solutions for crew as well as sewage and drainage.

3. Substations

Offshore wind turbines, fixed or floating, are connected with array cables to substations, which after transforming or converting the AC-generated power, transfer it ashore. Substations face unique challenges when it comes to piping, as the infrastructure needs to be cooled and kept dry for efficient operation. Only the highest-performing materials can withstand these conditions, ensuring uninterrupted operations. GF Piping Systems offers materials and know-how for the most demanding applications in terms of temperature and pressure requirements.

4. On-shore prefabrication

For floating wind to become competitive, onshore serialized production of the foundation and integration of the turbine dockside is essential. GF's onshore prefabrication solution is designed to complement this essential ambition. This approach enhances quality control, reduces construction time, negates the need for scarce trained labor, and minimizes the environmental impact at the site. Also, piping systems and process automation components can be customized, prefabricated, and delivered to the onshore prefabrication yard for streamlined logistics, improved worker safety, and ensured precise engineering standards. Once transported, these prefabricated components can be quickly assembled on-site, accelerating the deployment of wind energy projects and reducing overall costs.

Applications

Floating Wind

GF Piping Systems strives to help customers worldwide to improve operational safety and overcome environmental challenges through innovation. By developing highly engineered products, pioneering jointing technologies, and industry-leading training capabilities, we create solutions for smart fluid transportation offshore that enhance operational safety and enable our customers to reduce maintenance work.





Ballast piping system

Many of today's floating foundation designs incorporate ballast piping, ranging from simple passive in/out systems that facilitate turbine integration, towing, operational depth, and future maintenance of complex active systems that adjust the foundation's trim for optimal turbine power output. Whether you need just a few meters of pipe and valves or kilometers of piping with comprehensive monitoring and flow control, GF offers a cost-effective, corrosion-free, and zero-maintenance solution.



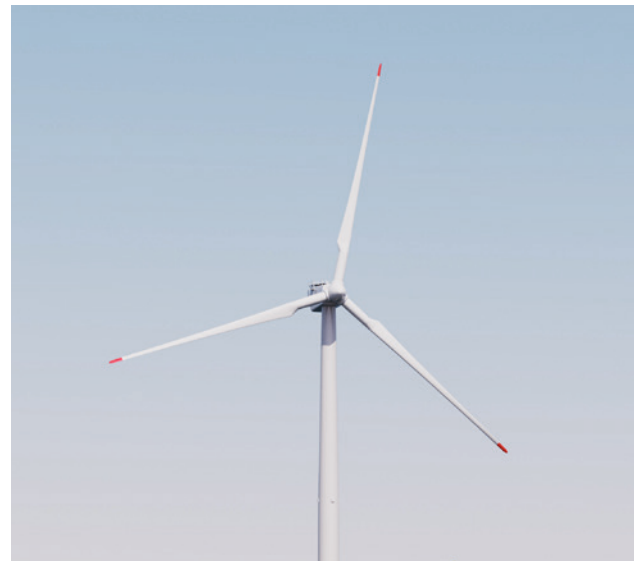
Bilge water and other foundation systems

Floating Wind platforms of any design will need a piping system to pump out seawater that manages to enter the foundation. A system to increase ventilation, reduce humidity, and for corrosion control. For more advanced designs, the nacelle components could be housed in the foundation which requires cooling and lubrication systems.



Electrical system cooling

Where designed, whether for substations or transformers in the floating foundation, a combination of seawater intake to heat exchanger and intricate integrated electrical stack piping to heat exchanger requires corrosion-proof medium temperature tolerant piping on one system side and clean, inert and high-temperature tolerant piping on the other system side.



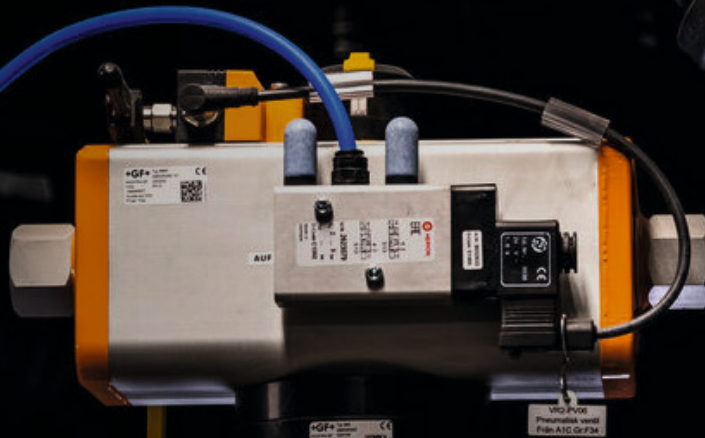
Wind turbine tower and nacel

In addition to floating platform or substations there are piping systems required within the wind turbine tower & nacelle. Recent applications using GF include cathodic system noxious gas venting & humidity control system piping within the tower and nacelle transformer cooling system.

Applications

Water and air quality on Offshore vessels and Substations

At GF Piping Systems, we offer deep application knowledge of the water treatment and HVAC/C processes on board. We offer a wide range of materials for pipes, fittings, and valves, including PVC-U, PVC-C, PP-H, PE, and ABS. Also, we provide automation and measurement and control devices for pH value, pressure, and conductivity measurement. Our solutions help to achieve a high and hygienic water quality and system availability, alongside climate control.





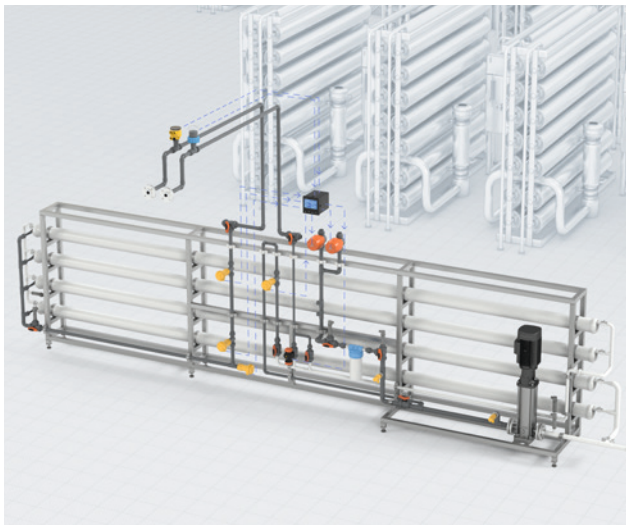
Fresh cold and hot water

Effective water supply thanks to a simple installation technology. Our systems are ideally suited for water distribution on all types of ships. Cabins, kitchens, restaurants, and bars are efficiently supplied with fresh water. The high flexibility of the material and the easy installation technology cut time and costs to a minimum. The installers can install individual or continuous lines, ring mains, T-piece branches, and continuous lines with circulation possible at every deck and in the risers of the vessel.



Sewage, black and grey water

Wastewater from sinks and showers, as well as from toilets and medical facilities, creates grey and black water that has to be conveyed safely to the wastewater treatment system on board. Safe transport is guaranteed by the solutions from GF Piping Systems. Our modern electrofusion, adhesive, or mechanical jointing technology is conducive to fast installation, and the highly diversified product mix provides installers with the flexibility they require. All our plastic systems do not corrode and deliver a long service life.



Water Treatment

GF Piping Systems offers comprehensive solutions for all applications throughout the water cycle, from chemical dosing systems and media filtration applications to ion exchangers. For customers seeking to automatize their processes on board, GF Piping Systems follows this wish with a comprehensive system of offering pipes, fittings, valves, the ideal jointing technology, and an optimally adapted selection of components for automation technology.



Air Conditioning (HVAC)

Air conditioning plays a vital role in onboard accommodation as it helps to have a healthy and pleasant atmosphere concerning temperature and humidity. GF Piping Systems provides energy efficient flow solutions that help owners and operators to lower the overall energy efficiency of cooling applications. Thanks to pre-insulated systems, the planning and installation time of the HVAC system can be reduced by up to 50% compared to conventional systems that have to be post-insulated.

Application overview

Applications possibilities in accordance with IMO Resolution A.753 (18) guidelines

Material	Marine Grade		SeaCor	ABS	COOL-FIT		ecoFIT
	PVC-U	PVC-C	PVC-C		2.0	4.0	PE-100
System of measurement	Met./Sched.	Met./Sched.	Schedule	Met./Sched.	Metric		Metric
Joining	Cementing	Cementing	Cementing	Cementing	Welding	Welding	Welding
Applications in Accomodation, Engine Room, Technical Spaces							
Freshwater System Hot		X*	X				
Freshwater System Cold	X	X*	X				X
Greywater System & Treatment	X	X	X	X			X
Blackwater / Sewage System & Treatment	X	X	X	X			X
Technicalwater / Deckwash Treatment	X	X	X				X
HVAC System / Chilled Water System				X	X	X	X
Food Processing / Waste Water Service	X	X	X				X
Kitchen Drains / Grease Trap System	X	X	X				X
Swimming Pool / Jacuzzi	X	X	X	X			X
Brine Water System / Cool-Freeze / Sec.System						X	X
Central Heating							
Drainage / Scuppers	X	X	X				X
Cable Protection Piping							X
Working Air / Compressed Air							X
Starting Air/ Engine							
FiFi / Fire Main System							X**
Engine Cooling Water System							X**
Ballastwater / Heeling System							X**
Bilgewater System							X**
Scrubber Treatment System							X**
Scrubber Effluent Lines							X**
Cargo Lines							X
Purging Lines Air / Water							X
Jetting Leg Backup System / Spud Pillars							X
Jet-Water System							X
RSW System (Refrigerated Sea Water)				X	X	X	X
Fish Production / Processing Street	X			X			X
Ballast Bubble System / De-Icing System							X
Tank Venting							X
Sounding Pipes							X
Desalination Units / RO Units	X	X	X				
Ballast Water Management System (BWMS)	X	X	X				X**
Cooling Hydrogen / H2-Container / Methanol							X
Electrical Cabinet / Panel Cooling							

*Only schedule system is applicable.

** If L3 is required, ecoFIT is only applicable in combination with HEAT-FIT Jacket System.

PROGEF PP-H	AQUASYSTEM PP-R	INSTAFLEX PB	i-FIT Multilayer Composite	Hyclean Automation System	JRG Sanipex MT Multilayer Composite	Seadrain White PPFR	HEAT-FIT Insulation Jacket	UNI-Coupling	Butterfly valve 565
Metric	Metric	Metric	Metric		Metric	Schedule	Metric	Metric	Metric
Welding	Welding	Welding	Mechanical		Mechanical	Welding/ Mechanical	Mechanical	Mechanical	Mechanical
	X	X	X	X	X			X	X
X	X	X	X	X	X			X	X
					X	X		X	X
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X	X	X	X		X			X	X
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X		X	X		X			X	X

Sustainable solutions for the marine industry

Environmental benefits

GF Piping Systems is committed to enabling the safe and sustainable transport of fluids and is a reliable partner for achieving the ambitious IMO goals of GHG reductions. We continuously analyze and improve our solutions to the latest (environmental) standards.

SUSTAIN

The environmental benefits of thermoplastic at a glance:



30% lower environmental impact

On average, GF's plastic piping systems have a potential environmental impact of around 30% lower than the competing systems made of stainless steel, copper, or glass-reinforced plastic.



Long service life

GF's thermoplastic solutions are extremely durable under harsh marine conditions, and their service life can exceed 25 years. Compared to competitive products, which might require replacement after 10 to 15 years, the long service life has a high, positive environmental impact across all categories.

GF Piping Systems' solutions comply with the Green Passport (Ship Recycling Plan or Inventory of Hazardous Materials). We help you identify environmentally preferable piping system options by providing (comparative) Life Cycle Assessments of our products and solutions. Additionally, our Environmental Product Declarations provide transparent information about the environmental performance of recycling practices, facilitating informed decision-making and encouraging responsible actions among stakeholders.



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LIABILITY



250'300 kg less CO₂

Regarding the global warming impact, one plastic system saves on average between 1'900 kg (PVC-U) to 250'300 kg (PB) of CO₂-equivalents. This corresponds to the volume of CO₂ released by a midsize vehicle on a journey of 11'900 to 1'564'000 kilometers, respectively.



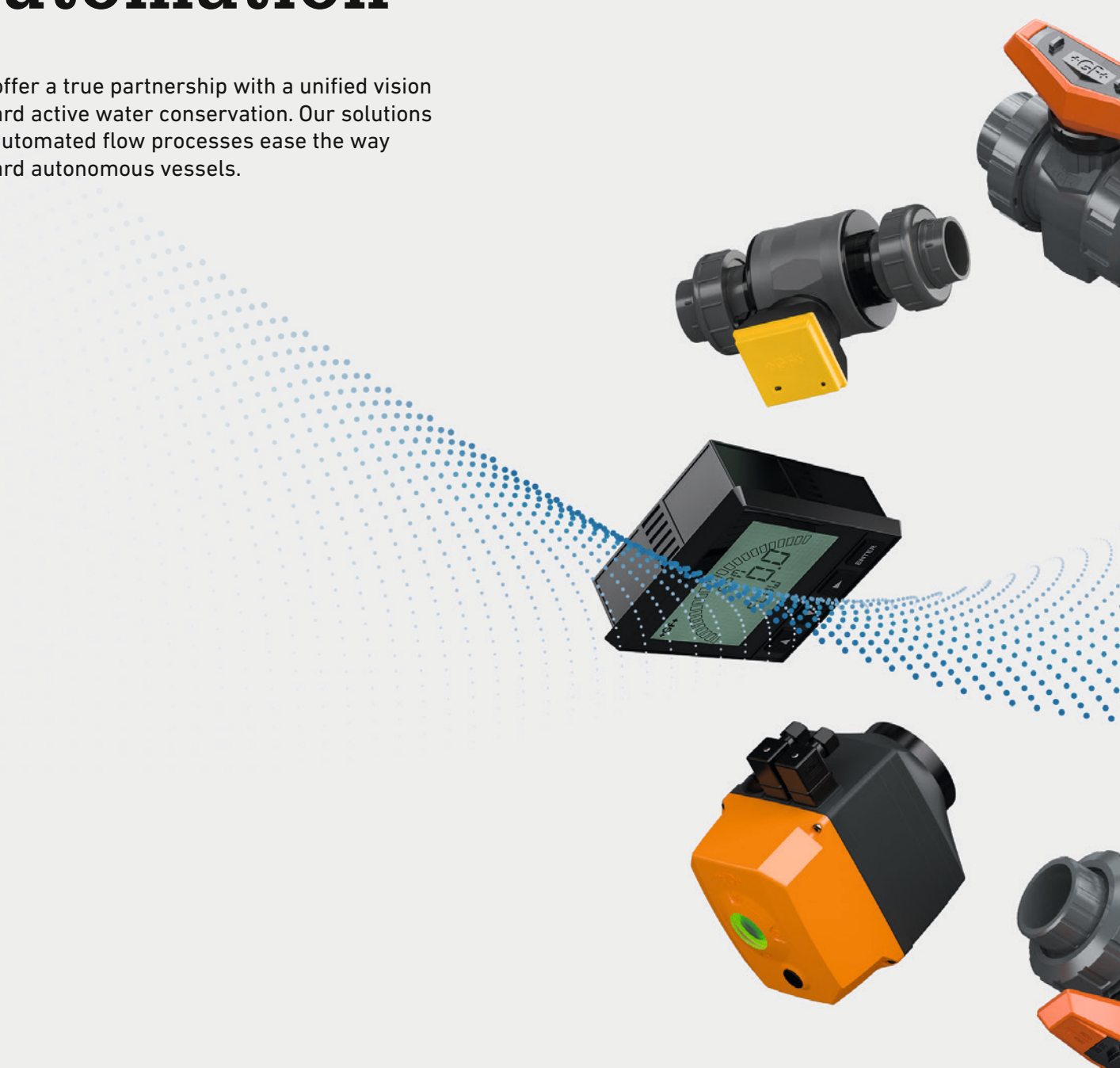
Renewable and recyclable

The environmental impacts during the raw and manufacturing phases are significantly higher for most competitive materials like stainless steel or copper. Additionally, GF Piping Systems uses renewable raw materials, such as tall oil, to produce systems like PVC-U.

Together as one

Process automation

We offer a true partnership with a unified vision toward active water conservation. Our solutions for automated flow processes ease the way toward autonomous vessels.



GF Piping Systems offer deep application knowledge of the entire process within the water treatment onboard. 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.



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.

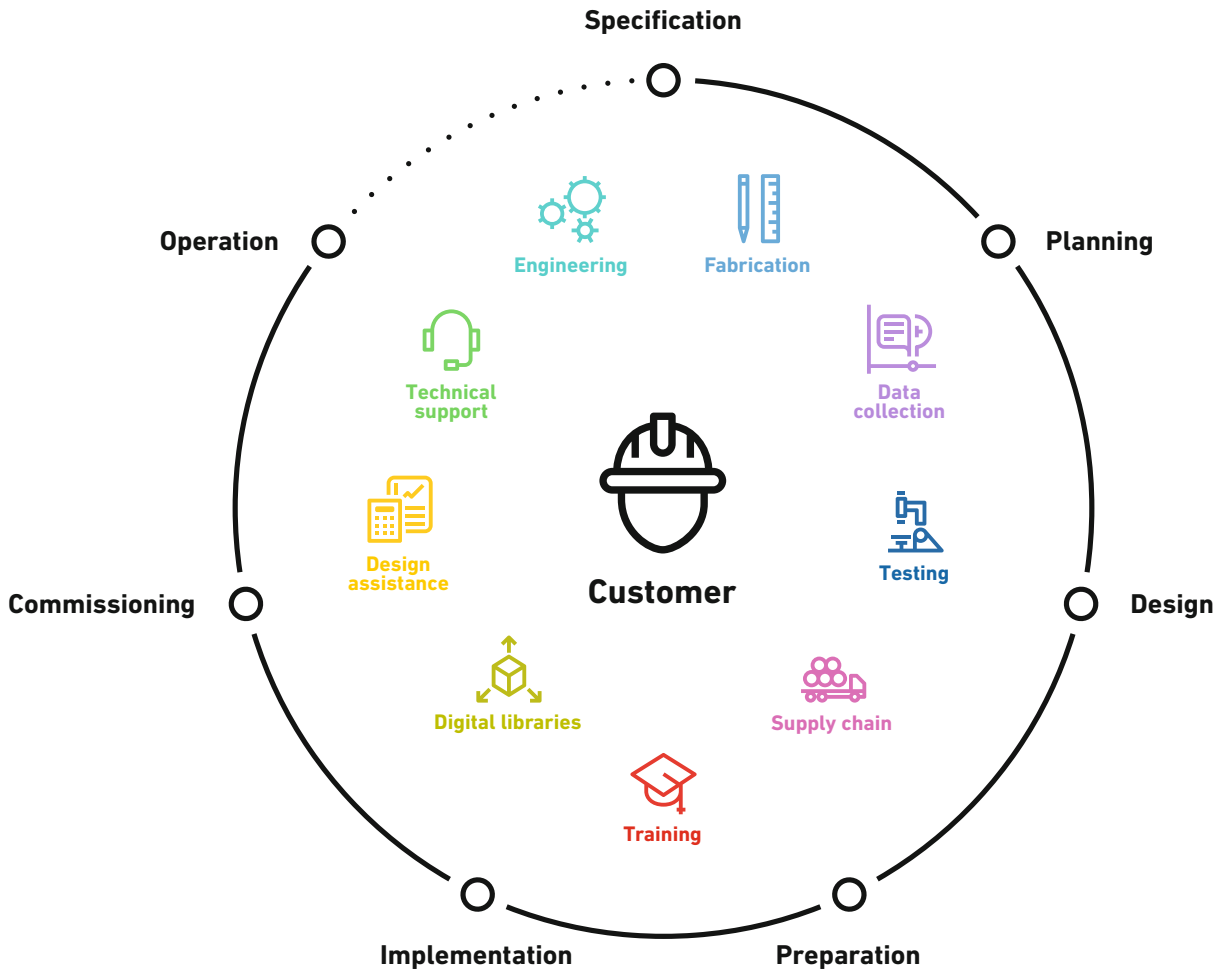


Own (Operation phase)

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

Specification to operation

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.





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.



Digital libraries

GF Piping Systems is continuously developing digital libraries with all of our product design drawings. Our files are fully compatible with Autodesk Revit, AVEVA, Intergraph, Autodesk AutoCAD Plant 3D and Trimble SketchUp with 3Skeng to provide proper engineering design tools used by planners, architects, owners and operators for BIM and Plant Design.



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. Through our global network of flexible locations, we offer a wide range of comprehensive solutions.



Training

GF Piping Systems instructional courses to help you teach your customers and their installers essential knowledge for the welding of pipes and piping components, as well as an in-depth understanding of butt and electrofusion connections. Trainings are available virtually, in-house or on site. Trusted training, empowering you.



Ultrasonic Non-Destructive Testing (NDT)

When installing a system, the most critical parts are going to be the weldings – often seen as the weakest point of a system and highly critical to a safe and reliable operation. With Ultrasonic NDT, you can proceed with assurance thanks to scientific proof that the welds are secure.

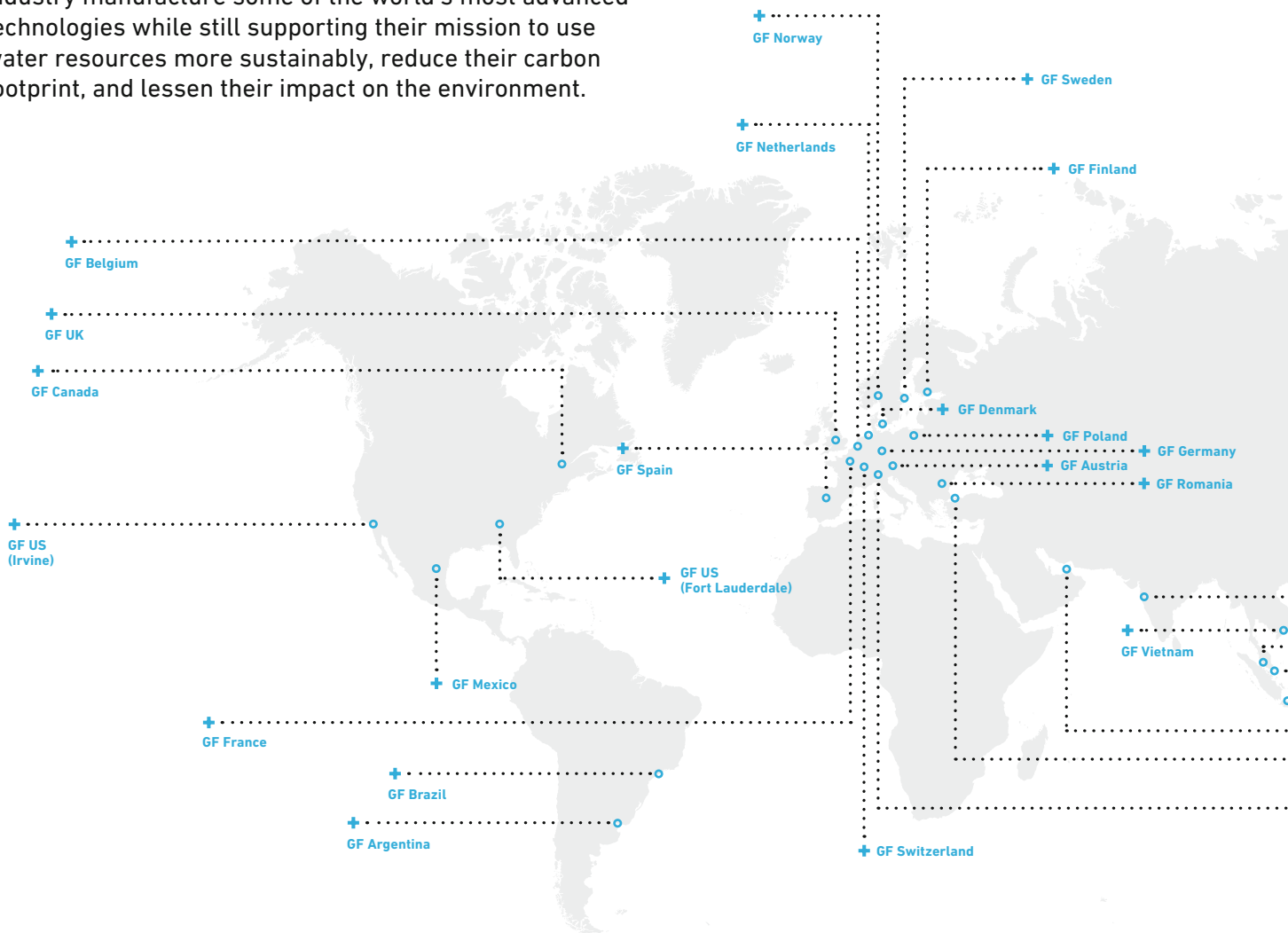
www.gfps.com/specialized-solutions



Speak to an expert

Support around the globe

GF Piping Systems has supported the marine industry's efforts to build efficient, safe, and hygienic piping systems onboard for more than 30 years. Our global teams help the industry manufacture some of the world's most advanced technologies while still supporting their mission to use water resources more sustainably, reduce their carbon footprint, and lessen their impact on the environment.

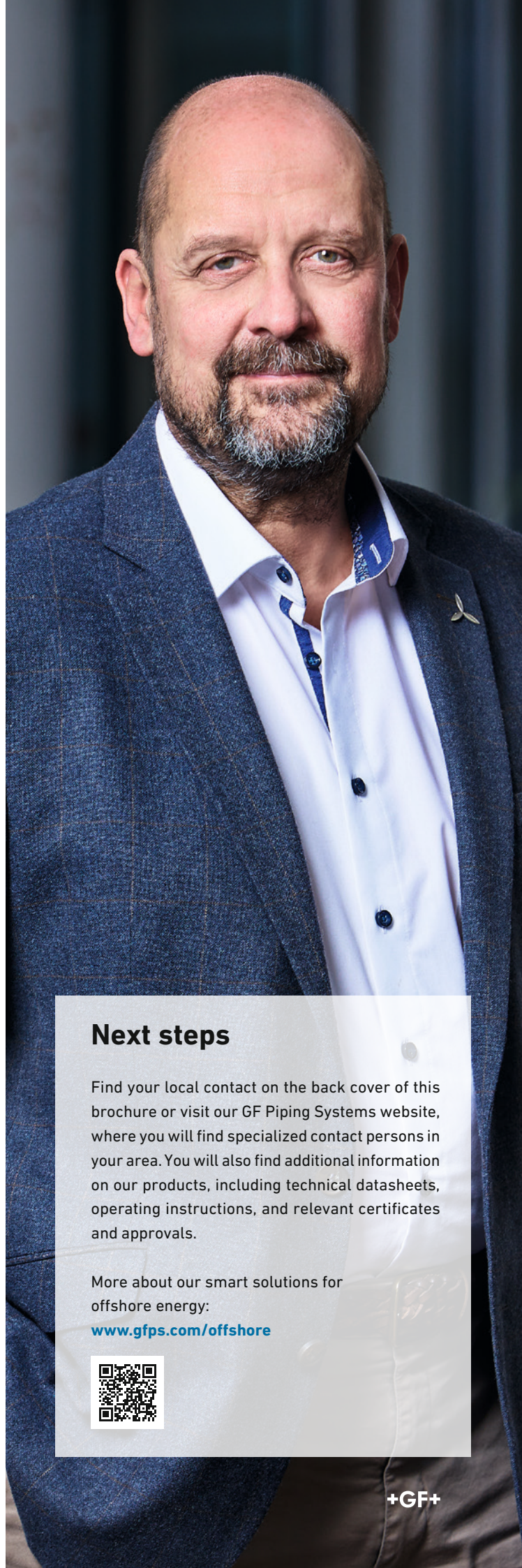
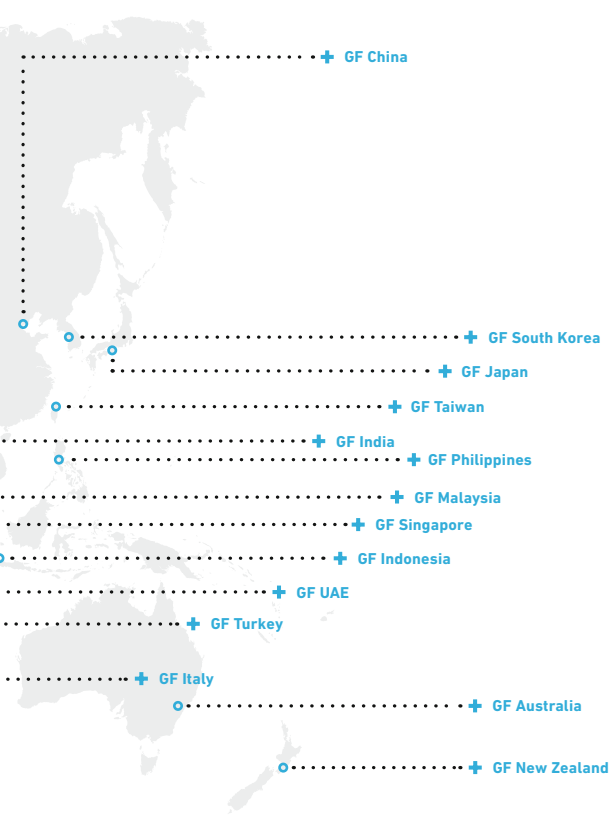


Locations

GF Piping Systems is represented in 33 countries with its own sales companies and 40 production sites. This means that we are always by our customer's side. Our production sites in the Americas, Europe, and Asia ensure sufficient availability and quick, reliable delivery.

Local Marine experts

Additionally, GF Piping Systems has a global network of more than 30 local experts specialized in the maritime sector to provide you with the best service on site. With a deep application know-how and strong background in regulations for the applications of thermoplastics on board, our team is available to our customers as partners throughout all project phases: from planning to implementation.



Next steps

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 about our smart solutions for offshore energy:

www.gfps.com/offshore



Local support around the world

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