

GF Piping Systems

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Future horizons

Sustainable water
solutions for marine



Route to decarbonization



The most significant long-term challenge the maritime industry is facing is sustainability. International shipping causes around one billion tons of CO₂ each year or 2,5% of global greenhouse gas emissions. If the industry were a country, this would make it the sixth largest emitter in the world. As a result, more and more international standards require shipbuilders, owners, and dockyards to find solutions that reduce greenhouse gas (GHG) emissions as quickly as possible.

Several of the essential guidelines for achieving this goal are defined by the International Maritime Organization (IMO) and marine classification bodies, whose strategy stipulates, among other things, that the marine industry must reduce annual GHG emissions by at least 50% by the year 2050, compared to 2008. To achieve this goal, the IMO has put several guidelines in place like the Energy Efficiency Design Index (EEDI), the Energy Efficiency Existing Ship Index (EEXI), or the Green Passport.



GF Piping Systems is committed to enabling the safe and sustainable transport of water, gas, and chemicals at sea that are compliant with the latest regulations. Selecting long-lasting, corrosion-free, lightweight piping materials and automated flow solutions helps ship owners, engineers, designers, and operators to improve the environmental impact of the ship over its whole service life.

“As a supplier of thermoplastic piping systems for the maritime industry, we see it as our duty to provide sustainable, long-lasting solutions that can have far-reaching positive effects for the entire ship or within the entire maritime world”

Roberto Chiesa
Head of Business Development Marine
at GF Piping Systems

Sustainable water solutions for marine

Future reliability

We empower the sustainability transition and digital transformation for the maritime industry. Our first-in-class, smart plastic piping systems ensure the sustainable treatment and transportation of fluids onboard cruise ships, merchant vessels, offshore platforms, and wind farming at sea.



Ensured safety

Plastic piping systems cover a wide range of fluid applications onboard and remain non-corrosive for their entire service life of the ship (at least 25 years). They are robust and cope with the harshest conditions at sea, without compromising on safety. Unexpected leakages and the resulting repair and maintenance work are reduced to a minimum.



Lightweight

In comparison to traditional metal piping systems, thermoplastic solutions are up to 60% lighter. By saving weight, ship owners and operators can reduce their fuel consumption and cost as well as reduce the Greenhouse Gas (GHG) and CO₂ emissions during the entire lifetime of the vessel.



Safety and hygiene

High water and fluid quality is certain at all times, with exact measurements, leak-tight systems and the best jointing technologies. Our drinking water solutions reduce the risk of bacterial pathogens in the cabins of your passengers or staff.



Easy to install

The high flexibility of the material and the easy installation technology cut time and costs of installation to a minimum. GF Piping Systems provides not only the piping systems, but also the tools and training to help your crew with a fast project execution onboard or in your prefabrication unit.



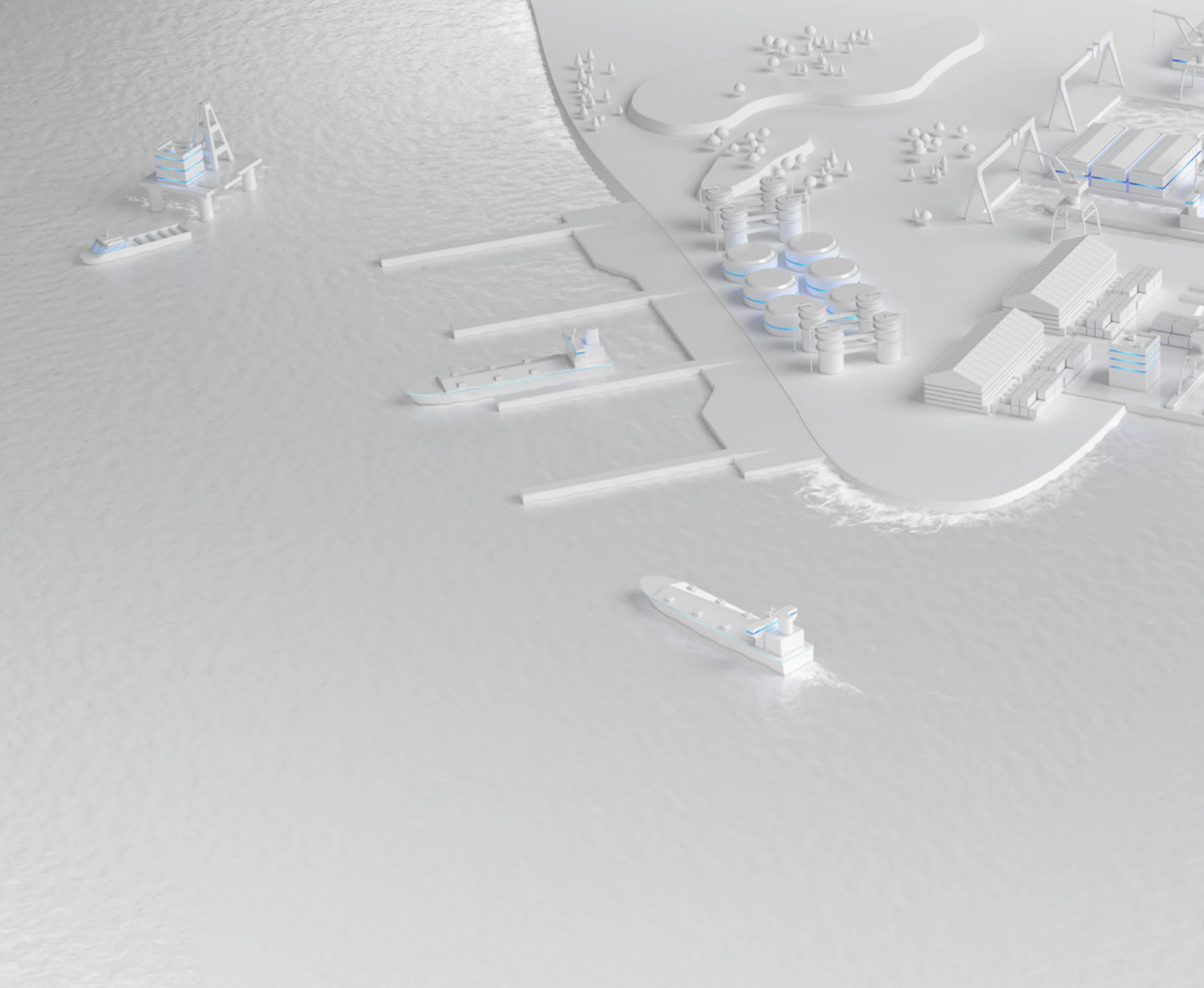
Class approved

The marine portfolio of our plastic piping systems, including pipes, fittings, valves, and tools meet the requirements of the International Maritime Organization (IMO) and are approved for essential and non-essential applications by ABS, BV, CCS, DNV, NK, LR, RINA, USCG.



Automation possibilities

We make process automation easy and help you save time and maintenance cost of your piping systems. Our valves and actuators ease the way to automate your flow processes onboard vessels and offshore energy platforms.



Applications for the maritime industry

Engineered performance

GF Piping Systems develops application-oriented thermoplastic piping solutions that enable fast and easy installation, profitable operations, and environmental benefits. We support our customers in implementing sustainable, future-oriented, and well-designed piping concepts with state-of-the-art planning techniques to optimize the economic efficiency of processes. Our piping systems can be applied for the transportation of water, seawater, coolants, and sewage onboard cruise ships, ferries, mega-yachts, container ships, bulk and LNG carriers, OSVs, wind farms, and offshore energy platforms.

Smart water solutions for cruise ships

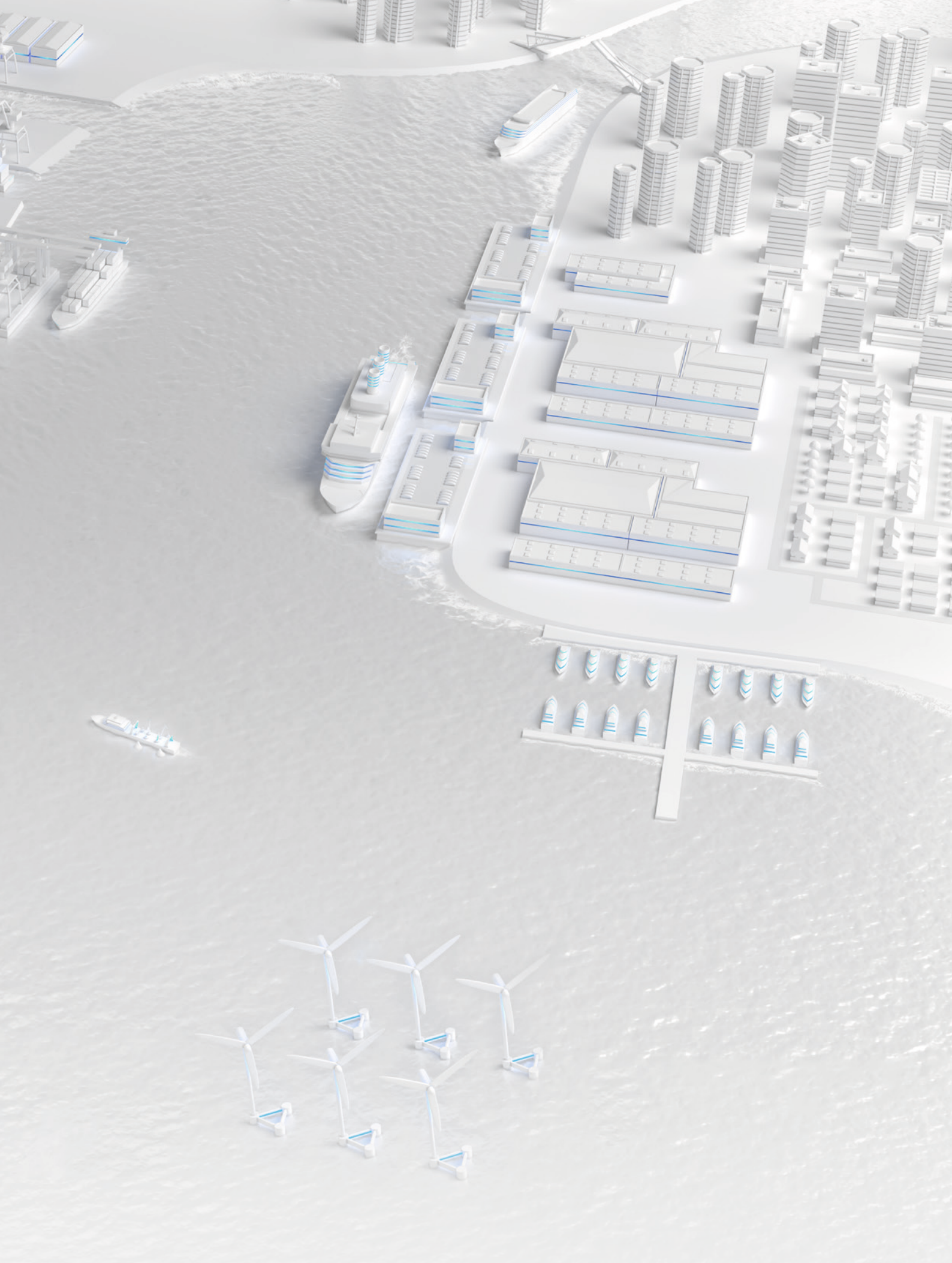
Thermoplastic and multilayer piping systems safely convey the transport of water onboard passenger ships like cruise liners, mega yachts, or ferries and provide a lightweight, soundproof, and corrosion-free alternative to metal piping systems.

Future-proof water solutions for merchant vessels

Corrosion- and maintenance-free thermoplastic piping systems have a long service life and help lowering the maintenance time and cost of merchant's vessels, bulk carriers, trawlers, and LNG carriers to a minimum.

Efficient water solutions for offshore energy

Floating wind farms, offshore support vessels, floating cranes, or oil platforms can benefit from the easy-to-install piping solutions with automation capabilities, enabling the way to autonomous operations.



Customized solutions



Fresh hot and cold water

Water safety and quality are fundamental to crew members and passengers onboard. Considering that water storage and distribution systems on ships are complex and could provide conditions for bacterial contamination, GF Piping Systems provides solutions for the safe and hygienic transport and treatment of potable water and innovative automation processes to ensure utmost safety for your water supply onboard.



Exhaust gas scrubber

For seawater scrubbing, seawater is used and the exhaust gases are brought into contact with seawater to capture sulfur dioxide (SO₂). A very low pH is achieved during this process, and piping systems of the effluent lines are exposed to highly aggressive fluids.



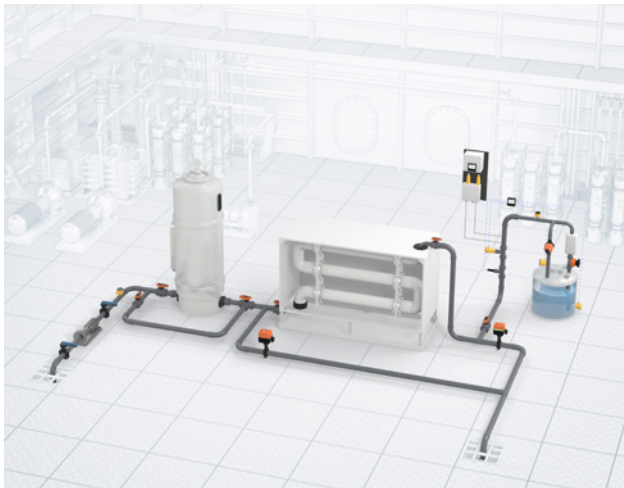
Sewage, black and grey water

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. With our wide range of ultra resistant materials we provide full piping solutions for safe and corrosion-free drainage systems and water treatment onboard.



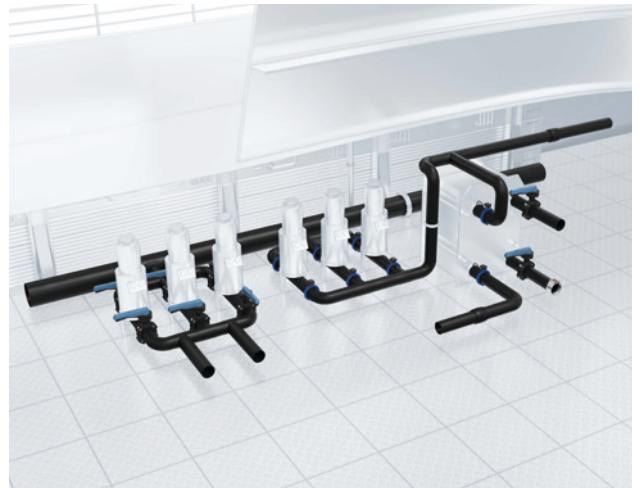
Air conditioning (HVAC)

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.



Ballast system & ballast water treatment

Ballast water systems ensure safe operating conditions during voyages, help ships reduce stresses on the vessel's hull, and provide transverse stability. GF Piping Systems' maintenance-free solutions help to efficiently load, distribute, treat, and unload ballast water from -10°C to 40°C, ensuring the ship can efficiently maneuver.



Fresh and seawater cooling

The particular feature of an engine cooling system is continuous fluid flow, which requires the careful selection of piping materials: Corrosion- and erosion-free plastic piping systems help ensure hassle-free operations of freshwater and seawater cooling in essential and non-essential applications.

Reduced environmental impact

Future sustainability

In 2021, GF Piping Systems and Foreship conducted a study investigating how pre-insulated plastic piping systems in HVAC applications can make passenger ships more efficient and sustainable. The study is based on a 150.000 GT cruise ship, comparing a standard post-insulated metal piping system with a pre-insulated polyethylene piping system. Read the key findings below.

Fuel reductions

COOL-FIT is up to 30% more energy efficient than metal alternatives, which translates to a measurable environmental impact. Due to the lower power requirements, fuel savings range between 82,1 m tons/year (LNG ship with variable flow pumps) and 112,5 m tons/year (MGO ship with constant flow pumps).

Financial savings

Pre-insulated plastic piping systems weigh less than metal alternatives and help lower a ships' fuel consumption. Taking into account the omitted maintenance work due to the material properties, shipowners should be able to expect around \$3.8 million in savings over 25 years¹.


Greenhouse Gas Emissions (GHG)

COOL-FIT can help save up to 373.7 m tons of CO₂ annually, depending on the vessel's configuration. It can reduce other pollutants such as Nitrogen (NOX), Sulfur Oxides (SOX), or Particulate Matter (PM) by up to 6.1 m tons per year.¹

Read the full study:
www.gfps.com/marine



¹ ref to average fuel cost (based on the average pricing between the period of April 2021, to September 2021 in port of Rotterdam)

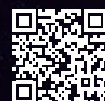
An aerial photograph of a river delta, showing a complex network of water channels and land. On the left side, a large, dark, circular structure, possibly a ship's hull or a large pipe, is partially visible. The water is a deep blue, and the land is a lighter, textured brown. The overall scene is captured from a high angle, looking down at the water and land.

We help you decarbonize your fleet

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 with regards to GHG reductions. By analyzing and constantly improving the full life cycle of our products, we are providing Environmental Product Declarations (EPD) to the industry. Also, our products are compliant with the Green Passport and help you recycle the piping systems at the end of their service life.

Learn more about our sustainability efforts:

www.gfps.com/sustainability



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.

Ready when you are

Future integration partner

Customer centricity for a fast and customized delivery of your project: With 40 production facilities and a global presence of our sales representatives and consultants in 100 countries worldwide, we help you realize your new build or retrofit project from planning to commissioning. Our sustainable water solutions for marine applications and our specialized solutions such as engineering, offsite prefabrication, and training programs ensure smooth project implementation.



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.

Project support at every step of the process to achieve construction excellence.

From planning to commissioning

Full service provider





Materials

GF Piping Systems' products are available in various materials such as ABS, PVC-U, PVC-C, Polybutylene, Polyethylene, Polypropylene or multilayer materials and cover a broad spectrum of operating temperatures, dimensions and nominal pressures so customers can find the optimal solution for their needs.



Jointing Technologies

For rapid, reliable, and high-quality jointing on condensed space, GF Piping Systems provides jointing technologies like electrofusion or butt fusion. When jointing thermoplastic materials, no hot work is required and installations can be up to 50% faster.



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.



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.

Speak to an expert

Smooth sailing for more than 30 years

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.

Our sustainable water solutions perform beyond the expectations of the demanding tech-based industry, with a total offering that encompasses all the needs to maintain water quality beyond ultra. We utilize our industry-leading offsite fabrication capabilities, domain expertise, and speed of delivery to meet the rapid demands of large-scale projects tailored to challenging specifications.

Next steps

Speak to one of our experts to discuss your needs. Scan the QR code on the back cover to get in touch with your local expert for piping systems on board.



More about approvals: www.gfps.com/marine





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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