

Limitless versatility

PROGEF Polypropylene welded system

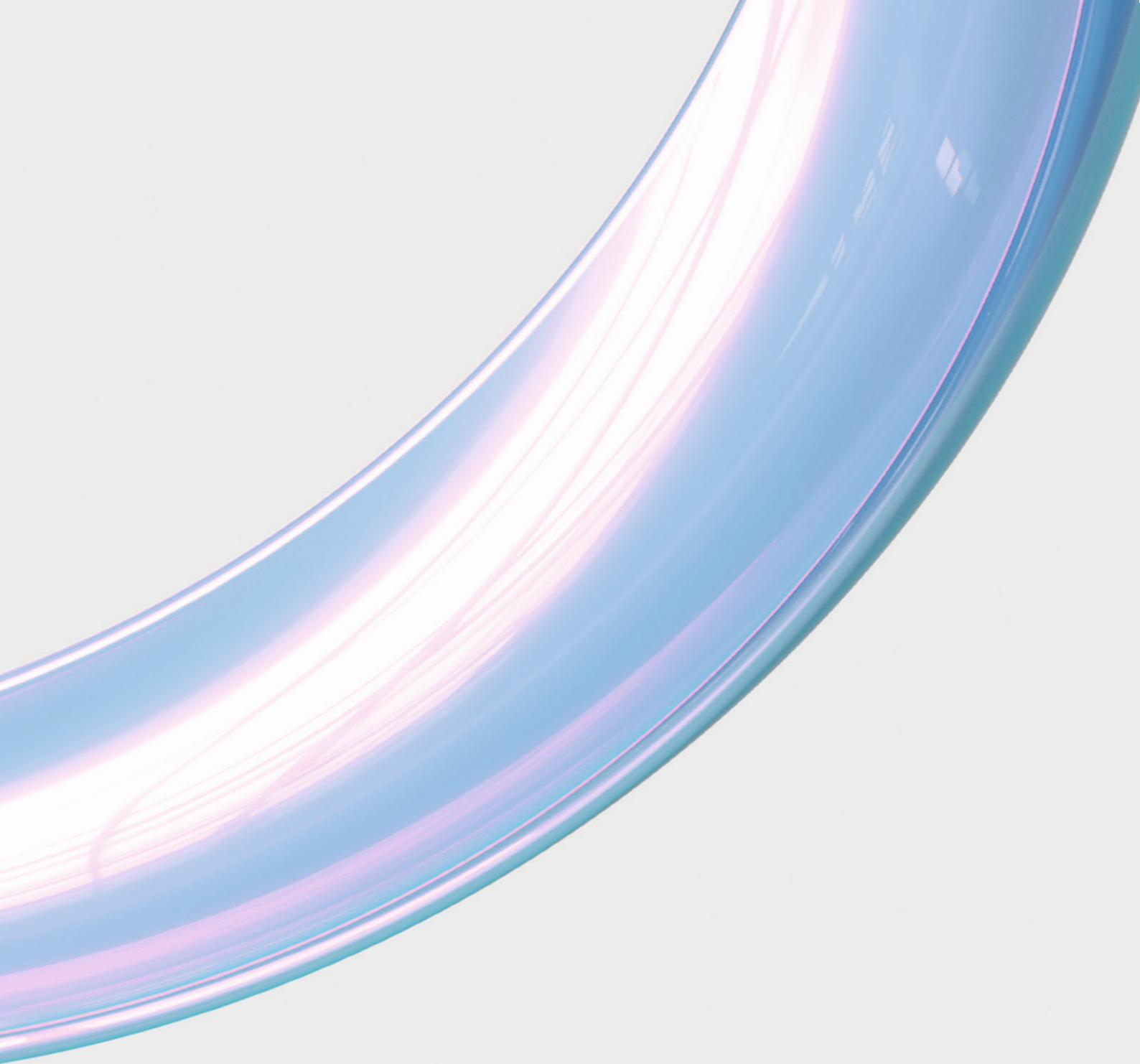


Operational safety for critical applications

Fluid handling in critical applications within the Chemical Process Industry, Microelectronics, or Water Treatment plants necessitates the utmost process, economic, and social safety. This frequently presents substantial challenges for plant operators.

Within various industries, piping systems play an indispensable role, with material selection exerting a profound influence on plant efficiency and safety. Manufacturers face unique challenges when confronted with highly aggressive media under elevated pressures, or for ultrapure water applications. Traditional metal piping solutions are prone to corrosion, leakage, or purity concerns.

GF Piping Systems' industrial polypropylene system (PP) PROGEF is a superior material offering exceptional attributes that ensure safe and efficient operations. As a reliable, versatile, and high-performance alternative to metal solutions, PP has consistently demonstrated its ability to enhance operational safety.



GF Piping Systems is the leading flow solutions provider across the world. We enable the safe and sustainable transport of fluids. We are committed to the design, production, and promotion of sustainable and cutting-edge piping systems, providing full system solutions: GF offers pipes, fittings, valves, tools, welding machines, process automation, and services to provide operational safety to its customers.

Limitless solutions

The Polypropylene piping system PROGEF is part of GF Piping Systems high-performance piping systems portfolio, providing unique mechanical properties, chemical resistance, outstanding weldability, and an exceptionally high resistance to thermal distortion.



Limitless flexibility

With a portfolio of pipes, fittings, valves, tools, jointing, automation technologies and measurement and control instrumentation, GF Piping Systems is a reliable partner that offers the full solution for a safe and reliable flow.



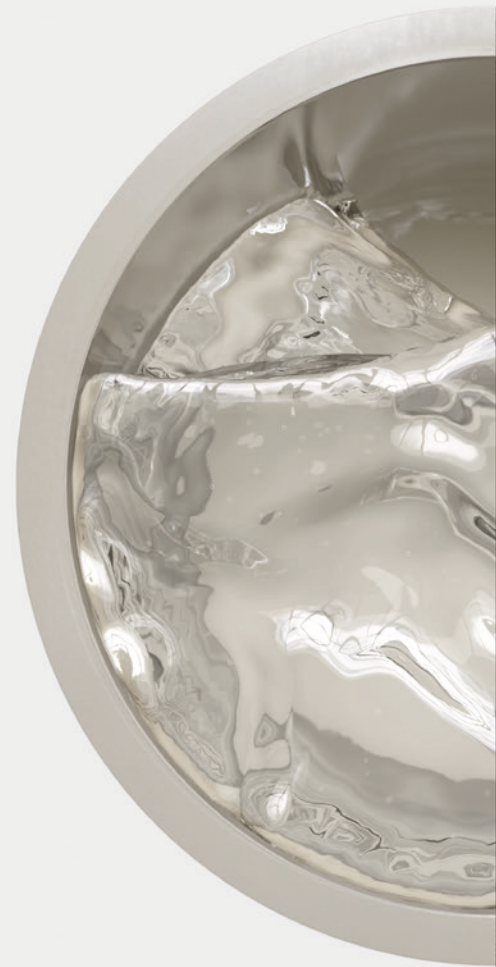
Limitless safety

GF Piping Systems' expertise in chemical resistance, material behavior, and application requirements, gathered over more than 30 years, has led to matchless product quality with an expected system lifetime of 25 years.



Limitless service

To increase the operational safety of each system, GF Piping Systems offers global customizing solutions, engineering services, CAD libraries, trainings, and prefabrication possibilities. Additionally, we offer training and on-site services for customers around the globe.





Limitless ambition

GF is setting ambitious sustainability goals that include re-using raw materials from our production scrap for non-critical items that are not in contact with the media, as well as reducing packaging materials and waste of resources to a minimum.



Limitless applications

With its versatile chemical resistance characteristic, comprehensive temperature range, and agile welding technologies (IR fusion, Butt fusion, BCF fusion, and socket fusion), PROGEF is the ideal solution for a multitude of industrial applications.



Limitless purity

Cleaned and packed in specified processes, GF offers the PROGEF Plus system with its silicone-, oil-, and contamination-free products to enable the effective transport of water for lower-demanding pure water qualities.

Welded system for industrial applications

With the extensive PROGEF system portfolio, 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 industrial applications.

PROGEF systems are developed and manufactured according to global standards. The production processes undergo continual improvement through audits and evaluations to provide unwavering reliability and safety for your application.

Butterfly valves

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

Measurement and control

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

Ball valves

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

Actuation

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.



Diaphragm valves

GF diaphragm valves are a fully plastic solution and quickly adapt to different process conditions.



Safe connections

Besides welding, flange connections are safe and reliable mechanical connections.

Materials

Quality raw materials are used to improve your overall system safety and reduce installation costs.

Cleaned products

Cleaned and packed in specified processes, GF offers silicone-free or oil-free products from the PROGEF Plus range.

Unions

PROGEF Natural unions are designed with aseptic O-ring placement to facilitate hygienic mechanical connections.

Adapters

A wide range of adapter fittings ease the way to bridge connections to other systems and machines.

Limitless protection



Systems	PROGEF Standard
Material	- d16–d315 β PP-H 100 (β Polypropylene Homopolymer) - d355–d500 PP Random Copolymer
Color	RAL 7032
Density	~ 0.90 g / cm ³ (ISO 1183 / ASTM D 792)
Thermal expansion	0.16 - 0.18mm / mK (DIN 53752)
Thermal conductivity	0.23W / mK (EN 12664)
Surface resistivity	> 10 ¹⁶ Ω (IEC 60093)
Dimensions	d16–d500 in accordance to EN ISO 15494
Surface condition	accordance to EN ISO 15494
Material- and product- approvals	FDA CFR 21 177.1520 USP 25 class VI (physiological non-toxic) DIBt (Z-40.23-4, Z-40.34-264, Z - 40.23-265) DNV (K-2630, K - 2636) Lloyd's Register (01/20030(E1)) UL94HB (horizontal burning)
Packaging	pipes, fittings and valves, bulk bagged
Marking	- brand name - product description - article number - material - dimensions - standards and approvals

Systems	PROGEF Plus
Material	- d20–d315 β PP-H 100 (β Polypropylene Homopolymer)
Color	RAL 7032
Density	~ 0.90 g / cm ³ (ISO 1183 / ASTM D 792)
Thermal expansion	0.16 - 0.18mm / mK (DIN 53752)
Thermal conductivity	0.23W / mK (EN 12664)
Surface resistivity	> 10 ¹⁶ Ω (IEC 60093)
Dimensions	d20–d315 in accordance to EN ISO 15494
Surface condition	- Inner surface Ra < 1.0 μm (39μin) for components d20–d110 - Inner surface Ra < 1.5 μm (59μin) for components d125–d315
Material- and product- approvals	FDA CFR 21 177.1520 USP 25 class VI (physiological non-toxic) UL94HB (horizontal burning)
Packaging	pipes, fittings and valves, each component double bagged
Marking	- brand name - product description - article number - material - dimensions - standards and approvals



Systems	PROGEF Natural
Material	-d20-d110 PP-R (Polypropylene Random Copolymer)
Color	pigment-free, transparent
Density	~ 0.90g / cm ³ (ISO 1183/ASTM D 792)
Thermal expansion	0.15mm / mK (DIN 53752)
Thermal conductivity	0.23W / mK (EN 12664)
Surface resistivity	> 10 ¹⁶ Ω (IEC 60093)
Dimensions	d20-d110 according to EN ISO 15494
Surface condition	Inner surface: Ra < 1.0 μm (39μin)
Material- and product- approvals	FDA CFR 21 177.1520 USP 25 class VI (physiological non-toxic) Food conformity (D)
Packaging	pipes, fittings and valves, each component single bagged
Marking	- brand name - product description - article number - material - dimensions - standards and approvals

For the PROGEF range, the following standards and approvals apply. For details, please check the respective system.

*** Standards:**



*** Approvals / Acceptance:**



* The most significant standards and approvals are shown above. An overview of all approvals is online: www.gfps.com

System specifications

Products	SDR	PN	d		DN																																													
			10	16	15	20	20	25	25	32	32	40	40	50	50	63	63	75	75	90	90	110	110	125	125	140	140	160	160	180	180	200	200	225	225	250	250	280	280	315	315	355	355	400	400	450	450	500	500	560
Pipes	7.4	16	PROGEF Standard																																															
	11	10	PROGEF Standard																																															
	17.6	6	PROGEF Standard																																															
Socket fusion fittings	11	10	PROGEF Standard																																															
Butt fusion fittings, Infrared (IR) compatible	11	10	PROGEF Standard																																															
	17.6	6	PROGEF Standard																																															
	11	10	PROGEF Standard																																															
Sanitary adapter	11	10	PROGEF Standard																																															
Ball valves	11	10	PROGEF Standard																																															
	17.6	6	PROGEF Standard																																															
Ball valves PP-H body/PP-R	11	10	PROGEF Standard																																															
Ball valves PP-H		10	PROGEF Standard																																															
Flange connections	11	10	PROGEF Standard																																															
Diaphragm valves	11	10	PROGEF Standard																																															
	17.6	6	PROGEF Standard																																															
Diaphragm valves PP-R	11	10	PROGEF Standard																																															
Diaphragm valves PP-H		10	PROGEF Standard																																															
Flange connections		10	PROGEF Standard																																															
Butterfly valves		10	PROGEF Standard																																															
Butterfly valves PP-H		10	PROGEF Standard																																															
Check valves	11/17.6	10	PROGEF Standard																																															
		6	PROGEF Standard																																															
Cone check valves PP-H body/PP-R	11	10	PROGEF Standard																																															
		10	PROGEF Standard																																															
Flange connections		10	PROGEF Standard																																															
Pressure regulating valves	11	10	PROGEF Standard																																															
Ventilating and bleed valve		10	PROGEF Standard																																															
Automation	upon request																																																	
	upon request																																																	
Flanges PP-V / PP-steel	PROGEF Standard																																																	
Flange seals EPDM / FKM	PROGEF Standard																																																	
Pipe clips PP / PE	PROGEF Standard																																																	

Welding machines	d	16	20	25	32	40	50	63	75	90	110	125	140	160	180	200	225	250	280	315	355	400	450	450	500	560	630		
Socket fusion machines		PROGEF Standard																											
Butt fusion machines		PROGEF Standard																											
Infrared (IR) fusion machines		PROGEF Standard																											

Limitless performance

Technical specifications with a focus on pressure-/temperature attributes.

PROGEF Systems*

Standard - Plus - Natural

PROGEF Systems, made from polypropylene show excellent physical properties and mechanical characteristics, indicating the material's status as a highly versatile and universal solution. Having a high operational temperature range and ensuring outstanding chemical resistance, high abrasion resistance and high impact strength values, the material meets all the requirements of demanding industrial conditions or environments.

Furthermore, properties such as low weight, low density, minimum internal stresses and an excellent smooth internal surface with high finish quality, make PROGEF systems a high-grade piping material.

According to the 10 °C line in the hydrostatic strength curve for PP, a permissible pressure of 12.0 bar / 7.4 bar in the temperature range of 0 °C to 10 °C for the SDR11 / PN10 and SDR17.6 / PN6 system can be applied.

Chemical Resistance Tool

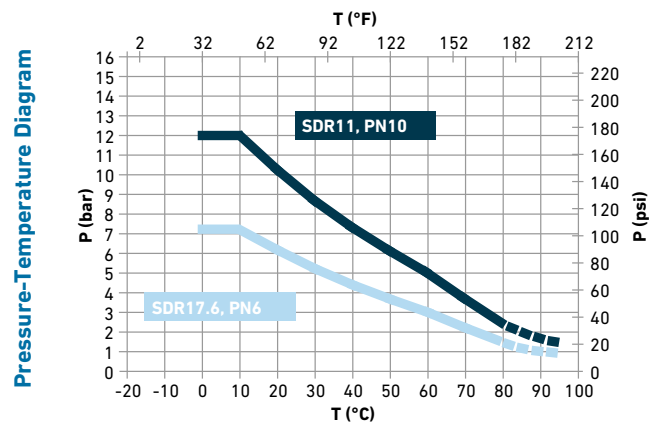
Our teams of experts have decades of experience in the chemical resistance of thermoplastic piping materials. The online Chemical Resistance Tool helps you find the appropriate materials for your project quickly and easily. The online tool summarizes a large amount of data about materials and media and presents it visually. Choose from the varied materials and solvent cements in the GF Piping Systems product portfolio and compare them to get a comprehensive overview.

Learn more:

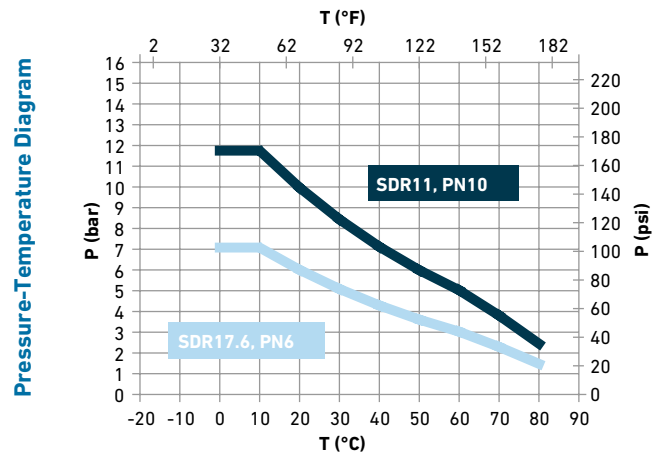
[gfps.com/chemres](https://www.gfps.com/chemres)



PROGEF Standard (PP) and PROGEF Plus (PP-H)



PROGEF Natural (PP-R)



P Permissible pressure in bar, psi

T Temperature in °C (Celsius), °F (Fahrenheit)

The pressure-/temperature curve is based on a medium water, operating temperature of 20 °C, a valid lifetime of 25 years and the design factor C = 2.

* More information regarding technical specifications can be found online in our planning fundamentals: www.gfps.com

Installation

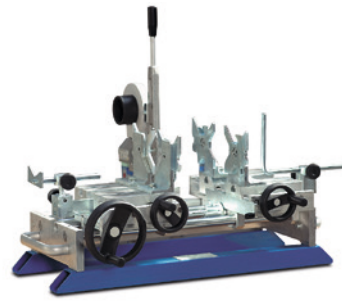
Fast and easy jointing

As a pioneer in the industry, GF Piping Systems has consistently prioritized the advancement of inventive jointing techniques tailored to precise material demands. Our jointing technologies are founded on principles of application simplicity, unwavering chemical resistance, enduring thermal stability, and steadfast weld strength.



Butt fusion

Butt fusion is a sensitive process, which is why all fusion parameters have to be coordinated to create a homogenous joint with consistently high welding quality. GF Piping Systems butt fusion machines minimize distortion, maintain a high level of stability and keep the butt fusion process as short as possible. All heating elements are exceptionally reliable and the units are easy to operate via an intuitive control panel.



Socket fusion

With a wide range of manual and mechanical variants to choose from, GF Piping Systems socket fusion machines are ideal for the job site, thanks to their space-saving dimensions. They are engineered to ensure perfect coordination and high temperature accuracy throughout the fusion process, while the short fusion times prevent distortion of the pipe ends and create a strong, homogenous joint. They are suitable for various pipes and materials.



WBI Tool

As compact as a computer mouse and equipped with cutting-edge photosensory technology, this innovation allows for the digital inspection of welds used in demanding applications. This ensures that any potential flaws are impartially brought to light, thereby minimizing the likelihood of leaks that could lead to significant financial losses. This revolutionary tool introduces a novel capability to swiftly and objectively evaluate weld beads and provide a rapid seal of approval, marking a milestone in inspection technology.



IR (Infrared) fusion

IR fusion machines are characterized by contact-free melting of the components to be fused. This eliminates the possibility of contamination or the pipe faces sticking to the heater. Due to the minimal defined welding bead, there is a good flow in the fusion zone, which increases the free passages of the pipe.



BCF fusion

The BCF fusion machine guarantees high reproducibility of fusion weld quality, even for on-site fusion. An external heating unit causes the material to flow into the fusion zone without changing the material property. A bladder positioned in the fusion zone produces a bead and crevice-free fusion weld. The machine covers PP-r (PROGEF Natural) material in the dimension range of d20 mm up to d110 mm.

Training

Project specific training programs provide the opportunity to gain confidence in working with GF's tools and systems. The training programs are available globally and are carried out by local teams of experts.

Our commitment extends further, with a comprehensive global jointing training initiative, widespread machine rental availability, and an extensive network of service centers worldwide, empowering our customers with specialized expertise and hands-on proficiency.

Learn more:

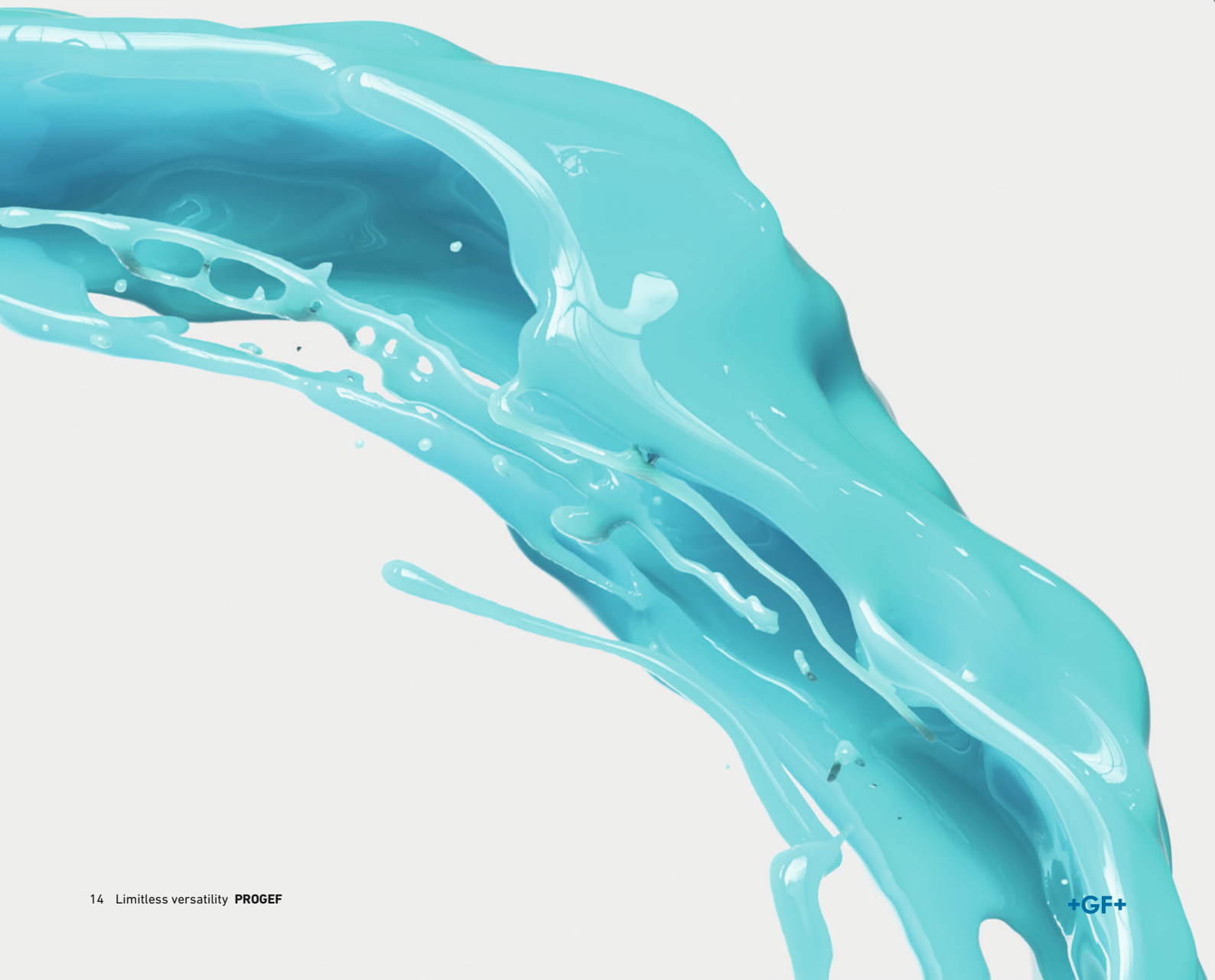
gfps.com/training



Limitless capabilities

We offer deep application knowledge of the entire fluid processing piping system, including warranting high water quality and system availability, providing reliable measurements, and fulfilling stringent regulations. By developing highly engineered products, pioneering jointing technologies, and industry-leading training capabilities, we create solutions that will enhance operational safety and enable our customers to avoid accidents, leakages, and reputation loss.

When safety, reliability, and a wide range of application possibilities are required simultaneously, the PROGEF Standard systems in particular offers these characteristics, making it the ideal solution.





Limitless purity

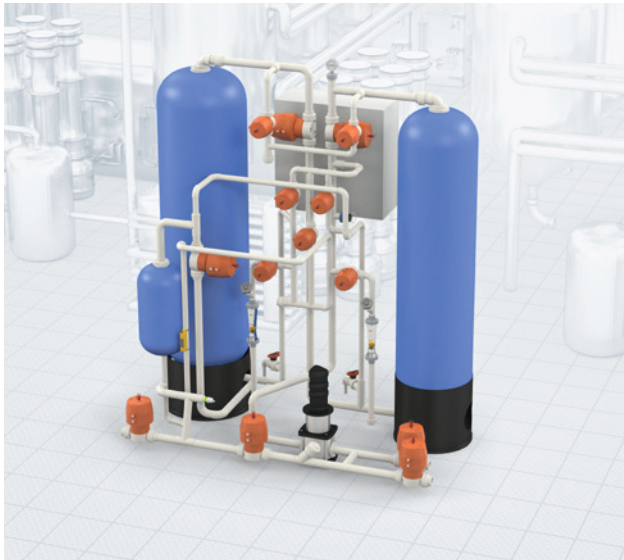
Paint wetting impairment substances (PWIS or LABS) can disrupt a surface's complete and uniform coating, resulting in lacquer errors and defects of the final products. To prevent PWIS from getting into the application, all the necessary components need to be exceptionally clean. With PROGEF Plus, we offer cleaned and double bagged products for increased purity of your application. Ideally suitable for cleanroom environments.

Application possibilities

Improving water quality

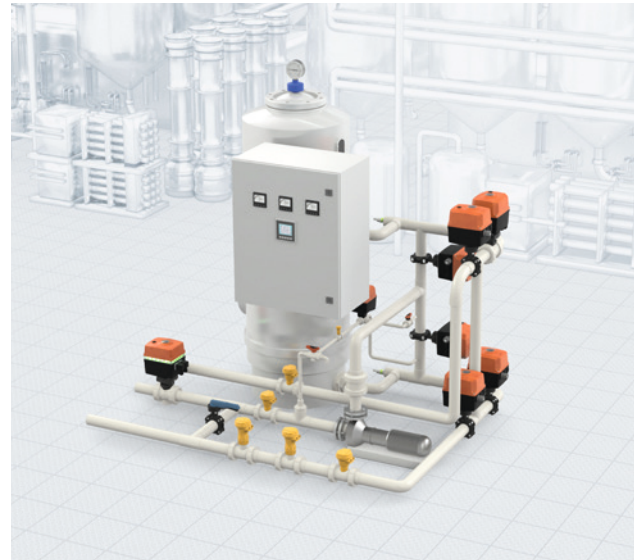
T9

S9



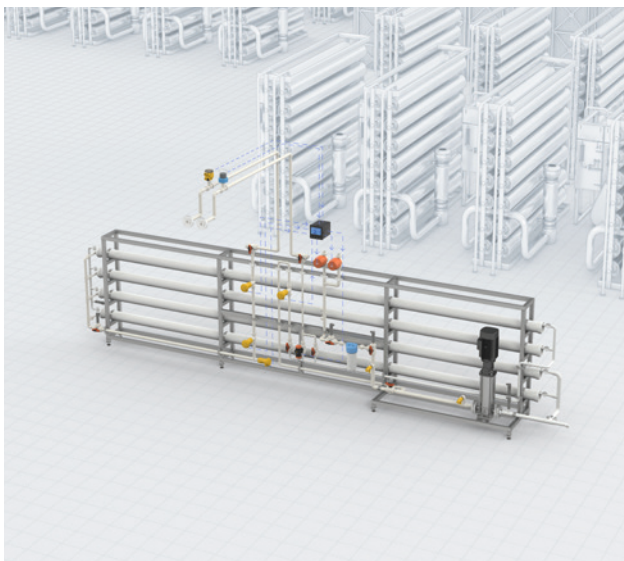
Ion Exchange

The compact construction of ion exchange plants requires flexible piping solutions and components. With the oil- and silicone-free solution PROGEF Plus, GF Piping Systems provides a complete high quality piping system, warranting maximum flexibility while ensuring an entirely safe plant operation with maximum uptime.



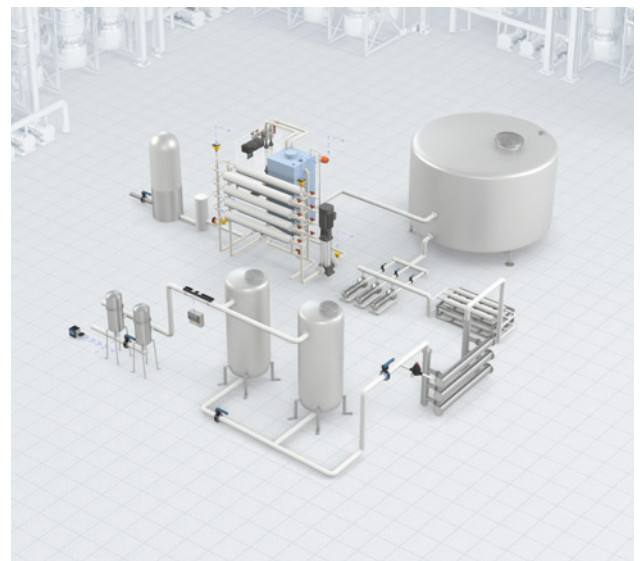
Media filtration

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



Reverse osmosis

Reverse Osmosis technology is a filtering method by which contaminated water passes through a very fine membrane under high pressure and removes nearly all water pollution. PROGEF Plus' components have a very high pressure performance and allow a reliable and long lasting process and tools to monitor the water quality of your application.



Deionized Water (DI)

Completely controlled processes in industrial or laboratory applications with the highest purity and quality standards in manufacturing require process water of specified qualities at different levels, such as deionized water or less demanding UPW water. Thanks to cleaned and packed products, PROGEF Plus is the ideal solution that guarantees a consistently specified water quality throughout the entire process chain.

Application possibilities

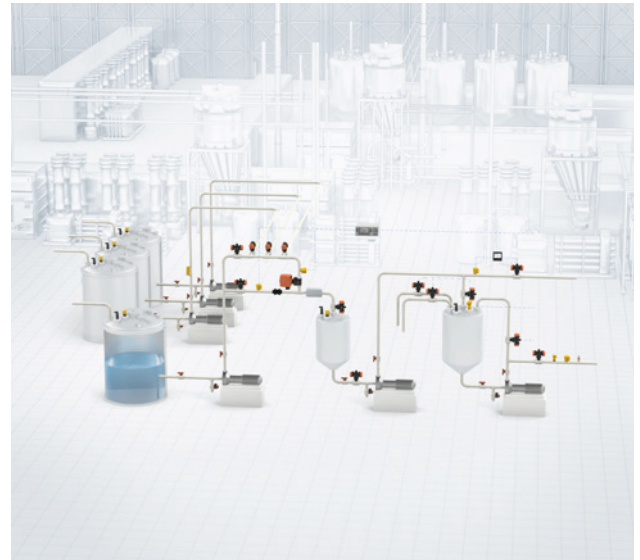
Improving operational safety





Mixing/ Batching

When mixing a range of chemicals, batching is a cost-effective method to consider. With PROGEF Standard, you can equip this process with a reliable, highly chemical resistant piping solution. Integrating actuated PROGEF valves and GF flow meters allows for the automation of the process and the automated opening times of each line ensure an accurate mixture of chemicals based on a pre-determined recipe.



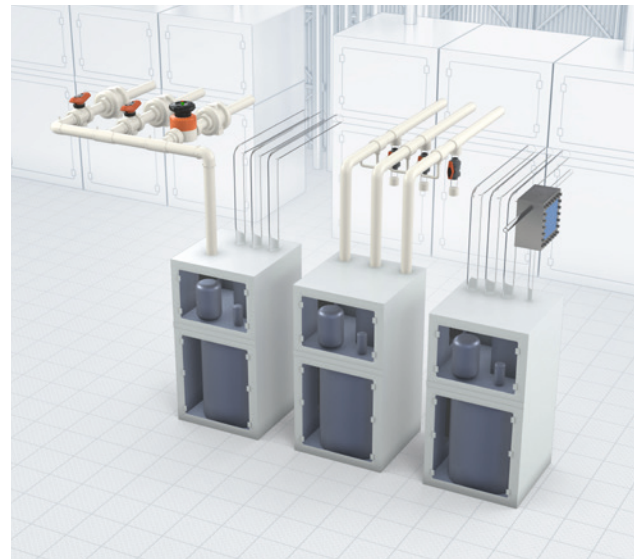
Dosing/ Dilution

Diluting chemicals requires highly specialized and reliable workflows and materials, especially when working with aggressive media. With its excellent temperature and chemical resistance, the Polypropylene system PROGEF Standard helps to keep your media flow safe and reliable.



Storage Tanks (+Filling)

In every manufacturing and processing plant, there is a tank required to store liquid media. GF Piping Systems offers fast, reliable, and safe tools for filling and emptying tanks. With its smooth inner surfaces, PROGEF allows for the efficient filling and emptying of tanks.



Chemical distribution

Transporting chemicals in the highest quality, different concentrations and exact dosing is mandatory which can be demanding for piping systems. With the highly resistant PROGEF Standard range and automation tools, productivity can be increased, thanks to the system's high chemical and temperature resistance, automation possibilities, and reduced down times.

Together as one

Process automation

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



We use our knowhow and experience of the complete control loop to solve the entire process challenge. Enabling the design, selection and installation of Process Automation systems. With Process Automation, GF Piping Systems can supply every customer, not only with highest quality parts, but also with an interoperable all-in-one solution.



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 at 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 installation and calibration with intuitively designed products; Finding the right product upon delivery - our packaging will guide you.

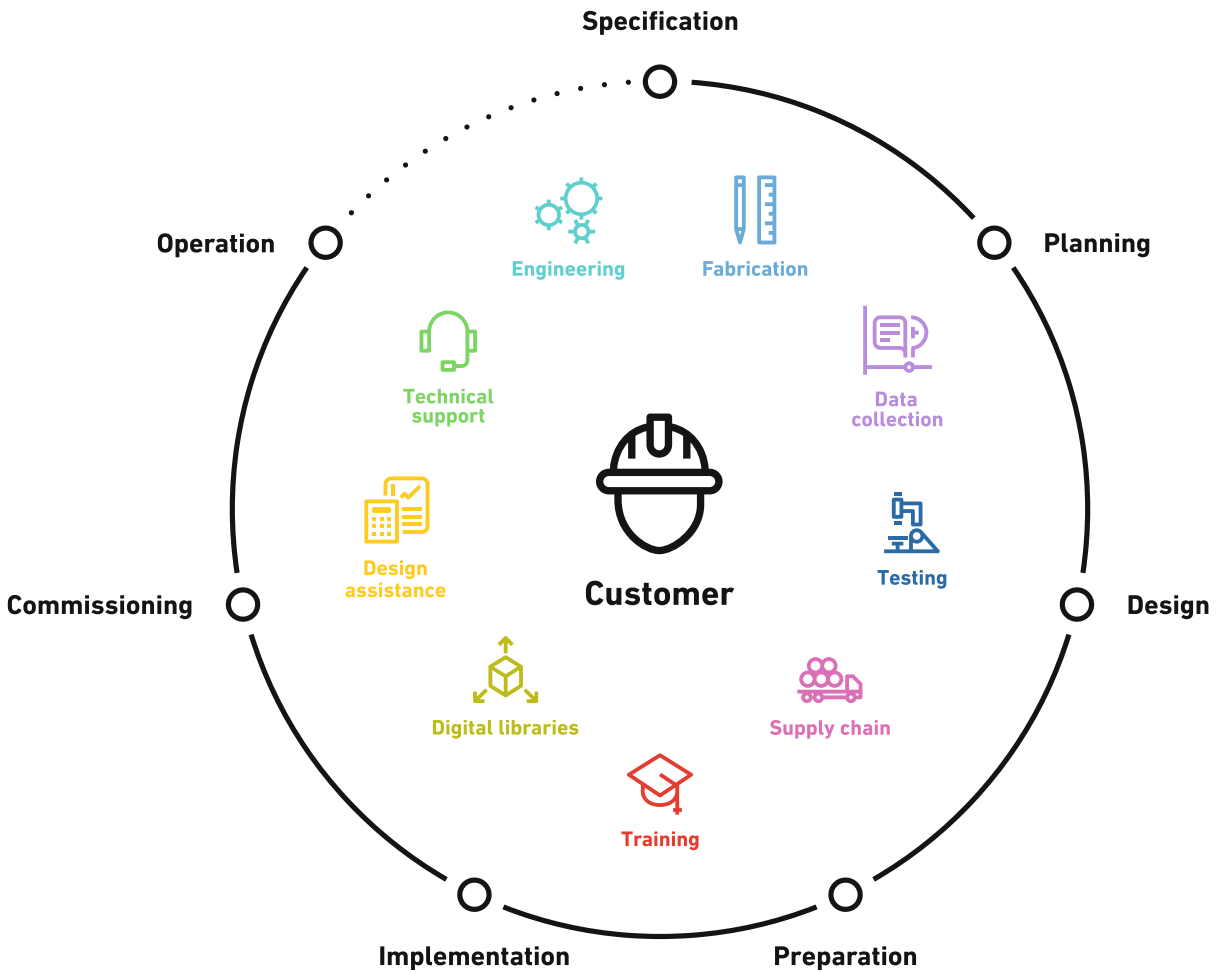


Own (Operation phase)

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. This allows 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

With 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

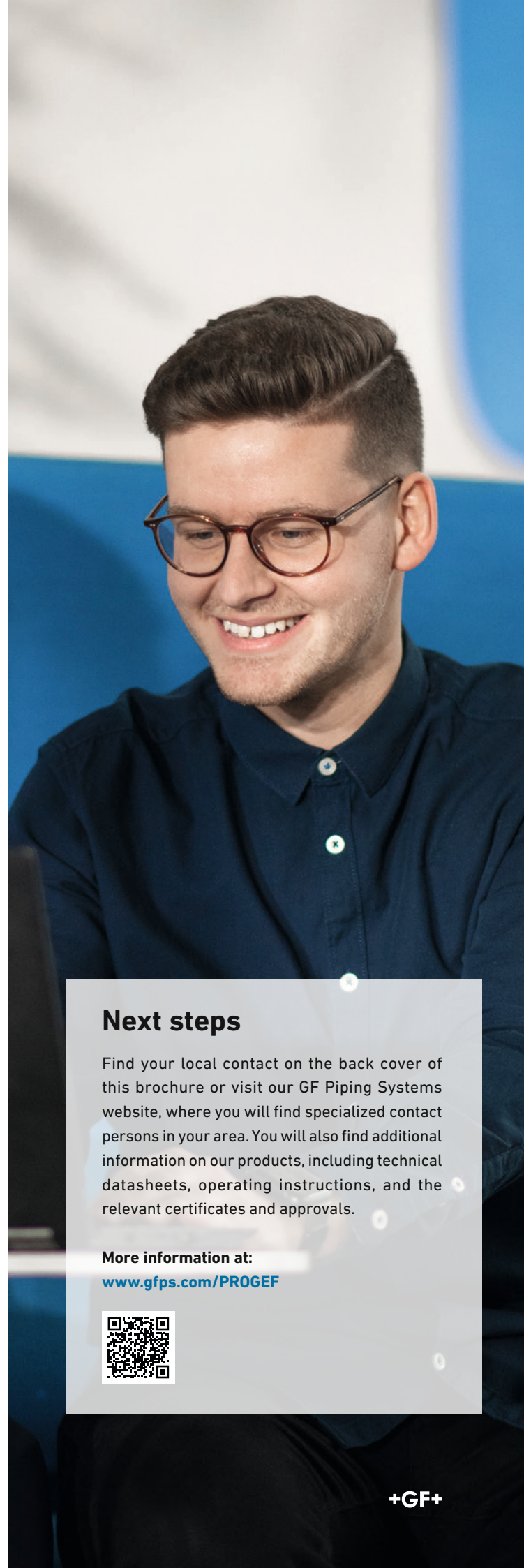
GF Piping Systems instructional courses to help you teach your customers and their installers essential knowledge for the welding of pipes and piping components, as well as an in-depth understanding of butt and electrofusion connections. Training is available virtually, in-house or on site. Trusted training,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



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 the relevant certificates and approvals.

More information at:

www.gfps.com/PROGEF



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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