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Life Science

System solutions for laboratory special waste and process water applications

Benefits

- System solutions
- Specialized solutions with design assistance
- Technical support team
- Plant Design (BIM)

From high purity recirculating laboratory water and special waste... we have piping system solutions for you.

GF Piping Systems is the leading manufacturer of thermoplastic piping systems for laboratory, special waste, and process cooling water applications in the Life Sciences & Institutional markets, and the only manufacturer to offer a complete piping system product offering to specification engineers and facilities personnel, allowing for all components and joining tools of a specified system to be from a single source.

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System solutions for life science

A diverse market
In terms of piping system applications, the Life Sciences & Institutional markets include pharmaceuticals, biotech, and also laboratories and cleanrooms in the research, academic, and healthcare fields.

System approach
With more than 60,000 standard products in many different materials, GF Piping Systems provides the most specific and complete system solutions for many applications in the Life Sciences & Institutional markets.

Future engineering
We offer highly engineered piping systems to integrate into your new build or retrofit project with the help of our engineering and prefabrication offerings.

Training & certification
Training and certification for all installers are conducted by GF Piping Tool Trainers prior to commencement of a project installation.

gfps.com/lifescience


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+ AquaTap® Recirculating Faucet

Advantages

- Continuous flow up to faucet needle valve eliminating dead leg
- Low installation costs
- No wetted material
- Easy flare-style connection method
- Deck or wall mounting options

Parameters

Material:	High purity PVDF
Faucet pressure rated for:	92 psi
Inline flow diverter (IFD):	SYGEF® PVDF, PROGEF® Plus PROGEF® Natural PP and PROGEF® Standard PP
Operation area:	Indoors

Fusion options

- Bead and Crevice (BCF), Infrared, Socket fusion, Sanitary

Applications

- Pharmaceutical Labs
- Research/ Hospital Labs
- University Labs

+ PROGEF Standard

More than a system

Advantages
- High impact strength
- Good chemical resistance
- Extremely smooth surface finish
- Low notch sensitivity
- High stress fracture resistance

Size range
⅜" - 20" (d16 - d500 mm)

Pressure rating
d16 - d225 mm, SDR11: PN10 (150 psi)
d50 - d225 mm, SDR17.6: PN6 (90 psi)
d250 - d500 mm, SDR11: PN10 (150 psi)
d250 - d500 mm, SDR17.6: PN6 (90 psi)

Operating temperature
0°C - 80°C (32°F - 176°F)

Materials
Polypropylene Homopolymer (PP-H)

Fusion options
- Socket fusion & Infrared (IR)

Applications
- RODI water, Purified water, Chemical distribution

Standard & Approvals
- FDA CFR 21 177.1520
- USP 25 Class VI
- NSF 61
- UL94HB (horizontal burning)
- ASTM Standards, D4101, D638, D2837, D2122

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+ PROGEF Plus

More than a system

Advantages
- Pipes, fittings and valves cleaned and double bagged
- High impact strength
- Good chemical resistance
- Extremely smooth surface finish
- High stress fracture resistance
- Silicone free valves

Size range
½" - 12" (d20 – d315 mm)

Pressure rating
d20 - d315 mm, SDR11: PN10 (150 psi)

Operating temperature
32°F - 176°F (0°C - 80°C)

Materials
Polypropylene Homopolymer (PP-H)

Fusion options
- Infrared (IR)

Applications
- Process water requiring clean system components
- RODI, Purified water

Standards
- FDA CFR 21 177.1520
- USP 25 Class VI
- ASME-BPE
- ASTM Standards, D4101, D638, D2837, D2122

PROGEF Natural

More than a system

Advantages
- Excellent resistance against certain disinfectants and chemicals
- Translucence
- Very high surface finish
- High temperature resistance
- Drain ability with bead and crevice free fusion

Size range
½" - 3" (d20 - d90 mm)

Pressure rating
d20 - d63, SDR11: PN10 (150 psi)
d75 - d110, SDR17.6: PN6 (90 psi)

Operating temperature
32°F - 176°F (0°C - 80°C)

Materials
Polypropylene Random Copolymer

Fusion options
- Infrared (IR) & Bead and Crevice (BCF)

Applications
- RODI, Purified water

Standards
- FDA CFR 21 177.1520
- USP 25 Class VI
- ASME-BPE
- ASTM Standards, D4101, D638, D2837, D2122

SYGEF Standard

Your solution for RODI & Ultrapure water conveyance

Advantages
- Sizes 20 mm -75 mm certified to UL723 for Plenum Installation
- Capped and single bagged
- Lot inspected for purity and dimensional tolerances
- Suitable for high temperature sanitation
- Excellent chemical resistance

Size range
½" - 12" (d20 - d315 mm)

Pressure rating
d20 - d110 mm: PN16 (232 psi)
d160 - d315 mm: PN10 (150 psi)

Operating temperature
-4°F - 284°F (-20°C - 140°C)

Materials
PVDF (Polyvinylidene Fluoride) Kynar

Fusion options
- Socket fusion, Infrared (IR) & Bead and Crevice (BCF)

Applications
- RODI water, Purified water

Standards
- ASME-BPE
- FDA CFR 21 177.2510
- USP Class VI
- UL723/ASTM E-84 (20 mm - 75 mm)
- ASTM Standards, D3222, D 638, D2837, D2122, FM 4910

SYGEF Plus

Your solution for RODI & Ultrapure water conveyance

Advantages
- Ultra high purity
- Manufactured in class 1000 clean environment
- Capped and doubled bagged
- 100% inspected for purity and dimensional tolerances

Size range
½" - 18" (d20 - d450 mm)

Pressure rating
d20 - d225 mm: PN16 (232 psi)
d90 - d450 mm: PN10 (150 psi)

Operating temperature
-4°F - 284°F (-20°C - 140°C)

Materials
Polyvinylidene Fluoride High Purity Homopolymer (Kynar)

Fusion options
- Infrared (IR) & Bead and Crevice (BCF)

Applications
- Ultra pure water (UPW)
- Water for injection (WFI)
- Sanitization (Steam, Ozone)

Standards
- ASME-BPE
- FDA CFR 21 177.2510
- USP Class VI

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SYGEF ECTFE

Solution for aggressive chemical applications

Advantages

- High operating temperature range
- Outstanding chemical resistance
- Extremely smooth surface
- Long service life

Size range

SYGEF ECTFE: 20 mm - 110 mm

Pressure rating

Up to 145 psi (10 bar)

Operating temperature

-4°F - 284°F (-20°C - 140°C)

Materials

ECTFE Halar

Fusion options

IR Plus fusion

Applications

Chemical processing industry, semiconductor, pharmaceutical, and chemical storage and transfer

Standards

- NSF/ANSI Standard 61
- California Proposition 65
- RoHS, WEEE, REACH

+ Stress Less

Finally, a support system engineered for plastic pipe

Advantages

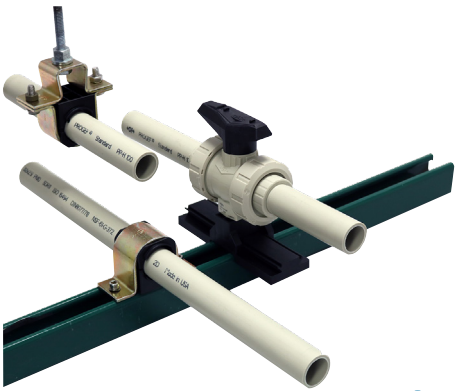
- Protects plastic piping systems
- Engineered to perform and protect against thermal expansion
- Corrosion and chemical resistant
- UV protected

Size range

½" - 12" (20 mm - 315 mm)

Available supports

Pipe guides
Vertical supports
Clevis hangers
Valve supports



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Fuseal PP Special Waste

Engineered piping solution for safe conveyance of special waste

Advantages

- Maintenance free service with low installation & ownership cost
- 30 ft (15 psi) max. head pressure test for DWV applications
- Outstanding chemical resistance
- Light, flexible, tough, and dependable

Size range

Fuseal® PP Electrofusion:

- 1½" - 12" Schedule 40
- 1½" - 12" Schedule 80

Fuseal® Fast-Lock Mechanical Joint

- 1½" - 4" Schedule 40

Pressure rating

50 psi for pressure waste applications (subject to manufacturers review of design)
35 psi for Fuseal® Fast-Lock Mechanical Joint

Operating temperature

32°F - 212°F (0°C - 100°C)

Materials

Polypropylene Flame Retardant (PPFR)
Polypropylene Non-Flame Retardant (PPNFR)

Applications

- Special/corrosive waste
- Institutional & Commercial laboratories
- Life Sciences, Pharmaceutical, Biotechnology

Standards

- NSF Standard 14
- NSF-cw
- UPC
- ASTM F1412
- ASTM D4101
- ASTM D3311
- CSA B181.3
- ICC-ES PMG-1774

+ Fuseal 25/50 PVDF

Engineered piping solution for safe conveyance in return air plenum

Advantages

- Complete system is UL723/ASTM E-84 Certified
- 30 ft (15 psi) max. head pressure test for DWV applications
- Superior flame and smoke rating
- Maintenance free for service life
- Low installation cost
- Outstanding chemical resistance

Size range

1½" - 6" (electrofusion)

Pressure rating

Up to 50 psi for pressure waste applications (subject to manufacturers review of design)

Operating temperature

-4°F - 284°F (-20°C - 140°C)

Materials

PVDF (Polyvinylidene Fluoride) Kynar

Applications

- Return Air Plenum Special Waste Piping Systems
- High Temperature Flow Stream Conveyance
- Institutional & Commercial Laboratories
- Life Sciences, Pharmaceutical, Biotechnology

Standards

- UPC
- NFPA 255
- UPL723
- ASTM E-84

ASTM F1673
ASTM D3311
CSA B181.3
ASTM D3222

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Neutralization

Neutralization and pH Monitoring of Special Waste Flow Streams

GF Piping Systems offers a comprehensive line of neutralization tanks and Automatic pH Adjustment/ Monitoring systems. In facilities where special waste piping systems are required, pH neutralization and/or monitoring of the special waste discharges are required by many local municipalities or Authorities Having Jurisdiction (AHJs).

Elements of Success
Fuseal PP Corrosive Waste
Measurement & Control
Neutralization Tanks

Tank size
Molded tanks 5–1,200 gallons
Custom fabricated round or rectangular tanks to 3,000 gallons

Tank material
Polypropylene (PP) molded and fabricated
Polyethylene (PE) molded

Inlet, outlet and vent connections configurable as required

Options
Customized one-piece tanks replace requirement for tank with extension section to grade

The GF line of tanks and treatment/monitoring systems provides the proper equipment required to suit this need. Our group of experts will help you choose the right system allowing for one source in providing both special waste piping and neutralization systems.

GF Piping Systems offers several different methods of treatment/monitoring for facility special waste discharges to ensure compliance with regulating authority mandates. GF Piping Systems design personnel works with the engineering team or facilities management team in outlining system options based on special waste design flow parameters, and flow stream chemistries. They will review the specification and explain as to why a particular installation is recommended.

GF Piping Systems offers custom one-piece PP fabricated neutralization tanks that allow for easier installation and limit potential infiltration problems with extension connection points.

Fuseal Squared® Double Containment

Engineered piping solution for double walled conveyance of special waste

Advantages

- Maintenance free for service life
- 30 ft (15 psi) max. head pressure test for carrier pipe
- Outstanding chemical resistance
- Light, flexible, tough, and dependable

Size range

1½" - 8" inner pipe (PPFR or PPNFR)
4" - 12" outer pipe (PPFR or PPNFR)
1½" - 6" inner pipe (PVDF)

Pressure rating

For Carrier Pipe up to 50 psi for pressure waste applications (subject to manufacturers review of design)
For Containment Pipe 5 psi maximum air test

Operating temperature

32°F - 212°F (0°C - 100°C) PP
-4°F - 284°F (-20°C - 140°C) PVDF Carrier

Materials

Polypropylene Non-flame Retardant Pipe (PPNFR)
Polypropylene Flame Retardant (PPFR)
Also available with PVDF carrier x PP Containment

Applications

- Special/Corrosive waste
- Institutional & Commercial laboratories
- Life Sciences, Pharmaceutical, Biotechnology

+ Contain-IT Clear PVC

Secondary containment piping system

Advantages

- Economical split-fitting design
- Fits over any primary carrier piping
- Clear resin allowing visual leak detection

Size range

3" - 6"

Pressure rating

32 psi (2.2 bar)
5 psi (interstitial) max air test

Operating temperature

32°F - 140°F (0°C - 60°C)

Material

Clear Polyvinyl Chloride (Clear PVC)

Applications

- Industrial & commercial laboratories
- Pharmaceuticals
- Hospitals

Standards

- ASTM D1784
- ASTM D2152
- ASTM D2412
- ASTM D2444

+ Double-See

Engineered simplicity

Advantages

- Fast and simple installation
- ASME B31.3 compliant
- Outer pipe is pressure rated
- PVC and/or CPVC

Size range

½" - 8" inner pipe
2" - 12" outer pipe

Pressure rating

Varies by Size (primary)
PN4 (50 psi) (secondary)

Operating temperature

Varies by pipe

Material

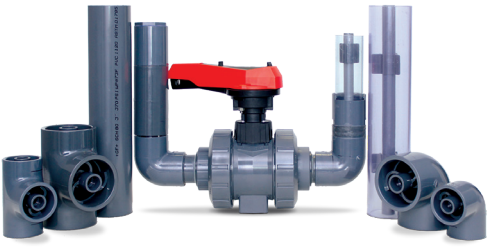
Polyvinyl Chloride (PVC) Grey
Chlorinated Polyvinyl Chloride (CPVC)
Clear Polyvinyl Chloride (Clear PVC)

Applications

- Secondary Containment for:
  - Personnel Safety
  - Equipment and Environmental Protection
  - Chemical Applications

Standards

- ASTM D1784
- ASTM D2467
- ASTM F441
- NSF 61
- ASTM D1785
- ASTM F439
- NSF 14
- ASTM B31.3 compliant



COOL-FIT PE Plus

Extreme cooling confidence

Advantages

- 100% maintenance-free
- Lighter weight
- 50% faster installation
- Higher energy efficiency

Size range

1" - 18" (d32 - d450)

Pressure rating

150 psi SDR 17

Operating temperature

-58°F - 140°F (-50°C to 60°C)

Material

Carrier Pipe: GF PE100 HDPE
Outer Jacket Pipe: GF PE100 HDPE
Outer Jacket Fittings: Polyurethane Low Density(PUR)
Foam Insulation: Polyurethane High Density(PUR)

Applications

- Chilled water, glycol, brine and alcohol solutions including ice slurries

Standards

- DIN EN ISO 15494

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+ Valves and Actuators

Upgrade through modularity

Advantages

- Wide range of valves, actuators and accessories
- Long time reliable operation
- High corrosion resistance
- Product range available in schedule and metric sizes

Parameters

Material: PVC-U, PVC-C, ABS, PP-H, PVDF, PP fiberglass reinforced

Product range:

Ball valves: ⅜" - 6" (DN10 - DN150)
Diaphragm valves: ½" - 6" (DN15- DN150)
Butterfly valves: 2" - 24" (DN50 - DN600)
Process valves: ⅜" - 4" (DN10 - DN100)
Electric and pneumatic actuators open/close and continuous control

+ Measurement & Control

Smart simplicity

Advantages

- Simple operation and installation
- Sensors for all major parameters
- High corrosion resistance of housings
- Global availability of products

Parameters

Material:	PVC, PP, PVC-U, PVC-C, PVDF, Ryton body, PTFE junction, 316L stainless steel
Product range:	Flow, conductivity/resistivity, pH, ORP (Redox), temperature, pressure, level, dissolved oxygen, salinity and chlorine
Jointing technology:	Special installation fittings, strap on saddles, ISO/NPT pipe threads

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Jointing Technologies (Socket Fusion)

Compact, reliable, efficient and versatile

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. The SG 125 is a compact and portable socket fusion machine with sturdy base frame and clamping devices to eliminate distortion when joining polymer pipes and fittings. It can be used both in workshops and on job sites.

Advantages

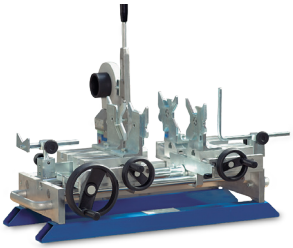
- Portable heating element
- High temperature accuracy
- Compact, sturdy design, distortion-free machine bed
- Wide range of applications
- For fusion jointing of PP, PE and PVDF pipes and fittings
- All devices equipped with on/off switch, mains and temperature control lamp
- Choice of electronic or thermostatic temperature control
- High temperature accuracy over the entire heating surface

Product range

SG 125	½" - 3"	(d20 - d90 mm)
MSE 63	½" - 2½"	(d16 - d63 mm)

Materials

Polypropylene, PVDF



+ Jointing Technologies (IR)

Peace of mind in quality joining technologies

IR fusion machines, designed and produced by GF Piping Systems, meet the highest demands of mechanical stability, reproducibility and quality of fusion jointing.

Advantages

- Easy to clean and safe to use
- Smart transportation
- Ideal for complex installations

Product range

IR-63 M:	½" - 2"	(d20 - d63 mm)
IR-110 Plus:	½" - 4"	(d20 - d110 mm)
IR-225 Plus:	2" - 8"	(d63 - d225 mm)
IR-110A:	1" - 4"	(d20 - d110 mm)
IR-315A:	4" - 12"	(d110 - d315 mm)

Temperature rating

+5°C to +40°C

Materials

Appropriate materials for IR Plus Fusion: PP-H, PP-n, PE, and PVDF; PFA and ECTFE on request

Applications

- Fusion machine designed for industrial applications and laboratory conditions

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+ Jointing Technologies - Bead and Crevice Free (BCF)

Peace of mind in quality joining technologies

The fusion joining process consists in transmitting precisely defined thermal energy to the pipe and fitting ends being joined by means of half-shell heating elements. At the same time an elastic, pressurized bladder supports the inside surface of the fusion zone in order to prevent the formation of an internal fusion bead.

Advantages

- Products a weld joint with NO interior bead
- All but eliminates concerns over bacterial build-up within flow stream
- Allows for complete system drainability which IR and Socket systems do not provide

Product range

BCF Plus ½" -4" (d20 - d110 mm)

Materials

Appropriate materials for BCF Plus Fusion: PP-n and PVDF

+ Electro Plus® Fusion Machine

Electrofusion redefined – Reliable and simple

Electrofusion is defined as the joining process where two plastic parts are fused utilizing electrical heat resistance to form a permanent joint. The Electro Plus has the time and labor saving features of multiple joint fusion. Multiple joint capability significantly reduces installation time and contributes directly to your bottom line.

Advantages

- Intuitive user interface
- Multiple joint capability for speedy installations
- Integral carrying case for ease of transportation
- Network and generator compatible for simple operation
- Self-diagnostic system takes the guesswork out of error detection
- Automatic compensation for ambient temperature
- One-button repeat fusion cycle for same size joints

Temperature rating

14˚F to 113˚F (-10˚C to 45˚C)

Product range

Fuseal® PPFR and PPNFR (1½"–12")
Fuseal Squared® PPFR and PPNFR (1½"×4"–8"×12")
Fuseal 25/50™ PVDF (1½"–6")

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Weld Bead Inspection Tool (WBI)

Your seal of approval

Built to provide peace of mind for piping systems in the microelectronics, chemical processing, life science, and energy sectors, the Weld-Bead Inspection Tool from GF Piping Systems assesses the quality of infrared (IR) weld beads more reliably than ever.

Size range
WBI Tool Set L (d20 - d225 mm)
WBI Tool Set S (d20 - d63 mm)

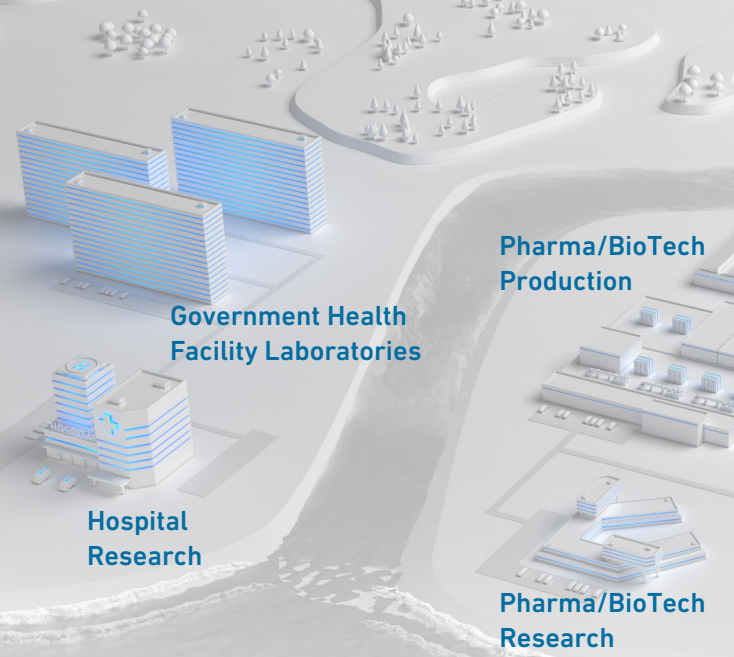
Working temperature
+5°C to +40°C

Electrical power supply
100-240V 50/60 Hz (Printer / Tablet)
Voltage 5V, 3A

Compatibility
WBI-L and WBI-S are adaptive for both PROGEF and SYGEF components and has been designed to fit up to 15 different pipe diameters ranging from d20 to d225

WB-L

WB-S



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 for Life Science can be applied for the conveyance of RODI and WFI water; single and double wall special waste; glycol secondary cooling; protective containment of existing single wall sanitary or rainwater piping.

Our custom fabrication capabilities for enhanced piping design, pH neutralization systems, equipment skids are also a key component of GF Piping Systems Life Science market offerings.

Life Science solutions

- Piping Material Selection
- Specifications
  - Preparation assistance
  - Master specification reviews

Design Assistance

- Hydraulic Calculations
- Stress Analysis
- Pipe Support Analysis
- Buried Pipe Load Calculations
- CO2 sustainability calculations
- Contract Drawing Review

Material take-off assistance

Custom fabrication

- Design assistance
- Neutralization and pumping systems

Reduced environmental impact

Learn more about our sustainability goals:

www.gfps.com/sustainability


Sustainability is a key value driver in our strategy: We aim to become a sustainability and innovation leader by offering high-value sustainable products and solutions to drive the circular economy.
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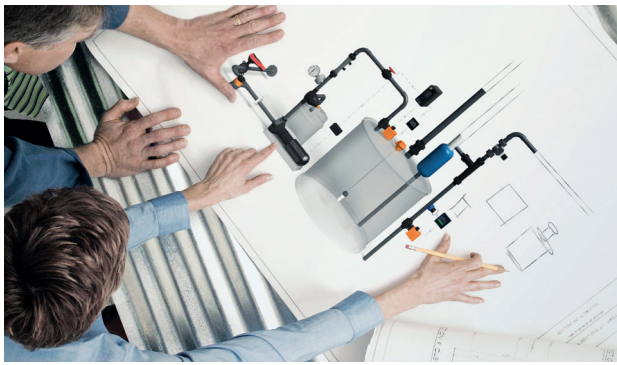
Specialized Solutions

Taking care of your needs

GF supports the design and installation of state-of-the-art plastic piping systems, so that owners and planners can concentrate on their daily business without interruption. GF is present every step of the way, from providing planning support on new projects to testing the condition of old systems.



+ Main benefits:

- Increase quality of your piping installation
- Reduce costs in implementation
- Increase safety in your operation
- Save time in preparation & planning

GF Piping Systems and its Specialized Solutions cover every aspect of a project's process, from the design phase all the way through to installation and maintenance.

With Specialized Solutions, GF Piping Systems supports the design and installation of state of the art plastic piping systems, so that owners and planners can concentrate on their daily business without interruption. GF Piping Systems is present every step of the way, from providing planning support on new projects to testing the condition of old systems.

Custom Products

Customized solutions to fit your needs

GF provides a variety of custom solutions. Sometimes this is as simple as reproducing a spool piece a hundred times in our facility, saving the effort of doing so in the field; other times it is may be much more complex, such as building an engineered skid with hundreds of individual parts.

+ Main benefits:

- Fabrication building
- Custom spool pieces
- Skid building
- Custom enclosures
- We provide detailed 3D model drawings

Our ability to custom fabricate components in our facilities allows our customers to leverage time and money by having nearly-complete systems delivered to the job. Our Engineering, Quality Control, and Fabrication teams pride themselves on being the best, and they deliver products with amazing attention to detail.
We frequently exceed the expectations of our most demanding customers with our tight tolerances and quality of work.

Our customer products feature specialized assembly designs, tailored solutions, and prefabricated modules, all produced with clean room quality. We accommodate lot sizes from one and ensure top performance through testing in audited laboratories.

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GF Piping Systems

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