GF Piping Systems

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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
d16 - d500 mm (⅜" - 20")

### 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 - d500mm, 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)

# + 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
d20 – d315 mm (½" - 12")

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

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

### Materials
Polypropylene Homopolymer (PP-H)

### Fusion options
- Socket fusion & Infrared (IR)

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

### Standards
- FDA CFR 21 177.1520
- USP 25 Class VI
- ASME-BPE

# + 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

d20 - d90 mm (½" - 3")

### Pressure rating

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

### Operating temperature

0°C - 80°C (32°F - 176°F)

### Materials

Polypropylene Random Copolymer

### Fusion options

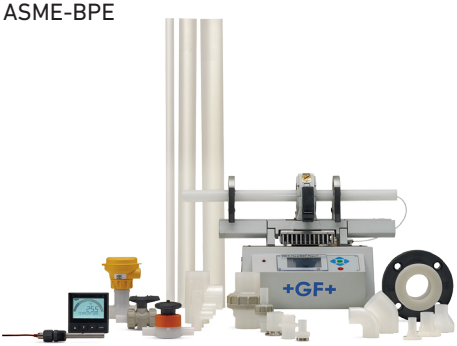
- Socket fusion, Infrared (IR) & Bead and Crevice (BCF)

### Applications

- RODI, Purified water

### Standards

- FDA CFR 21 177.1520
- USP 25 Class VI
- ASME-BPE



# SYGEF Standard

## Your solution for RODI & Ultrapure water conveyance

### Advantages
- Sizes 20mm -75mm 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
d20 - d315 mm (½" - 12")

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

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

### 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)

# + 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
d20 - d450 mm ( ½" - 18")

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

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

### Materials
Polyvinylidene Fluoride High Purity Homopolymer (Kynar)

### Fusion options
- Socket fusion, 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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# Stress Less

## Finally, a support system engineered for plastic pipe

### Advantages

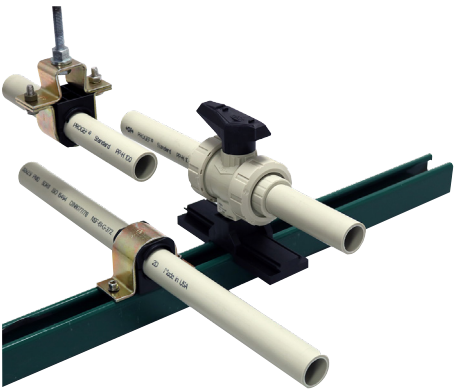
- Protects plastic piping systems
- Engineered to perform and protect against thermal expansion
- Corrosion and chemical resistant
- UV protected

### Size range

½" - 12" (20 mm - 315 mm)

### Available supports

Pipe guides
Vertical supports
Clevis hangers
Valve supports



# + Hycleen Automation System

## Revolutionizing sanitary automation processes

The Hycleen Automation System conducts your drinking water installation safely and conveniently from one central control unit. With the automated control system GF Piping Systems ensure flowing harmony in your installation.

### Advantages

- Hygiene thanks to uniformly high temperatures and regular water exchange
- Comfort
- Energy saving thanks to optimal hydraulic balancing
- Simple to install

### Product range

DN15- DN20

### Temperature rating

+5°C to +90°C

### Pressure rating

Up to 10 bar

### Applications

- Potable water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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" - 18" 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

# + 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 D322

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# + 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 GF Piping 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

0°C - 60°C (32°F - 140°F)

### 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"- 6" inner pipe
2" - 10" outer pipe

### Pressure rating

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

### Operating temperature

Varies by pipe

### Material

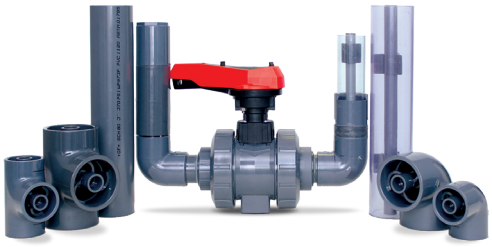
Polyvinyl Chloride (PVC) Grey
Chlorinated Polyvinyl Chloride (CPVC)
Clear Polyvinyl Chloride (Clear PVC)

### 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

d32-d450 (1" - 18")

### Pressure rating

150 psi SDR 17

### Operating temperature

-58°F to 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

- Glycol Secondary cooling systems

### Standards

- DIN EN ISO 15494

# + 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: DN10 to DN150<br>Diaphragm valves: DN15 to DN150<br>Butterfly valves: DN50 to DN600<br>Process valves: DN10 to DN100<br>Electric and pneumatic actuators open/close and continuous control |

### Applications

- RODI water, Purified water

# + Process Automation

## Together as one: we make process automation easy

### 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 |

### Applications

- RODI water, Purified water

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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)
WBI Tool Set S (d20-d63)

### 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

# + 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-110A d20mm-d110mm (1 ½" – 4")
IR-315A d110mm-d315mm (4" – 12")

IR Plus 63/110/225 d20mm-d225mm (½" – 9")

### 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 clean room conditions




# 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 d20mm - d110mm (½" -4")

### Materials

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

# 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

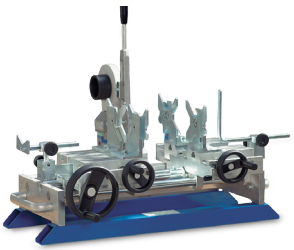
- Portable heating element
- High temperature accuracy
- Compact, sturdy design, distortion-free machine bed
- Wide range of applications
- For fusion jointing of PP, PE and PVDF pipes and fittings
- All devices equipped with on/off switch, mains and temperature control lamp
- Choice of electronic or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

### Product range

| | |
|---|---|
| SG 125 | d20mm - d90mm (½" - 3") |
| MSE 63 | d16mm - d63mm (½" - "2½") |

### Materials

Polypropylene, PVDF



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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

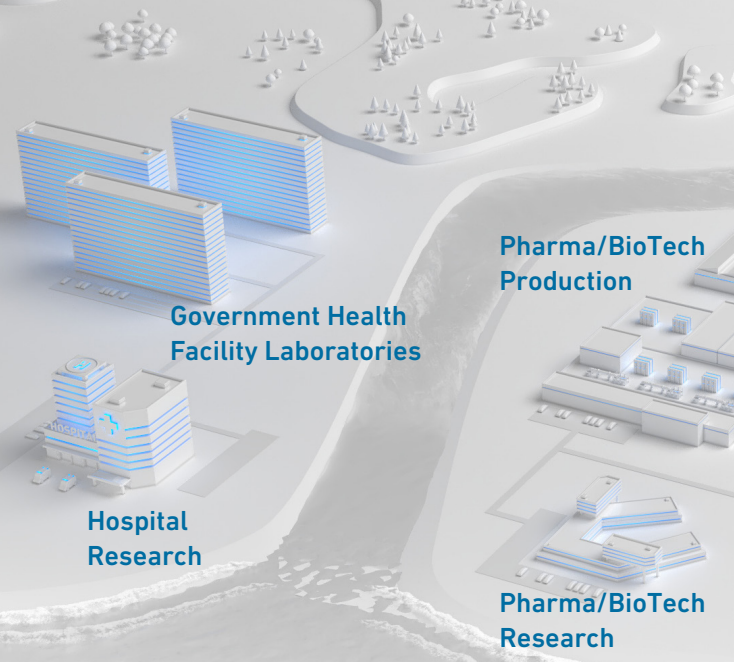
Inlet, outlet and vent connections configurable as required

**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.

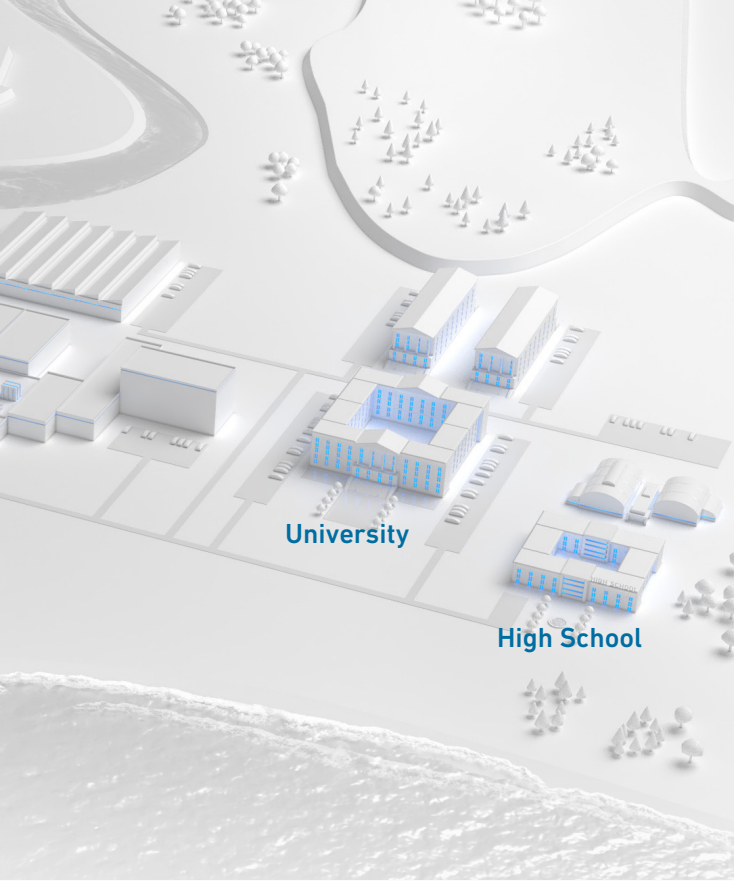
GF Piping Systems offers custom one-piece PP fabricated neutralization tanks that allow for easier installation and limit potential infiltration problems with extension connection points.




# 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

Material take-off assistance

Custom fabrication

- Design assistance
- Neutralization and pumping systems

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# 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

## Ready when you are

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 Product Design and Prefabrication

**Specialized ideas**

### Engineering

**Specialized expertise**

### CONNECT conrivo

**Specialized visibility**

### Training

**Specialized education**

Learn more

**gfps.com/specialized-solutions**

**With Specialized Solutions, the global leader GF Piping Systems provides project support every step of the way to achieve construction excellence.**

Custom Design & Prefabrication Solutions offers the opportunity to address a customer's specific needs during the planning and design phase, within the Specialized Solutions range by GF Piping Systems.

GF Piping Systems supports the conception and design process of a project from the outset to ensure that a sustainable and efficient solution is achieved. Whether in the selection of the right plastic solution from our extensive portfolio, the management of complex sub-projects, or quality control based on recognized international standards - you can benefit from Specialized Solutions for all application areas and references from a wide range of industries across the entire product range.

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**gfps.com**

# Fuseal® Fast-Lock™ for Corrosive Waste

**GF Piping Systems is introducing a revolutionary new mechanical joint systemfor special waste drainage systems:** Fuseal® Fast-Lock™. The new fittings are available in sizes 1-1/2" – 4", in Fuseal polypropylene flame retardant and will

work with both flame retardant and non-flame retardant pipes. Enjoy all the standard features of Fuseal® piping system, with the new benefits of a truly innovative Fast-Lock™ system.

**GF Piping Systems**

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Learn more about life science solutions
**gfps.com/lifescience**

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