



Ship Building
Offshore

From Applications
to Products



GEORG FISCHER
PIPING SYSTEMS

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GF Piping Systems

Your global system provider

We are dedicated to designing, manufacturing and marketing piping systems for the safe and secure conveyance of liquids and gases.

We put customers first

- Customer needs guide our product development
- We offer customer support and training worldwide
- We measure your satisfaction

We act fast

- Local presence worldwide
- Superior logistics
- Speed in all details

We do what we say

- Tested quality
- Always trustworthy

Your benefits at a glance

- technological expertise
- “one stop” shopping around the world
- system solutions
- know-how and experience
- local support

Plastics can do more for Ship Building and Offshore

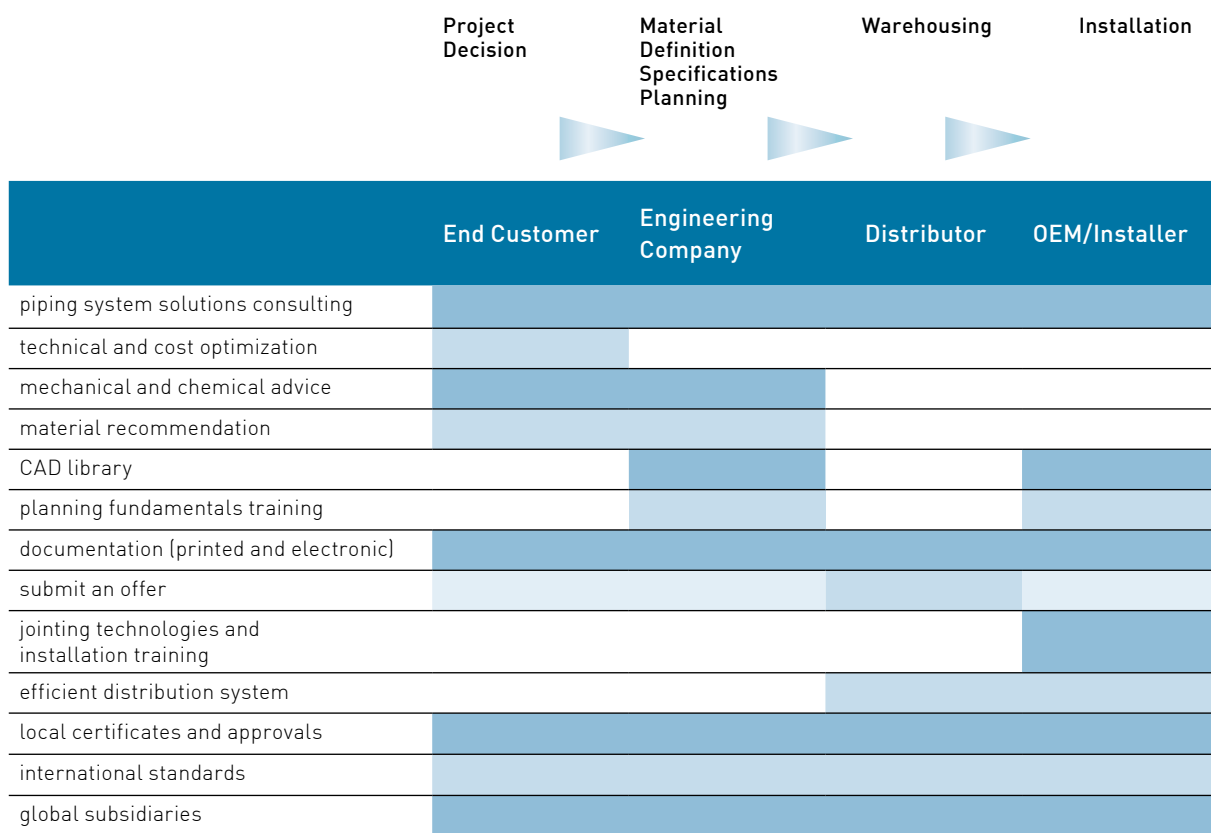
A corrosion-free piping system besides ensuring a long service life of the non-essential piping systems, adds a long list of additional benefits:

- Material weight savings drastically reduces the total deck weight.
- Faster, safer and secure installation, eliminating the need for hot work certificates.
- Plastic prefabrication capabilities radically reduce installation time on board.
- Enables installations with a minimum amount of tools especially in small or in difficult access areas.
- Service and maintenance costs are reduced significantly due to speed of installation, portability and easy handling.



GF Piping Systems at your service

We support you throughout



Brandname	Material
FUSEAL Sea Drain	→ PP Flame retardant
INSTAFLEX® PB	→ Polybutylene
iFIT	→ Polybutylene and Multilayer pipes, fittings PPSU
AQUASYSTEM	→ PP-Random
ELGEF Plus	→ PE 100



1
Start with
Application Environment



2
Select your Application



3
Find your System Solution

Characteristics	Ø PP-H	PVC-U
Temperature limits (25 years)	0 / +80 **	0 / +60
Weight / meter pipe (PN10, d63)	0.49	0.4
Density	0.90-0.91	1.38
Flexural modulus	1250	> 2400
Tensile modulus	1300	
Stiffness *	3	5
Toughness *	5	3
	3	2
	1	1
Charpy notched impact strength	85	> 6
	4.8	> 3
	-	-
Taber abrasion	150...200	250...300
Abrasion resistance *	4	4
Coefficient of thermal expansion	0.16...0.18	0.07...0.08
Thermal conductivity	0.23	0.15

4
Define your Material

Type 546 2-way Ball Valve		Fi 5678
Type 567 Butterfly Valve		GMST 5885
Variable Area Flow Meter		Fi 8222

5
Add Products



Application Environment

Ships are not only floating cities but are also essential for the world's economy. Preventing corrosion is more important here than anywhere else.

With GF Piping Systems, corrosion is no longer an issue. Cost-effective and high-quality plastics are your right choice.

We will help you increase production by reducing maintenance time and overall operational cost.



Hot and Cold, Fresh Water



INSTAFLEX® (PB),
AQUASYSTEM (PP-R)
iFIT (PB / ML)

*prefabrication
and easy to install*

Black and Grey Water



FUSEAL Sea Drain
(PPFR), PVC, ABS

*vacuum safe,
corrosion resistance*

Ship Building with Piping Systems from GF



Water Treatment



Drinking Water, Waste Water and Swimming Pools

PVC-C, PVC-U, PP-H, PE,
ABS, PB

*50 years of experience
with plastics for OEM'S*

Cooling / AC Cooling



Sea and Fresh Water Cooling

ABS, PE 100

Refrigeration below 0°C

ABS, PE 100, COOL-FIT

Air Conditioning

ABS, PE 100

*reduced condensation,
less corrosion*

Bunker Lines / Ballast



Fresh Water Bunker Lines Ballast Systems

PE 100

*less weight,
safe handling*





Application Environment

Offshore drilling rigs are exposed to the forces of nature day and night. Wind, rain and saltwater can be very harsh on structures, housing and supply lines.

The pipelines for hot and cold water, effluent and greywater, rain catchment and chemical distribution are particularly affected, internally and externally, by corrosion as well as incrustation.

The solutions from GF Piping Systems warrants the safe conveyance of drinking water and other process fluids – without altering their quality in the least.



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Offshore with Piping Systems from GF



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**Fresh Water Bunker Lines
Ballast Systems**
PE 100

*less weight,
safe handling*





Systems in combination

» INSTAFLEX (PB) d 16 to d 225

Pipes in bars or coils
Fitting and valves
Installation accessories

» Jointing technology

Compression fittings d16 – d25
Socket fusion fittings d16 – d110
Electrofusion fittings d16 – d110
Electrofusion sockets d16 – d225
Butt fusion fittings (d125, d160, d225)

» iFIT – the tool-less push-fit fitting system

d16 – d32
Innovative modular fitting system with modules and adaptors
Polybutylene pipes and multi-layer composite pipes (PE-RT-AL-PE)

» INSTAFLEX (PB) and iFIT application ranges

PN 16 hot and cold water
(16 bar at 20 °C)
(10 bar at 70 °C)
(6 bar at 95 °C)
Temperature range 0 ° – 95 °C

» AQUASYSTEM (PP-R)

d20 – d110
Socket fusion fittings, electrofusion couplings

» AQUASYSTEM application ranges

PN 10 cold water (10 bar at 20 °C)
PN 20 hot water (8 bar at 70 °C)
Temperature range 0–80 °C



Simple installation technology. Our electrofusion fittings permit fast, efficient and economical installation of the systems. In combination with the iFIT push-fit system, the cabins are easily connected from the main pipe to the toilets, showers and sinks. And entirely without fusion, soldering, flames, smoke or compression noise. With INSTAFLEX (PB), AQUASYSTEM and iFIT your installations are safe and reliable.



Hot and Cold Water, Fresh Water

INSTAFLEX® (PB), iFIT,
AQUASYSTEM (PP-R)



Hot and Cold,
Fresh Water



Hot and cold water distribution. Our INSTAFLEX (PB) and AQUASYSTEM (PP-R) systems in combination with iFIT are ideally suited for drinking water distribution on all types of ships. Cabins, kitchens, restaurants and bars are optimally supplied with fresh water. The high flexibility of the PB material and the easy installation technology cut time and costs to a minimum.

Pre-fabrication provides shorter building time. With INSTAFLEX (PB) it is possible to pre-fabricate pipelines in coils, up to 70 m including all the outlets. Flexibility branch positioning with welding saddle of AQUASYSTEM (PP-R). These are then installed in the decks and connected to the cabins with the iFIT system. Our hot and cold water distribution solutions are system-related and therefore ideal for new builds, renovation projects and the repair of conventional systems. The high quality plastics PB, PP-R and PPSU are guaranteed corrosion-free and have a very long service life.

Hot and Cold, Fresh Water



System features

» FUSEAL Sea Drain

Material PPFR (PP Flame Retardant)
 d 1½" to 6" to 12"
 PN 1.76 (with safety factor 4)
 80% vacuum (EVAC-System compatible)
 Temperature 80°C constant load,
 99°C short-term load
 Drainage system with high corrosion
 resistance, even for chemically
 contaminated waste water

» ABS

Material ABS
 (Acrylonitrile butadiene styrene)
 d16 – d315
 PN 10 (10 bar at 20°C)
 -40°C to +60°C
 Pipes and fittings
 Special components also possible
 Especially useful for repairs

» PVC-U

Material PVC-U (Polyvinyl Chloride)
 d12 – d225
 PN 16 (16 bar at 20°C)
 0°C to 60°C
 Pipes, fittings ball valves and
 butterfly valves



Waste water pipes for aggressive effluents.

Appropriate pipes for carrying water from toilets, showers and the kitchens are essential for the safe operation of cruise ships.

Black and Grey Water

FUSEAL Sea Drain, ABS, PVC-U



Black and Grey
Water

Black and Grey Water

Pre-fabricated solutions for black and grey water applications. Black and grey water systems from GF Piping Systems are a major contributing factor to safety in the cabins. The all-plastic, durable systems complement our drinking water systems ideally. Our modern electrofusion technology or adhesive jointing technology is conducive to fast installation and the highly diversified product mix provides installers with the flexibility they require. For custom-made solutions we offer our pre-fabrication service.

Our FUSEAL Sea Drain, ABS and PVC-U systems. With these systems you have a choice of excellent solutions for grey and black water conveyance. FUSEAL Sea Drain – the fire retardant drainage system – is extremely resistant to corrosion and uses the electrofusion jointing method. Adaptor unions for the transition from plastic to metal enable a fast connection in case of repairs and renovation of existing systems.



Systems for Water Treatment

PVC-U d12 – d225

PVC-C d16 – d225

PP-H d16 – d400

PE d20 – d400

ABS d16 – d315

» Pipes, fittings, measurement and control instruments, valves and installation tools

» System features

PVC-U 0–60 °C

PVC-C 0–80 °C

PP-H 0–80 °C

PE 100 –40 °C to +60 °C

ABS –40 °C to +60 °C

PN 10 (10 bar at 20 °C)

» Media

Sea water

Fresh water

Osmosis water

Deionized water



High economic efficiency and long service life. PVC-U and PVC-C piping systems have become the worldwide leading industrial systems for water treatment thanks to their special features. GF Piping Systems has been producing these plastic piping systems since 1957. Whether for treatment of drinking water or swimming pool water – with plastic systems from

GF Piping Systems you know you have a recognised and time-tested solution for Ship Building.

Compact solutions from GF

Piping Systems. To enable compact constructions, we have developed special components. And with our modular automation and SIGNET measurement and control technology you are assured

flexible and efficient measurement and control.

The water treatment systems can be pre-fitted by the manufacturer and subsequently installed on the ships as compact units. Modules, pre-assembled with measurement and control technology, are built directly into the piping systems. Water treatment systems for a variety of applications on ships are generated from these individual

Water Treatment

For drinking water, sea water, waste water, swimming pools and whirlpools with PVC-U, PVC-C, PP-H, PE and ABS systems



modules. Whether for drinking water, swimming pools, whirlpools or for waste water treatment, GF Piping Systems has the solution.

Measurement and control technology. We offer complete solutions in plastic for water treatment and distribution, including automated valves

(pneumatic and electric actuators). SIGNET systems for flow measurement, for pH value measurement, for pressure and temperature measurement and for conductivity measurement are also included in our scope of performance.



Water
Treatment

Water Treatment



Complete systems

ABS: d16 – d315

PE 100: d20 – d400

» Pipes, fittings, valves, measurement and control devices

» Parameters

PN 10 (10 bar at 20 °C)

Working temperature

ABS: -40 °C to +60 °C

PE 100: -40 °C to +40 °C

» Media

Water

Ice water

Ice slurries

Saline solutions (organic)

Glycol-water mixture

Alcohol-water mixture

» Not suitable for refrigerants:

R22, R407 etc.

ammonia

CO₂

www.cool-fit.georgfischer.com



COOL-FIT reduces
your installation time,
energy loss and service costs.



A variety of cooling methods. ABS with or without Armaflex NH is the perfect solution for fresh or sea water cooling, for instance in fish processing plants. In standard practice, cold water distribution networks are susceptible to corrosion – both from the inside as well as from the outside. ABS is a corrosion and incrustation-free material that is also free of halogens. Noted for its applications at extremely low temperatures, -40 °C to +60 °C, this material is particularly suited for these distribution systems. No fusion or soldering required. The time-tested cementing technique renders the system easy and safe to operate. Due to the low weight of the plastic, it is also fast and practically effortless to install.

Sea and Fresh Water Cooling Refrigeration below 0 °C / AC Cooling

ABS and PE 100,
iFIT Multilayer piping



COOL-FIT – the pre-insulated plastic piping system.

An ideal system for secondary cooling and air conditioning applications. Here, ABS, which is used to carry the medium, is insulated with PUR foam and encased with a PE pipe. Thanks to the new COOL-FIT nipple, pre-insulated pipes and fittings are cemented quickly. This inner cementing has the decisive advantage that no insulation needs to be removed. In other words, COOL-FIT reduces your installation time, energy loss and service costs.

Cooling

AC Cooling



*Cooling /
AC Cooling*



Complete systems

PE 100: d20 – d400

» Pipes, fittings, valves, measurement and control devices

» Parameters

PN 10 (10 bar at 20 °C)

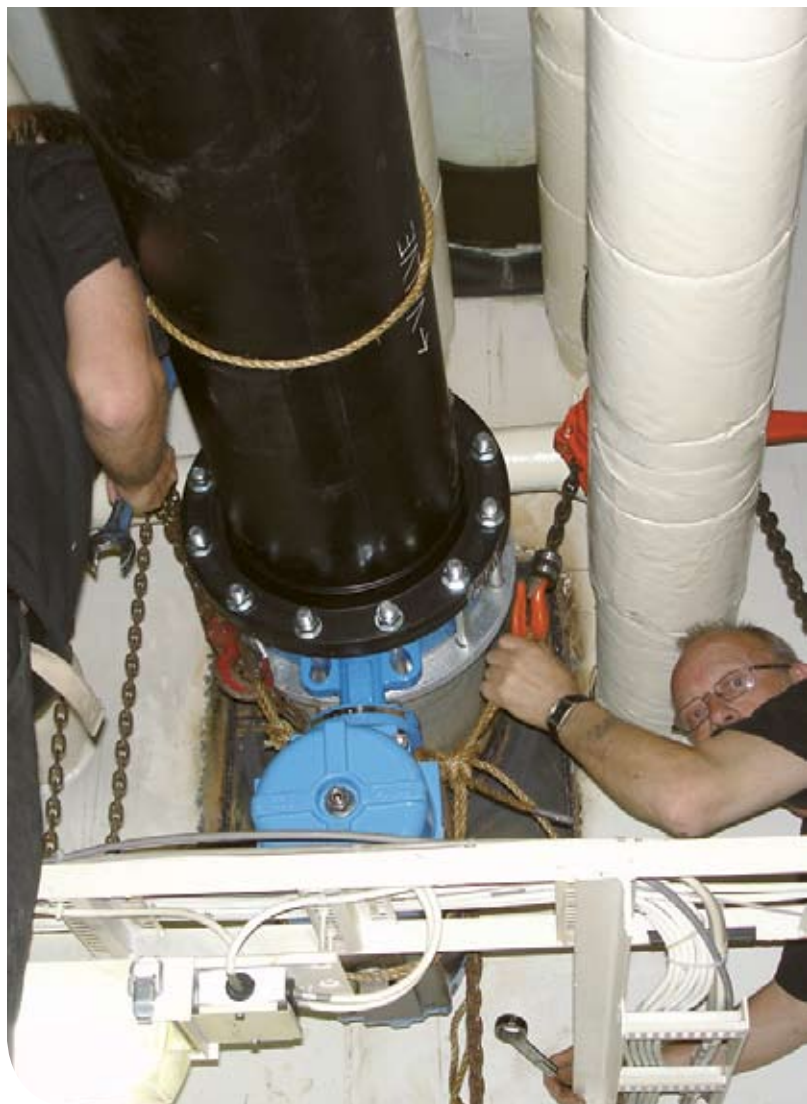
Working temperature

» Media

Fresh water

Sea water

Brack water



Fresh water bunker lines in PE. PE 100 is an excellent choice of material for bunker lines. PE100 joined with electrofusion sockets (ELGEF Plus), especially in the large dimensions d110 to d315, has been used successfully on a number of cruise ships. The electrofusion sockets are the ideal solution here in combination with butt fusion.

Fresh Water Bunker / Ballast Lines

PE 100



Fresh water in varying qualities negatively affects the product life of metal pipes, but not of plastic pipes. The low weight, high resistance and easy handling are further advantages of PE 100.

Ballast Lines



Bunker /
Ballast Lines

Bunker



PVC-U / PVC-C

Polyvinyl chloride

The **fast solution** for your water treatment system.

- excellent chemical resistance
- non-toxic, physiologically inert
- tolerance fit for specific purpose
- easy and fast jointing
- fast installation
- wide range of drinking water approvals
- complete system in global standards (EN/DIN, BS, ASTM, JIS)
- proven in millions of applications over nearly 50 years



ABS

Acrylonitrile-Butadiene-Styrene

Ideal for **low temperature applications**.

- high impact strength even at low temperatures to -40 °C
- easy handling thanks to solvent cemented jointing
- biologically inert
- recyclable
- 25% less installation time than metal



PPFR FUSEAL Sea Drain

- dedicated for black and grey water
- high chemical resistance
- dry fit, pre assembly
- electrofusion fitting
- flame retardant
- ideal for repairs and renovation
- transition fittings to existing systems
- 80% vacuum (EVAC-System compatible)



β PP-H / PP-R

Beta-Polypropylene-Homopolymer /
Polypropylene-Random

The **proper material** for good water quality in hot water or chemically sanitized processes.

- socket, butt or fusion technology
- high impact strength
- temperature resistant up to 80 °C
- good long-term performance
- excellent resilience to cleaning agents
- UV-resistant
- excellent leach-out values



PE 100

Polyethylene

The **economical solution** for cold water applications.

- socket, butt, electrofusion or technology
- good chemical resistance
- good ductile characteristics
- superior price-performance ratio
- UV-resistant
- blank mounting for skid possible
- adjustable with Alprene Poly 16 couplers
- huge network of installers
- high impact resistance



PB INSTAFLEX / iFIT

Polybutylene / Multilayer

- dedicated material for hot and cold water application
- excellent flexibility
- perfect for pre-fabrication
- dry fit, preassembly
- socket, butt, electrofusion, push-fit and compression
- temperature resistant 95 °C = 6 bar



Material



Material

Material Specification

Characteristics		ABS	PE 100	β PP-H
Temperature limits (25 years)		-40 / +60	-40 / +60	0 / +80
Weight / meter pipe (PN10, d63)		0.368	0.33	0.49
Density		≥ 1.035	0.95	0.90-0.91
Flexural modulus	23°C	≥ 1800	-	1250
Tensile modulus	23°C		900	1300
Stiffness *		4	2	3
Toughness *	23°C	5	5	5
	0°C	4	4	3
	-40°C	3	3	1
Charpy notched impact strength	23°C	42	83	85
	0°C	-	-	4.8
	-40°C	>10	13	-
Taber abrasion		-	60	150...200
Abrasion resistance *		/	5	4
Coefficient of thermal expansion	not linear	0.1	0.15...0.2	0.16...0.18
Thermal conductivity	23°C	0.17	0.38	0.23
Limiting oxygen index LOI		19	< 19	19
Burning behavior (0 burning / X self-extinguishing)		0	0	0
Long-term strength MRS		14	10	10
Pressure resistance *		3	2	2

	PVC-U	PVC-C	PE 100	β PP-H	INSTAFLEX PB	iFIT	FUSEAL PPFR
Pipes	■	■	■	■	■	■	■
Fittings	■	■	■	■	■	■	■
Butterfly Valves	■	■	■ ²	■			
Ball Valves	■	■	■ ²	■	■ ¹	■	
Diaphragm Valves	■	■		■	■ ¹		
Actuated Valves	■	■	■ ²	■	■ ¹		
Process Control Valves	■	■	■ ²	■			
Measurement and Control	■	■	■ ²	■	■		

¹ Valves in PP, PVC with PB Adapter

² Valves in PP, PVC, ABS

This table allows you to select the material according to its characteristics.

PP-R	PPFR ***	PVC-U	PVC-C	PB	Unit	Standard
0 / +80	0 / +80	0 / +60	0 / +80	0 / +90	°C	
0.49	0.435	0.4	0.435	1.020 **	kg /m	
0.90-0.91	0.91	1.38	1.5	0.94	g/cm ³	ISO 1183
800	-	> 2400	-		N/mm ²	EN ISO 527-1
-	1300		> 2550	450	N/mm ²	EN ISO 527-1
2	3	5	5	1		
4	3	3	3	4		
3	2	2	2	3		
1	1	1	1	-		
20	~ 7	> 6	> 6	30	kJ/m ²	DIN EN ISO 179/1eA
35	-	> 3	-	14	kJ/m ²	DIN EN ISO 179/1eA
-	-	-	-	-	kJ/m ²	DIN EN ISO 179/1eA
150...200	150...200	250...300	250...300	160	mm ³ /10 ³ cycles	DIN 53754
4	4	4	4	4		
0.16...0.18	-	0.07...0.08	0.06...0.07	0.13	mm/m K	DIN 53752
0.23	0.23	0.15	0.15	0.32	W/m K	DIN 52612
< 19	-	42	60	< 19	%	ISO 4589
0	X	X	X	0	0	
8	-	25	25	14	-	ISO 9080 / ISO 12162
2	1	4	4	3	-	

* Relative values ranked on a scale from 1 to 5.5 being the highest value

** PN 16

*** Values measured according to ASTM standards

Material



Material

Solvent Cemented

- the fast connection



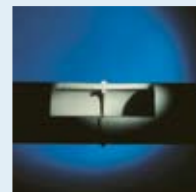
Socket Fusion

- the strong connection



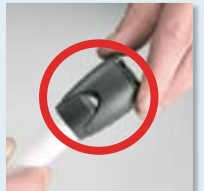
Butt Fusion

- the connection for larger dimensions



iFIT

- the rapid connection



Mechanical Compression

- the traditional connection



Electrofusion

- the easy connection



In combination with the most suitable piping system, the best jointing technology is required to install a reliable and high quality piping system. GF Piping Systems has developed it for you.

Solvent Cementing

for ABS, PVC-U and PVC-C

reliable jointing, excellent with GF dry fit pipes and fittings



Tip: Use our Dytex cement for acid lines in regeneration.

Socket Fusion

for PE, β PP-H, PP-R and PB

- fast and easy welding
- transportable device

Butt Fusion

available for large dimensions of PE, PB, PP

Push-fit Connection

for PB and ML

- easy and fast to install
- 90% faster than conventional jointing
- less tools
- extremely cost-effective

Mechanical Compression Fitting

for PB only

- no additional seal needed
- less tools
- fast and easy

Flange Connection

- for all materials approved
- standards DIN, ASTM and JIS

Electrofusion

for PE100, PB / INSTAFLEX / FUSEAL Sea Drain / PP-R

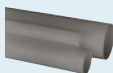
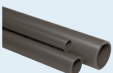
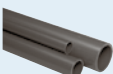
- electrical fusion
- safe for the user
- record and trace with bar code system (only PE)

Material



Material

Product Range

Product Range							
		Document Number	Size Range	Pressure Rating	Temperature Range	Material Available	
ABS Pipes / Fittings		GMST 8256	d16 – d315	PN 10	-40°C – 60°C	–	WT AC C BG
PE100 Pipes / Fittings		GMST 8256	d20 – d400	PN 16	-50°C – 60°C	–	BW FBW AC C
β PP-H Pipes / Fittings		GMST 8256	d16 – d400	PN 10	0°C – 80°C	–	WT
PP-R Pipes / Fittings		GMST 8256	d20 – d110	PN 10 / 20	0°C – 80°C	–	HC AC
PVC-U Pipes / Fittings		GMST 8256	d25 – d315	PN 10	0°C – 60°C	–	BG WT
PVC-U Pipes / Fittings		GMST 8256	d12 – d160	PN 16	0°C – 60°C	–	BG WT
PVC-C Pipes / Fittings		GMST 8256	d16 – d160	PN 16	0°C – 80°C	–	WT HC
PVC-C Pipes / Fittings		GMST 8256	d75 – d225	PN 10	0°C – 80°C	–	WT HC
PB Pipes / Fittings INSTAFLEX		GMST 8256	d16 – d225	PN 10	0°C – 90°C	–	HC WT AC
PPFR Pipes / Fittings FUSEAL SEA DRAIN		GMST 8256	1 1/2" – 12"	PN 2	0°C – 99 °C	–	BG
iFIT Pipes / Fittings		GMST 8256	d16 – d32	PN 16	0°C – 90°C	PB / ML	HC AC
Type 546 2-way Ball Valve		Fi 5678	d16 – d160	PN 16	0°C – 60°C 0°C – 80°C -40°C – 60°C 0°C – 80°C 0°C – 80°C	PVC-U PVC-C ABS PP-H PB Adaptors	WT HC AC 3
Type 230 2-way Ball Valve pneumatic		Fi 5749	d16 – d63	PN 10	0°C – 60°C 0°C – 80°C -40°C – 60°C 0°C – 80°C 0°C – 80°C	PVC-U PVC-C ABS PP-H PB Adaptors	WT HC AC 3
Type 107 2-way Ball Valve electric		Fi 5750	d16 – d63	PN 10	0°C – 60°C 0°C – 80°C -40°C – 60°C 0°C – 80°C 0°C – 80°C	PVC-U PVC-C ABS PP-H PB Adaptors	HC WT AC 3

Product Range							
		Document Number	Size Range	Pressure Rating	Temperature Range	Material Available	
Type 343 3-way Ball Valve		Fi 5368	d16 – d63	PN 10	0°C – 60°C 0°C – 80°C -40°C – 60°C 0°C – 80°C 0°C – 80°C	PVC-U PVC-C ABS PP-H PB Adaptors	HC AC 3
Type 275 3-way Ball Valve pneumatic		Fi 5804	d16 – d63	PN 10	0°C – 60°C 0°C – 80°C -40°C – 60°C 0°C – 80°C 0°C – 80°C	PVC-U PVC-C ABS PP-H PB Adaptors	WT AC 3
Type 175 3-way Ball Valve electric		Fi 5804	d16 – d63	PN 10	0°C – 60°C 0°C – 80°C -40°C – 60°C 0°C – 80°C 0°C – 80°C	PVC-U PVC-C ABS PP-H PB Adaptors	WT AC 3
Type 567 / 568 Butterfly Valve		GMST 5885	d63 – d225	PN 10	0°C – 60°C 0°C – 80°C -30°C – 60°C -5°C – 80°C	PVC-U PVC-C ABS PP-H	HC WT AC 3
Variable Area Flow Meter		Fi 8222	d32 – d75	PN 10	0°C – 60°C 0°C – 80°C -40°C – 60°C -5°C – 80°C	PVC-U PVC-C ABS PP-H	WT 3

HC	Hot and Cold
WT	Water Treatment
BG	Black and Grey Water
AC	Air Condition
C	Cooling
BW	Ballast Water
FWB	Fresh Water Bunker Lines
3	Choose the right material according temperature

Products



Products

Product Range

Product Range							
		Document Number	Size Range	Pressure Rating	Temperature Range	Material Available	
Type V182 Pressure Reducing Valve		Fi 5093	d16 – d50	0.5 – 10 bar	0°C – 60°C -10°C – 80°C	PVC-U PP-H	WT
Type V782 Pressure Reducing Valve		Fi 5093	d16 – d50	0.5 – 10 bar	0°C – 60°C -10°C – 80°C	PVC-U PP-H	WT
Type V251 Throttle Valve		Fi 5558	d16 – d63	PN 10	0°C – 60°C -10°C – 80°C -20°C – 100°C	PVC-U PP-H	WT
Type Z700 Gauge Guard		Fi 5558	d25 – d32	0 – 10 bar	0°C – 60°C -10°C – 80°C	PVC-U PP-H	WT
Type V95 Ventilating Valve		Fi 5558	d16 – d90	PN 10	0°C – 60°C -10°C – 80°C	PVC-U PP-H	WT
Type 060 / 061 KLIP-IT		GMST 8256	d16 – d400			PP PE	BG WT AC HC
Adaptors and Threaded Connections		GMST 8256	16-3/8" – 90-3"			PVC-U* PVC-C* PB ABS* PP-H* PE*	HC WT AC C 3
Adaptor Unions for Stainless Steel and Plastic		GMST 8256	d16-3/8" – d63-2"			PVC-C* PVC-U* ABS*	HC WT AC C 3
Type 305 Line Strainer			d20 – d90	PN 10		PVC-U PVC-C ABS PP-H	WT 3
Type 2551 Magmeter Flow Sensor		Fi 5535	DN15 – DN200	10 bar		PP-H	WT
Type 2536 Paddlewheel Flow Sensor		Fi 5535	DN15 – DN1000	-2.5 bar 14 bar	-20°C – 85°C	PP	WT

* › Metal

Product Range							
		Document Number	Size Range	Pressure Rating	Temperature Range	Material Available	
Type 2450 Pressure Sensor		Fi 5455		0 – 17 bar	-15°C – 85°C	PVDF	HC WT AC C
Type 2754 – 2757 pH/ORP Electrodes		Fi 5535		< 6.9 bar	0°C – 85°C	PVC-C	WT
Type 2350 Temperature Sensor		Fi 5535		< 10 bar	-10°C – 100°C	PVDF	HC WT AC C
Type 2819-2821 Conductivity/Resistivity Sensors		Fi 5535		< 6.9 bar	– 120°C	stainless steel	WT FWB
Type 8250 Pressure Transmitter		Fi 5638			-10°C – 70°C		HC WT AC C
Type 8550 Flow Transmitter		Fi 5535			-10°C – 70°C		HC WT AC C
Type 8900 Multi-Parameter		Fi 5535			-10°C – 70°C		HC WT AC C
Pro-Fit		Fi 5548	d20 – d63	PN 16		PVC-U	WT

HC	Hot and Cold
WT	Water Treatment
BG	Black and Grey Water
AC	Air Condition
C	Cooling
BW	Ballast Water
FWB	Fresh Water Bunker Lines
3	Choose the right material according temperature

Products



Products

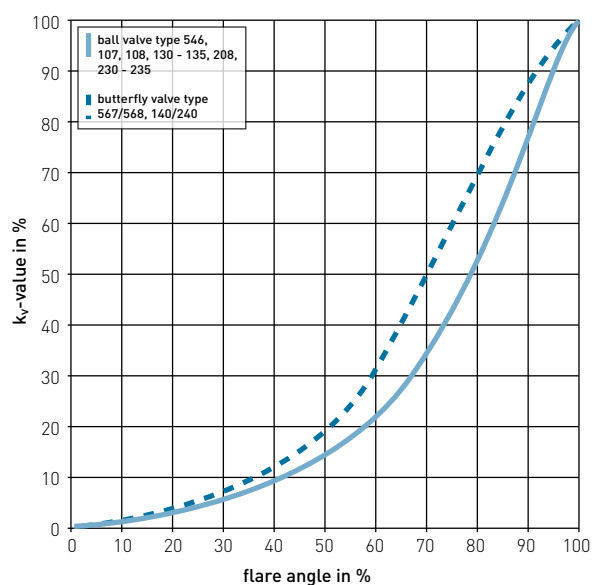
Valve Selection

Criteria	Valuation	
Characteristics	 Butterfly Valve	 Ball Valve
Chemical resistance	+	+
Abrasion resistance	o	-
Controllability fluids	-	-
Pressure range	+	+
Temperature range	+	+
Vacuum	+	+
Leak tight closing	+	+
Pressure drop (valve 100% opened)	+	+
Low flow turbulence (valve 100% opened)	+	+
Low flow turbulence (valve partly opened)	-	-
Applied material diversity	+	+
Compact installation height	+	+
Weight / Size ratio	+	+
	+ recommended	- not recommended o limited

Valves			
PVC-U	Manual	Electric Actuated	Pneumatic Actuated
2-way Ball Valve	 Type 546	 Type 107	 Type 230 - FC
3-way Ball Valve	 Type 343	 Type 175	 Type 275

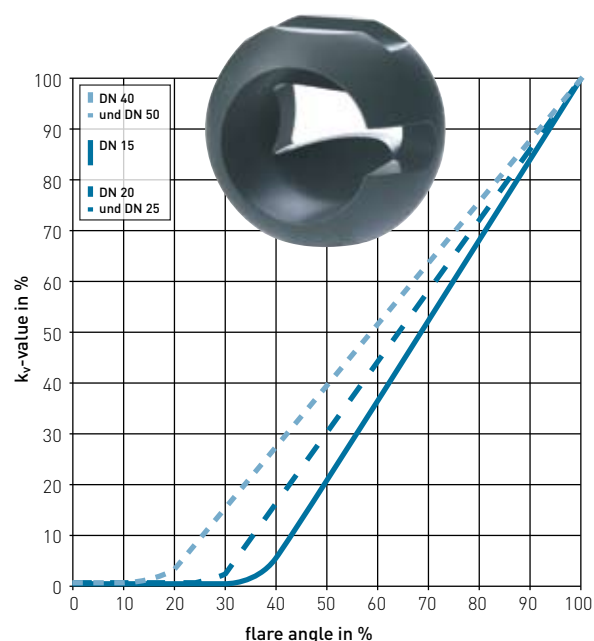
Flow characteristics

of valves



Flow characteristics

Ball Valve 546 linear (Type 110)



Instrumentation Selection

Guidelines

Flow

Four high-performance GF SIGNET flow sensor types make the choice simple and complete. Just select on the basis of «most favourable» criteria.

		Performance Characteristics											Application
		Size Range	Material Options	Installation Simplicity	Dynamic Range	Low Flow Capability	Accuracy	Repeat Ability	Pressure Drop	Moving Parts	High Purity Water	Cost	
	Paddlewheel	5	5	5	5	3	3	5	5	yes	3	5	
	 Magnetic - inductive	4	2	3	5	4	4	5	5	no	1	2	
Items are ranked on a scale of 1 to 5. 5 being most favourable.													

Engineered specifically for small diameter applications, the 2100 Turbine Flow Sensor provides accurate readings in two flow ranges (low/high).

Level



A complete level sensing system is ready to go to work in a host of applications.

2450 Pressure Sensor offers 4 to 20mA or serial output.

Together with the transmitter 8250 allows fill-empty systems, registration, indications etc.



8250 Level Transmitter is ideal for field installations.

		Point Level				Continuous Level				
		Float	Electro Optic	Tuning Fork	Ultrasonic	Pressure	Capacitance	Ultrasonic	Magnetostrictive	Radar
Fluid Conditions	Operating Environment									
Process Cleanliness	Some particles	☐	Δ				Δ		☐	Δ
	Viscous, coating	☐	Δ	Δ	Δ	☐ /★	Δ		☐	
	Slurry	☐	Δ	Δ	Δ	★	Δ		☐	Δ
Temperature	> 50 degrees C	☐ /○			Δ	Δ	Δ	Δ	☐ /○	Δ
Pressure	0 to 15 psi					○				
	16 to 15 psi					○				
	> 50 psi	☐ /○				○				
Fluid Surface	Mixed	☐						Δ/-	☐	
	Splashing, Choppy	☐	Δ	Δ	Δ			Δ/-	☐	
	Foam	☐	Δ	Δ	Δ		Δ	Δ	☐	Δ
Area Above Fluid Surface	Still									
	Vapours							○		
	Spray	☐						Δ/-		
	Pressurized	☐						-	☐	

☐ = may interfere with mechanical movement Δ = may affect electrical stability ○ = may affect measurement reference
 ★ = may clog small diameter tubes or openings - = may require residual wetness

A table is a general overview only and should not be used for the specification of level sensors in place of manufacturer specifications or recommendations. Any level sensor should work well in clean, still and ambient conditions. This matrix may help to select the right sensor for your particular application. Table is based on non-flammable fluids. Blank cells denote applicable without restriction.





Approvals

We do more - for you

GF Piping Systems sees you through the change-over to plastic. We supply our know-how in the form of training documentation and we provide practical training for workers in shipyards and dry docks. In addition, our staff is available for on-site support and of course also for the riding crew on board ships all over the world.



If you like to have the latest up date of the Type Approvals, please go to:
www.piping.georgfischer.com

↳ **Ship Building**

↳ **Approvals**

Pipe penetration solutions for GF Piping Systems are approved from

- Beele Rise-System
- Beele CSD-Plugs
- Roxtec
- Sleeve-it
- Fire Seal
- MTL-Brattberg

Approved applications according to IMO resolution A.753 (18) appendix 4 Non-essential systems like:

- Hot and Cold Water
- Black and Grey Water
- Water Treatment
- Fresh Water Bunker Lines
- Ballast – in location H, I
- AC Cooling
- Brine



Approvals. GF Piping Systems has a whole range of approvals from all the major classification societies.

Material System	Classification Society							
	GL	LR	BV	RINA	ABS	DNV	CCS	RMRS
ABS	■	■	■	■	■	■		■
PVC-C	■	■	■	■	■	■	■	■
PVC-U	■	■	■	■	■	■	■	■
PE 100	■	■	■	■	■	■	■	■
PP-H		■	■	■		■		
INSTAFLEX PB	■	■	■	■	■	■	■	■
PP-R AQUASYSTEM	■	■		■	■	■		
iFIT	■	■	■	Applied	■	■		■
FUSEAL Sea Drain	■	■		Applied	■	■		■

GF Piping Systems → worldwide at home

Our sales companies and representatives ensure local customer support in over 100 countries.

www.piping.georgfischer.com

↳ Ship Building



The technical data is not binding. They neither constitute expressly warranted characteristics nor guaranteed properties nor a guaranteed durability. They are subject to modification. Our General Terms of Sale apply.

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