Ship Building Offshore

From Applications to Products

+GF+

GEORG FISCHER
PIPING SYSTEMS

Table of Contents

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

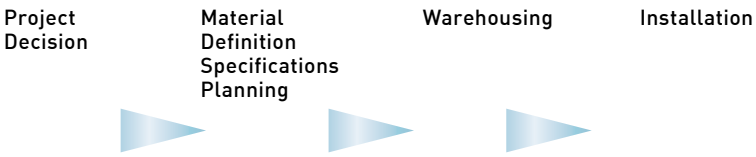
A corrosion-free piping system besides ensuring a long service life of the non-essential piping systems, adds a long list of additional benefits:

- 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.

Added Value

GF Piping Systems at your service

We support you throughout



	End Customer	Engineering Company	Distributor	OEM/Installer
piping system solutions consulting	■	■	■	■
technical and cost optimization	■			
mechanical and chemical advice	■	■		
material recommendation	■	■		
CAD library		■		■
planning fundamentals training		■		■
documentation (printed and electronic)	■	■	■	■
submit an offer	■	■	■	■
jointing technologies and installation training				■
efficient distribution system			■	■
local certificates and approvals	■	■	■	■
international standards	■	■	■	■
global subsidiaries	■	■	■	■

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	ß 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 worlds 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.

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

Offshore
with Piping Systems from GF

Water Treatment

Drinking Water, Waste Water
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

+GF+

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 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

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.

Black and Grey Water

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

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:**
  R 22, R 407 etc.
  ammonia
  CO_2

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 airconditioning 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.

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.

Type Approved Material Selection

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)

ß PP-H / PP-R

Beta-Polypropylene-Homopolymer / Polypropylene-Radom

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 Specification

Characteristics		ABS	PE 100	ß 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 (O burning / X self-extinguishing)		O	O	O
Long-term strength MRS		14	10	10
Pressure resistance *		3	2	2

	PVC-U	PVC-C	PE 100	ß 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/cm³	ISO 1183
	800	-	> 2400	-		N/mm²	EN ISO 527-1
	-	1300		> 2550	450	N/mm²	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/m²	DIN EN ISO 179/1eA
	35	-	> 3	-	14	kJ/m²	DIN EN ISO 179/1eA
	-	-	-	-	-	kJ/m²	DIN EN ISO 179/1eA
	150...200	150...200	250...300	250...300	160	mm³/10³cycles	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
	O	X	X	X	O	O	
	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 acording to ASTM standards

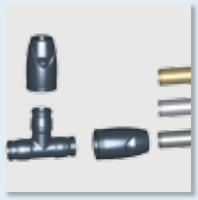
Jointing Technology

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, ß 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

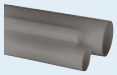
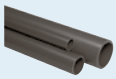
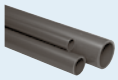
Mechanical Compression Fitting
for PB only
- no additional seal needed
- less tools
- fast and easy

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)

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
ß 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

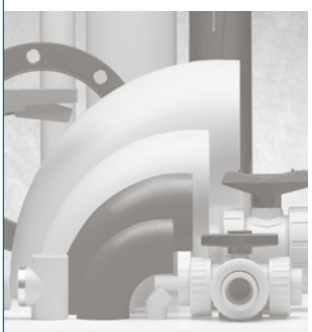
Product Range

		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

+GF+

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

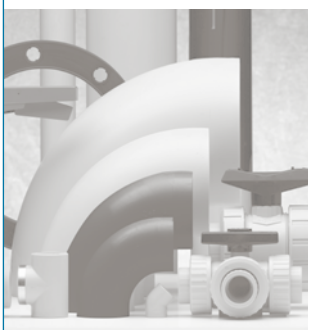
* › Metal

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



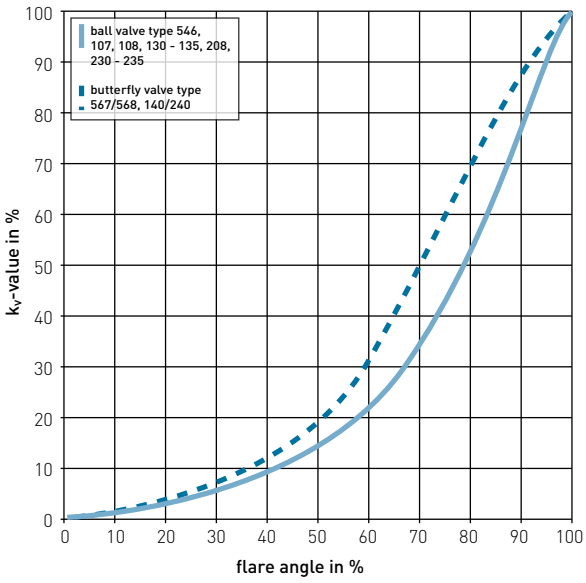
Valve Selection

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

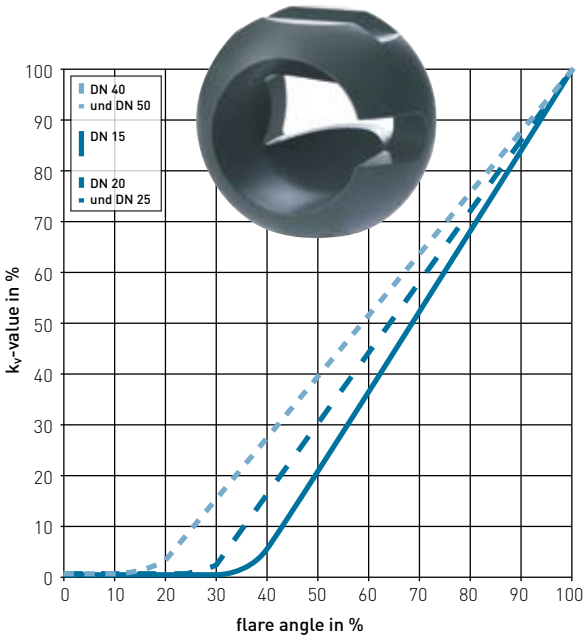
Flow characteristics

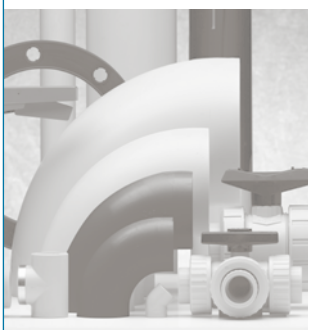
of valves



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.

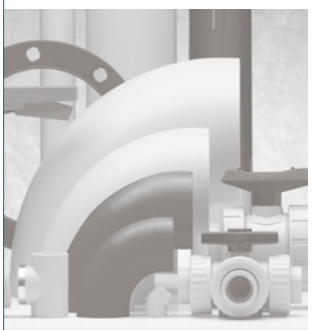
8250 Level Transmitter is ideal for field installations.

Fluid Conditions	Operating Enviroment	Point Level: Float	Point Level: Electro Optic	Point Level: Tuning Fork	Point Level: **Ultrasonic**	Continuous Level: **Pressure**	Continuous Level: Capacitance	Continuous Level: **Ultrasonic**	Continuous Level: **Magnetostrictive**	Continuous Level: Radar
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.

	Classification Society							
Material System	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.

Adding Quality to People's Lives

Australia
George Fischer Pty Ltd
Riverwood NSW 2210 Australia
Phone +61(0)2 9502 8000
australia.ps@georgfischer.com
www.georgefischer.com.au

Austria
Georg Fischer
Rohrleitungssysteme GmbH
3130 Herzogenburg
Phone +43(0)2782 856 43-0
austria.ps@georgfischer.com
www.georgfischer.at

Belgium / Luxembourg
Georg Fischer NV/SA
1070 Bruxelles/Brüssel
Phone +32(0)2 556 40 20
be.ps@georgfischer.com
www.georgfischer.be

Brazil
George Fischer Ltda
04795-100 São Paulo
Phone +55(0)11 5687 1311
br.ps@georgfischer.com

China
Georg Fischer
Piping Systems Ltd Shanghai
Pudong, Shanghai 201319
Phone +86(0)21 58 13 33 33
china.ps@georgfischer.com
www.cn.piping.georgfischer.com

Denmark / Iceland
Georg Fischer A/S
2630 Taastrup
Phone +45 (0)70 22 19 75
info.dk.ps@georgfischer.com
www.georgfischer.dk

France
Georg Fischer SAS
95932 Roissy Charles de Gaulle Cedex
Phone +33(0)1 41 84 68 84
fr.ps@georgfischer.com
www.georgefischer.fr

Germany
Georg Fischer GmbH
73095 Albershausen
Phone +49(0)7161 302-0
info.de.ps@georgfischer.com
www.georgfischer.de

India
Georg Fischer Piping Systems Ltd
400 076 Mumbai
Phone +91 224007 2001
in.ps@georgfischer.com
www.georgfischer.in

Italy
Georg Fischer S.p.A.
20063 Cernusco S/N (MI)
Phone +3902 921 861
it.ps@georgfischer.com
www.georgfischer.it

Japan
Georg Fischer Ltd
556-0011 Osaka,
Phone +81(0)6 6635 2691
jp.ps@georgfischer.com
www.georgfischer.jp

Korea
Georg Fischer Piping Systems
Guro-3 dong, Guro-gu, Seoul, Korea
Phone +82(0)2 2081 1450
Fax +82(0)2 2081 1453
kor.ps@georgfischer.com

Malaysia
Georg Fischer (M) Sdn. Bhd.
40460 Shah Alam, Selangor
Phone +60 (0)3 5122 5585
conne.kong@georgfischer.com

Mexico
Georg Fischer S.A. de C.V.
Apodaca, Nuevo Leon
CP66636 Mexico
Phone +52 (81)1340 8586
Fax +52 (81)1522 8906

Middle East
George Fischer Piping Systems
Dubai, United Arab Emirates
Phone +971 4 289 41 20
gfdubai@emirates.net.ae
www.piping.georgfischer.com

Netherlands
Georg Fischer N.V.
8161 PA Epe
Phone +31(0)578 678 222
nl.ps@georgfischer.com
www.georgfischer.nl

Norway
Georg Fischer AS
1351 Rud
Phone +47(0)67 18 29 00
no.ps@georgfischer.com
www.georgfischer.no

Poland
Georg Fischer Sp. z o.o.
02-226 Warszawa
Phone +48(0)22 313 10 50
poland.ps@georgfischer.com
www.georgfischer.pl

Romania
Georg Fischer
Piping Systems Ltd
020257 Bucharest - Sector 2
Phone +40(0)21 230 53 80
ro.ps@georgfischer.com

Russia
Georg Fischer Piping Systems
Moscow 125047
Tel. +7 495 258 60 80
ru.ps@georgfischer.com

Singapore
George Fischer Pte Ltd
528 872 Singapore
Phone +65(0)67 47 06 11
sgp.ps@georgfischer.com
www.georgefischer.com.sg

Spain / Portugal
Georg Fischer S.A.
28046 Madrid
Phone +34(0)91 781 98 90
es.ps@georgfischer.com
www.georgfischer.es

Sweden / Finland
Georg Fischer AB
12523 Älvsjö-Stockholm
Phone +46(0)8 506 775 00
info.se.ps@georgfischer.com
www.georgfischer.se

Switzerland
Georg Fischer
Rohrleitungssysteme (Schweiz) AG
8201 Schaffhausen
Phone +41(0)52 631 30 26
ch.ps@georgfischer.com
www.piping.georgfischer.ch

Taiwan
Georg Fischer Piping Systems
San Chung City, Taipei Hsien
Phone +886 2 8512 2822 Ext. 15
Fax +886 2 8512 2823

United Kingdom / Ireland
George Fischer Sales Limited
Coventry, CV2 2ST
Phone +44(0)2476 535 535
uk.ps@georgfischer.com
www.georgefischer.co.uk

USA / Canada / Latin America / Caribbean
Georg Fischer LLC
Tustin, CA 92780-7258
Phone +1(714) 731 88 00
Toll Free 800/854 40 90
us.ps@georgfischer.com
www.us.piping.georgefischer.com

George Fischer Sloane, Inc.
Little Rock, AR 72206
Tel. +1 (501) 490 77 77
sloane.ps@georgfischer.com
www.us.piping.georgefischer.com

Miami Office
Georg Fischer Inc.
Miami FL 33172
Phone +1(305)477 5700
Fax +1(305)477 5003
cesar.iglesias@georgfischer.com
www.us.piping.georgefischer.com

Export
Georg Fischer
Piping Systems (Switzerland) Ltd.
8201 Schaffhausen
Phone +41(0)52 631 30 03
Fax +41(0)52 631 28 93
info.export@georgfischer.com
www.piping.georgfischer.ch

GMST 6006/4b (3.08)

+GF+

GEORG FISCHER
PIPING SYSTEMS