

Industrial PE

Design-Flow™ & ecoFIT®-metric

All you need in PE

Polyethylene welded system
for industrial applications



The versatile high-density polyethylene piping system

We are dedicated to designing and manufacturing piping systems for the safe and secure conveyance of water, liquids, and chemicals. Customers rely on our 50+ years experience in plastics, our state-of-the-art production technology, and our global presence with a worldwide service and training offering. In close coordination with industrial customers, GF Piping Systems introduced the PE piping system based on certified polyethylene raw material. PE offers maximum safety, reliability, and performance. It is the ideal choice for many challenging applications in the industrial world.



From one source

A polyethylene system is ideally adapted to your needs.

We offer our customers not only reliable and innovative products, we supply tailor-made solutions from one source, which generate assurance for our customers. With a comprehensive system solution, GF Piping Systems provides the right fit and quality for many industrial applications and projects worldwide. The diversity of pipe, fittings, valves, and joining, as well as automation technologies in the PE portfolio is as diverse as our customers and their individual challenges.

+ Individuality - from the planning stage



Pipe



Fittings



Valves

Customizing

The focus of our customizing teams, located worldwide, is manufacturing custom parts for special systems. Standardized processes guarantee the highest level of quality.

Technical support

Technical support such as material selection is a key factor for a successful installation. A team of experts is available for individual support all around the world.



+ Main benefits

Complete system range

- High quality system components
- Diverse valve range with many connection options
- Proven joining technologies
- Worldwide service: Customizing, machine rental pool, training and sales support

Total plastic solution

- Low operating temperature (-40°)
- Corrosion-free
- UV and weather resistant
- Excellent abrasion resistance
- Good chemical and temperature resistance
- No electric conductivity, low thermal conductivity
- Smooth internal surface
- Excellent resistance to water hammer
- High impact resistance, especially at low temperatures
- Low weight and excellent flexibility

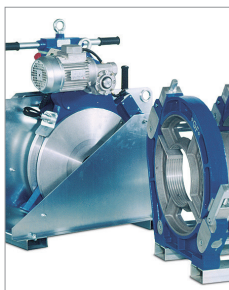
Cost-effective investment

- Superior price-performance ratio
- Low installation and maintenance cost
- Product lifetime over 25 years*

to installation



Automation



Joining technology



Customizing and training

Technical documentation

Our extensive know-how of more than 50 years is fully documented in detail in our technical manuals, planning fundamentals and application guides.

Chemical resistance

In the area of chemical resistance, our specialist teams offer individual support and advice in selecting the right material for the corresponding requirements.

CAD library

The extensive CAD library is the most frequently used planning tool. The freely available database comprises over 30,000 drawings as well as technical data for our customers. Many formats are available.

Training courses and on-site training

Offering a wide range of training courses, we provide participants an excellent opportunity to gain confidence in working with our products and proven joining technologies.

Industrial PE system range

More than a system

With a constant focus on maximum reliability and safety, our PE system assures a sustained high level of product quality and outstanding performance standards in all applications. Certified manufacturing processes, as well as product approvals, are part of the active and sustainable quality management system of GF Piping Systems and make us a reliable partner. Customers can be assured that their needs are covered and that all required standards are met with our PE welded system range.

Polyethylene system range

ecoFIT® Metric products	Material	SDR	d (mm)	20	25	32	40	50	63	75	90	110	160	225	250
				Pipe	PE100	11									
		17/17.6													
Electrofusion fittings	PE100	11													
Long spigot electrofusion/ butt fusion	PE100	11													
		17/17.6													
Valves	Various														
Automation	Various														
Flanges	PP-V/PP-ST														
Flange gaskets	EPDM/FPM														
Pipe brackets	PP/PE														

Welding machines	d (mm)	20	25	32	40	50	63	75	90	110	160	225	250
Electrofusion machines													
Butt fusion machines													
Infrared (IR) fusion machines													

Design-Flow™ IPS products	Material	SDR	size (in)	2	3	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	36	
				Pipe	4710	11																
		17/17.6																				
Electrofusion couplings	4710	11																				
Electrofusion saddles	4710	11																				
Butt fusion fittings	4710	11																				
		17/17.6																				
Valves	Various																					
Flanges	Epoxy/steel																					

Welding machines	size (in)	2	3	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	36
Electrofusion machines																			
Butt fusion machines																			
Infrared (IR) fusion machines																			

Industrial PE valve range

More flexibility

Quality, design, and innovative features make our PE valve range unique. The comprehensive range in a wide selection of dimensions, materials, and connections offers highest flexibility in installation and use. Due to the modular and compact system structure with many options, excellent operation is ensured. Valve bodies made of PVC or PP with PE end connections allow easy integration in the PE system. For maximum flexibility, the valves come with socket fusion, butt fusion or flanges. Furthermore, our PE valves can be equipped with electric or pneumatic actuators and therefore ideally meet various process automation needs.

PE valve range

Valve body		End connection	ecoFIT® Metric Valves													Design-Flow™ IPS Valves											
			d	20	25	32	40	50	63	75	90	110	160	225	250	Size (in)	2	3	4	6	8	10	12	14	16		
Ball valves	PP-H	Electrofusion/butt fusion																									
		Flanged																									
	PVC	Electrofusion/butt fusion																									
		Flanged																									
	ABS	Electrofusion/butt fusion																									
		Flanged																									
Diaphragm valves	PP-H	Electrofusion/butt fusion																									
		Flanged																									
	PVC	Electrofusion/butt fusion																									
		Flanged																									
	ABS	Electrofusion/butt fusion																									
		Flanged																									
Butterfly valves	PP-H	Flanged																									
	PVC	Flanged																									
	Metal	Flanged																									
Cone check valves	PP-H	Electrofusion/butt fusion																									
		Flanged																									
	PVC	Electrofusion/butt fusion																									
		Flanged																									
	ABS	Electrofusion/butt fusion																									
		Flanged																									

Visit our website for latest system or product information: www.gfpiping.com

Industrial PE fittings

Innovative, Comprehensive, Easy to Install!

The ecoFIT line of electro-fusion fittings is the most innovative, comprehensive, and easy-to-install line of electro-fusion fittings available. Electro-fusion is a fast, reliable, and easy joining method. For this reason, GF has taken care to develop a wide range of fittings that make virtually any piping design possible. Along with the broad offering, GF has incorporated unique features into our fittings such as visual fusion indicators that show when a joint has been completed, and integrated fasteners, allowing for pre-assembly dry-fit of a system. The ecoFIT line of fittings has the electro-fusion coils built into each fitting. This includes elbows, reducers, saddles, etc. Unlike other systems, an installer is not required to use multiple couplings to join one fitting. For example, an ecoFIT 90° elbow is one fusion joint. On other systems, it requires two electro-fusion couplings, one on each end of the elbow. This doubles the number of fusions, and joining time, as well as adding cost.



Convincing welding technologies

A diverse range of innovative and intelligent welding solutions enriched with global training and service offerings.

As a pioneer in the field, GF Piping Systems has always placed a high priority on developing innovative joining techniques to fulfill specific requirements and materials in use. Simplicity in application, chemical resistance, thermal stability, and long-term weld strength are the key drivers in our joining technologies. With a global joining training program, international machine rental, and a worldwide network of service centers, our customers benefit from expert know-how and practical experience.

Welding technology

Butt fusion – the economical connection

Economical and flexible fusion especially for bigger diameters. From manual machines to full CNC control with traceability.

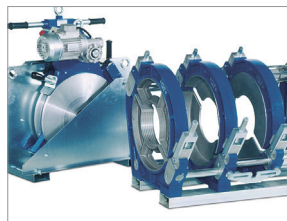
IR-Plus (Infrared) fusion – the fast, clean connection

Fast, repeatable and clean welds via non-contact heating. Full traceability of the welding process, with user guidance.

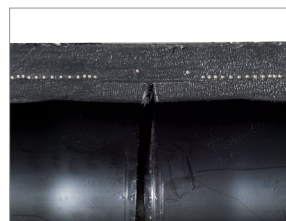
Electrofusion – the easy connection

State-of-the-art semi-automatic technology, combined with a low weight, make the MSA-Plus machines perfect for on-site fusion.

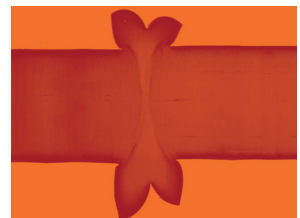
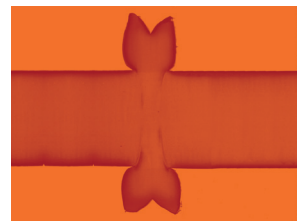
Welding machine



Joint cross-section



Macro-image



For more information about training courses from GF Piping Systems please contact our local sales companies.

Industrial PE quality standards

Exceeding your standards of quality

Technical specifications with focus on pressure/temperature attributes

ecoFIT system

Polyethylene is one of the most common, fastest growing, and versatile thermoplastics currently used. It is a member of the material group known as polyolefines.

Polyethylene meets all requirements of demanding industrial conditions or environments. It features a wide operational temperature range (-50 to +60°C) and ensures excellent chemical resistance, high abrasion resistance, and high impact strength values.

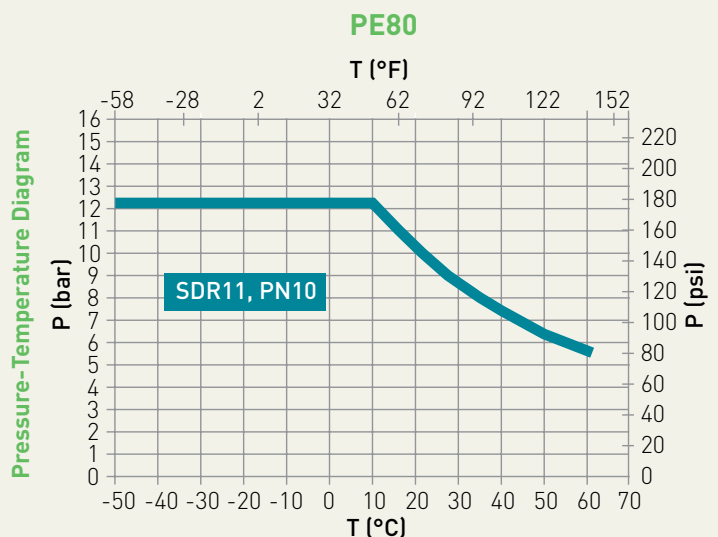
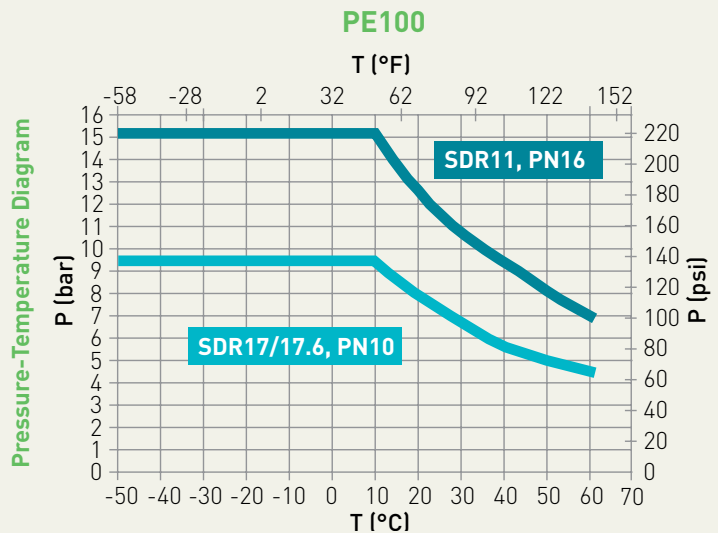
Furthermore, properties such as low weight, low density, minimum internal stresses, and an excellent smooth internal surface with high finish quality, make polyethylene a high-grade piping material.

This universal solution covers all aspects of safety, efficiency, and reliability required to build, maintain, and operate industrial piping systems.



As a member of PPFA, GF Piping Systems promotes the sustainable character of plastic.

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



P Permissible pressure in bar, psi
T Temperature in °C (Celsius), °F (Fahrenheit)

The pressure/temperature curve based on medium water, operating temperature of 20°C, valid life time of 25 years and the design factor C = 1.6.

For your operational safety

Polyethylene (PE) – a high quality material



Professional material technology

Chemical resistance at 20°C

(Applications can be very dependent on the concentration)

Media	Chemicals	Partially crystalline thermoplastics			Amorphous thermoplastics		Stainless Steel	
		PE	PP	PVDF	PVC	CPVC	1.4401 316	1.4301 304
Oxidizing Acids (HNO ₃ , H ₂ CrO ₄ , H ₂ SO ₄ , etc.)	HNO ₃ ≤ 25%	o	o	+	+	+	o	o
	25% ≤ HNO ₃ ≤ 65%	o	-	+	o	+	o	o
	H ₂ CrO ₄ aqueous solution	o	o	+	o	o	o	o
	H ₂ SO ₄ ≤ 70%	+	+	+	+	+	-	-
	70% ≤ H ₂ SO ₄ ≤ 96%	-	-	+	+	+	-	-
Non Oxidizing Acids (HCl, HF, etc.)	HCl ≤ 30%	+	+	+	+	+	o	-
	HF ≤ 40%	+	+	+	+	-	o	-
	40% ≤ HF ≤ 75%	+	+	+	-	-	-	-
Organic (formic acid, acetic acid, citric acid, etc.)	HCOOH ≤ 25%	+	+	+	+	+	o	-
	25% ≤ HCOOH ≤ tech. pure	+	+	+	+	-	o	-
	CH ₃ COOH ≤ 50%	+	+	+	+	+	o	-
	50% ≤ CH ₃ COOH ≤ tech. pure	+	+	+	o	-	o	-
Bases	C ₃ H ₄ OH (COOH) ₃	+	+	+	+	+	o	-
	Inorganic (NaOH, KOH, etc.)	+	+	-	+	o	+	+
	Organic (amine, imidazole, etc.)	+	+	-	o	-	o	o
Salts	NaCl, FeCl ₂ , FeCl ₃ , CaCl ₂ , etc.	+	+	+	+	+	o	o
Halogens	Chlorine, bromine, iodine, (no fluorine)	-	-	o	o	o	o	-
Fuels /Oils	Aliphatic hydrocarbons	o	o	+	+	o	+	+
	Aromatic hydrocarbons	-	-	+	-	-	+	+
	Chlorinated hydrocarbons	-	-	o	-	-	o	o
Solvents	Ketones	+	+	o	-	-	+	+
	Alcohols	+	+	+	o	-	+	+
	Esters	o	o	o	-	-	+	+
	Aldehydes	+	+	-	-	-	+	+
Phenols	Phenol, Cresol, etc.	+	+	+	-	-	+	-

+ resistant o conditionally resistant, please consult us - not resistant

Please note: The above list is only intended as a guideline and does not replace an in-depth review of material suitability for the particular application. The information is based on our experience and is state of the art. These data are general indicators only. In practice, other factors such as concentration, pressure and joining technology must also be taken into consideration. The technical data are not binding and are not expressly warranted characteristics of the goods.

Please contact us for help in selecting the right materials.

System specification

* Standards:



	PE100
Material	
Color	RAL 9005
Density	~ 0.95 g/cm ³ (EN ISO 1183/ASTM D 792)
Thermal expansion coefficient	0.15–0.20 mm/m K (DIN 53752)
Thermal conductivity at 23°C	0.38 W/m K (EN 12664)
Thermal expansion	0.16–0.18 mm/m K
Yield stress at 23°C	25 N/mm ² (EN ISO 527)
Tensile E-modul at 23°C	900 N/mm ² (EN ISO 527)
Charpy notched impact strength at 23°C	83 kJ/m ² (EN ISO 179)
Charpy notched impact strength at –40°C	13 kJ/m ² (EN ISO 179)
Limiting Oxygen Index (LOI)	17.4% (ISO 4589)
Dimensions	d20–d630 in accordance to EN ISO 15494
Surface condition	accordance to EN ISO 15494
Material and product approvals	<ul style="list-style-type: none"> - DIBt (Deutsches Institut für Bautechnik) - FM Approvals (Factory Mutual) - IIP (Istituto Italiano dei Plastici) - GL (Germanischer Lloyd) - LR (Lloyd's Regist. of Shipping) - RINA (Registro Italiano Navale) - DNV (Det Norske Veritas) - CCS (China Classific. Society) - ABS (American Bureau of Shipping) - NK (Nippon Kaiji Kyokai) - RMROS (Russian Maritime Register of Shipping)
Packaging	Fittings and valves are bagged
Marking and labeling	<p>All components are embossed with a permanent identification during the production process to ensure full traceability:</p> <ul style="list-style-type: none"> - Brand name - Material - Dimensions - Pressure rating - Lot No. - Product description - Article number - Standard and approvals

* Approvals / Acceptance:



* An overview of all standards and approvals is stated online: www.gfps.com

As versatile as your applications

Application-oriented systems of highest safety and reliability to fit your demanding industrial applications.

GF Piping Systems develops customized best-in-class solutions, aligned to the specific requirements of our customers in various sectors of industry, enabling profitable operation. With our system knowledge and product expertise, we support our customers during the planning process, the sustainable realization of the projects, and provide valuable added services. Expertise in developing and producing piping systems, combined with profound industry and market knowledge, based on long-standing experience, makes GF Piping Systems a qualified and professional partner for our customers.

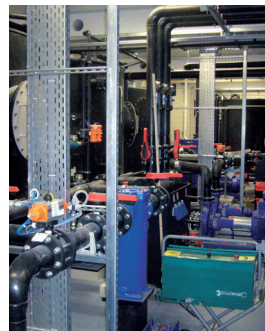
Energy

ecoFIT system combines high performance utilization with excellent material properties. This ensures secure processing in water and chemical applications. Finally, this leads to beneficial effects in terms of safety and health.



Water Treatment

With PE, applications in water treatment are designed to be reliable and of highest efficiency. Challenges such as guaranteeing high water quality and solving any corrosion issues can be solved at the same time.



Cooling

Corrosion-free and lightweight, together with low heat conductivity, make PE an efficient and cost-effective solution for cooling circuits within industrial processes. Reducing energy loss results in major energy savings in cooling applications.



Chemical Process Industry

PE offers a broad and versatile solution for the safe conveyance of several harsh chemicals, covering a quite large temperature range, having no problem with UV or sunlight exposure and with various joining technology possibilities.



Marine

Lighter and more corrosion resistant than metal, PE is ideally suited for sea and cold water conveyance on board. Electrofusion joining and prefabrication fit to tight ship environment. PE covers various applications.



Food and Beverage

The PE fit system is ideal in a variety of food and beverage applications; two of the most common applications are low-temp cooling systems and waste piping.



Worldwide at home

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

www.gfiping.com

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