

# ecoFIT

## All you need in PE

Polyethylene welded system  
for industrial applications



ecoFIT system

# The solution for all your challenges

**The qualified, corrosion-resistant solution for universal usage in highly diverse industrial applications.**

We are dedicated to designing, manufacturing and marketing piping systems for the safe and secure treatment and distribution of water, liquids, chemicals and gases. 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 end-users, GF Piping Systems introduced the ecoFIT piping system based on certified polyethylene raw material. Covering all requirements of the most significant international standards proves the systems' quality and safety. ecoFIT guarantees a maximum of safety, reliability and performance. It is the ideal choice for any challenging application on the industrial field.



## All you need from one source

**ecoFIT 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 pipes, fittings, valves, jointing as well as automation technologies in the ecoFIT portfolio is as diverse as our customers and their individual challenges.**

## + Individuality - from the planning stage



Pipes



Fittings



Valves

### Customizing

The focus of our worldwide located customizing teams 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 jointing technologies
- Worldwide service: Customizing, machine rental pool, training and sales support
- System lifetime warranty\*

### Total plastic solution

- 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



Jointing 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.

### Online and mobile calculation tools

Our numerous online and mobile calculation tools in many different languages support our customers in configuring and commissioning automation products.

### 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 jointing technologies.

### System lifetime warranty\*

Confirming confidence in the premium quality of our polyethylene product and system range, we grant a limited system lifetime warranty.

# More than a system

With a constant focus on maximum reliability and safety our ecoFIT system assures a sustained high level of product quality and outstanding performance standards in all applications. The clearly defined development and manufacturing processes of our worldwide specified systems are carried out on the basis of all relevant standards and specifications and are regularly audited and evaluated to achieve continuous improvement. Certified processes as well as product approvals are part of the active and sustainable quality management system of GF Piping Systems and makes us a reliable partner. Therefore, with our ecoFIT welded system range customers can be assured that their needs are covered and that all required standards are met.

## ecoFIT system range

Products	Material	DN		d																											
		SDR	PN	15	20	25	32	40	50	63	75	90	110	125	140	160	180	200	225	250	280	315	355	400	450	500	560	630			
Pipes	PE100	7.4	20																												
		11	16																												
		17/17.6	10																												
Socket fusion fittings	PE80	11	10																												
Butt fusion fittings	PE100	11	16																												
		17/17.6	10																												
Infrared (IR) compatible butt fusion fittings	PE100	11	16																												
		17/17.6	10																												
Electrofusion fittings (ELGEF)	PE100	11	16																												
		17/17.6	10																												
Valves																															
Automation																															
Flanges	PP-V/PP-ST																														
Flange seals	EPDM/FPM																														
Gaskets																															
Pipe clips	PP/PE																														

Welding machines	d	20	25	32	40	50	63	75	90	110	125	140	160	180	200	225	250	280	315	355	400	450	450	500	560	630	
Socket fusion machines																											
Butt fusion machines																											
Infrared (IR) fusion machines																											
Electrofusion machines																											



ecoFIT system

# System specification



**\* Standards:**



	PE100	PE80
<b>Material</b>		
Color	RAL 9005	RAL 9005
Density	~ 0.95 g/cm <sup>3</sup> (EN ISO 1183/ASTM D 792)	~ 0.93 g/cm <sup>3</sup> (EN ISO 1183 / ASTM D 792)
Thermal expansion coefficient	0.15–0.20 mm/m K (DIN 53752)	0.15–0.20 mm/m K (DIN 53752)
Thermal conductivity at 23 °C	0.38 W/m K (EN 12664)	0.43 W/m K (EN 12664)
Thermal expansion	0.16–0.18 mm/m K	0.16–0.18 mm/m K
Yield stress at 23 °C	25 N/mm <sup>2</sup> (EN ISO 527)	18 N/mm <sup>2</sup> (EN ISO 527)
Tensile E-modul at 23 °C	900 N/mm <sup>2</sup> (EN ISO 527)	700 N/mm <sup>2</sup> (EN ISO 527)
Charpy notched impact strength at 23 °C	83 kJ/m <sup>2</sup> (EN ISO 179)	110 kJ/m <sup>2</sup> (EN ISO 179)
Charpy notched impact strength at -40 °C	13 kJ/m <sup>2</sup> (EN ISO 179)	7 kJ/m <sup>2</sup> (EN ISO 179)
Limiting Oxygen Index (LOI)	17.4 % (ISO 4589)	17.4 % (ISO 4589)
<b>Dimensions</b>	d20–d630 in accordance to EN ISO 15494	d20–d110 in accordance to EN ISO 15494
<b>Surface condition</b>	accordance to EN ISO 15494	accordance to EN ISO 15494
<b>Material and product approvals</b>	<ul style="list-style-type: none"> <li>- DIBt (Deutsches Institut für Bautechnik)</li> <li>- FM Approvals (Factory Mutual)</li> <li>- IIP (Istituto Italiano dei Plastici)</li> <li>- GL (Germanischer Lloyd)</li> <li>- LR (Lloyd's Regist. of Shipping)</li> <li>- RINA (Registro Italiano Navale)</li> <li>- DNV (Det Norske Veritas)</li> <li>- CCS (China Classific. Society)</li> <li>- ABS (American Bureau of Shipping)</li> <li>- NK (Nippon Kaiji Kyokai)</li> <li>- RMR0S (Russian Maritime Register of Shipping)</li> </ul>	<ul style="list-style-type: none"> <li>- DIBt (Deutsches Institut für Bautechnik)</li> </ul>
<b>Packaging</b>	Fittings and valves are bagged	Fittings and valves are bagged
<b>Marking and labeling</b>	All components are embossed with a permanent identification during the production process to ensure full traceability: <ul style="list-style-type: none"> <li style="width: 50%;">- Brand name</li> <li style="width: 50%;">- Lot No.</li> <li style="width: 50%;">- Material</li> <li style="width: 50%;">- Product description</li> <li style="width: 50%;">- Dimensions</li> <li style="width: 50%;">- Article number</li> <li style="width: 50%;">- Pressure rating</li> <li style="width: 50%;">- Standard and approvals</li> </ul>	

**\* Approvals/Acceptance:**



\* An overview of all standards and approvals is stated online: [www.gfps.com](http://www.gfps.com)



ecoFIT system

# 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 been placing a high priority on developing innovative jointing 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 jointing technologies. With a global jointing training program, international machine rental and a worldwide network of service centers, our customers benefit from expert know-how and practical experience.

## Welding technology

### Socket fusion – the strong connection

The strong, fast and easy solution to produce heavy-duty connections, in the workshop or the field.

## Welding machine



## Joint cross-section



## Macro-image



### Butt fusion – the economical connection

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



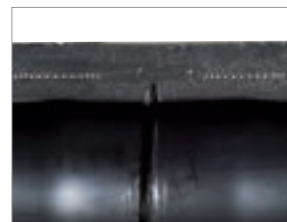
### IR-Plus (Infrared) fusion – the fast, clean connection

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.



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

ecoFIT 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 considered to be 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.

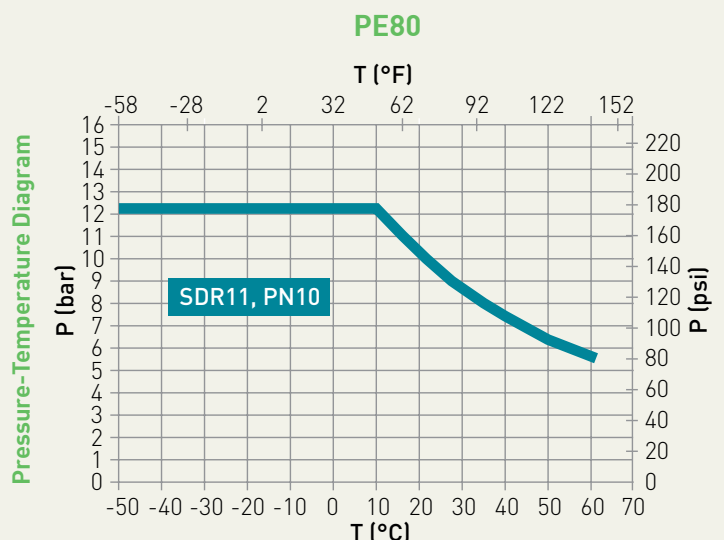
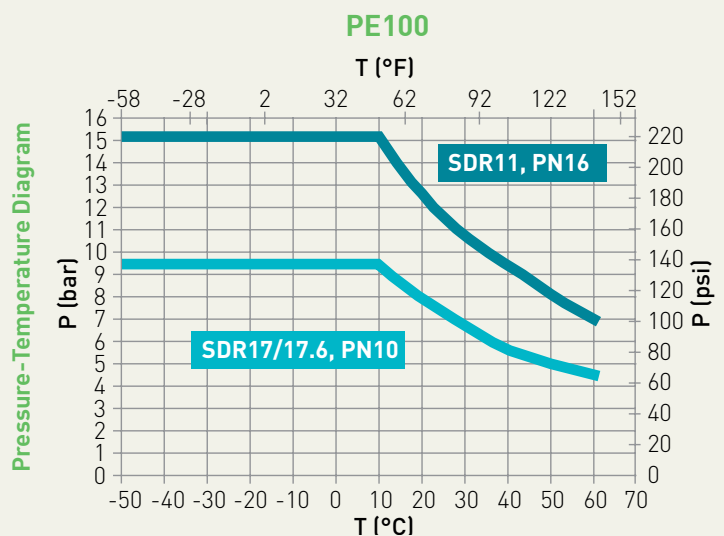
Furthermore, properties such as low weight, low density, minimum internal stresses and an excellent smooth internal surface with high finish quality, make polyethylene a high-grade piping material.

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



The European Plastic Pipes and Fittings Association  
**Channelling Performance**

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



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.

More information regarding technical specifications can be found online in our planning fundamentals: [www.gfps.com](http://www.gfps.com)



## Chemical Resistance

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

The smarter way of automation

# Automation made easy

**A unique system-based approach that bundles and integrates competencies, knowledge, best-in-class resources and technologies.**

With an innovative product portfolio in the field of measurement, control and actuation devices, GF Piping Systems follows its system approach consistently. The complete solution combines measurement, control and actuation technology together with high quality piping systems and therefore represents a unique form of product and competence bundling. The system-integrated devices that measure values such as temperature, pressure and flow deliver accuracy, productivity, reliability and safety to customers in a wide range of industries. Providing the entire range of automation technology from simple instrument panels to complex measurement installations, GF Piping Systems has not only the product resources and the technical know how, but also the global service and support infrastructure needed to meet the high customer requirements.



ecoFIT applications

# 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 longstanding 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.



## **Cooling**

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



## **Marine**

Lighter and corrosion resistant compared to metal, ecoFIT is ideally suited for sea and cold water conveyance on board. Electrofusion jointing and prefabrication fit to tight ship environment. ecoFIT covers various applications.



## **Water Treatment**

With ecoFIT, applications in water treatment can be designed reliable and of highest efficiency. Thereby, challenges such as guaranteeing high water quality and solving any corrosion issues at the same time can be faced.

## **Chemical Process Industry**

ecoFIT offers a broad and versatile solution for the safe conveyance of several harsh chemicals, covering a quite large temperature range, with no problem to UV or sun light exposure and with various jointing technology possibilities.



## **Microelectronics**

The CONTAIN-IT Plus double containment system aids in minimizing the risk of personal injury and environmental damage. Our patented jointing process permits independent jointing of the inner and outer pipes, and 100% compliance to DVS guidelines.



# Worldwide at home

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

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