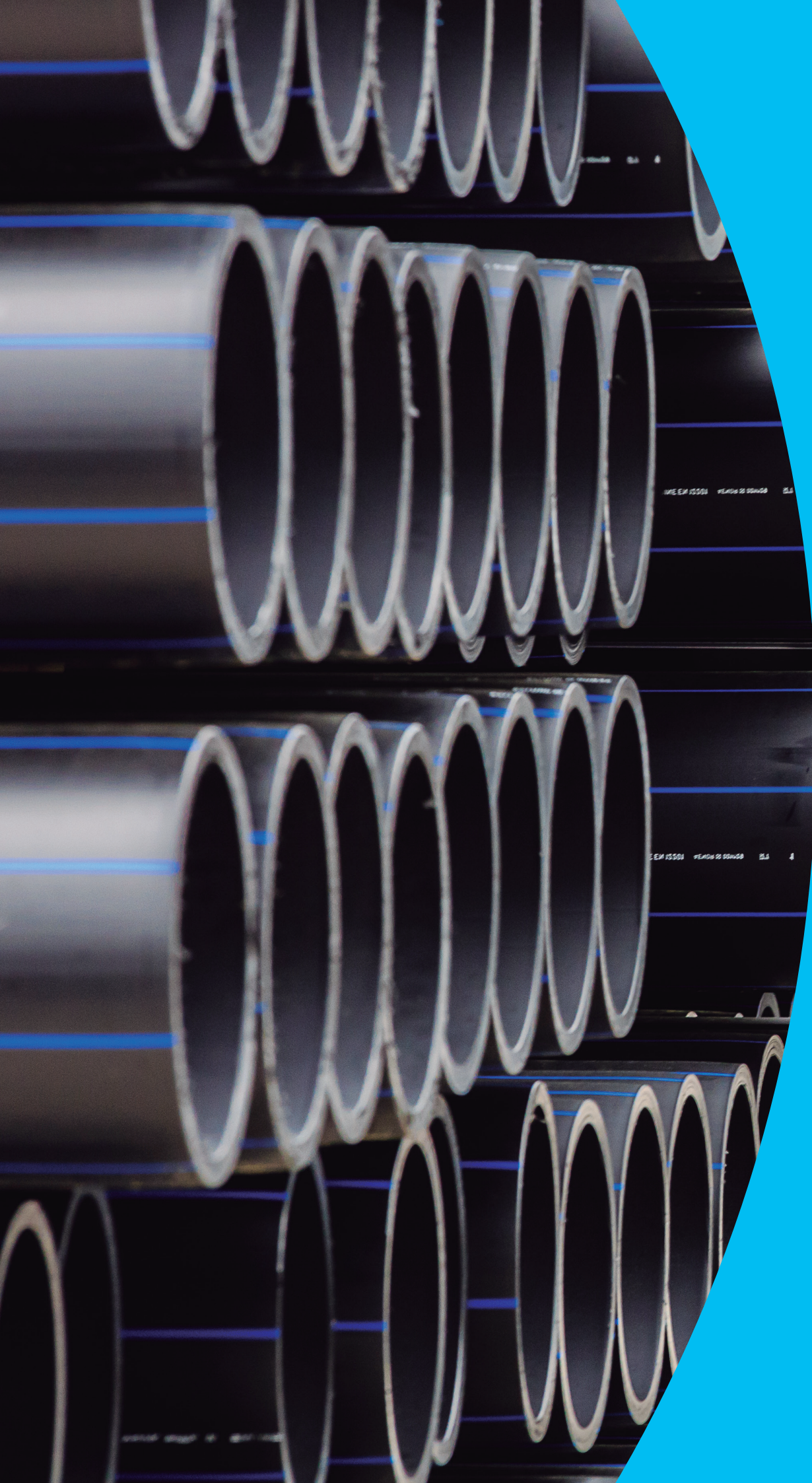




Flexipol

Pipes and fittings for drinking-water supply





Aliaxis Iberia

Aliaxis is **a global leader in advanced plastic-piping systems**, offering innovative and sustainable solutions to get drinking water, sanitation and energy to people, where they need it.

Aliaxis Iberia started out as a manufacturer, with a long-spanning career and extensive knowledge in each of its sectors – synonymous with experience and quality.

Aliaxis began producing polyethylene pipes in 1961, with its factory in Okondo (Álava), specialising in providing services for infrastructure and industry. We stand out thanks to the high standards for quality we follow, the finished end of our products and our capacity to manufacture made-to-measure bespoke parts, with large diameters and for projects of any type.



Contents

Health, safety, quality and the environment	6
Flexipol pipes	10
Design and installation of polyethylene pipes	14
Polyethylene water pipes	20
Pipe handling and storage	22
No-dig pipe installation	24
Joining techniques	27
Electrofusion	28
Butt welding	32
Flanges	36
Push-Fast system	38
Services	40
Summary of the Flexipol range of products	42
Case study	45

**Health, safety,
quality and the
environment**



Health, safety, quality and the environment

Health and safety

Aliaxis undertakes to guarantee that health and safety is our priority in the manufacture of your polyethylene pipes. We look both inside and outside of our immediate environment to ensure that we are contributing to the highest possible standards of health and safety for all parties.



Our Vision

At Aliaxis, we make life flow.

We're building a better tomorrow by bringing water and energy to people, wherever they need it.



Our Mission

We're passionate about creating **sustainable and innovative solutions** for the supply of water.

We offer efficient piping systems for people across the world. We are **leaders in our industry**, anticipating the evolving needs of our customers.

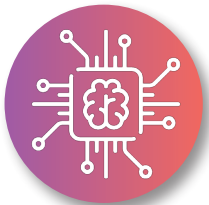


Our Values

Our values define who we are.

We want to achieve a better future together, working with people and for people to build a better and more sustainable future.

Passion for construction



We are flexible, quick and efficient

Connected for success



Together we achieve more

Committed to care



We live and breathe our values

User guidelines

Aliaxis polyethylene products have been installed and safely used in large volumes for many years. However, good working practices are fundamental to guaranteeing safety, as our products must be handled and processed in accordance with the guidelines established in order to protect the safety of workers and users.

All PE 40 and PE 100 piping systems contain traces of process residue and may contain other materials such as pigments, antioxidants and UV stabilisers. PE is chemically non-reactive and is considered biologically inert, although some pipe materials contain low levels of additives that may be toxic.

Aliaxis polyethylene products have been installed and safely used in huge volumes for many years



Ingestion

Avoid the ingestion of PE. In the case of ingestion, some pipe materials may contain additives which are harmful. The specified materials for various water-supply purposes may contain pigments which are not suitable to use with drinking water. These materials may be harmful if ingested in large quantities.



Inhalation

PE does not give off harmful vapours at room temperature. The threshold limit for PE dust is 10 mg/m³ (8-hour weighted average in the working environment), but the generation of such levels when working with PE pipes or accessories is very unlikely.



Physical contact

PE does not irritate the skin. When PE dust is generated when cutting pipes or accessories, PE-dust particles may cause abrasive eye irritation.



Fire characteristics

When PE is heated in air, it will melt at 120–135 °C and decomposition will begin at approximately 300 °C. Above this temperature, oxidative pyrolysis of PE will take place, producing carbon dioxide, carbon monoxide, water and various hydrocarbons. These gases can ignite and give off heat, which can accelerate the pyrolysis of any other PE that may be in the vicinity.

When burning, drops of molten material can be released, which may ignite any adjacent flammable materials. Actual cooling conditions in a real fire will be influenced by various factors, such as the location and availability of oxygen, which will determine the progress and products of fire combustion.

PE combustion may release toxic materials. Avoid inhaling fumes or vapours. Furthermore, do not allow PE dust to accumulate, as in exceptional circumstances there may be a risk of said dust exploding, and carefully monitor the presence of any possible heat sources, such as electrical equipment.

Any type of extinguisher may be used in case of fire involving PE pipes. Powder extinguishers are very effective in putting out flames. Sprinklers are particularly effective in cooling and rapidly extinguishing a fire; however, they are not recommended in the initial phases, as this may help to spread flames. Other factors may also influence the selection of extinguishers, such as the proximity of electrical equipment. Consult the specific classifications of fire extinguishers.



Handling molten material

During fusion welding of PE pipes and accessories, molten PE is produced. If this comes into contact with the skin, it will stick firmly and cause serious burns. This molten material has a high heat content and will remain hot for some time. Gloves should be used if there is a risk of contact with skin.

Molten PE can emit small quantities of vapour; these are more pronounced at higher temperatures and more care should be taken if there is a risk that PE may adhere to hot surfaces, such as the hot plates used for welding. Ventilation must be ensured to guarantee safe working conditions.

Did you know?



We constantly monitor our commercial activities in order to minimise their environmental impact

Quality guarantee
EN ISO 14001

Products subject to rigorous dimensional, mechanical and destructive tests are carried out according to Aliaxis product-quality plans.

By prior agreement, these quality plans may be modified to incorporate specific the customer's specific inspection and testing requirements.

Flexipol pipes



Comprehensive polyethylene-pipe solutions for the supply of drinking water



At the forefront of the development of polyethylene pipes for more than 60 years. Aliaxis Iberia offers a complete and comprehensive service, from the start to the end of your project.

By adopting a truly collaborative approach, Aliaxis works with the entire supply chain to deliver the made-to-measure solution that will best satisfy the needs of each individual plan.

From advice on specifications to the delivery of continuous and personalised training and on-site support during installation, the Aliaxis team is with you every step of the way.

More than a simple manufacturer, Aliaxis has an unbeatable reputation in forming long-lasting associations with customers, based on their range of services and added-value proposals. This customer-focused approach, combined with a variety of quality-engineered products, has made the company the market leader it is today.

Complete support for projects and range of services

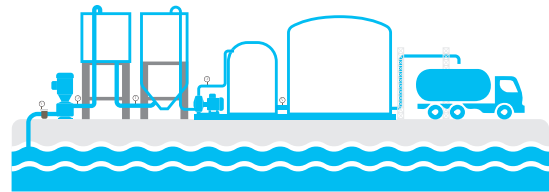
Characteristics

- Available in PE 40 and PE 100
- Sizes vary from 20 mm. to 1000 mm.
- Available in standard SDR 17/11/26 (other SDRs are available upon request)
- Standard roll lengths of 50 m. and 100 m. (other lengths are available upon request)
- Standard bar lengths of 6 m. and 12 m. (other lengths are available upon request)
- Complete range of compatible accessories
- In compliance with EN12201

Benefits

- Flexible, lightweight and corrosion resistant
- Low friction and high flow rate
- Suitable for various installation techniques Save on transport and installation
- The security of a continuous and flexible supply for our customers
- Reducing our carbon footprint

Applications

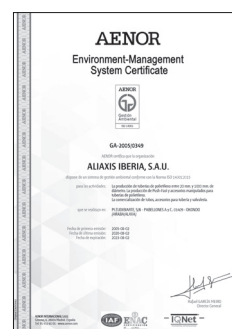
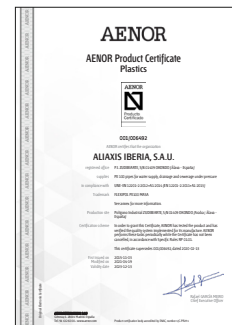
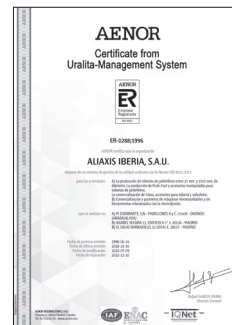


By offering reliable performance for an expected use life of 100 years, Aliaxis provides fully approved polyethylene (PE) pipes and accessories, supporting our customers' need to maintain the quality of drinking water through their distribution network, while offering excellent value throughout the supply chain.

Certifications

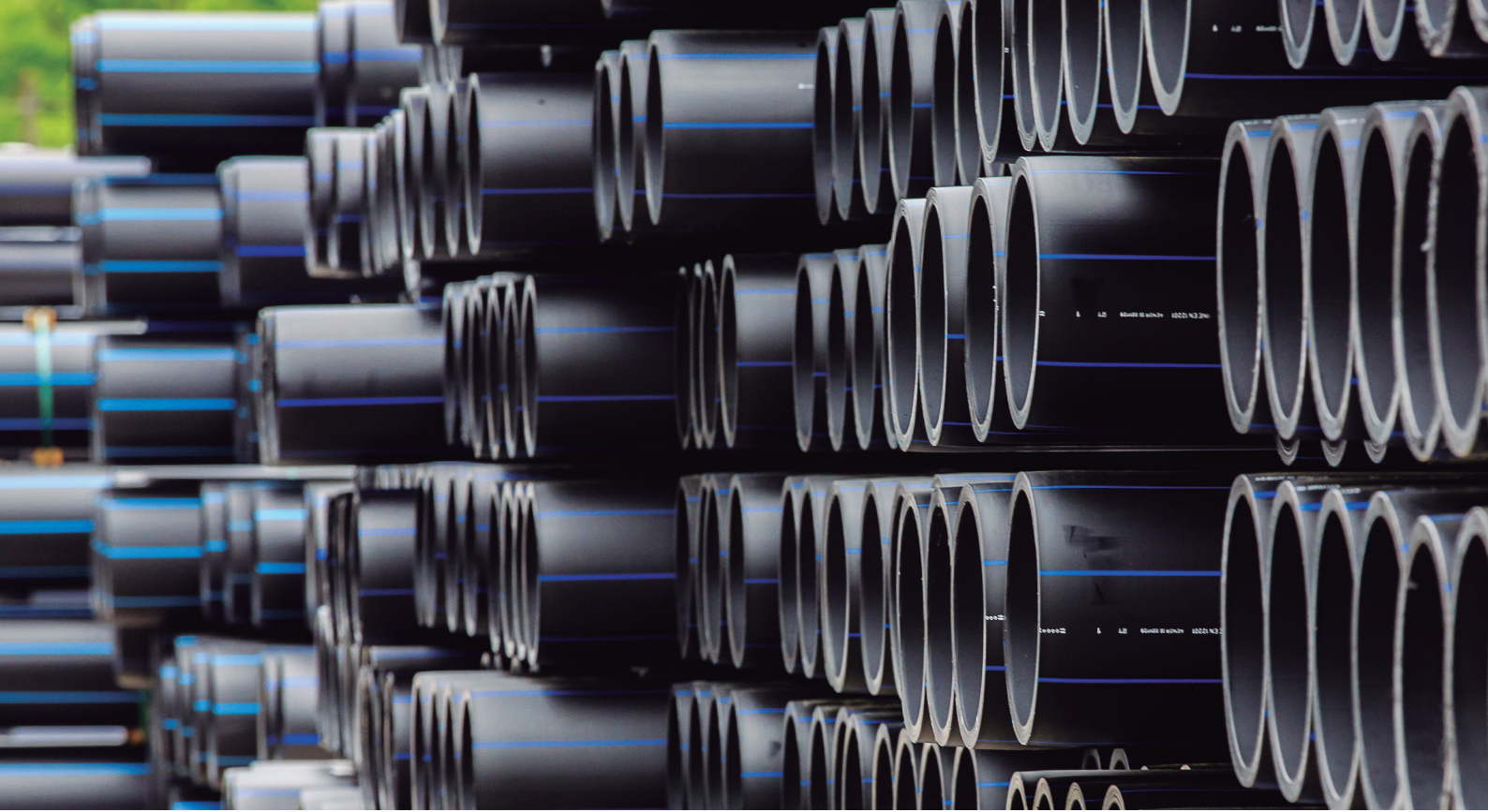
Approved with
ISO 9001 / ISO 14001

Approved with
EN 12201 / ISO 4427





Design and installation of polyethylene pipes



Design and installation of polyethylene pipes

Pressure test

The pipe-pressure test must be carried out in accordance with UNE 53394 'Hydrostatic pressure test'.

Pipe burial

The dimensions of the trench opening are normally dictated by the diameter of the pipe, the joining method and site conditions. Guidance should be sought on the selection and use of suitable materials to provide structural support to buried pipes. The usual minimum depth of cover for the piping should be 900 mm from ground level to the crown of the pipe. The width of the trench is normally no less than the external diameter of the pipe, plus 250 mm, to allow suitable compaction of side fill, unless specialist narrow-trench techniques or free-flow and easy-compaction lateral materials are used.

Did you know?

PE pipes may be designed with different wall thicknesses to better adapt to the application of pressure.



Maximum continuous operating pressures for standard PE100 pipe

TEMP (°C)	Years service	SDR ISO-S	Maximum functional pressure (bar)													
			51 25	41 20	33 16	26 12.5	22 10.5	21 10	17.6 8.3	17 8	13.6 6.5	11 5	9 4	7.4 3.2	6 2.5	5 2
10	5		4,0	5,0	6,3	7,9	9,4	10,1	12,1	12,6	2,5	20,2	25,2	31,5	40,4	50,5
	10		3,9	4,9	6,2	7,8	9,3	9,9	11,9	12,4	15,5	19,8	24,8	31,0	39,7	49,6
	25		3,8	4,8	6,0	7,6	9,0	9,6	11,6	12,1	15,1	19,3	24,2	30,2	38,7	48,4
	50		3,8	4,7	5,9	7,5	8,9	9,5	11,4	11,9	14,8	19,0	23,8	29,7	38,0	47,6
	100		3,7	4,6	5,8	7,3	8,7	9,3	11,2	11,6	14,6	18,7	23,3	29,2	37,4	46,7
20	5		3,3	4,2	5,3	6,6	7,9	8,4	10,2	10,6	13,2	16,9	21,2	26,5	33,9	42,4
	10		3,3	4,1	5,2	6,5	7,8	8,3	10,0	10,4	13,0	16,6	20,8	26,0	33,3	41,6
	25		3,2	4,0	5,0	6,4	7,6	8,1	9,8	10,1	12,7	16,2	20,3	25,4	32,5	40,7
	50		3,2	4,0	5,0	6,3	7,5	8,0	9,6	10,0	12,5	16,0	20,0	25,0	32,0	40,0
	100		3,1	3,9	4,9	6,1	7,3	7,8	9,4	9,8	12,2	15,7	19,6	24,5	31,4	39,2
30	5		2,8	3,6	4,5	5,6	6,7	7,2	8,6	9,0	11,2	14,4	18,0	22,5	28,8	36,0
	10		2,8	3,5	4,4	5,5	6,6	7,0	8,5	8,8	11,0	14,1	17,7	22,1	28,3	35,4
	25		2,7	3,4	4,3	5,4	6,4	6,9	8,3	8,6	10,8	13,8	17,2	21,6	27,6	34,5
	50		2,7	3,3	4,2	5,3	6,3	6,7	8,1	8,4	10,6	13,5	16,9	21,2	27,1	33,9
	100		2,6	3,2	4,1	5,2	6,2	6,6	8,0	8,3	10,5	13,4	16,8	21,1	27,0	33,8
40	5		2,4	3,0	3,8	4,8	5,8	6,1	7,4	7,7	9,6	12,3	15,4	19,3	24,7	30,9
	10		2,4	3,0	3,8	4,7	5,7	6,0	7,3	7,6	9,5	12,1	15,2	19,0	24,3	30,4
	25		2,3	2,9	3,7	4,6	5,5	5,9	7,1	7,4	9,2	11,8	14,8	18,5	23,7	29,7
	50		2,3	2,9	3,6	4,5	5,4	5,8	7,0	7,2	9,1	11,6	14,5	18,2	23,3	29,1
	100		2,2	2,8	3,5	4,4	5,3	5,7	6,9	7,1	8,9	11,4	14,3	18,0	23,1	28,9
50	5		2,1	2,6	3,3	4,2	5,0	5,3	6,4	6,7	8,3	10,7	13,4	16,7	21,4	26,8
	10		2,0	2,6	3,2	4,0	4,8	5,2	6,2	6,5	8,1	10,4	13,0	16,2	20,3	26,0
	15		1,9	2,3	2,9	3,7	4,4	4,7	5,7	5,9	7,4	9,5	11,8	14,8	19,0	23,7
60	5		1,5	1,9	2,4	3,0	3,6	3,8	4,6	4,8	6,0	7,7	9,7	12,1	15,5	19,4
70	2		1,2	1,5	1,9	2,4	2,9	3,1	3,7	3,9	4,9	6,2	7,8	9,8	12,5	15,7

Refined backfill and pipe edge:
cohesive or granular materials that do not contain sharp stones should be used around the pipe.

Normal side fill and backfill requirements

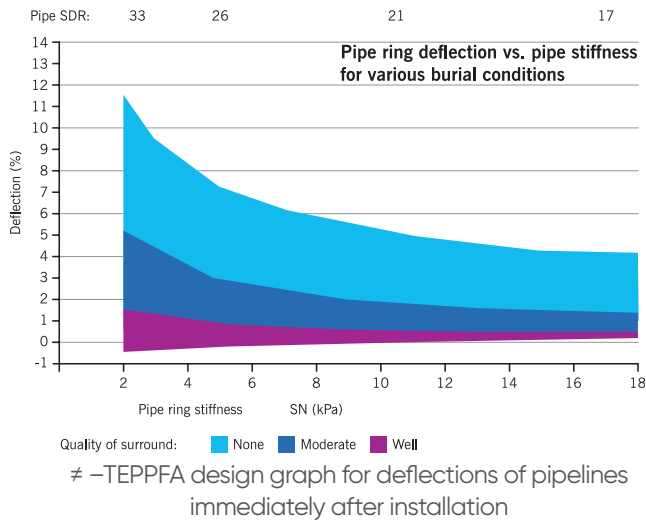
For minor roads, the excavated material can often be returned to the trench and compacted in layers of thickness as specified by the Service Company Target markets. Specifications relevant to the water industry, for example: much thicker material is allowed for PE pipe sides and backfill than what is normally recommended for the base. However, heavy compaction equipment should not be used until the crown of the pipe has been covered by at least 300 mm.



Structural design of buried PE pipes



The graphic shows short-term pipe deflection produced in various burial conditions (materials used, as well as level of care) and the pipe's rigidity (SDR), with long-term deflection values determined through the sum of the prescribed quantities.



Assuming that the correct pipe pressure rating is selected for the specified service, the total tension in the wall when the pipe is buried will always be less than the nominal value (ref. EN 1295-1: 1997). The pipe's designer will simply need to decide how much deflection is acceptable in the specific circumstances (for example, a higher value would be more suitable in a field than below a road), and then select the PE pipe and type of environment accordingly.

Keep in mind that long-term deflections of up to 12.5%-15% are completely safe for PE pipes.

The pipe's long-term and short-term annular rigidity values depend on the pipe's flexural elasticity, which, in turn, is subject to time, temperature and material.

Currently, there is no international agreement on the best modulus values for use in each situation, but the following are generally considered appropriate at room temperature (20 °C).

The pipe's long-term annular rigidity values depend on the pipe's flexural elasticity, which, in turn, is subject to time, temperature and material.

Type	Es (short-term elastic modulus)	EI (Long-term elastic modulus)
PE100 (HDPE)	1100 MPa	160 MPa

Entry to structures

Polyethylene is not affected by concrete components and the pipe can be partially or completely surrounded. However, the surface of the pipe should be protected in order to avoid friction damage by wrapping it in a high-resistance polyethylene membrane before forming the concrete enclosure. The lining should extend beyond the concrete-covered area. If anchoring is also required, a puddle flange may be incorporated. Achieving a watertight seal where the polyethylene pipes pass through concrete structures is difficult due to the natural flexibility of the materials; however, an external seal may be provided. The natural flexibility of fully-welded polyethylene pipes may be adapted to relatively high deflections. However, when a high degree of differential settlement is forecasted, the use of support pads should be considered. The use of articulated joints (swivel joints) is not considered suitable for polyethylene-piping installations.

Embankment installation

When pipes are required to be installed above the existing ground level and then covered, they may not be placed until the mound of recovered earth has been reconstructed and compacted to one metre above where the crown of the pipe will be located. Then, a trench should be dug out of the mound and the pipes placed as usual.

Did you know?

PE pipes have a minimum lifecycle of 100 years.

Supports

Recommendations for the maximum spacing of supports are shown in the table below. These are based on a mid-span deflection of 6.5 mm., when the pipe is full of water, assuming a long-term flexural modulus of 200 MPa at an ambient temperature of 20 ° C. The pipe clamps used for anchoring and support should have flat and non-abrasive contact surfaces, or be lined with rubber sheeting, and should not be too tight. The width of supports and hangers should normally be 100 mm., or half the nominal diameter of the pipe, whichever is greater.



Maximum separation between pipe supports above the ground (metre)

Pipe	SDR 11	SDR 17	SDR 21	SDR26
20mm	0.6	N/A	N/A	N/A
25mm	0.7	N/A	N/A	N/A
32mm	0.9	N/A	N/A	N/A
63mm	1.1	N/A	N/A	N/A
90mm	1.3	1.2	N/A	N/A
110mm	1.5	1.3	N/A	N/A
125mm	1.6	1.4	N/A	N/A
160mm	1.8	1.6	1.6	1.5
180mm	1.9	1.7	1.7	1.6
200mm	2.0	1.8	1.8	1.7
225mm	2.1	1.9	1.9	1.8
250mm	2.2	2.0	2.0	1.9
280mm	2.3	2.1	2.1	2.0
315mm	2.5	2.3	2.2	2.1
355mm	2.6	2.4	2.3	2.2
400mm	2.8	2.5	2.4	2.3
450mm	2.9	2.7	2.6	2.5
500mm	3.1	2.8	2.7	2.6
560mm	3.3	3.0	2.9	2.8
630mm	3.5	3.2	3.1	2.9
710mm	N/A	3.4	3.3	3.1
800mm	N/A	3.6	3.5	3.3
900mm	N/A	3.8	3.7	3.5
1000mm	N/A	4.0	3.9	3.7

Note: These figures are for the spacing of horizontal supports and may be duplicated for vertical-support spacing.



Polyethylene water pipes

The Aliaxis range of pipes is designed for the main water-supply pipes. The range is composed of pipes of 20 mm. to 1000 mm in diameter, with working pressures of up to 16 bar.

Characteristics and benefits

- SDR standard 11 / 17 / 26 and more, on request
- Standard bar lengths of 6 m. and 12 m. (other lengths are available upon request)
- 100-year use life

Did you know?

PE pipes do not corrode nor rust, which guarantees that speed and flow remain the same throughout the pipe's use life.

BENEFITS

Suitable for **different installation techniques**



Greater lengths

to reduce the risk of leakages

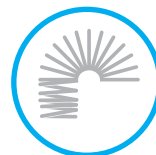


Ahorro de costes

during installation



Low friction and **high flow rate**



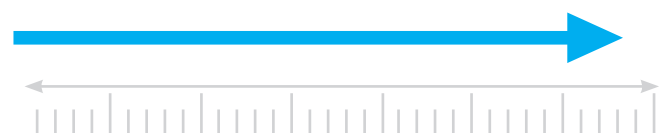
Flexible

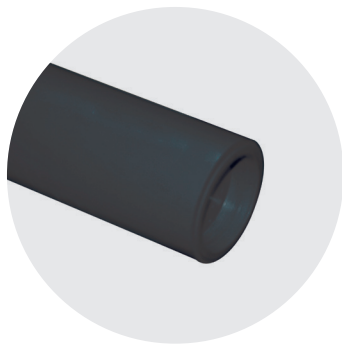
Material characteristics



Superior crack-resistance properties

in the largest diameters



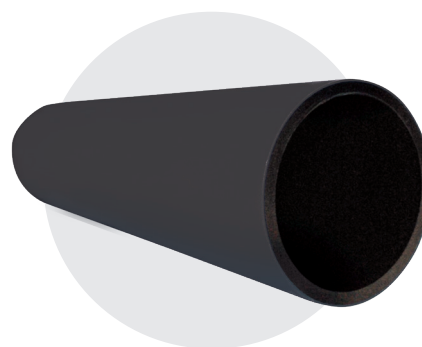


▲ FLEXIPOL PE40

- Complies with EN12201
- Available from 20 to 90 mm.
- Available in SDR11 and SDR7.4
- Suitable water supply of up to 10 bar



In compliance with
EN12201



▲ FLEXIPOL PE100

- Complies with EN12201
- Available from 20 to 1000 mm.
- Available from SDR 7.4 to SDR 41
- Suitable water supply of up to 25 bar



In compliance with
EN12201



Pipe handling and storage

Though they are relatively light, polyethylene-piping products must be handled with a similar level of precaution to that of heavier metal-piping products.

Although polyethylene is a strong and resistant material, care should be taken to avoid excessive scratching when excavating the surface. Damage may be caused to the surface during handling, storage and installation, but as long as the depth of any scratch does not exceed 10% of the wall thickness, the pipe or accessory's service performance will not be affected.

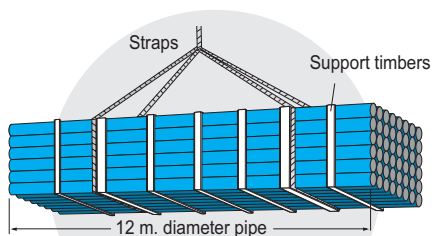
Six measures for handling pipes

- 01** Pipes should be stored on level and firm ground, capable of supporting the weight of materials and lifting equipment.
- 02** When pipes are loaded and unloaded, they allow for a certain amount of bending deflection; the lifting points should be uniformly spaced out.
- 03** When using slings, these should be wide and made from a suitable non-metal material (for example, nylon or polypropylene). Metal slings, hooks or chains should not be used.

- 04** Standard packages of six metres may be handled with a forklift, but larger sections must be moved with a side loader with a minimum of four support forks, or a crane with a spreader beam.
- 05** Take special care when handling pipes in wet or frozen conditions in case they are slippery.
- 06** Pipes should never fall or be dropped from any height, including from delivery vehicles.



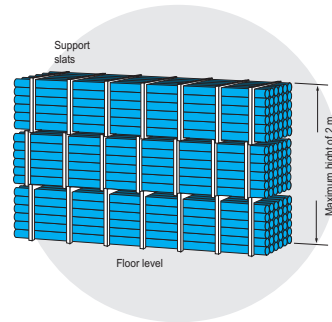
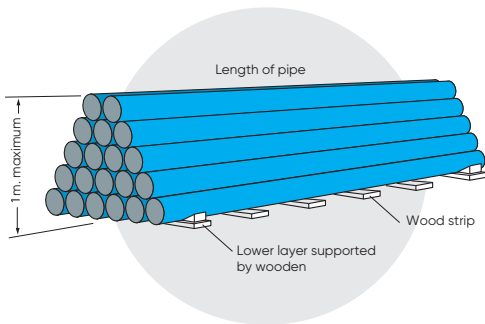
Handling significant lengths



Good lifting practices

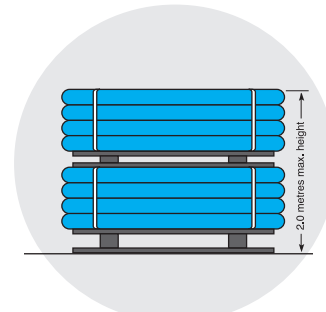
How to store your pipes

- Never drag or twist pipes or individual packages
- Keep pipes away from sharp objects
- Packaging (slats, shrink wrapping, pallets, straps, etc.) is designed to protect the pipes and should be maintained intact until the pipes are ready to be used
- Do not allow pipes to come into contact with lubricants or hydraulic oils, petrol, solvents or any other aggressive materials
- Pipe sections stored individually should be stacked in a pyramid no more than one metre high, with the lower layer placed on wooden slats and fully supported by wedges



Storage of packages

- Rolls of pipes may be stored horizontally one on top of the other (they must be levelled, with the bottom roll properly protected from the floor, and should not be stacked to more than two metres high), or vertically, stacked in a single layer



Storage of rolls

- Batches of rolls delivered on pallets should stay attached to the pallet and should only be unloaded when they are ready to be used



Safety first: Pipes attached in rolls are under pressure and strapped accordingly. Rolls may be dangerous if incorrectly strapped.



No-dig pipe installation

Procedures available for piping installation using no-dig techniques

Aliaxis Iberia polyethylene-piping systems are designed for quick, simple and affordable installation. Installation is as important a part of cost evaluation as the ease of maintenance and the cost of the piping systems themselves.

The huge advantage of polyethylene when it comes to installation is not just in its lightness and flexibility, but also in its resistance, which allows for a series of low-impact installation processes. These processes require minimal alteration and impact to the environment and often involve 'low-dig' or 'no-dig' techniques. As this eliminates the need for joints within the trench, the width of excavations can be minimised, meaning less labour costs, less backfill, and lower re-installation costs.

A few of these techniques are described below.

Backhoe

Modified mechanical excavators with oblique profiled shovels are most suited for the spoil produced by the digging action is relatively fine. Chain excavators, in particular, will break the original soil into small pieces and allow for trench widths of only 50 to 100 mm greater than the external diameter of the PE pipe.



Pipe bursting

Size-for-size replacement or upsizing of existing iron pipes can be achieved with significant savings through the pipe-bursting method.

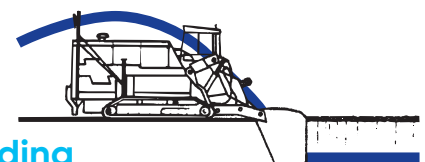
With this technique, an existing main pipe is burst and the borehole simultaneously expanded with a mole. Modern bursting moles, particularly those with expansive hydraulic segments, can burst and open unusable pipes, including those with repair flanges or concrete enclosures. The risk of damage to adjacent public-service installations is minimised through the use of hydraulic moles, which helps to mitigate the cost of using the existing 'hole in the ground'.



Impact moulding

Impact moulding is very economical in certain cases, such as when crossing roads, allowing significant savings in comparison with traditional open-cut excavation methods. Normally, traffic-control systems will not be required, for example, and the cost of excavation, backfill and reinstallation is practically eliminated. Thanks to this installation method, excavation is only necessary where the pipes start and end, allowing for the placement of the mole and its auxiliary equipment. Impact moulding opens a borehole between the launching and receiving holes, leaving the surface of the ground intact.

Impact-moulding illustration (courtesy of TT-UK Ltd)



Plough moulding

This technique was initially developed for the installation of land drainage and has been adapted for the installation of gas and water pipes in rural areas. This allows pipes to be placed in rural landscapes with minimal interruption to agriculture, with the soil virtually returned to its original state. A new line of PE pipes is literally introduced into the ground at a predetermined depth and the soil immediately returns to its original state.

Sliding lining/insertion

This is a restoration and renovation technique in which a smaller replacement strip of PE is inserted into an existing, out-of-service pipe.

Although this is not usually necessary, pressure grouting of the annular space may allow for structural restoration of the existing pipe, while reinforcing the annular resistance of the new PE pipe.



Although a certain reduction in flow capacity is inevitable, this may be minimised with careful preparation and cleaning of the old pipe, so as to allow for the insertion of a new PE pipe with the largest diameter possible. Often, an average annular clearance of just 5% of the diameter of the main pipe, and even less for sizes of more than 300 mm, has been proven to be suitable when pipes are straight and of a uniform internal diameter. In pressure conditions, the reduced load capacity may be offset by increasing internal pressure.

In gravity applications, any effect of the reduction of the bore is minimised both through the exclusion of groundwater entering the system and through the PE's improved flow characteristics.

Directional drilling

This is a pipe-installation technique originally developed for oil and gas wells. However, it is now increasingly used for PE pipes. This allows piping to be installed under roads and rivers, etc., with minimal installation work. This technique involves drilling a hole under the obstacle and

pulling the pipe back through an enlarged hole from the far side.



Close-fit piping systems

Close-fit refurbishment systems have two advantages. They never require mortar and, in the majority of cases, although there is a slight reduction in pipe diameter, the exceptional hydraulic fluidity of the PE pipe allows for an increased flow capacity.

If the old pipe is not structurally solid, the fitted PE linings may be SDR17 or SDR11, according to soil cover and pressure requirements. For strong pipes experiencing leakages, a PE lining thickness of up to SDR33 or slimmer should be considered. With a minimum useful life of 100 years and exceptional crack-bridging ability, PE lining for thin walls provides an affordable and totally reliable waterproofing seal.





12465
1248.7
1252.2 1. Stack
1255.0 2. Stack
1340/1000
CT 90
G. Johnson
12460

PRIMEC FRANK
PRIMEC FRANK

Joining techniques



Electrofusion

Principles of electrofusion

Electrofusion accessories include an electric heating coil, to which the electrofusion-control unit (ECU) supplies the electrical energy required to heat said coil. When the coil is energised, the adjacent material melts and forms an expanding pool which comes into contact with the surface of the pipe. The continuous introduction of thermal energy makes the surface of the pipe melt too, producing a mixture of the pipe's molten mass and the molten mass of the accessories; this is vital in order to ensure good welding. Once the heating cycle has been completed, the accessory and the pipe are left to cool and the molten material solidifies to form a solid joint.

The preparation and assembly procedures are similar for all electrofusion systems. Some accessories require manual entry of the fusion time into the ECU and, as such, they are described as manual. Some accessories include automatic-recognition support and, as such, are described as automatic ECUs.

Some of our accessories can only be read via barcode and may only be read by an ECU with the barcode-scanner function. All our standard accessories require a 39.5 V power supply. Keep in mind that barcode-only accessories have variable voltages, determined by the ECU box through the barcode-scanner function.

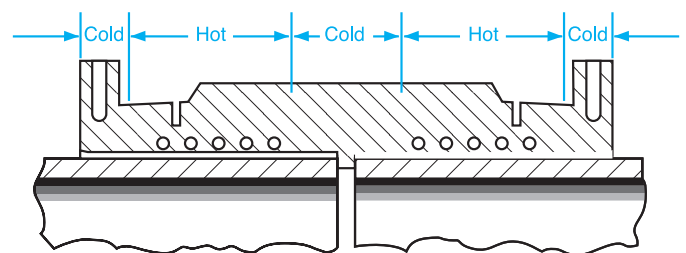
The hot and cold areas, sometimes known as fusion and freezing areas, form after the coil is energised. The length of these areas is particularly important. Each area guarantees that fusion is controlled at a specific distance

from the accessory socket and that the pressure of the molten mass is also controlled throughout the entire joining process. By precisely controlling the distance and positioning of the coil in relation to the internal surface of the socket, uniform heat distribution is ensured.

Electrofusion-control units (ECU)

Electrofusion-control units are designed to function from an electrical network or a field generator with an output of 110 V and a rating of 3.5 to 7.5 kVA for 39.5 V, in general. Frialen XL accessories require a specialised three-phase ECU box (get in touch with technical support for more information).

All ECUs manufactured from 1 January 1996 for sale in Europe must comply with the Electromagnetic-Compatibility Directive and have CE marking.



The new generation of FRIAMAT units goes even further to meet your needs

We have modernised our FRIAMAT welding-equipment in order to technically adapt the range and make them 'ready for the future', with the aim of simplifying your work in every respect. Starting with the unit's low weight and high performance, right through to the simple handling of documentation.

FRIAMAT Basic is our basic model. It features flow-optimised active cooling, robust housing, a high-quality graphic screen, intuitive user interface, and much more.

FRIAMAT Prime offers a huge number of digital features for documentation and traceability, thanks to the new Bluetooth interface, together with the FRIAMAT app. With the optional 1D/2D scanner, the new FRIAMAT is also capable of scanning and processing 2D barcodes according to the ISO 12176-5 standard. This allows users to record all the necessary information for fusion, including traceability data and extended product information, simply by scanning.

Why FRIAMAT?

Powerful and economical

- State-of-the-art converter technology with flow-optimised active cooling to reduce downtime and processing times
- Future-proof microcontroller technology
- Reduced weight
- Robust housing design for on-site work
- Longer cables increase on-site mobility
- Long use life thanks to coordinated equipment servicing and availability of spare parts
- Software updates through USB port Delivery in robust transport packaging included

Easy and comfortable to use

- The 4.3" high-resolution, high-brightness colour TFT screen guarantees better reading
- Intuitive user interface with a clear menu structure
- With the FRIAMAT preCHECK feature: the FRIAMAT automatically determines whether or not the following fusion weld can be carried out right through to the end
- Easy documentation and data management (FRIAMAT Prime)
- Recording and documentation of fusion and traceability data, as well as extended installation information, such as order number and welder
- Up to 20,000 fusion records may be stored in the unit
- Export as CSV or PDF file or in FRIATRACE format via a standard USB memory stick
- Supervisor feature for individualisation of device features and specification of operation sequences
- Bluetooth interface for connection with FRIAMAT app
- Optional 1D/2D scanner, therefore capable of processing 2D barcodes according to the ISO 12176-5 standard



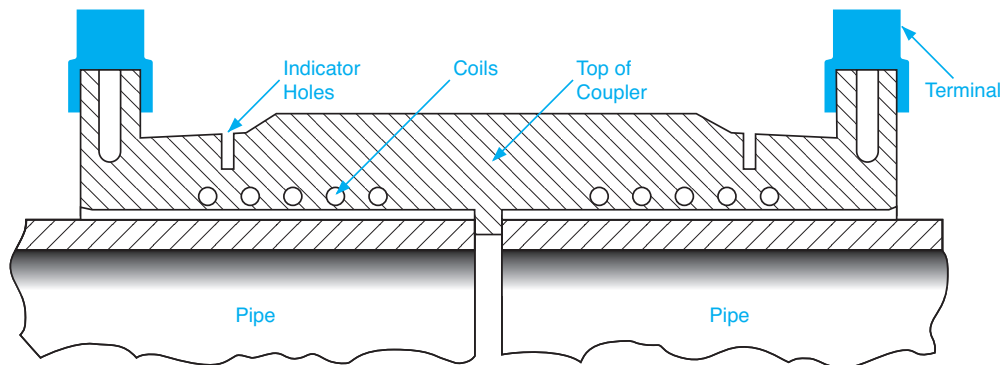
Did you know?

A properly installed electrofusion coupler will last as long as the pipe, over 100 years.

Electrofusion sequence

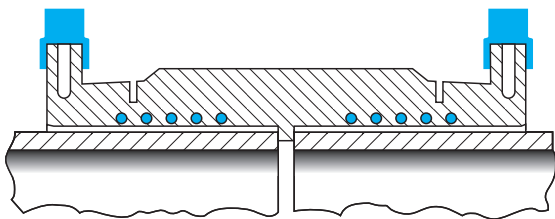
The sectional drawings indicate the joining sequence, from the coil's energisation to completed fusion. The entire cycle is electronically supervised by the electrofusion-control unit (ECU).

01



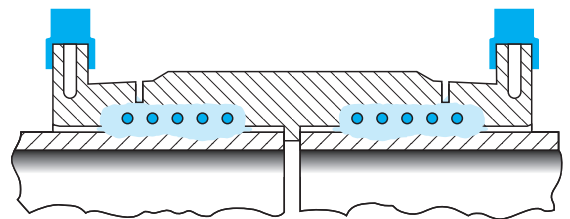
Pipe placed in coupler before energising the coil.

02



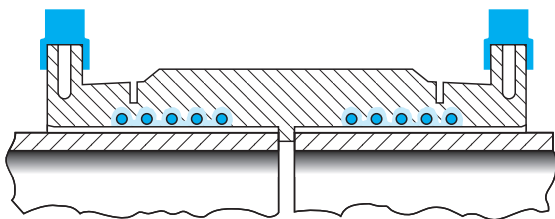
Energised coil.

05



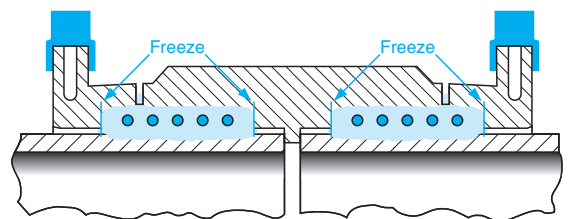
The heat passes through the wall of the pipe and the pipe material begins to melt.

03



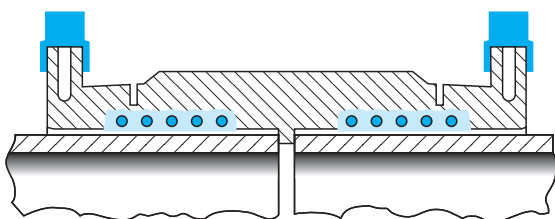
The material surrounding the coils starts to melt.

06



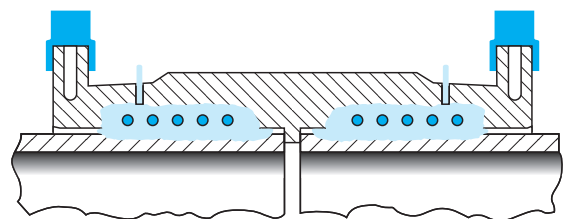
The molten mass solidifies, starting with the cold areas, thereby sealing the fusion area. Higher energy input will cause an increase in fusion pressure.

04



The fusion areas spreads and expands towards the surface of the pipe.

07



Fusion pressure reaches the optimal value at the end of the activation cycle. The appearance of molten mass in indicator bores signals that fusion has been completed. Keep in mind: for a greater diameter, accessories will have visual indicators that turn red when fused.

Pre-joining checks

- 01 Use clean equipment, in good condition and regularly serviced
- 02 Whenever possible, use mechanical tools for the preparation of pipes
- 03 Ensure that the cutters/blades of mechanical scrapers are clean and in good condition
- 04 Check that you have a clean and dry space on which to place tools and equipment during the electrofusion process, and sufficient access to the work area

What to do

● Work safely

- Understand the principles of electrofusion (consult pipe manufacturers' details if necessary)
- Use protection and a tarpaulin (a suitable anti-slip surface) both in dry and wet conditions to minimise contamination. Use protection at the ends of the pipes (plugs or caps) to eliminate air flow
- Always use suitable clamps to ensure proper alignment and containment of all pipes, both for bars and rolls
- Ensure that the voltage of the control box is compatible with the accessories. Check that the pipe and accessories to be joined are mutually compatible
- Cut the ends of the pipe square for all electrofusion-socket accessories Fully prepare the surfaces of the injected pipe or accessory
- Keep the pipe and accessory surfaces clean
- Assemble the joint and immediately fuse after preparing the pipe
- Check that the fusion time displayed by the ECU (automatic or manual) matches the accessory's fusion time. In the case of automatic recognition, if the time is different from that indicated on the accessory, do not weld.
- Check that the correct fusion and cooling times are respected
- Always enter the correct operator code and work code to ensure complete tracking of electrofusion-control units with data-recovery features
- Label completed joints with a joint number/data
- Check that the fusion indicators have gone up; if there is no apparent movement in one or both indicators, cut the weld and make a new one
- Check that when joining the 'tapping tees', the accessory is correctly located in the pipe before fusion. After the required quality inspections and pressure tests on the saddle-welded accessory, the pipe can be threaded through it
- Always enter your ID in case it is requested by the ECU. Enter your operator and work code to facilitate proper tracking
- Always remember to mark/sign the completed joint with the number issued by the ECU, together with the date, if this is shown. This is required for proper tracking

What not to do

- Never start any electrofusion weld unless you can complete it without interruption Under no circumstances should you try to carry out a second fusion cycle on any accessory Do not use dirty or contaminated accessories
- Do not use accessories from torn or broken bags, all accessories must be stored in bags until just before their use Never touch surfaces prepared for fusion/welding
- Do not allow the prepared fusion/welding surfaces to get wet or damp
- Do not remove clamps from the accessory until the cooling time has been completed Do not remove the integrated cutter from the saddle (risk of contamination)



Butt welding

General

Butt welding is a joining method that allows for in-situ joining of pipes of 90 mm or more. This is a thermofusion process that involves the simultaneous heating of the ends of the two components to be joined, until a state of fusion is achieved on each contact surface.

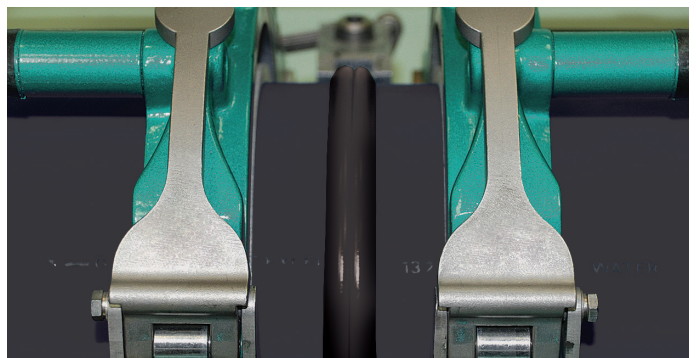
Then, the two surfaces are joined under controlled pressure for a specified fusion/cooling time, producing a homogenous fusion.

The resulting union is fully resistant to end thrust and has an identical performance under pressure to that of the pipe.

This joining method requires an electrically heated plate to increase the temperature of the ends of the pipe to the required fusion temperature. It is used both for PE 80 and PE 100 grade materials, for pipes of 90 mm or more with the same standard dimension ratio (SDR).

Automatic butt-welding machines are preferred. However, when joining larger pipes, semi-automatic machines may be used, with complete data recovery.

- Automatic machines have joining data programmed in, with respect to the pipe material and the pressure rating required to join them.



PE100 Flexipol pipe in the final stage of the butt-welding process.

Dis you know?

Butt welding provides greater joining integrity than any other joining method.

Training courses

It is vital that installers of polyethylene-piping systems have received exhaustive training. Get in touch with us for more information about our training courses at the **Aliaxis Academy**.

Principles of butt welding

Butt-welding machines can weld moulded accessories directly to the pipe. However, this will not be possible in all circumstances, as this may depend on the design and manufacture of the equipment. Aliaxis offers two ranges of accessories to provide greater flexibility.

Injected accessories

These unreinforced accessories are long enough to be clamped for butt welding in some types of machines.

Cold welding

When butt welding is carried out at temperatures below $-50\text{ }^{\circ}\text{C}$, a space heater must be provided to ensure that welding protection raises the local temperature above $0\text{ }^{\circ}\text{C}$.

Equipment

- Generator to power the heating plate, facing tool and hydraulic pump
- Butt-welding machine equipped with clamps, facing tool, heating plate, hydraulic pump and appropriately sized timer
- Pipe-support rollers Welding tent
- Tool to remove external/internal edges Contour gauge
- Cleaning equipment, lint-free cotton cloth or paper towel
- Digital thermometer with surface probe to check the heating plate
- Caps for pipe ends Pipe-bevelling machine
- Air-temperature thermometer Indelible marker
- Timer

Joining method. Pre-joining checks

Before commencing welding:

- Use clean equipment, in good condition and regularly maintained
- Make sure you aware of the correct weld parameters for the type of machine and pipe in use
- Check that the heating plate is clean and dry
- Check that the facing tool is clean and that the blades have not been damaged and are in the proper position for the size of pipe required
- Check that the clamp linings and fixing bolts are the correct size
- Check that the generator is in good condition and has sufficient fuel
- A cover is included to provide protection during welding, as well as caps for the pipe ends
- The pipes and accessories to be joined must be of the same size, SDR and material

False welding

Although cleaning the heating plate can remove large dirt deposits, it is possible that very fine dust particles may remain. To remove this dust, you will need to carry out a false weld at the beginning of each welding session, whenever the plate has been left to cool below $180\text{ }^{\circ}\text{C}$ or when changing the size of the pipe. Two false welds should be made if the size of the pipe is greater than 180 mm.

A false weld may be made by using pipe cuttings of the same size, SDR and material as the pipe to be installed; however, it is not necessary to create a joint, as the procedure may be interrupted after having completed the full heat cycle. In the case of automatic machines, the cancellation button may be used to stop the process once the heat-soaking period has been completed.



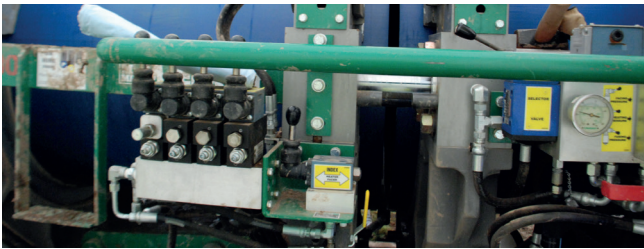
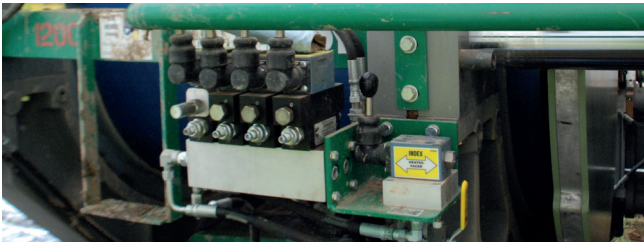
Butt-welding machine before starting the welding process

Welding process

- 01 With the machine in the open position, place the pipes in the clamps with the ends adjacent to the facing tool and with the pipe markings aligned
- 02 Align and level the components using external support rollers
- 03 Tighten the pipe clamps to hold and re-round the pipes
- 04 Cover the free ends of the pipes to avoid plate cooling through internal air flows
- 05 Turn on the facing tool and bring the clamps together slowly so that the ends of the pipe move against the cutting tool until continuous chips have been cut on each surface
- 06 Turn the facing tool as you separate the clamps to avoid passing through faced surfaces
- 07 Remove the facing tool, taking care not to touch the ends of the facing pipes
- 08 Remove the loose chips from the machine and the ends of the pipes Do not touch the prepared surfaces or place hands between the ends of the pipe
- 09 Check that both surfaces are completely flat If not, repeat the cutting process
- 10 Bring the clamps together and check that there is no visible space between the faced surfaces
- 11 There should be no perceptible mismatch between the external diameter greater than 180 mm or more than 10% of the thickness of the wall for pipes of more than 180 mm. If the mismatch is greater than these values, the pipe must be realigned and refaced
- 12 Automatic machines will measure the drag pressure and offset this. However, with earlier manual machines, you will need to accurately assess this before carrying out each weld and add this to the basic piston pressure values shown on the machine
- 13 With the machine in the open position, place the heating-plate assembly in the machine, checking that the temperature is correct
- 14 Now you can start the automatic butt-welding cycle, after which the required contact pressure must be maintained until a uniform edge of the correct size is formed on each pipe
- 15 After the initial edge formation, the pressure in the hydraulic system will reduce to between zero and the drag pressure, in order to control the growth of the edge throughout the heat-soaking time
- 16 After the heat-soaking time, the machine will automatically open and remove the heating plate after joining the ends of the pipe under the required contact pressure
- 17 The predetermined pressure must be maintained throughout the minimum cooling time required
- 18 After this time, the assembly may be removed from the machine, but should not be excessively handled during the required period

Post-weld checks

- 01 Examine the weld to ensure that it is clean and uniformed and verify that the width of the edge is within the specific limits
- 02 The weld beads and weld should be numbered/coded with an indelible marker in accordance with the weld details entered in the butt-welding machine's data-recovery system
- 03 Weld beads should be twisted in various positions and, if an edge is seen to split at any point or if there are deformations in the lower part, the pipe weld should be cut and redone. If a similar fault appears again, all additional welds should be stopped until the equipment has been thoroughly cleaned and examined and satisfactory new test welds carried out



- Check that a continuous ribbon of material is produced when facing, on both ends of the pipe, before starting the removal operation
- Always use the heating-plate and facing-tool supports provided
- Always remove the chips from below the ends of the pipes and the machine frame after cutting
- Visually check that both ends of the pipe are completely faced
- Always check the alignment of the pipes and spaces around the entire circumference of adjoining pipes

What not to do

- Do not try to use equipment unless you have been trained to do so
- Do not try to weld pipes with different wall thicknesses
- Do not touch the facing-tool blades during cleaning and especially when in motion, these are very sharp and may cause serious injury
- Do not touch the heating plate (except to clean it when cool)
- Do not leave chips in the pipe or in the machine frame
- Do not allow any dirt to enter the ends of the cut pipes at any time, particularly when removing chips
- Do not remove pipes from the machine until the cooling period has ended
- Do not try to install pipes until these are completely cool
- Do not try to work with the facing tool while it is outside of the machine or attempt to bypass the safety switch
- Never try to cut corners at any point in the welding cycle

What to do

- SAFE-WORKING METHOD (if in doubt, always ask)
- Understand the principles of butt welding (consult pipe manufacturers' details if necessary)
- Always enter the correct operator code and work code to allow complete tracking with automatic butt-welding machines
- Label completed joints with a joint number/data
- Use protection and a tarpaulin (a suitable anti-slip surface*) both in dry and wet conditions to minimise contamination, and place protection at the ends of the pipes (plugs or caps) to eliminate air flow
- Ensure that pipes are correctly aligned and supported on pipe rollers to avoid dragging
- Place pipes on clamps with pipe markings aligned and facing up
- Make false welds at the start of each welding session when changing the size of the pipe or if the heating plate has been left to cool (one false weld on pipes of 180 mm or less and two on larger pipes)

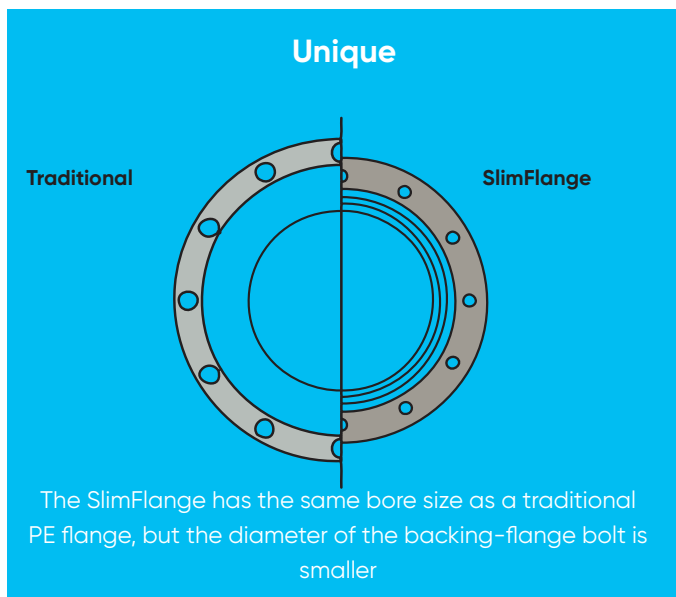
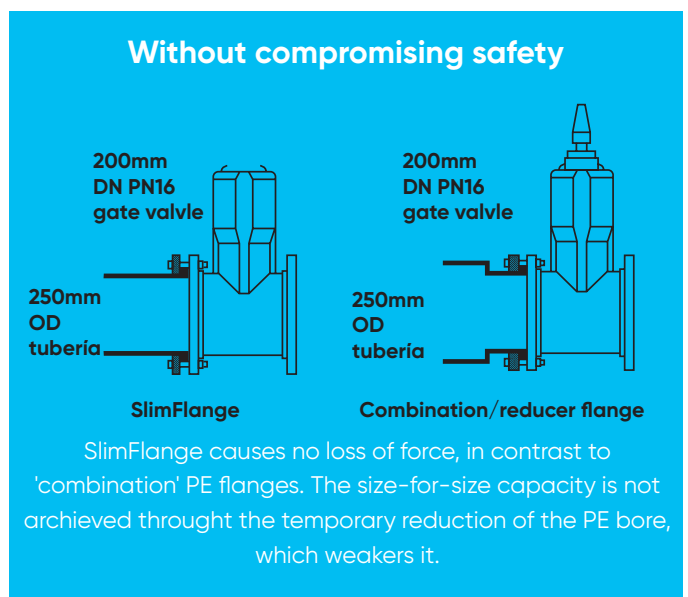
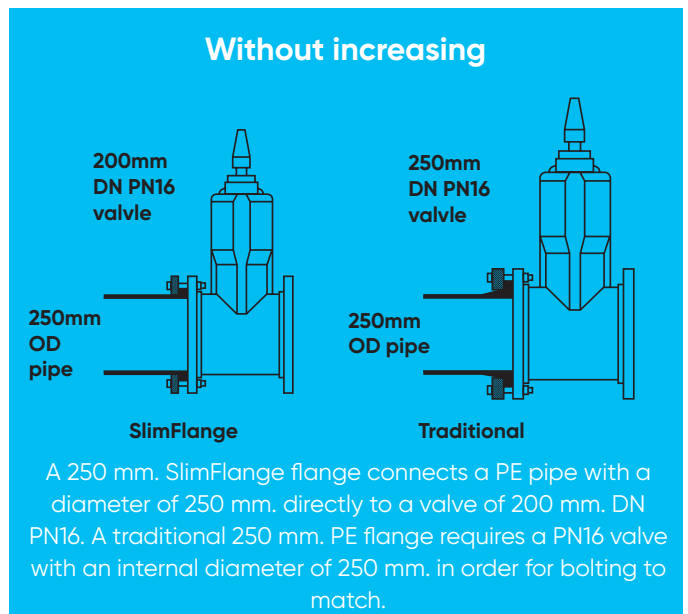


Flanges

SlimFlange is a unique steel-reinforced flange adaptor that allows size-for-size joining of a PE pipe to a metal flange.

SLIMFLANGE®

Compact and lightweight, yet strong, this accessory eliminates the need to increase the size of valves or other metal accessories, allowing installers to benefit from faster and more effective installations.

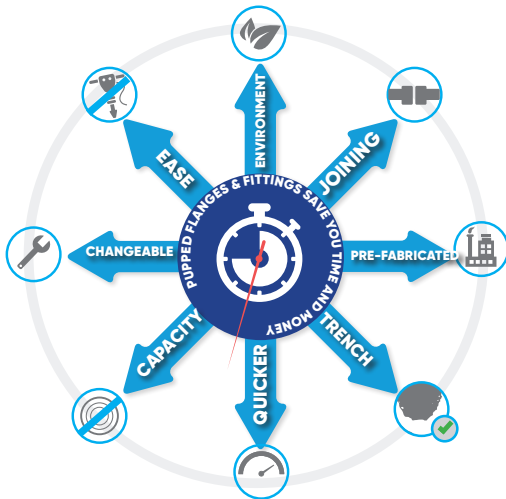


Characteristics

- It is not necessary to increase the size of metal accessories nor reduce the PE internal diameter
- Reduced size and weight
- Loose backing flange for flexible installation

Benefits

- Cost savings thanks to size-for-size diameter connections
- Reduced installation costs
- Smooth bore to maintain total flow capacity. Improved sealing performance against leaks



Connecting PE to other materials

When joining PE to other materials, it is important to remember that PE works on an external diameter and that the thickness of the wall will vary according to the SDR.

Be sure to keep in mind the nominal bores when measuring flange adaptors to make a connection.

Given that PE is an extreme load-bearing material, precautions should be taken when making connections to a pipe of another material.

To avoid non-load-bearing joints at the ends slipping out, the transition may need to be externally ensured or anchored/thrust-locked.

Tightening

For PE diameters of above 180 mm., it is recommended that two operators work simultaneously on diametrically opposed bolts whenever possible.

To guarantee the subsequent waterproofing, the final tightening should be repeated after the assembly has been left to relax for approximately one hour.

The uniformed waterproofing is as important as the final torque values; consult the following table.

The table is suitable for SDR 11 and SDR 17.6 pipes made from PE 100 or PE 80.

Tightening torques for flanges (PE to PE or PE to metal flanges)

Size nominal de PE (mm.)	Standard flanges			SlimFlanges or special flanges		
	Bolting size (mm.)	Torque	Torque (Nm) ±10%	Size nominal of iron (mm.)	Torque	Torque (Nm) ±10%
63	50	M16x4	35	-	-	-
90	80	M16x8	35	-	-	-
125	100	M16x8	35	-	-	-
180	150	M20x8	60	-	-	-
200	200	M20x12	80	-	-	-
225	200	M20x12	80	-	-	-
250	250	M24x12	100	200	M20x12	60
280	250	M24x12	100	-	-	-
315	300	M24x12	120	250	*M20x12	70
355	350	M24x16	150	300	M24x12	120
400	400	M27x16	200	350	M24x16	150
450	450	M27x20	250	400	M27x16	200
500	500	M30x20	300	450	M27x20	250
560	600	M33x20	350	500	M30x20	300
630	600	M33x20	400	500	M30x20	300
710	700	M33x24	400	600	M33x20	400
800	800	M36x24	450	700	M33x24	400
900	900	M36x28	450	800	M36x24	450
1000	1000	M39x28	500	900	M36x28	450
1200	1200	M54x32	550	1000	M39x28	500

*Non-standard bolt size

Push Fast System

PUSH FAST PIPE-JOINING SYSTEM

The Push Fast joining system is a fantastic innovation that facilitates the joining of PE pipes through the traditional bell-socket system, simplifying the joining of PE pipes.

COLOURS

Head: Black

Pipe: Black, Black with Blue Band, Black with Purple Band, Black with Brown Band, Black with Red Band, etc.

ADVANTAGES

Quick, simple and effective joining: Does not require machinery. Does not require anchors or clamps. Available up to 16 bar in PE100. Compatible with PE100, PE80, one-pipe, etc.

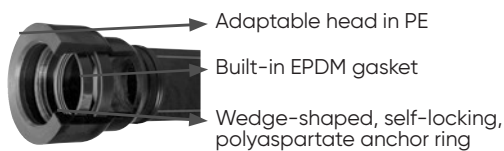
Manufactured with 6 m. or 12 m.-long pipe.

The advantages of PE pipes

- Resistant to chemical agents
- Impervious to the action of aggressive soils Lightweight and flexible
- Easy transport and handling
- Adaptable to sinuous soil
- Excellent water-hammer behaviour

These may be installed in adverse conditions: rain, presence of water in the trench.

Waterproofing improves with the weight of a load. Use life of at least 50 years.



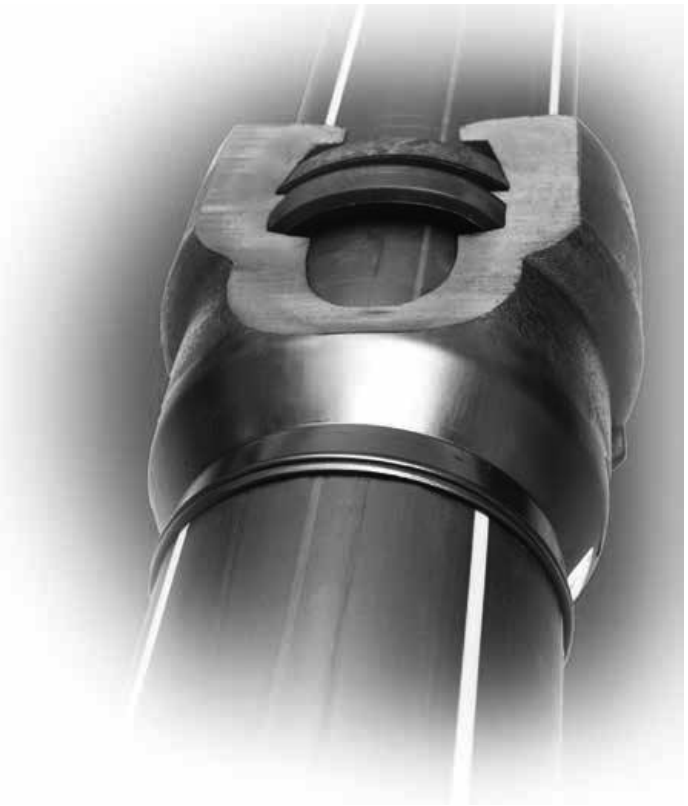
Regulations and Certifications

Pipes manufactured according to the UNE-EN 12201 standard for pressurised water pipes.

PE100 pipes with AENOR and/or AFNOR product certification.

Spanish Institute for Construction Sciences Report.

Eduardo Torroja: Internal short-term and long-term pressure-resistance tests and depression of PE 100 pipe joints according to the UNE-EN-545 standard.



PUSH FAST system

with new generation PE100 RC pipe

Advantages over Standard PE 100 grades

- Cost savings for civil works
- The pipe can be installed with no sand bed
- According to the type of excavation aggregate, this may be reused
- Better performance in 'aggressive' installations
- In installations on soil with rocks and stones, etc., this is important if the pipe suffers scratches during installation

For more information about the physical characteristics of PE100 RC, consult the 'PE/PVDF and new-generation PE pipes' / 'Pipes with high crack resistance' section.



Instituto de Ciencias de la Construcción
EDUARDO TORROJA



Services

Services

Design and manufacture of made-to-measure polyethylene accessories

Aliaxis has a workshop dedicated exclusively to the design and manufacture of made-to-measure polyethylene joints for infrastructure and irrigation projects. We also offer an expert team that offers **maximum versatility in our joints** through butt welding, in order to obtain the shape required for your project.



Summary of the range of Flexipol products

Pipe size (UNE 12201-2)

PE 100	SDR 9				SDR 11				SDR 17				SDR 26				
	20 BAR				16 BAR				10 BAR				6 BAR				
Dimension nominal (mm.)	Max Ø ext. (mm.)	e Min. (mm.)	e Max. (mm.)	Weigh Avr. (kg/m)	Ø Int. Avr. (mm.)	e Min. (mm.)	e Max. (mm.)	Weigh Avr. (kg/m)	Ø Int. Avr. (mm.)	e Min. (mm.)	e Max. (mm.)	Weigh Avr. (kg/m)	Ø Int. Avr. (mm.)	e Min. (mm.)	e Max. (mm.)	Weigh Avr. (kg/m)	Ø Int. Avr. (mm.)
20	20,3	2,3	2,7	0,1	15,2	2,0	2,3	0,1	15,9	-	-	-	-	-	-	-	-
25	25,3	3,0	3,4	0,2	18,8	2,3	2,7	0,2	20,2	-	-	-	-	-	-	-	-
32	32,3	3,6	4,1	0,3	24,5	3,0	3,4	0,3	25,8	2,0	2,3	0,2	27,9	-	-	-	-
50	50,4	5,6	6,3	0,8	38,3	4,6	5,2	0,7	40,4	3,0	3,4	0,5	43,8	2,0	2,3	0,3	45,9
63	63,4	7,1	8,0	1,3	48,1	5,8	6,5	1,1	50,9	3,8	4,3	0,7	55,1	2,5	2,9	0,5	57,8
75	75,5	8,4	9,4	1,8	57,5	6,8	7,6	1,5	60,9	4,5	5,1	1,0	65,7	2,9	3,3	0,7	69,1
90	90,6	10,1	11,3	2,6	68,9	8,2	9,2	2,1	72,9	5,4	6,1	1,5	78,8	3,5	4,0	1,0	82,8
110	110,7	12,3	13,7	3,8	84,4	10,0	11,1	3,2	89,3	6,6	7,4	2,2	96,4	4,2	4,8	1,4	101,4
125	125,8	14,0	15,6	4,9	95,8	11,4	12,7	4,1	101,3	7,4	8,3	2,8	109,7	4,8	5,4	1,8	115,2
160	161,0	17,9	19,8	8,0	122,8	14,6	16,2	6,7	129,7	9,5	10,6	4,5	140,4	6,2	7,0	3,1	147,3
180	181,1	20,1	22,3	10,2	138,2	16,4	18,2	8,5	146,0	10,7	11,9	5,7	158,0	6,9	7,7	3,8	166,0
200	201,2	22,4	24,8	12,6	153,4	18,2	20,2	10,5	162,2	11,9	13,2	7,1	175,5	7,7	8,6	4,7	184,3
225	226,4	25,2	27,9	15,9	172,6	20,5	22,7	13,2	182,5	13,4	14,9	9,0	197,4	8,6	9,6	5,9	207,5
250	251,5	27,9	30,8	19,6	192,1	22,7	25,1	16,3	203,0	14,8	16,4	11,0	219,6	9,6	10,7	7,3	230,5
280	281,7	31,3	34,6	24,6	215,0	25,4	28,1	20,4	227,4	16,6	18,4	13,8	245,9	10,7	11,9	9,1	258,3
315	316,9	35,2	38,9	31,1	241,9	28,6	31,6	25,8	255,8	18,7	20,7	17,5	276,6	12,1	13,5	11,7	290,4
355	357,2	39,7	43,8	39,5	272,6	32,2	35,6	32,8	288,3	21,1	23,4	22,3	311,6	13,6	15,1	14,7	327,4
400	402,4	44,7	49,3	50,2	307,2	36,3	40,1	41,6	324,8	23,7	26,2	28,2	351,3	15,3	17,0	18,7	368,9
450	452,7	50,3	55,5	63,5	345,6	40,9	45,1	52,7	365,4	26,7	29,5	35,7	395,2	17,2	19,1	23,6	415,1
500	503,0	55,8	61,5	78,3	384,2	45,4	50,1	65,1	406,0	29,7	32,8	44,1	439,0	19,1	21,2	29,1	461,2
560	563,4	62,5	68,9	98,2	430,3	50,8	56,0	81,5	454,9	33,2	36,7	55,3	491,8	21,4	23,7	36,5	516,6
630	633,8	70,3	77,5	124,2	484,1	57,2	63,1	103,3	511,6	37,4	41,3	70,0	553,2	24,1	26,7	46,3	581,1
710	716,4	-	-	-	-	64,5	71,1	131,4	577,6	42,1	46,5	89,0	624,6	27,2	30,1	58,9	655,9
800	807,2	-	-	-	-	-	-	-	-	47,4	52,3	112,8	703,9	30,6	33,8	74,6	739,2
900	908,1	-	-	-	-	-	-	-	-	53,3	58,8	142,8	792,0	34,4	38,3	94,7	831,4
1000	1009,0	-	-	-	-	-	-	-	-	59,3	65,4	176,4	879,8	38,2	42,2	116,4	924,1



Success Story



Case study

Comprehensive modernisation of an irrigation infrastructure in order to solve leaks and breakages in the Santa Cruz de Alcolea de Cinca irrigation community.

The main problem that the Santa Cruz de Alcolea de Cinca irrigation community were experiencing, was that it had an old and defective irrigation system using concrete irrigation ditches, which would lose water through breakages in the supply and evaporation.

This installation was responsible for irrigating rice, maize and cereal crops, and depended on a large quantity of water in order to work.

The Aliaxis solution, we built an efficient irrigation infrastructure, avoiding the loss of water and economic resources. This work involved the participation of Marco Obra Pública in order to cover the 4,207.78 hectares of farmland.

For this, we installed 195 km of Flexipol polyethylene pipes and polyethylene joints (PE fittings), which were made to measure at our Okondo (Álava) plant.

Why these materials?

- Flexipol pipe: flexible and resistant, avoids breakages and leaks with a 100 years use life
- Polyethylene joints: quality materials, made-to-measure parts at a very competitive price

The final construction optimised hydraulic management and avoided the waste of economic resources, for the 242 residents of the Santa Cruz de Alcolea de Cinca irrigation community who benefited from the improvement.



What made the difference?

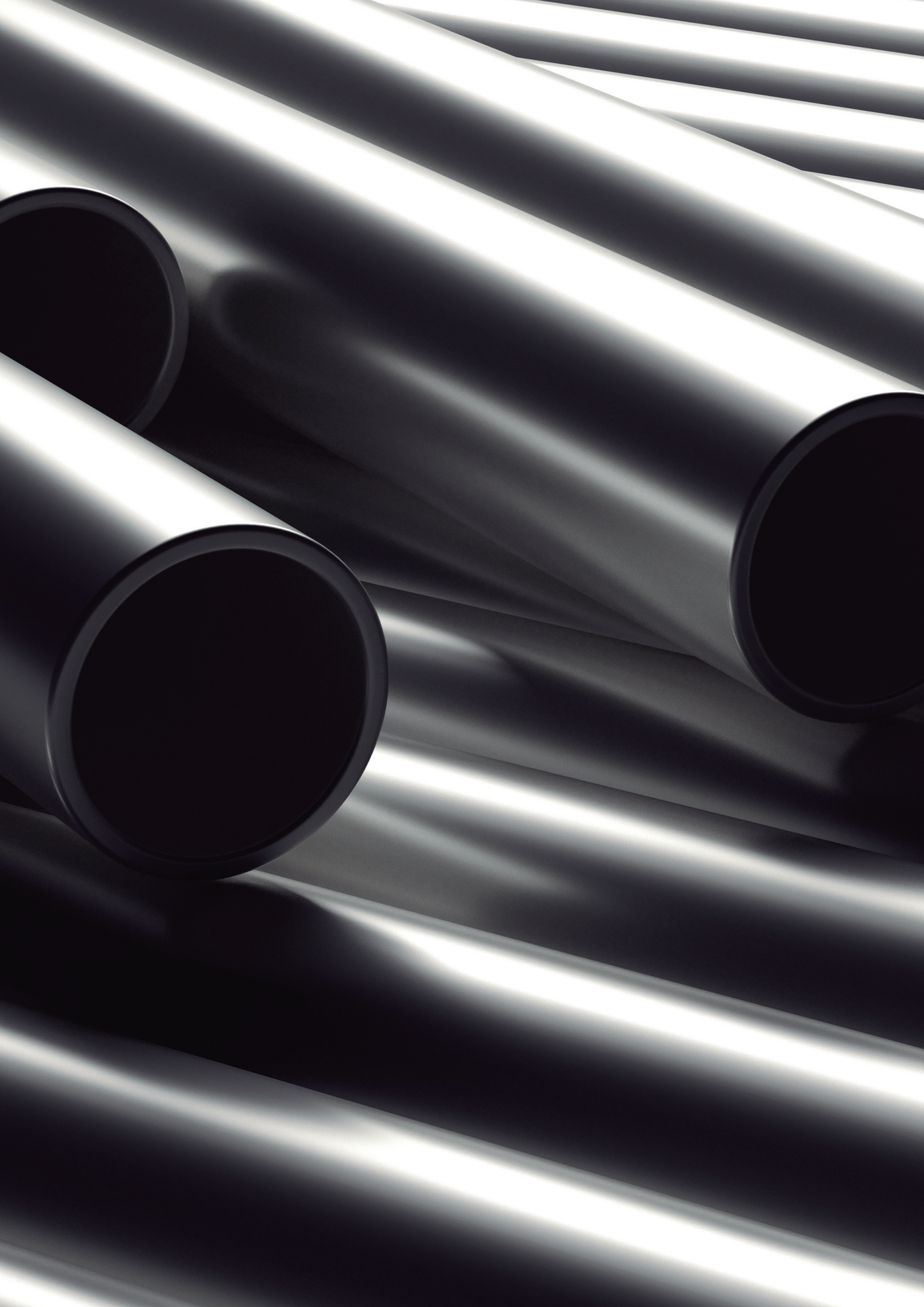
In contrast with other products used, our polyethylene pipes and joints offer advantages that make them more efficient for their intended use, placement and installation:

- **The flexibility of the pipes** stands out thanks to their high curvature radius. Despite the difficulty of matching two pipes with different sections, which may cause deviations of a few degrees, and even though the ends did not match, these could be adapted without issue thanks to the PE pipes and fittings
- **Easy installation and handling of materials.** It was not necessary to have a person present in the trench to place the solutions, as our parts – which measure between 12 and 13 metres – may be joined from outside of the trench, ready for their subsequent placement
- **Low internal roughness** within the pipe, allowed us to guarantee that the water would not lose any pressure due to friction
- **We offered maximum time savings for installation** thanks to the small number of welds required throughout the work. We were able to complete the work with larger sections than when it was to be concrete, using a butt weld for faster pipe joining
- All our solutions offered a **use life** of up to **100 years**. This way, we provided a return on investment, avoiding any wasted materials and improving sustainability
- It is the **cleanest technology** to safely transport water, as PE does not emit any particles
- **We guaranteed the project's timely delivery**, despite the large scale of the challenge, which covered many kilometres. Thanks to our solutions, we were able to ensure that works were not halted at any time

The result was 195 km of efficient installation using 100% made-in-Spain products. It carries an estimated continuous flow of 29,226,098 m³, with no breakages water leaks.







Aliaxis Iberia S. A.
alixis.es

Madrid

Centro Empresarial Albatros,
Anabel Segura 11, Oficina 1-3
28108 Alcobendas (Madrid)

Okondo

P.I. Zudibiarte s/n
01409 Okondo, Álava

+94 589 82 00, info@alixis.com



Empresa registrada según normas



ER-0084/1996 GA-1999/0156

