PIPE SYSTEMS

PRE-INSULATED DIVISION

Engineered FIRE PIPING

PRE-INSULATED PIPES

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PRE-INSULATED DIVISION

PRE-INSULATED

DEFINITIVE THERMAL PROTECTION FOR ALL YOUR APPLICATIONS

Engineered Fire Piping is the international leader in prefabricated piping for fire protection, participating in large-scale international projects. Our quality and customer service speak for themselves. We began our activity in 2011, located 40 km from Madrid, with over 45,000 m² facilities. At Engineered Fire Piping, quality is a must, and as a company we´re ISO9001 and ISO14001 certified.

Our aim is to become a benchmark in pre-insulated pipe manufacturing. We are a reliable supplier and offer our preinsulated pipe for major projects and a wide range of industrial applications and sectors. Urban heating and cooling systems, power generation, geothermal energy, industrial plants, infrastructure construction, tourism applications, sanitary infrastructure, etc.

Contribuiting in the climate crisis solving and efficient use of energy, Engineered Fire Piping continues to advance in R&D activities with the aim of offering a wide variety of products and solutions in different sectors and areas of application where thermal insulation is required for fluids conduction.

Our Pre-insulated Pipe is produced following the criteria of the UNE EN 253 standard, meets the requirements of the Thermal Installations Regulations for Buildings (RITE), and complies with the Technical Building Code.

Regulation of
Thermal Installations
in Buildings
RITE

Produced following the criteria of the standard
UNE EN 253
Preinsulated Pipe Systems for
Underground Hot Water Networks

CTE
TECHNICAL
BUILDING CODE

QUALITY ASSURANCE AND CERTIFICATES

QUALITY ASSURANCE

Our production process ensures the quality of our products, which are subjected to quality controls and tests that exceed any market standards. We implement verification and quality control processes in our production lines, guaranteeing the highest quality of our products.

CERTIFICATIONS

We have the best technical advice and the most innovative technologies in the production of prefabricated piping for fire protection and HVAC.

Quality Standards

We are certified by ISO 9001 and 14001 quality standards, by Bureau Veritas, a global leader in auditing and certification services.

Raw Materials

We work with the highest quality welded steel pipes, always with an inspection certificate 3.1 in accordance with UNE-EN 10204.

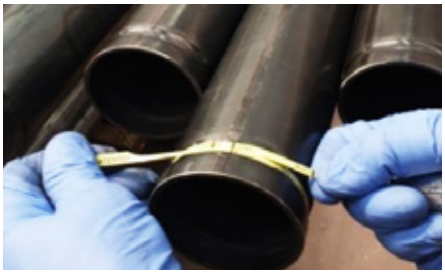
Certifications

All threaded and grooved joints are always under the FM approval certification.

Civil Liability Insurance

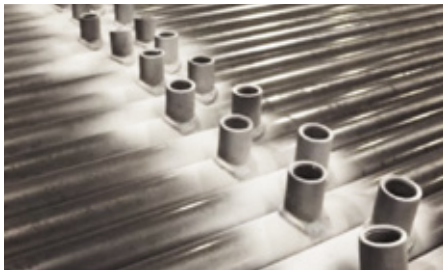
We have a civil liability insurance of 10 million euros to cover any unexpected event in our facilities.

Our pre-insulated pipe is produced following the criteria of the UNE EN 253 standard, meets the requirements of the building thermal installations regulation (RITE), and complies with the technical building code.



Grooving test

Pipe cleaning and dimensional control.



100% welding socket and butwelding test.

Hydrostatic pressure test. 5 min 80 bar.

Adherence and layer thickness test.

Polyester powder coating adherence test.

c
p
v

ISO 9001
ISO 14001
BUREAU VERITAS
Certification

FM
APPROVED

VdS

VdS-approved welding procedure for pipes < DN 65 sleeves, pipe connection

TESTING AND QUALITY CONTROL

1.- Dimensional control of the grooves at the ends of pipes and welded sockets.

2.- Surface cleaning. It is verified that the surface has a minimum cleanliness grade of SA 2 1/2.

3.- Emptying of all cutted pipes by, using a vibrating lifting table.

4.- NDT (Non-Destructive Testing) by penetrant liquids. 100% welds inspection by applying penetrant liquids.

5.- Hydrostatic pressure tests on 20% of our production (5 mins. at 80 bar.)

6.- Chemical and mechanical surface preparation of the pipe, which includes: blasting, phosphating, interior and exterior washing, passivation, blowing, and oven drying.

7.- Performing adhesion and layer thickness controls of our polyester powder coating.

8.- Labeling of the pipes for proper identification and product traceability.

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RITE

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Preinsulated Pipe Systems for
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Preinsulated Pipe: Efficient energy for a world that's SUSTAINABLE

Preinsulated pipe is a solution that combines the functionality of a pipe with the additional benefit of integrated thermal insulation. This special lining not only protects the fluids flowing inside it but also significantly aids the environment by reducing heat or cold loss during liquid transport.

By minimizing thermal energy loss, preinsulated pipes contribute to a more efficient use of energy resources, resulting in lower energy consumption and therefore a reduction in greenhouse gas emissions. This approach not only benefits businesses and users in terms of lower operating costs but also has a positive impact on the health of the planet by reducing our environmental footprint.

By choosing preinsulated pipes, we are opting for a more sustainable and environmentally friendly infrastructure while promoting responsible practices that contribute to energy savings and the protection of our natural environment.

PRE-INSULATED PIPE

FEATURES AND COMPOSITION

Our pre-insulated pipe with PUR-HFO insulation is produced following the criteria of the UNE EN 253 standard. It has an outer jacket made between 1.8 and 7 mm made of high-density polyethylene (HDPE) with UV protection (see diameter and thicknesses table). These features make our pre-insulated pipe heat-insulated.

HFO is part of the 4th generation of fluorine-based gases used as blowing agents in PUR creation. It is non-persistent, non-toxic, and has minimal impact on the ozone layer. It represents the most viable alternative in terms of sustainability and energy efficiency.

THE PRE-INSULATED PIPE IS MADE OF 3 PARTS.

1 **INNER PIPE - Carbon Steel.**
High-quality carbon steel pipe for pressurized networks, used for fluid transport at extreme temperatures (see insulation table: -10 to 180ºC). Manufactured according to UNE EN-10217 and UNE EN-10255 standards, as required.
The inner pipe is coated with a polyester primer and electrostatically applied powder paint, ensuring high corrosion resistance and long-lasting durability.

2 **INTERMEDIATE LAYER - Polyurethane Foam (PUR-HFO)**
The intermediate insulation layer consists of polyurethane (PUR) HFO foam. The foams used in the pre-insulation of the pipe have a closed-cell structure and are made from renewable polyols derived from natural oils and recyclable materials such as PET waste. These features provide optimal mechanical and insulating properties, as well as an extended service life.

It has a closed-cell structure of 90%, with a maximum cell size of 0.5 mm, which enhances insulation performance.
This foam has been developed using fourth-generation Hydrofluoro-Olefins (HFO) blowing agents, which have minimal environmental impact.

3 **OUTER COATING - High-Density Polyethylene (HDPE)**
The outer coating is made of high-density polyethylene (HDPE), a material resistant to impacts, corrosion, and chemicals. It offers excellent rigidity and performance, and UV-protective additives are incorporated to ensure a service life of up to 50 years when exposed to outdoor conditions.

TECHNICAL SPECIFICATIONS

1 TECHNICAL CHARACTERISTICS OF STEEL PIPE

Technical data	Values
Piping standards	EN10217 - EN10216 - EN10255
DN	25 - 1" / 350 - 14"
Polyester powder paint	C3 - C5

2 TECHNICAL CHARACTERISTICS OF PUR-HFO FOAM

Technical data	Values	Units
Density	> 55	Kg / m^3
Thermal conductivity at 50 ºC	0,025	W / m ºC
Compression resistance (10% deformation)	≥ 0,3	N / mm^2
High temperature water absorption	≤ 10	% volume
Maximum cell size	0,5	mm
Closed cells	≥ 90	%
Resistance to axial deformation	23 ± 2ºC ≥ 0,12 140 ± 2ºC ≥ 0,08	N / mm^2 N / mm^2
Resistance to tangential deformation	≥ 0,20	N / mm^2
Service life against continuous operating temperatures	120ºC 115ºC < 115ºC	30 years 30-50 years > 50 years

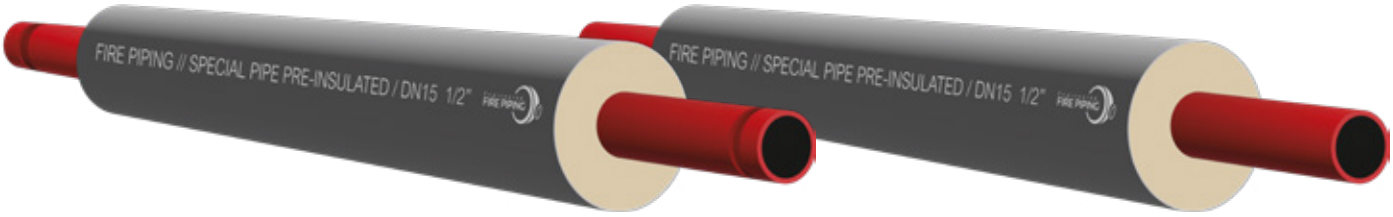
3 TECHNICAL CHARACTERISTICS OF HDPE

Technical data	Valores
Dimensions	UN-EN 253 section 4.3.2.2 table 2
Material	HDPE
Melt flow index	0,2 ≤ MFR ≤ 1,4 g / 10 min
Thermal stability	> 20 min (210 °C)
Elongation at break	≥ 350 %
Thermal reversal	< 3%
Stress crack resistance	> 300 h (4 MPa, 80°C)

INNER PIPE TYPOLOGY

GROOVED / PLAIN PRE-INSULATED PIPE

Inner carbon steel pipe according to UNE EN-10217 or UNE EN-10255, with polyester primer and powder coating. Grooved for flange connections or plain for applications requiring welding. Intermediate insulation layer made of Polyurethane (PUR)-HFO foam. Outer coating of High-Density Polyethylene (HDPE).



GROOVED / PLAIN PRE-INSULATED STAINLESS STEEL PIPE

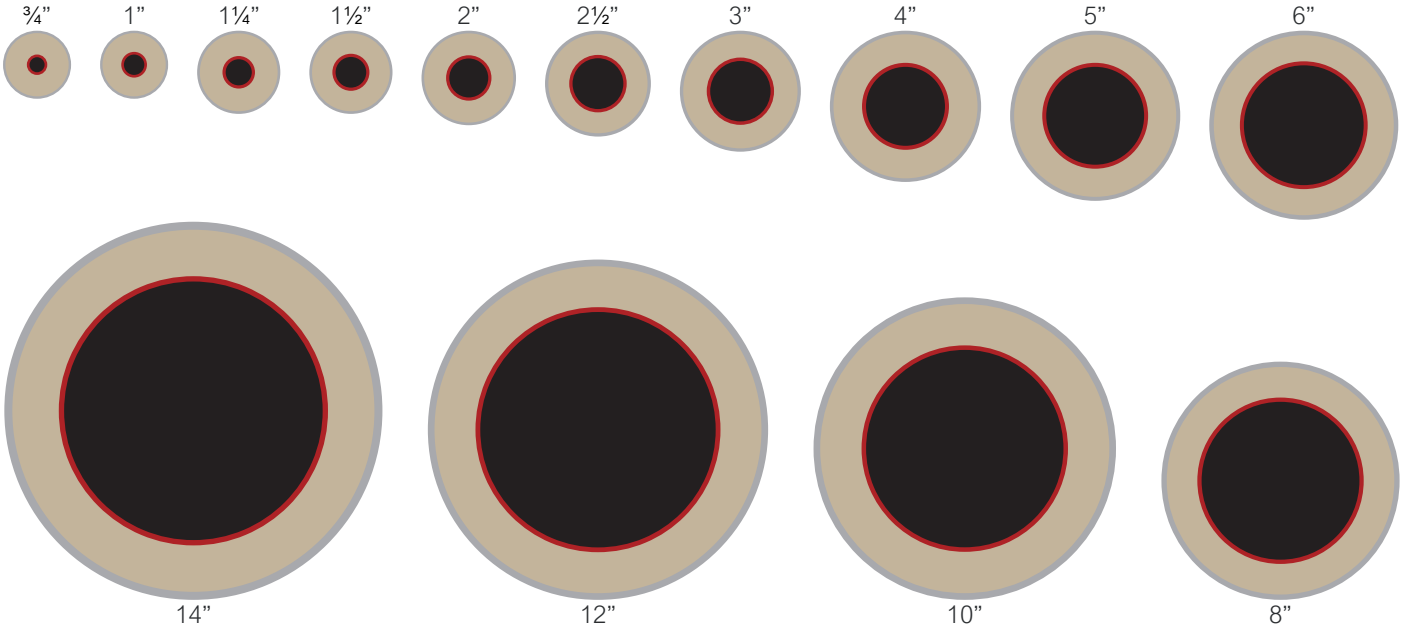
Inner stainless steel pipe according to UNE EN-10217-7, grooved for flange connections or plain for applications requiring welding. Intermediate insulation layer made of Polyurethane (PUR)-HFO foam. Outer coating of High-Density Polyethylene (HDPE).

GROOVED / PLAIN PRE-INSULATED GALVANIZED PIPE

Inner carbon steel pipe according to UNE EN-10217 or UNE EN-10255, with a galvanizing process and the option of polyester primer and powder coating. Grooved for flange connections or plain for applications requiring welding. Intermediate insulation layer made of Polyurethane (PUR)-HFO foam. Outer coating of High-Density Polyethylene (HDPE).

DIAMETER AND THICKNESSES

PRE-INSULATED PIPE	INNER PIPE			OUTER JACKET		
Internal carbon steel piping. Primer and powder coating.	DN	DN	D Outer	D Outer Pipe Type 2	Thickness Outer Pipe Type 2	Thickness Insulation Type 2
	inches		(mm)	(mm)	(mm)	(mm)
PRE-INSULATED PIPE ¾”	¾	20	26,9	90	2	30
PRE-INSULATED PIPE 1”	1”	25	33,7	90	2	27
PRE-INSULATED PIPE 1 ¼”	1 ¼”	32	42,4	110	2,2	32
PRE-INSULATED PIPE 1 ½”	1 ½”	40	48,3	110	2,2	29
PRE-INSULATED PIPE 2”	2”	50	60,3	125	2,5	30
PRE-INSULATED PIPE 2 ½”	2 ½”	65	76,1	140	2,5	31
PRE-INSULATED PIPE 3”	3”	80	88,9	160	2,5	33
PRE-INSULATED PIPE 4”	4”	100	114,3	200	3	40
PRE-INSULATED PIPE 5”	5”	125	139,7	225	3,4	40
PRE-INSULATED PIPE 6”	6”	150	168,3	250	3,4	38
PRE-INSULATED PIPE8”	8”	200	219,1	315	4,5	44
PRE-INSULATED PIPE 10”	10”	250	273	400	6,5	57
PRE-INSULATED PIPE 12”	12”	300	323,9	450	7	56
PRE-INSULATED PIPE 14”	14”	350	355,6	500	7	66



MINIMUM THICKNESSES

SIMPLIFIED METHOD INDICATED IN THE RITE

RITE Tables: The thicknesses indicated in the RITE table, according to its standard, are calculated for a thermal conductivity coefficient of 0.04 W/(m·K).

Simplified Method: The thicknesses calculated with the simplified method are based on the RITE, but the thermal conductivity coefficient varies according to the insulating capacity of the insulation material. In our case, the thermal conductivity coefficient is 0.02 W/(m·K). Lower thicknesses are needed to comply with the regulations.

Insulation Thickness: This refers to the thickness of the Fire Piping Pre-insulated Pipe, which has insulation with a thermal conductivity coefficient of 0.02 W/(m·K). In most cases, the thickness exceeds the minimum required by the simplified method standard.

INTERIOR OF BUILDINGS

DIAMETERS			0ºC to 10ºC		Fire Piping Thicknesses	10ºC to 40ºC		Fire Piping Thicknesses	40ºC to 60ºC		Fire Piping Thicknesses	60ºC to 100ºC		Fire Piping Thicknesses
Thread Size	Nominal Diameter	Outer Diameter	RITE Tables	Simplified Method	Insulation Thickness	RITE Tables	Simplified Method	Insulation Thickness	RITE Tables	Simplified Method	Insulation Thickness	RITE Tables	Simplified Method	Insulation Thickness
(“)	(mm)	(mm)	(mm)	(mm)	Type 1	(mm)	(mm)	Type 1	(mm)	(mm)	Type 1	(mm)	(mm)	Type 1
1”	25	33,7	25	9,71	19	20	8,07	19	25	9,71	19	25	9,71	19
1 ¼”	32	42,4	30	11,75	22	20	8,35	22	30	11,75	22	30	11,75	22
1 ½”	40	48,3	30	12,01	19	20	8,5	19	30	12,01	19	30	12,01	19
2”	50	60,3	30	12,44	23	30	12,44	23	30	12,44	23	30	12,44	23
2 ½”	65	76,1	30	12,84	22	30	12,84	22	30	12,84	22	30	12,84	22
3”	80	88,9	30	13,08	23	30	13,08	23	30	13,08	23	30	13,08	23
4”	100	114,3	40	17,36	30	40	17,36	30	30	13,42	30	40	17,36	30
5”	125	139,7	40	17,75	27	30	13,66	27	30	13,66	27	40	17,75	27
6”	150	168,3	40	18,06	25	30	13,86	25	35	15,98	25	40	18,06	25
8”	200	219,1	40	18,45	26	30	14,09	26	35	16,29	26	40	18,45	26
10”	250	273	40	18,72	36	30	14,26	36	35	16,5	36	40	18,72	36
12”	300	323,9	40	18,9	32	30	14,36	32	35	16,64	32	40	18,9	32
14”	350	355,6	40	18,99	40	30	14,42	40	35	16,71	40	40	18,99	40

EXTERIOR OF BUILDINGS AND BURIED INSTALLATIONS

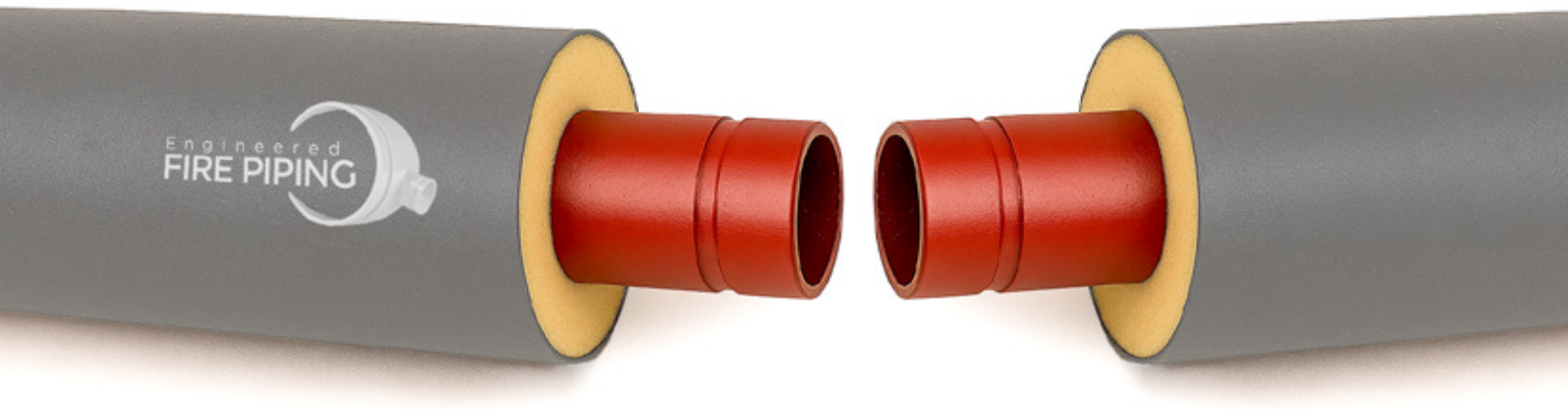
DIAMETERS			0ºC to 10ºC		Fire Piping Thicknesses	10ºC to 40ºC		Fire Piping Thicknesses	40ºC to 60ºC		Thicknes-ses	60ºC to 100ºC		Fire Piping Thicknesses
Thread Size	Nominal Diameter	Outer Diameter	RITE Tables	Simplified Method	Insulation Thickness	RITE Tables	Simplified Method	Insulation Thickness	RITE Tables	Simplified Method	Insulation Thickness	RITE Tables	Simplified Method	Insulation Thickness
(“)	(mm)	(mm)	(mm)	(mm)	Tipo 1	(mm)	(mm)	Tipo 1	(mm)	(mm)	Tipo 1	(mm)	(mm)	Tipo 1
1”	25	33,7	45	15,43	19	40	14,1	19	35	12,71	19	35	12,71	19
1 ¼”	32	42,4	50	17,65	22	40	14,82	22	40	14,82	22	40	14,82	22
1 ½”	40	48,3	50	18,17	19	40	15,21	19	40	15,21	19	40	15,21	19
2”	50	60,3	50	19,01	23	50	19,01	23	40	15,84	23	40	15,84	23
2 ½”	65	76,1	50	19,83	22	50	19,83	22	40	16,45	22	40	16,45	22
3”	80	88,9	50	20,34	23	50	20,34	23	40	16,82	23	40	16,82	23
4”	100	114,3	60	24,67	30	50	21,1	30	40	17,36	30	50	21,1	30
5”	125	139,7	60	25,39	27	50	21,65	27	40	17,75	27	50	21,65	27
6”	150	168,3	60	25,99	25*	50	22,1	25	45	20,1	25	50	22,1	25
8”	200	219,1	60	26,74	26*	50	22,66	26	45	20,57	26	50	22,66	26
10”	250	273	60	27,27	36	50	23,05	36	45	20,9	36	50	23,05	36
12”	300	323,9	60	27,64	32	50	23,32	32	45	21,12	32	50	23,32	32
14”	350	355,6	60	27,82	40	50	23,45	40	45	21,23	40	50	23,45	40

For installations greater than 70 kW, the alternative method must be used.
These calculations do not take into account the outer coating, which provides additional insulation and ensures that the pipe is insulated.
For larger insulation thicknesses and higher temperature ranges, inquire about Type 2 thicknesses.
* It is recommended to use Type 2 insulation.

GROOVED SYSTEM EASY INSTALLATION

Grooved aerial and buried network system, does not require welding the joints, reduces costs and assembly times.
Grooved joints for demanding networks working with high pressures and temperatures (20 bar and up to 177ºC).

Simple and quick installation. Grooved joints are reliable and safe connections, facilitate adjustments and absorb vibrations and expansion. They are a great advantage in maintenance work and replacement of sections of the system.



ADVANTAGES

Joint Insulation System

- Joint insulation kits.
- Preformed PUR molds.
- Self-vulcanizing taping.

Grooved Joint System

- Couplings and FM piping.
- High working Tº 110ºC / 177ºC.
- We avoid welding on site.

Reinforced structure

- Reinforcement centerers every meter.
- Precise adjustment between tubes.
- Provides robustness to the support.

Arguments and advantages of our pipe for buried networks.

- Steel pipe without corrosion due to great protection:
  - Powder paint.
  - Pipe insulation.
- Pipe with thermal and electrical insulation.
- System with great mechanical resistance.
- Steel pipe has a much higher resistance than pipes made of other materials.
- Assembly is quick and simple as it features a grooved joint system.
- The grooved system facilitates repairs and maintenance.

Extraordinary services that we can add to the pre-insulated pipe.

- Possibility of adding a leak detection system with localized leak warnings.
- Possibility of adding a heating cable system to protect extremely low temperatures.

Installation and guarantees of success.

- Training for installation companies on joint insulation techniques and materials and general assembly of the system.
- Installation guarantees.

INSTALLATION WITH GROOVED FITTINGS

COMPLEMENTARY MATERIALS AND EQUIPMENT

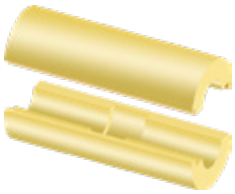
Densolen AS30 Tape: Protection for pipes.

Densolen HT-Primer: Adhesive that improves the sealing of the protective tape.

Densomat-1 Tape Wrapping Machine: Manual wrapper for applying the protective tape.

FITTINGS KITS

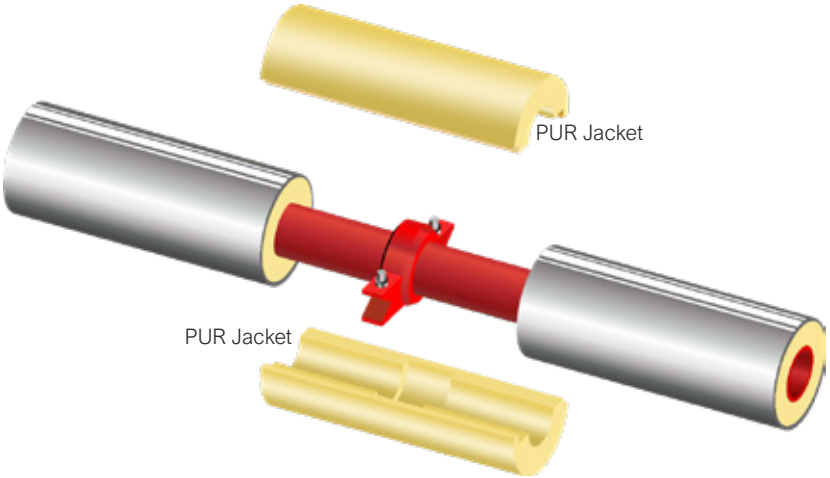
The fittings kits for pre-insulated pipe systems are installed quickly and efficiently. We offer a wide range of assembly kits: straight joints, tees, bends, etc. Place the coupling aligned with the kit position and follow the recommended insulation instructions.

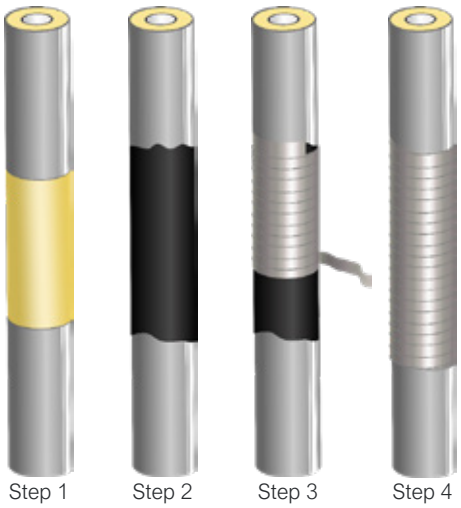


Straight Joint Kit

90º bends kit

FITTINGS INSTALLATION WITH ITS INSULATION KIT





1.- Place the PUR jacket (insulation kit) around the pipe.
2.- Mark the outer pipe between 100 and 50 mm to locate the first wrapping.
3.- Clean the areas to be wrapped, removing dust and dirt, and let dry.
4.- Apply a uniform layer of primer (200 ml/m²) in the area to be covered.
5.- Allow the primer to dry for 15-30 minutes. Cover the area within 6 hours.
6.- Tape the entire area, leaving an overlap of at least 50 mm.
7.- Final result.

PIPE SYSTEMS

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