Engineered
FIRE PIPING

PRODUCT CATALOG

WE MAKE IT EASY

Engineered
FIRE PIPING

www.firepiping.com

Engineered FIRE PIPING

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ENGINEERED FIRE PIPING

COMPANY

Engineered Fire Piping was founded in January 2011 as a result of an entrepreneurial initiative by a team of experts in the prefabricated piping industry for fire protection.

Located in the town of Yuncos (Toledo), 44 km from Madrid. It has more than 15,000 m2 of production area and more than 30,000 m2 for logistics and stock management. With a total of 10 robotised cells, it is capable of producing fire protection pipes with a daily output of approximately 12,000 sprinklers. In addition to covering more than 50,000 metres of painted pipe per day with the 2 automated production plants.

Thanks to this, it has become an international reference as the main supplier of prefabricated pipes for automatic sprinkler systems, being present in more than 30 countries.

Its expansion is not limited to the geographical scope, but to the family of high quality products that it continues to add to the market.

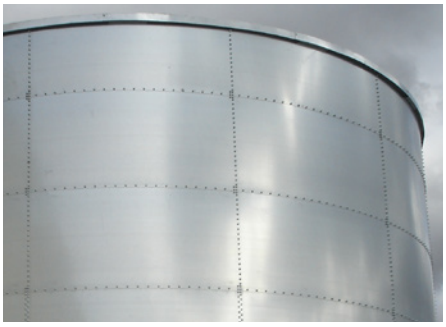
- Water storage tanks for fire protection.
- Industrial hydrants, standpipes, indoor fire hydrants, and accessories.
- Pre-insulated and heat-insulated piping.
- Fire suppression systems using gaseous agents and low-pressure water mist.
- Cold Fire encapsulator for extinguishing lithium-ion battery fires.

ADVANTAGES

- Customised manufacture, flexibility in design.
- Detailed documentation.
- Cost effective installation.
- Specialised technical advice.
- Export experience, with customers in more than 30 countries.
- FM, VdS and Cepreven certifications.
- ISO 9001 and 14001 standards
- ESG policies.

Manufacturing in a controlled and supervised environment, with adequate means and procedures are the only way to guarantee the quality of the final product.

we make it easy



ENGINEERED FIRE PIPING

CERTIFICATIONS

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

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 couplings are always covered by FM Approved certification.

Civil Liability Insurance

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

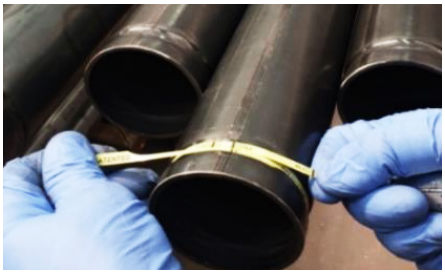
c p v

ISO 9001
ISO 14001
BUREAU VERITAS
Certification

FM APPROVED

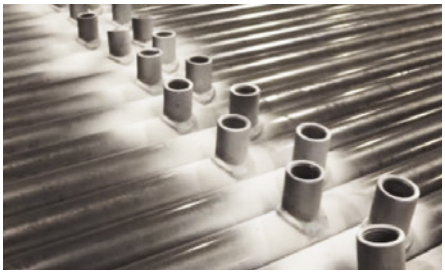
VdS

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



Grooving test

Shot blasting



100% welding socket and butwelding test

Hydrostatic pressure test. 5 min 80 bares

Adherence and layer thickness test

Polyester powder coating adherence test

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 high-quality products.

TESTING AND QUALITY CONTROL

1 Dimensional control of the grooves at the ends of pipes and sleeves.

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

3 Emptying of interior shot by gravity in all cut pipes, using a vibrating lifting table.

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

5 Hydrostatic pressure tests on 20% of our production of pipes longer than 6 meters (for 5 minutes at 80 bar pressure)

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 thickness controls of the paint on our prefabricated pipes.

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

ENGINEERED FIRE PIPING

SERVICES

Fire Piping strengthens its position in the national and international market by inaugurating a new factory, which increases its production capacity to a total of 10 fully automated robotic cells and 2 multifunctional and independent coating ovens. This allows us to double our production capacity with 2 completely independent production lines.

Production Capacity

Fire Piping's production capacity reaches a maximum of pipe manufacturing for 16,000 sprinklers per day and painting of over 70,000 linear meters per day.

Identification

Every pipe prefabricated by Fire Piping will be identified with a labeling system that reflects quality data, type of pipe, assembly reference, etc.

Cost-effective Installations

Fire Piping is committed to offering cost-effective installations by not having limitations on the manufacturing of non-standard lengths (greater than 6 meters), for cases where the distance between sprinklers is different from 3 meters. This significantly reduces assembly costs and the number of grooved joints.

Packaging and Logistics

Fire Piping ensures the best packaging and protection of prefabricated pipes by placing caps on the ends, separating pipes, strapping, and loading them onto trucks. This prevents damage during transportation and allows for quick identification.

Robotic Cells

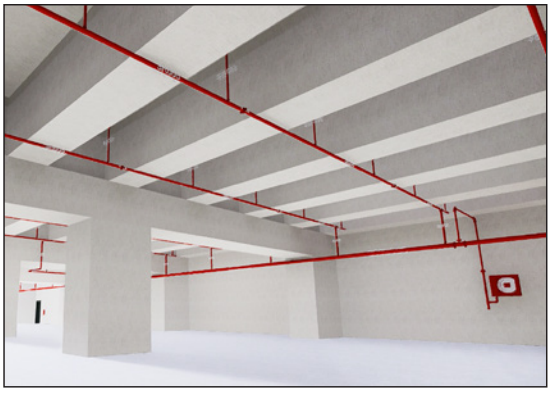
The robotic cells are capable of working with pipes up to 9 meters in length, obtained by pipe splicing using orbital welding, which has FM and VDS Approval.

The robotic cells and painting lines are designed to work with a maximum pipe diameter of 14" and couplings up to 8".

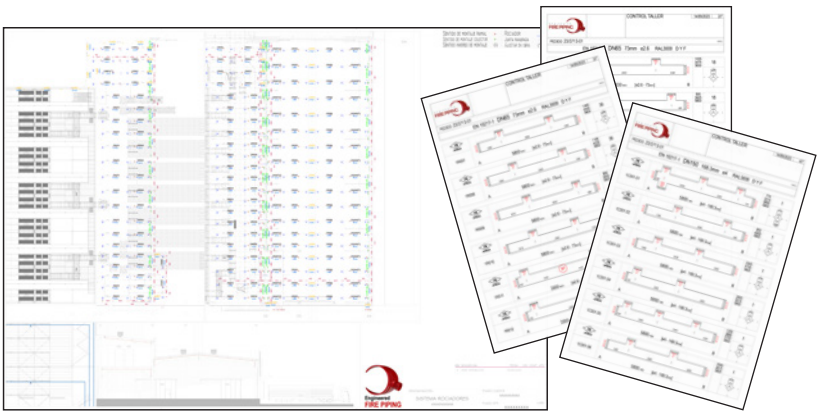
TECHNICAL OFFICE

BIM REVIT METHODOLOGY

We have a team of highly qualified engineers and draughtsmen who are able to optimise the design of the sprinkler system using our own 2D and 3D tools. We work with BIM (Building Information Modelling) methodology and tools such as REVIT and AutoCAD.



3D BIM REVIT rendering.



2D and 3D assembly plans.

Workshop sheets.

FIRE PIPING TOOLS FOR REVIT®

Fire Piping Tools for REVIT® is a free plugin with our product families installed and ready to add to your REVIT projects. It allows us to work faster and improves the functionality of Revit® with automatisms in the construction of 2D and 3D drawings, facilitates the selection of materials and automatically provides the order of materials with all the references.
Download Fire Piping Tools For Revit Plug-in at www.firepiping.com/apps

FIRE PIPING SHARE. CLOUD SERVICE

Fire Piping Share is a free cloud storage service. Our customers who request it will have access to a private space, where they can access their project documentation and view their files in 2D and 3D. Fire Piping Share has an integrated 2D and 3D file viewer where you can view all types of drawings of your projects.
Log in to Fire Piping Share Cloud Service at share.firepiping.com

APPLICATION FOR THE DESIGN OF GAS EXTINGUISHING SYSTEMS.

Fire Piping offers its clients an application that allows them to quickly and easily obtain a list of measurements for their gas extinguishing system designs. It is as simple as choosing the type of approval, design standard, type of fire and the specific parameters of the rooms to be protected. The software provides you with a list of all necessary components including manifolds and discharge nozzles.
gas.suppression.firepiping.com

PREFABRICATED PIPE

THICKNESSES ACCORDING TO PIPE STANDARD.

DN	PIPE STANDARD (e=mm)										
	EN 10216-1	EN10217-1	EN10255				ANSI/ASME B36.10M				
	(1)	(1)	Serie M	Type L1	Type L	Type L2	Sch 5	Sch 10	Sch 20	Sch 30	Sch 40
25	2,3 a 8,8	1,4 a 8,8	3,2	2,9	2,9	2,6	1,7	2,77			3,3
32	2,6 a 10,0	1,4 a 8,8	3,2	2,9	2,9	2,6	1,7	2,77			3,56
40	2,6 a 12,5	1,4 a 8,8	3,2	2,9	2,9	2,9	1,7	2,77			3,81
50	2,9 a 16,0	1,4 a 10,0	3,6	3,2	3,2	2,9	1,7	2,77			3,81
65	2,9 a 20,0	1,6 a 10,0	3,6	3,2	3,2	3,2	2,1	3,05	N/A	N/A	5,08
80	3,2 a 25,0	1,6 a 10,0	4,0	3,6	3,2	3,2	2,1	3,05			5,59
100	3,6 a 32,0	2,0 a 11,0	4,5	4,0	3,6	3,6	2,1	3,05			6,1
125	4,0 a 40,0	2,0 a 11,0	5,0		4,5		2,8	3,4			6,6
150	4,5 a 50,0	2,9 a 11,0	5,0	N/A	4,5	N/A	2,8	3,4			7,1
200	6,3 a 70,0	3,2 a 12,5	N/A		N/A		2,8	3.76	6,4	7	8,18
250	6,3 a 80,0	3,2 a 12,5					3,4	4,19	6,4	7,8	9,27

The maximum thickness depends on each manufacturer. In all cases, the maximum thickness specified in the EN 10220 standard is not always reached.

MINIMUM THICKNESSES ACCORDING TO SPRINKLER DESIGN STANDARDS.

TUBE			REQUIREMENTS ACCORDING TO SPRINKLER INSTALLATION DESIGN STANDARDS												FirePiping: Minimum FM Approved Thicknesses (mm)
			Minimum Wall Thickness (mm) (1)												
Diameters (mm)			EN 12845										FM LPDS 2-0 October 2021		
Thread Size	Nominal Diameter	Outer Diameter	Roll-grooved or Welded	Threaded or Milled	Roll-grooved or Welded			Threaded or Milled			Roll-grooved or Welded	Threaded or Milled	Roll-grooved	Threaded or Milled	
			ISO4200 D	ISO 65 M (EN 10255 M)	10216-1	10255 L2/L	10217-1	10255 M	10216-1	10217-1	SCH10	SCH40			
1”	25	33,7	2	3,2	2,6	2,6	2,6	3,2	3,2	3,2	2,8	3,4	1,7	3,4	2
1,25”	32	42,2	2,3	3,2	2,6	2,6	2,6	3,2	3,2	3,2	2,8	3,6	1,7	3,6	2,3
1,5”	40	48,3	2,3	3,2	2,6	2,9	2,6	3,2	3,2	3,2	2,8	3,7	1,7	3,7	2,3
2”	50	60,3	2,3	3,6	2,9	2,9	2,6	3,6	3,6	3,6	2,8	3,9	1,7	3,9	2,3
2,5”	65	76,1 *	2,6	3,6	2,9	3,2	2,6	3,6	3,6	3,6	3	5,2	3,0	5,2	2,6
3”	80	88,9	2,9	4	3,2	3,2	2,9	4	4	4	3	5,5	3,0	5,5	2,9
4”	100	114,3	3,2	4,5	3,6	3,6	3,2	4,5	4,5	4,5	3	6	3,0	6,0	3,2
5”	125	139,7	3,6	5	4	4,5	3,6	5	5	5	3,4	6,6	3,4	6,6	3,6
6”	150	168,3 **	4	5	4,5	4,5	4	5	5	5	3,4	7,1	3,4	7,1	4
8”	200	219,1	4,5	N/A	6,3	N/A	4,5	N/A	6,3	6,3	4,8 (2)	7 (3)	4,8	7,0	4,5
10”	250	273	5	N/A	6,3	N/A	5	N/A	6,3	6,3	4,8 (2)	7,8 (3)	4,8	7,8	N/A

cpv

ISO 9001
ISO 14001
BUREAU VERITAS
Certification

FM APPROVED

VdS

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

PAINT THICKNESS

CLASSIFICATION OF CORROSIVE ATMOSPHERES ACCORDING TO UNE EN ISO 12944-2. EXAMPLES						
CORRO-SION CATE-GORIES	Mass loss per unit area/thickness loss (After one year of exposure)				Examples of environments (Informative)	
	Low carbon steel		Zinc		Outdoor	Indoor
	Mass g/cm2)	Thickness Qm	Mass g/cm2)	Thickness Qm		
C1 VERY LOW	≤ 10	≤ 1,3	≤ 0,7	≤ 0,1	___	Heated buildings with clean atmospheres (offices, shops, schools, hotels etc).
C2 LOW	> 10 to 200	> 1,3 to 25	> 0,7 to 5	> 0,1 o 0,7	Atmospheres with low levels of pollution, generally in rural areas	Unheated buildings with the possibility of condensation Sports halls, warehouses etc.)
C3 MEDIUM	> 200 to 400	> 25 to 50	> 5 to 15	> 0,7 to 2,1	Urban or industrial atmospheres with moderate levels of sulphur dioxide: coastal zones with low salinity	Production areas with high humidity and some contamina-tion (food processing plants, laundries, breweries and dairies, etc.)
C4 HIGH	> 400 to 650	> 50 to 80	> 15 to 30	> 2,1 to 4,2	Industrial atmospheres coastal areas with moderate salinity	Chemical plants, swimming pools, shipyards, shipyards, wharfs
C5 VERY HIGH	> 650 to 1500	> 80 to 200	> 30 to 60	> 4,2 to 8,4	Industrial atmospheres with high humidity and aggressive atmospheres. coastal areas with high salinity	Buildings or areas with perma-nent condensation and high contamination
CX EXTREME	> 1500 to 5000	> 200 to 700	> 60 to 180	> 8,4 to 25	Offshore areas with high salinity and industrial areas with ex-treme humidity and aggressive atmospheres. Tropical and subtropical atmospheres	Industrial areas with extreme humidity and aggressive atmos-pheres

PROTECTIVE PAINT SYSTEMS ISO 12944-5							
MATERIAL	BASE SURFACE PREPARATION	PAINT SYSTEM	MINIMUM THICK-NESS	ENVIRON-MENT	DURABILITY	HUMIDITY CHAMBER ISO 6270-1	SALT SPRAY ISO 9227-1
BLACK STEEL	CHEMICAL PRETREATMENT BY SPRAY (DEGREASING + AMORPHOUS PHOSPHATING + RINSING) + CHROMIUM-FREE PASSIVATION	MEGAPOL IND. ULC 72U00	80 µ	C3	MEDIUM	120 H	240 H
		MEGAPRIMER 72P0N + MEGAPOL IND. ULC 72U00	140 µ	C4	MEDIUM	240 H	480 H
BLACK STEEL	BLAST CLEANING GRADE Sa 2 ½	MEGAPRIMER 72P0N + MEGAPOL IND. ULC 72U00	140 µ	C4	MEDIUM	240 H	480 H
		MEGAPRIMER 72P0Z + MEGAPOL IND. ULC 72U00	140 µ	C5	MEDIUM	480 H	720 H
GALVANIZED STEEL	CHEMICAL PRETREATMENT BY SPRAY (DEGREASING + AMORPHOUS PHOSPHATING + RINSING) + CHROMIUM-FREE PASSIVATION	MEGAPRIMER 72P0N + MEGAPOL IND. ULC 72U00	140 µ	C5	MEDIUM	480 H	720 H
	MECHANICAL + CHEMICAL PRETREATMENT + FINAL PASSIVATION		140 µ	C5	HIGH	720 H	1.440 H

Durability table according to UNE EN ISO 12944-1* Low: up to 7 years. Medium: from 7 to 15 years. High: from 15 to 25 years. Very high: more than 25 years.

* The concept of durability is not a guarantee of durability. The concept is a technical consideration to be used by the end user to plan an appropriate maintenance programme.

2 INDEPENDENT PRODUCTION FACILITIES

We are experts in prefabrication and lacquering of fire protection pipes. We have 2 automated plants with 10 robotic cells to guarantee the most demanding needs in the work areas. Our production capacity is 70,000 linear metres of pipe per day

Robotic welding cells processing prefabricated pipes. .



LACQUERING PROCESS:

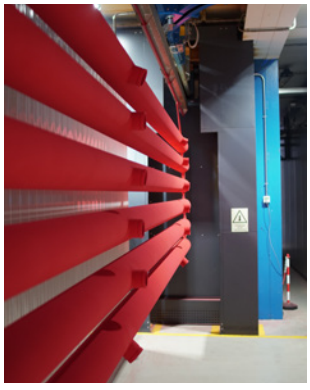
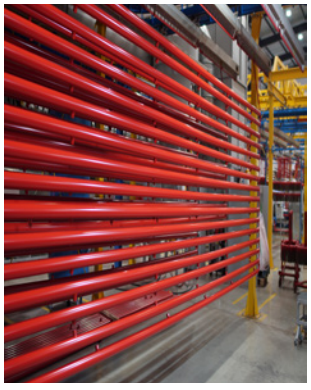
- Chemical and mechanical surface preparation
- Liquid primer booth
- Powder coating and curing in polymerised ovens
- Quality control and labelling

The lacquering process, with high-speed multifunctional ovens, guarantees high resistance to corrosion and guaranteed adherence thanks to the spray application of powder paint, with the possibility of electrostatic application for any type of finish

Factory 1: Production of 30,000 linear metres of pipe per day.




Factory 2: production of 40,000 linear metres of pipe per day.


SPECIAL PROJECTS

Manufacturing of Any Support Elements for Collectors, Meridian Bands, Gas Spheres, Pump Rooms, etc.

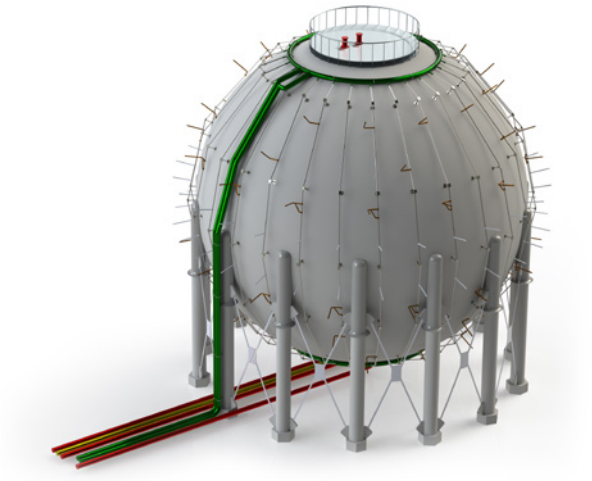
Key Features

- ANSI/ASME, EN10216-1, EN10217-1 or EN10255 pipe
- Flange ANSI B 16.5 or EN1092
- Accessories ANSI B 16.9 o EN10253
- Pipe with grooved or flanged ends. Welded Outlets
- Fire department connections and caps: Barcelona, Storz, BS336, Guillemin, Gost or NH
- Hydrant valves: Globe and ball valve, angle and gate valve in bronze marine RG5 or brass.

Fuel tanks fire protection

Fabricación de anillos de refrigeración y de espuma para protección de tanques de Combustible.

Fire protection system for gas spheres



Self-supporting with meridian belts and water cooling ring system. Vertical branch pipes and reverse nozzle springs.

Manifold and collectors of high flow

Manufacturing of manifolds for Fire Pump areas. Fire Protection System Supply

Modular valve stations fire proteccion

Foam storage and mix control room.

Deluge valves with TRIM.

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.

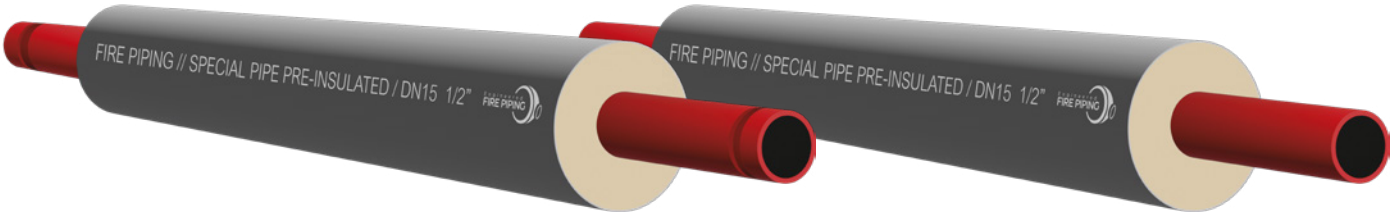
It has a closed-cell structure of 90%, with a maximum cell size of 0.5 mm, which enhances insulation performance.
This foam has been developed using fourth-generation Hydrofluoro-Olefins (HFO) blowing agents, which have minimal environmental impact.

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.

INNER PIPE TYPOLOGY

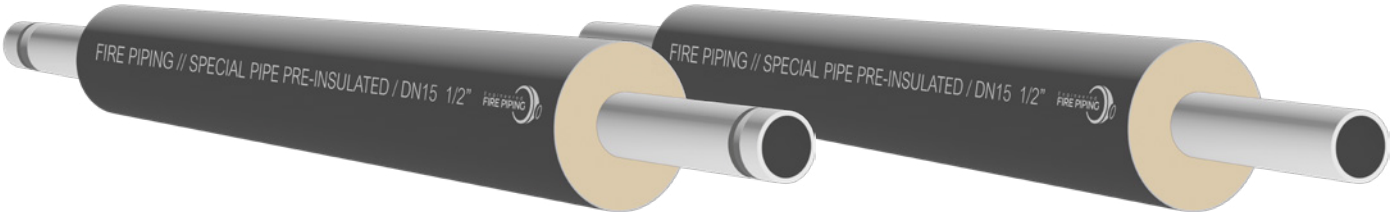
GROOVED / PLAIN PRE-INSULATED PIPE

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).



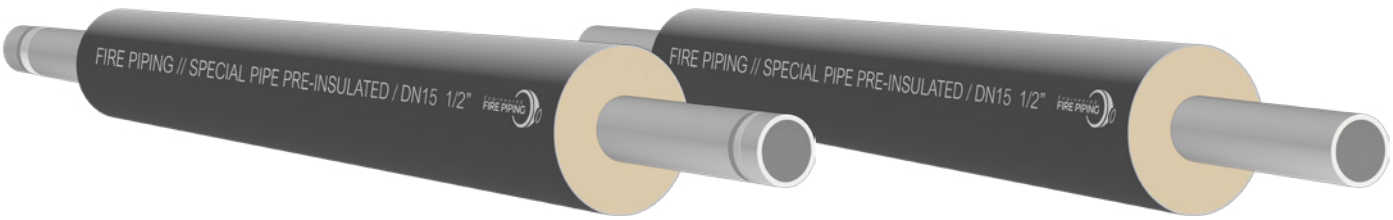
GROOVED / PLAIN PRE-INSULATED STAINLESS STEEL PIPE

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).



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			>-10 … 0 ºC		Fire Piping thickness	De 0ºC a 10ºC		Fire Piping thickness	De 10ºC a 40ºC		Fire Piping thickness	De 40ºC a 60ºC		Fire Piping thickness	De 60ºC a 100ºC		Fire Piping thickness	>100 … 180 ºC		Espesores Fire Piping
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	RITE Tables	Simplified Method	Insulation Thickness	RITE Tables	Simplified Method	Insulation Thickness
(“)	(mm)	(mm)	(mm)	(mm)	Tip 1	(mm)	(mm)	Tip 1	(mm)	(mm)	Tip 1	(mm)	(mm)	Tip 1	(mm)	(mm)	Tip 1	(mm)	(mm)	Tip 1
1”	25	33,7	50	16,71	19	45	15,43	19	40	14,1	19	35	12,71	19	35	12,71	19	40	14,1	19
1 ¼”	32	42,4	60	20,29	22	50	17,65	22	40	14,82	22	40	14,82	22	40	14,82	22	50	17,65	22
1 ½”	40	48,3	60	20,93	19	50	18,17	19	40	15,21	19	40	15,21	19	40	15,21	19	50	18,17	19
2”	50	60,3	60	21,98	23	50	19,01	23	50	19,01	23	40	15,84	23	40	15,84	23	50	19,01	23
2 ½”	65	76,1	60	23,03	22*	50	19,83	22	50	19,83	22	40	16,45	22	40	16,45	22	50	19,83	22
3”	80	88,9	60	23,69	23*	50	20,34	23	50	20,34	23	40	16,82	23	40	16,82	23	50	20,34	23
4”	100	114,3	70	28,09	30	60	24,67	30	50	21,1	30	40	17,36	30	50	21,1	30	60	24,67	30
5”	125	139,7	70	28,99	27*	60	25,39	27	50	21,65	27	40	17,75	27	50	21,65	27	60	25,39	27
6”	150	168,3	70	29,74	25*	60	25,99	25*	50	22,1	25	45	20,1	25	50	22,1	25	60	25,99	25*
8”	200	219,1	70	30,70	26*	60	26,74	26*	50	22,66	26	45	20,57	26	50	22,66	26	60	26,74	26*
10”	250	273	70	31,39	36	60	27,27	36	50	23,05	36	45	20,9	36	50	23,05	36	60	27,27	36
12”	300	323,9	70	31,87	32	60	27,64	32	50	23,32	32	45	21,12	32	50	23,32	32	60	27,64	32
14”	350	355,6	70	32,10	40	60	27,82	40	50	23,45	40	45	21,23	40	50	23,45	40	60	27,82	40

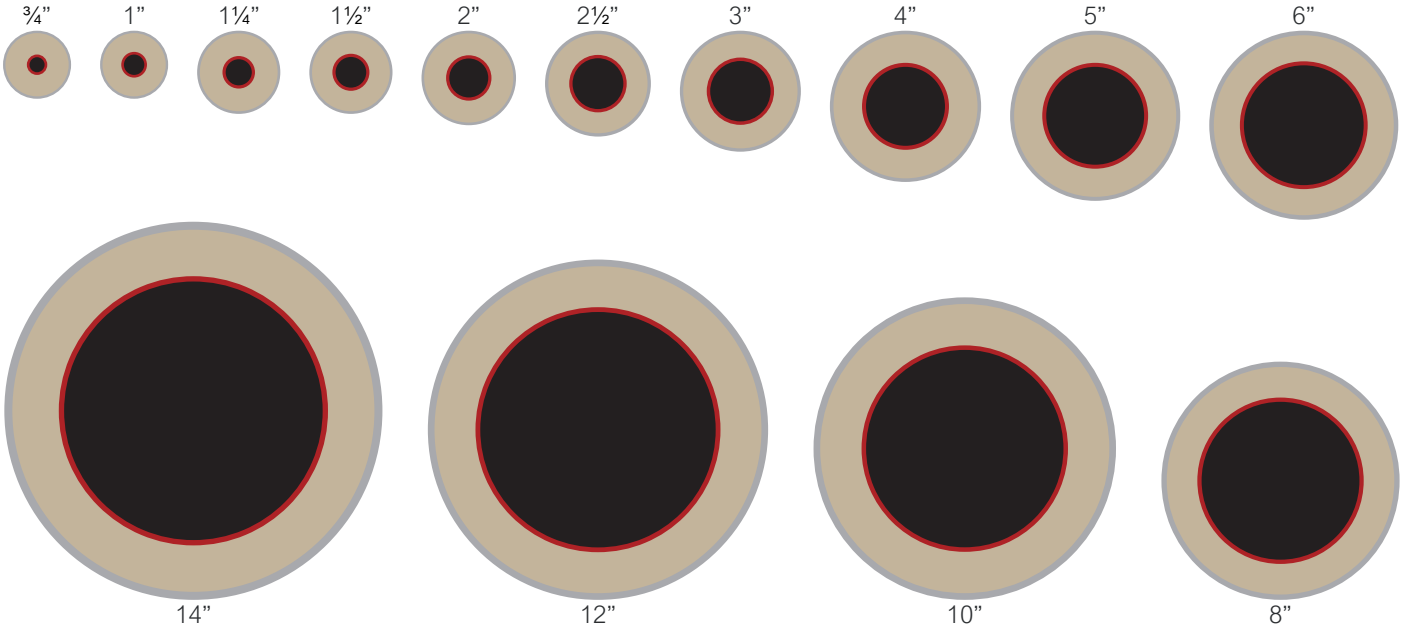
EXTERIOR OF BUILDINGS AND BURIED INSTALLATIONS

DIAMETERS			>-10 … 0 ºC		Fire Piping thickness	De 0ºC a 10ºC		Fire Piping thickness	De 10ºC a 40ºC		Fire Piping thickness	De 40ºC a 60ºC		Fire Piping thickness	De 60ºC a 100ºC		Fire Piping thickness	>100 … 180 ºC		Espesores Fire Piping
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	RITE Tables	Simplified Method	Insulation Thickness	RITE Tables	Simplified Method	Insulation Thickness
(“)	(mm)	(mm)	(mm)	(mm)	Tip 1 / Tip 2	(mm)	(mm)	Tip 1 / Tip 2	(mm)	(mm)	Tip 1 / Tip 2	(mm)	(mm)	Tip 1 / Tip 2	(mm)	(mm)	Tip 1 / Tip 2	(mm)	(mm)	Tip 1 / Tip 2
1”	25	33,7	50	16,71	19 / 26	45	15,43	19 / 26	40	14,1	19 / 26	35	12,71	19 / 26	35	12,71	19 / 26	40	14,1	19 / 26
1 ¼”	32	42,4	60	20,29	22 / 32	50	17,65	22 / 32	40	14,82	22 / 32	40	14,82	22 / 32	40	14,82	22 / 32	50	17,65	22 / 32
1 ½”	40	48,3	60	20,93	19 / 29	50	18,17	19 / 29	40	15,21	19 / 29	40	15,21	19 / 29	40	15,21	19 / 29	50	18,17	19 / 29
2”	50	60,3	60	21,98	23 / 30	50	19,01	23 / 30	50	19,01	23 / 30	40	15,84	23 / 30	40	15,84	23 / 30	50	19,01	23 / 30
2 ½”	65	76,1	60	23,03	22* / 29	50	19,83	22 / 29	50	19,83	22 / 29	40	16,45	22 / 29	40	16,45	22 / 29	50	19,83	22 / 29
3”	80	88,9	60	23,69	23* / 33	50	20,34	23 / 33	50	20,34	23 / 33	40	16,82	23 / 33	40	16,82	23 / 33	50	20,34	23 / 33
4”	100	114,3	70	28,09	30 / 40	60	24,67	30 / 40	50	21,1	30 / 40	40	17,36	30 / 40	50	21,1	30 / 40	60	24,67	30 / 40
5”	125	139,7	70	28,99	27* / 39	60	25,39	27 / 39	50	21,65	27 / 39	40	17,75	27 / 39	50	21,65	27 / 39	60	25,39	27 / 39
6”	150	168,3	70	29,74	25* / 37	60	25,99	25* / 37	50	22,1	25 / 37	45	20,1	25 / 37	50	22,1	25 / 37	60	25,99	25* / 37
8”	200	219,1	70	30,70	26* / 43	60	26,74	26* / 43	50	22,66	26 / 43	45	20,57	26 / 43	50	22,66	26 / 43	60	26,74	26* / 43
10”	250	273	70	31,39	36 / 57	60	27,27	36 / 57	50	23,05	36 / 57	45	20,9	36 / 57	50	23,05	36 / 57	60	27,27	36 / 57
12”	300	323,9	70	31,87	32 / 56	60	27,64	32 / 56	50	23,32	32 / 56	45	21,12	32 / 56	50	23,32	32 / 56	60	27,64	32 / 56
14”	350	355,6	70	32,10	40 / 65	60	27,82	40 / 65	50	23,45	40 / 65	45	21,23	40 / 65	50	23,45	40 / 65	60	27,82	40 / 65

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.

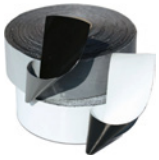
DIAMETER AND THICKNESSES

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



INSTALLATION WITH GROOVED

COMPLEMENTARY MATERIALS AND EQUIPMENT



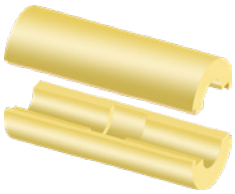
Densolen AS30 Tape: Protection for pipes.

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

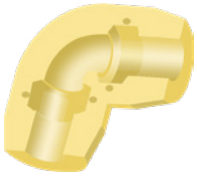
Densomat-1 Tape Wrapping Machine: Manual wrapper for applying the protective tape.

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.

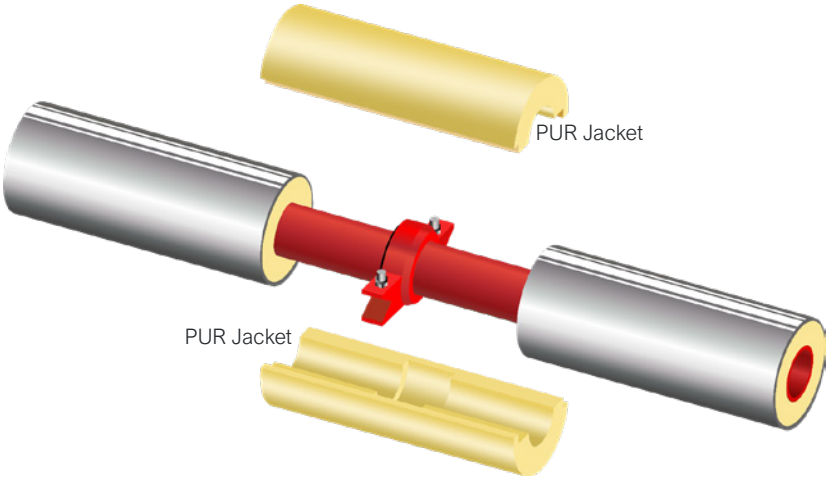


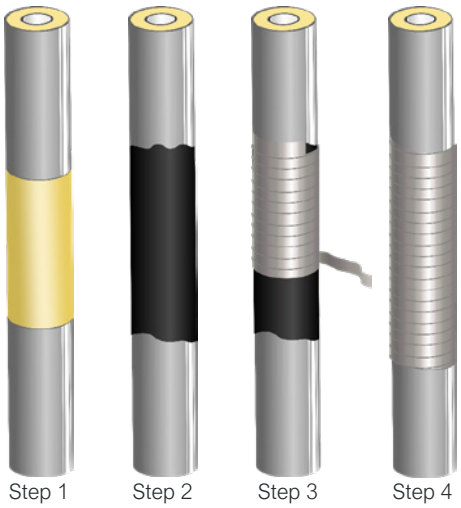
Straight Joint Kit

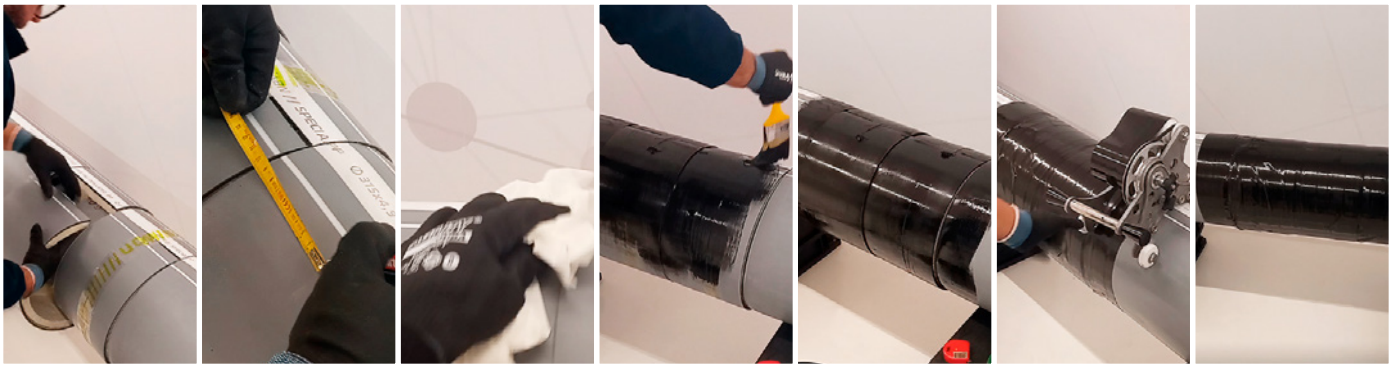


90º bends kit

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.

WATER RESERVE TANKS

FIRE PIPING TANKS

Our PCI water reserve tanks are designed and manufactured in accordance with international standards (AWWA, NFPA, FM, and CEPREVEN). We use highly automated processes in their manufacturing.

The entire process guarantees excellent quality, with the possibility of customizing the tank according to the client's special requirements: corporate paint and vinyls. Optional elements include chlorination systems, heating resistance, thermostats, terminal strips, magnetic level sensors, etc.

ADVANTAGES OF BOLTED CONSTRUCTION

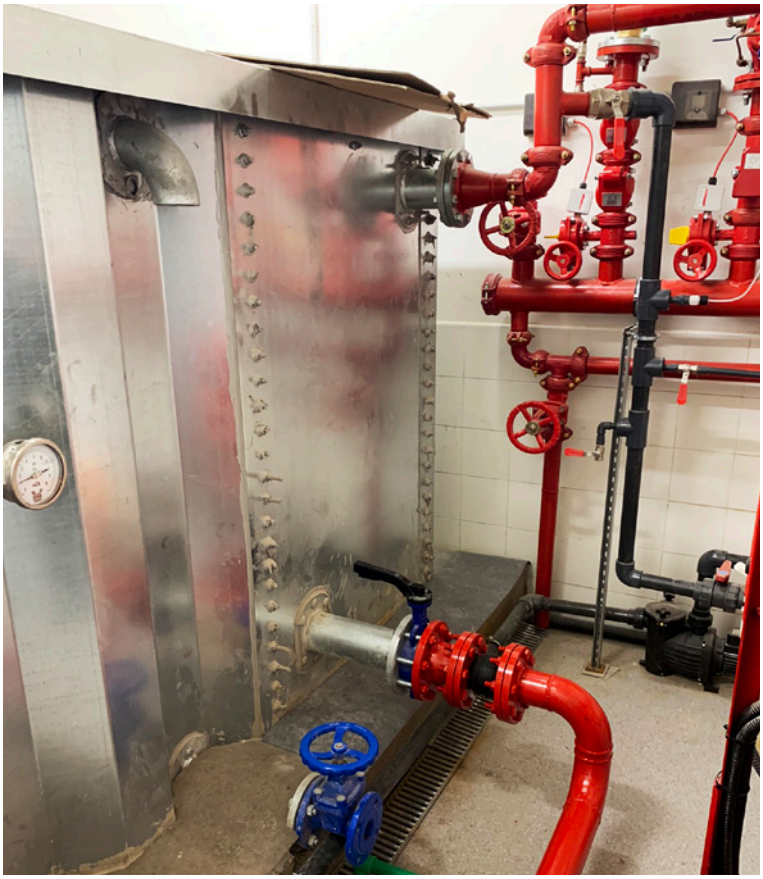
- Quick and economical assembly.
- Easy and economical transportation to any part of the world.
- Leak-free tanks.
- Wide stock of tanks and accessories.
- No special maintenance required.
- Wide range of diameters and heights. Flexibility in design.
- No painting required.
- Environmentally friendly use of materials.

RECTANGULAR TANKS

Rectangular tanks provide an excellent solution in places where space is a limitation, as they can adapt to existing obstacles in the terrain or installation, bypassing columns or incorporating them into the interior.

Their assembly configuration using folded sheet metal plates with “corrugated” folds gives the tank great strength, along with the interior and exterior supports calculated based on the required dimensions and capacity.

Their quality and options are comparable to those of our circular tanks: supply, painting, accessories, etc.



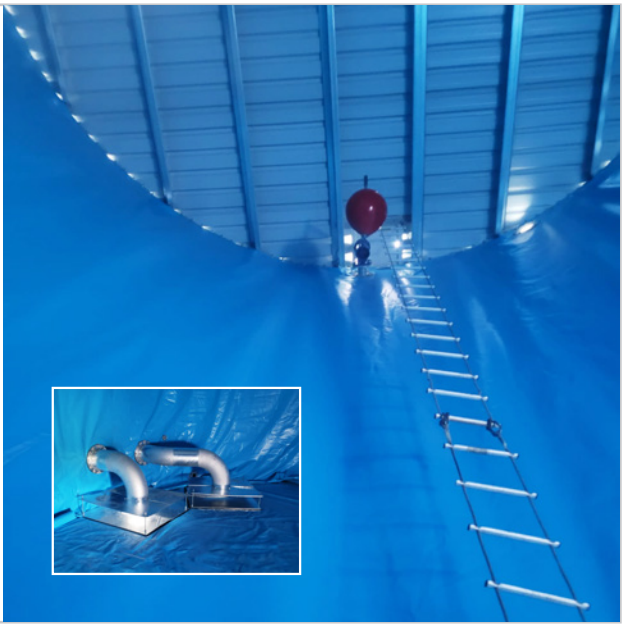
INSTALLATIONS

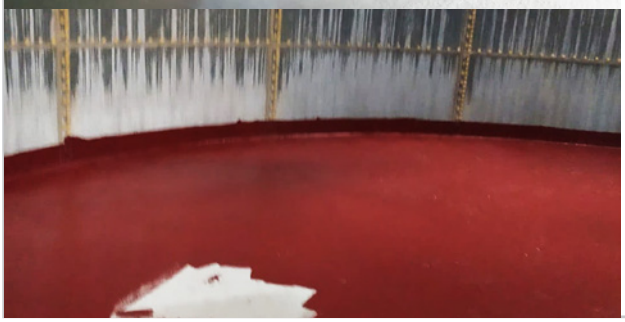
We have 5 installation teams with qualified personnel who receive constant training in the field.

Installation system using hydraulic jacks, without the need for working at heights.

Water and electricity points are required.

Total commitment to the Occupational Risk Prevention Plan.





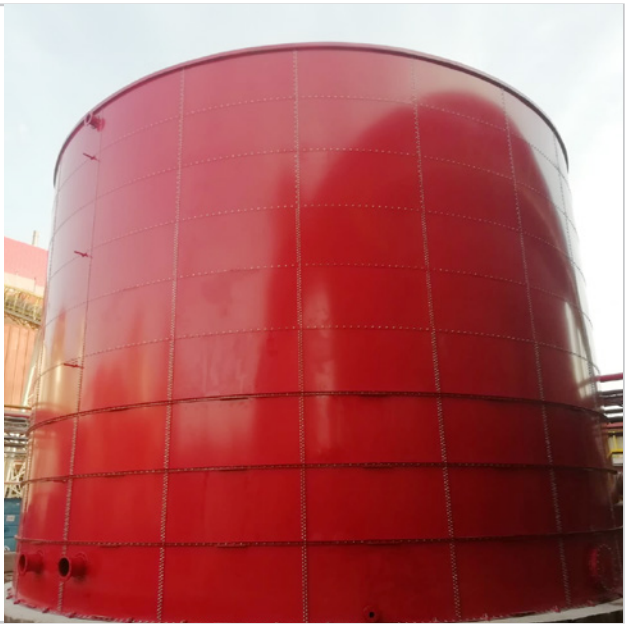
REPAIRS

Services and repairs we offer for water reserve tanks:

- Membrane replacement.
- Leak repairs.
- Waterproofing of bases.
- Technical reports.
- Periodic inspections.

PAINTING

- Tank painting is optional.
- Choice of colors from the RAL chart.
- Additional protection to galvanizing.
- High-speed oven lacquering.



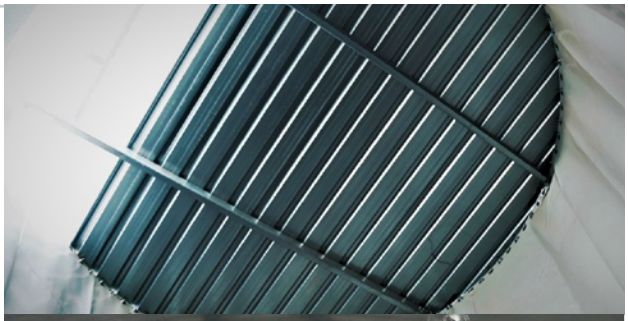
SEALING SYSTEMS

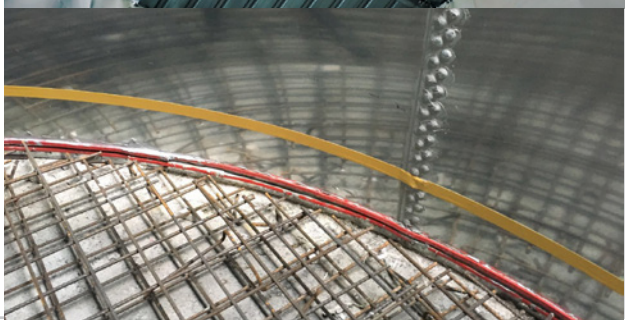
Membrane

Incorporates a PVC membrane for fire protection or potable water with a health certificate. Additionally, neoprene gaskets provide extra security.
Simpler civil works.

Mastic

Uses Sikaflex 11 FC polyurethane sealant, combined with double expansion joint Sikaswell P2010. More complex civil works, requiring two phases.





SUPPLY

- Suction, return, overflow, filling, and draining connections.
- Filling valve (float) and draining valve (gate).
- Hot-dip galvanized plates with more than 275 gr zinc/m .
- Aluminum ladder and platform.
- Lower manhole and upper inspection hatch.

TRIPLE TECHNOLOGY ADDITIVE

ENHANCED TECHNOLOGY FOR LITHIUM-ION BATTERY FIRE SUPPRESSION

Cold Fire represents the **next generation** of additives for **fire control and suppression**, specifically designed for **lithium-ion battery fires**, leading the advancement in fire extinguishing technology.

This new additive is an environmentally friendly fire extinguishing agent, specially formulated to rapidly suppress and control fires by:

- Cooling hot surfaces.
- Preventing reignition.
- Encapsulating hydrocarbon gases.

Leader in fire suppression technology, it stands out for its exceptional ability to dissipate extreme heat from any material (metal, wood, rubber, etc.) upon contact.

Its high efficiency allows it to be discharged mixed with water at 3%, enhancing the water's cooling power to combat lithium-ion battery fires.

eFP-600
Li-ion Battery Fire Suppression
Powered by Cold Fire

COLD FIRE

NEW GENERATION ADDITIVE

Its unique plant-based sap formula provides a cooling effect **10 times greater** than untreated water. Additionally, its rapid action is due to Cold Fire penetrating the fire **6 times faster** than water alone. As it infiltrates the surface, Cold Fire safely cools the area below its ignition point.

This additive is classified as next-generation due to its **Triple Suppression Technology**, functioning as a **Wetting Agent**, **Encapsulating Agent**, and **Inhibitor Agent**, achieving fire suppression through three distinct mechanisms: reducing the surface tension of water, encapsulating the heat source and fuel, and inhibiting the chain reaction.

PERFORMANCE AS A WETTING AGENT

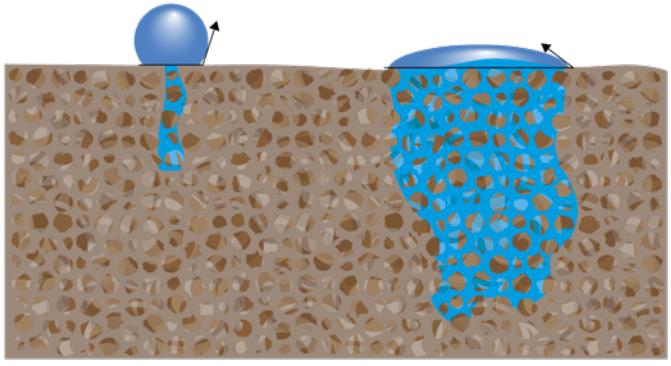
Cold Fire is a wetting agent, as it reduces the surface tension of water to one-third of its value in its pure state. This reduction provides several advantages over water without additives:

- It allows the additive to spread more quickly and penetrate surfaces and fire more effectively.
- It has a penetration factor 6 times greater than water without an additive.
- It produces smaller droplets, resulting in a significantly larger cooling surface area than water alone, allowing for greater contact with the fuel and superior absorption of thermal energy.

REDUCES THE SURFACE TENSION OF WATER AND INCREASES PENETRATION ON SURFACES

Water droplet without Cold Fire:
High surface tension.
Wide contact angle.

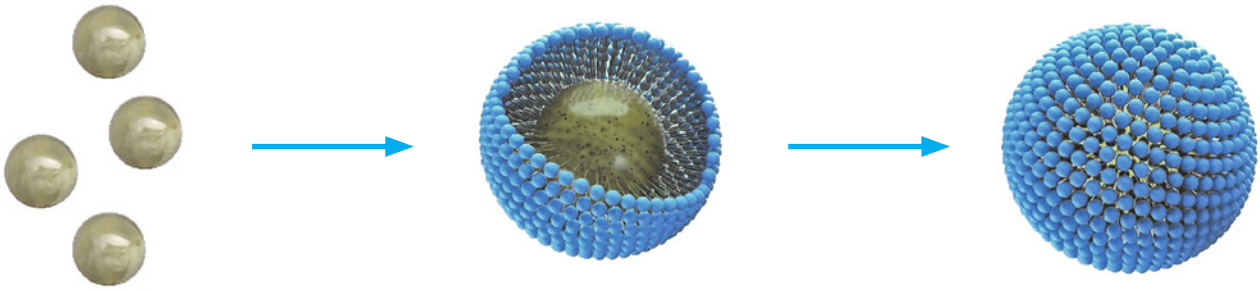
Water droplet with Cold Fire:
Low surface tension.
Reduced contact angle.



ENCAPSULATING TECHNOLOGY FOR FLAMMABLE LIQUIDS AND VAPORS

Cold Fire acts by forming **micelles** at molecular level. This property gives Cold Fire a dual **encapsulation** effect: it interacts with both the macroparticles of water and, at the molecular level, with the hydrocarbons of the fire. The micelles encapsulate the molecules of flammable liquids and vapors, transforming them into non-flammable substances. This property helps prevent the re-ignition potential, which is highly persistent in lithium-ion battery fires.

Additionally, the micelles also encapsulate the smoke produced during the fire, improving visibility and breathing of emergency responders if their intervention is required after the application of this additive.



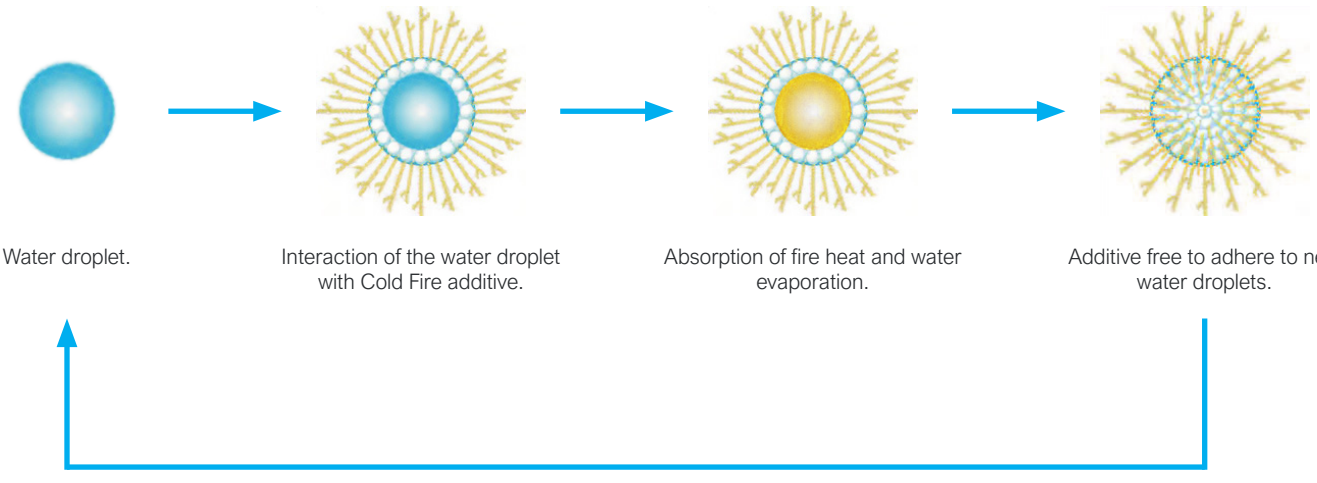
Hydrocarbon gases generated during the fire

Molecular interaction with Cold Fire

Complete encapsulation, micelle formed

The interaction of Cold Fire with water droplets results in the formation of reverse micelles, which act as efficient heat dissipators, creating a cyclical process that enables rapid temperature reduction of the fire:

- The Cold Fire molecules interact with water molecules through their hydrophilic head, forming urchin shaped molecules called reverse micelles.
- The Cold Fire molecules absorb a large amount of heat and transfer it to the interior of the water droplet, which immediately turns into vapor, thus consuming the energy from the fire.
- The released vapor collides with other adjacent water molecules, which then condense back into droplets.
- The newly formed droplets adhere to the Cold Fire, restarting the cycle.



Water droplet.

Interaction of the water droplet with Cold Fire additive.

Absorption of fire heat and water evaporation.

Additive free to adhere to new water droplets.

eFP-600
Li-ion Battery Fire Suppression
Powered by Cold Fire

COLD FIRE

CERTIFICATIONS

COMPLIES WITH NFPA 18 – WETTING AGENTS

Cold Fire complies with NFPA 18 in accordance with the performance and acceptance requirements for wetting agents. It ensures reliable performance and compatibility with fire protection systems. It is UL certified.

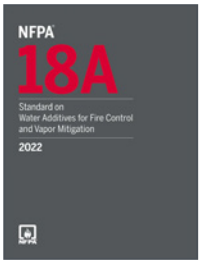
NFPA 18 – Standard on Wetting Agents

This standard establishes the requirements for the performance and use of wetting agents in relation to fire control and extinguishment. It is intended to guide fire fighters, authorities having jurisdiction (AHJs), and other interested parties in judging the acceptability and use of any wetting agent offered for such purposes.

LISTED
WETTING AGENT
2N75

COMPLIES WITH NFPA 18A

Standard on water additives for fire control and vapor mitigation.
7.2 Spill fire test. 7.3 Pool fire test. 7.7 Encapsulating agent.
Spherical stability test of micelles (fuel in liquid phase)



NFPA 18A – Standard on water additives for fire control and vapor mitigation

This standard establishes the minimum requirements for water additives used for the control and/or suppression of Class A and Class B fires and for the mitigation of flammable vapors. It is intended for those responsible for the purchasing, testing, listing, and use of such additives.

COLD FIRE IS 100% BIODEGRADABLE AND ENVIRONMENTALLY SAFE.

The encapsulating agent Cold Fire is not a foam, so it does not contain fluorinated ingredients like perfluorooctyl sulfonate (PFOS) or PFAS. This additive is environmentally safe and 100% biodegradable.

Cold Fire holds UL (Underwriters Laboratories) approvals for both the United States and Canada, and is also listed by the EPA (Environmental Protection Agency) in the USA.

ENVIRONMENTAL BENEFITS

- Environmentally safe
- Does not contain PFOS (perfluorooctane sulfonate)
- Does not contain PFOA (perfluorooctanoic acid)
- Listed in the EPA SNAP Program (USA)
- Non-corrosive
- Non-toxic
- Does not contain fluorides
- 100% biodegradable

CERTIFIED SYSTEMS

CERTIFIED BY APPLUS+ LABORATORIES

The eFP-600 systems with Cold Fire additive have been tested and certified by APPLUS, validating the corresponding Technical Suitability Document (DITE), equivalent to the CE marking for innovative products in sectors where no specific regulations exist, such as in Lithium Ion battery fires. According to the general provision of the Ministry of Industry in its Royal Decree 513/2017:

eFP-600 Li-Ion Battery Fire Suppression
Powered by Cold Fire

COLD FIRE

Applus laboratories

Royal Decree 513/2017 of May 22 (RIPCI), in its Article 5. Technical Suitability Document (DITE):
Products (equipment, systems, or components) for fire protection that are non-traditional or innovative and for which no standard exists, and where there is a risk, must justify compliance with the requirements established in this Regulation through a favorable technical evaluation of suitability for their intended use, carried out by authorized bodies designated by the competent public administrations.

INFORME DE ENSAYO
EXTINTOR PORTÁTIL DE INCENDIOS CON AGENTE eFP-600 PARA UN INCENDIO DE BATERÍA DE ION LITIO.

Report number: 25/32302628 M1
Este informe anula y sustituye el informe 25/32302628 emitido con fecha 21 de marzo de 2025.

Motivo de la modificación: error tipográfico en el título del documento.

LGAI Technological Center, S.A. (APPLUS)
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08193 Bellaterra (Barcelona)
T +34 93 567 20 00
CIF: A-63207492
www.applus-laboratories.com

Applus

EVALUACIÓN TÉCNICA DE IDONEIDAD

No. ETI-2149

Applus

Evaluación Técnica de Idoneidad

LGAI Technological Center S.A. (APPLUS), ha realizado la Evaluación Técnica de Idoneidad con resultado satisfactorio para el producto:

Nº ETI-2172

Fecha de emisión: 05/12/2025

ETI válida hasta: 01/08/2030 mientras no se modifique el producto, ni las condiciones de fabricación en planta, a menos que sean suspendidos o retirados por el Organismo habilitado

Fecha de seguimiento: antes del 31/08/2026

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08193 Bellaterra (Barcelona)
T +34 93 567 20 00
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www.applus-laboratories.com

Applus

EVALUACIÓN TÉCNICA DE IDONEIDAD

No. ETI-2150

EQUIPPED FIRE HOSE REEL

SYSTEM COMPONENTS

- System consisting of 2 modular cabinets painted with oven-baked red RAL3000.
- Hose reel with 20 m of 25 mm hose.
- Viper Spartan: Professional Triple Effect nozzle made of aluminum, with a constant nominal flow rate.
- Dual-mode proportioner: simple water flow with a nominal flow rate of 100 lpm or flow with 3% additive.
- Kugel 1" proportioner with fixed dosing at 3% of Cold Fire. Hose reel certified according to UNE EN 671-1: Fixed fire-fighting installations.
- Shut-off valve.
- Manometer.
- Optional additional 45mm intake.

Includes two 20-liter* Cold Fire container inside the cabinet, with Triple Suppression technology, specialized for lithium-ion battery fires.

System certified by Applus, with Technical Assessment Document No. 2149, for use in lithium-ion battery fires.

DIMENSIONS

- Cabinet with Nozzle and Hose: 58 x 27 x 80 cm
- Cabinet with Additive Tanks: 68 x 27 x 80 cm
- Total: 126 x 27 x 80 cm

Kugel Proportioner at 3%

Professional nozzle.

eFP-600
Li-ion Battery Fire Suppression
Powered by Cold Fire

COLD FIRE

* Available in larger capacities upon request.

AUTOMATIC SPRINKLER

SYSTEM FEATURES

- Fire suppression system specially designed for parking areas with electric vehicles.
- Design according to UNE EN 12845 standard.
- Risk Class: Ordinary Hazard 2 (OH2)
- Design Density: 5 mm/min.
- Suppression Agent: Cold Fire at 3% in water.

System certified by Applus, with Technical Assessment Document No. 2150, for use in lithium-ion battery fires.

SYSTEM COMPONENTS

- K80 nozzles of ½”
- Activation temperature: 68ºC
- System tested by Applus with the activation of only 4 sprinklers.
- Fixed proportioner at 3% for Cold Fire.
- 688 liters of Cold Fire additive.
- Performance time 48 minutes.

eFP-600
Li-ion Battery Fire Suppression
Powered by Cold Fire

COLDFIRE

eFP-600 MOBILE UNIT

SYSTEM COMPONENTS

- Mobile cart with a red polyethylene tank, impact-resistant.
- 100 liters of Cold Fire additive, specially designed for use in lithium-ion battery fires.
- Steel tube frame, painted and mounted on solid wheels, with a parking brake.
- Level indicator band.
- BYPP-200 inline mixer with a 3% dosing system.
- VIPER STI 60P multi-effect nozzle with a nominal flow rate of 200 lpm.
- Two 45mm diameter hoses, 20 meters* in length, arranged in zigzag folding trays for quick deployment, with UNE 45mm couplings.
- Nominal flow rate: 200 lpm.
- Minimum operating pressure: 0.3 MPa.

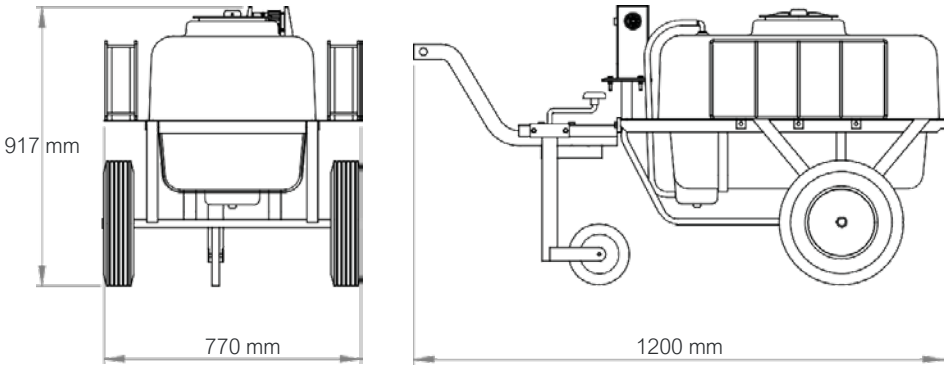
AVAILABLE IN 2 CAPACITIES: 100 AND 200 LITERS

eFP-600
Li-ion Battery Fire Suppression
Powered by Cold Fire

COLDFIRE

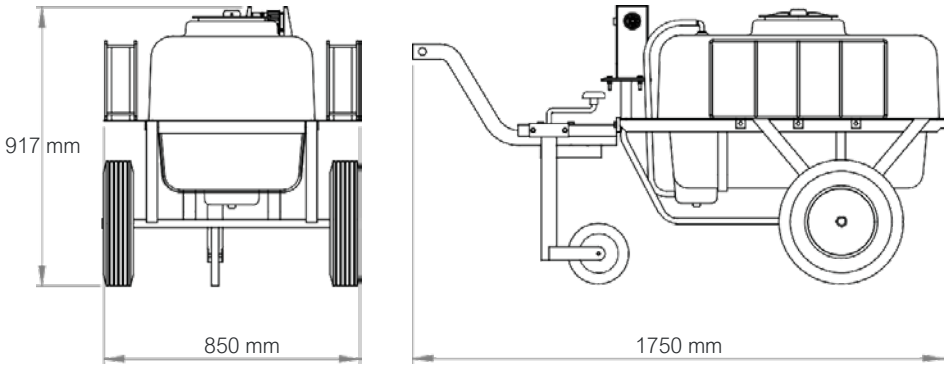
CR100: 100L

- Includes a tank with a capacity of 110 liters.
- 100 liters of Cold Fire additive, specially designed for use in lithium-ion battery fires.
- Emptying time at 3%: 16 minutes.
- Empty weight: 51 kg.



CR200: 200L

- Includes a tank with a capacity of 208 liters.
- 200 liters of Cold Fire additive, specially designed for lithium-ion battery fires.
- Emptying time at 3%: 32 minutes.
- Empty weight: 67 kg.



* Available in 25 mm hose

EXTINGUISHERS FOR BATTERIES

SYSTEM COMPONENTS

The Cold Fire fire extinguishers are designed for quick action in suppressing fires in Lithium-Ion battery packs.

They consist of water + **Cold Fire at 3%**, a fire extinguishing agent with **Triple Suppression Technology**: it acts as a **wetting agent, encapsulator, and inhibitor**. It multiplies the cooling power of water, encapsulates flammable gases, and prevents the re-ignition of lithium-ion batteries. It is a 100% biodegradable and environmentally safe agent.

Its great mobility and easy handling allow for controlled, effective, and targeted application, making it ideal for environments with electronic devices, electric scooters, etc. Tested according to NTA 8133 standards.

System certified by Applus, with a Technical Suitability Document (DITE) for use in Lithium-Ion battery fires. Complies with EN 3-7 standard.

Applus laboratories

CERTIFIED

eFP-600
Li-Ion Battery Fire Suppression
Powered by Cold Fire

COLDFIRE

SPECIFICATIONS

	Extinguisher 9 L.	Extinguisher 50 L.
Suppression Agent	Water + 3% Cold Fire	Water + 3% Cold Fire
Agent Quantity	9 L	45 L
Compressor Agent	25g Nitrogen	650g Nitrogen
Class A Fires	✓	✓
Class B Fires	✓	✓
Lithium-Ion Fires	✓	✓
Design Pressure	15 bar	20 bar
Height	59,5 cm	88 cm
Average Total Weight	13,6 kg	76,15 kg
Discharge Range	40 cm	5 m
Service Temperature	0 - 55 ºC	0 - 55 ºC

ELECTRIC BICYCLE PARKING

PARKING FOR BIKES

It is a parking system for electric and conventional bicycles with an integrated fire extinguishing system that ensures protection in case of ignition. The system is specially designed for fires in Lithium-Ion Batteries.

It is an automatic fire detection system triggered by temperature. Once activated, the extinguishing action relies on a mixture of misted water and Cold Fire additive at 3%.

Its effectiveness is based on the combination of the encapsulation power of Cold Fire with its Triple Suppression Technology and the atomization of water through high-pressure nozzles. This results in a misted water and Cold Fire additive mixture, providing high cooling power in the protected space.

System certified by Applus, with Technical Assessment Document No. 2172, for use in lithium-ion battery fires.

eFP-600
Li-Ion Battery Fire Suppression
Powered by Cold Fire

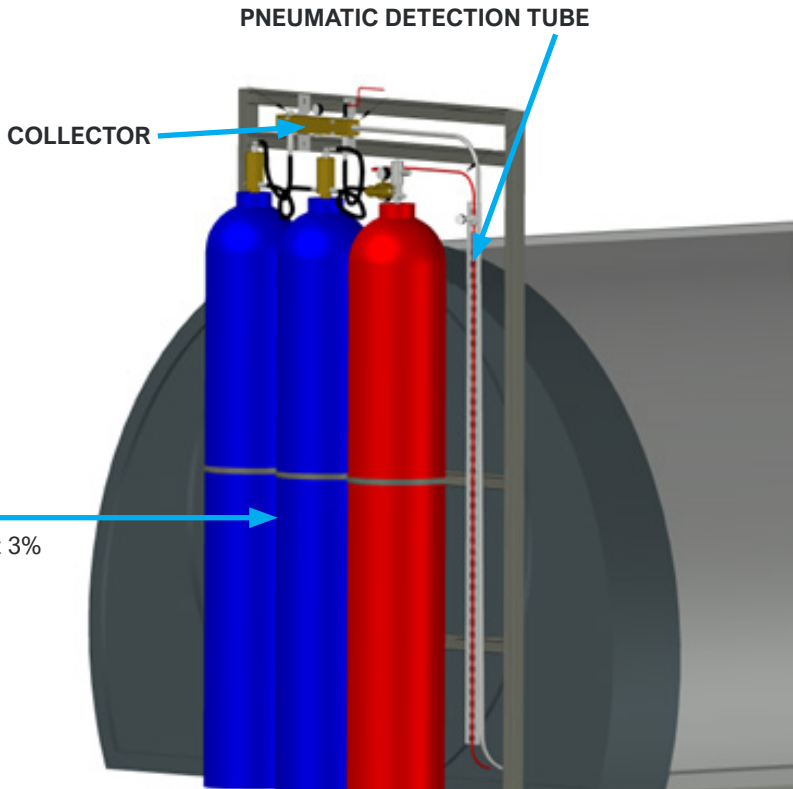
COLDFIRE

CERTIFIED

COMPONENTS

It is a fully autonomous system that does not require electrical power or a water supply, and consists of:

- 2 Water Cylinders with interior treatment, each with a capacity of 80 liters, filled with deionized water containing a 3% concentration of Cold Fire (2.4 liters per cylinder).
- 1 Cylinder of 80 liters of pressurized N2 at 200 bar, equipped with a discharge valve.
- High-pressure misted water nozzle.
- Detection system with a pneumatic detection tube connected to the discharge valve. Activation temperature: 130ºC.



OPERATION

Upon reaching the activation temperature, the detection tube will rupture, causing a drop in pressure. The differential pressure valve will open, triggering the discharge of the misted water system with Cold Fire additive through the nozzle at a maximum pipe pressure of 100 bar.

The system is designed for dual action:

- Water discharge with Cold Fire for 25 minutes to control/suppress the fire. Once activated, the immediate effect is to quickly lower the temperature inside the parking area.
- N2 discharge for 35 minutes, once the misted water discharge is complete, to ensure proper ventilation of the hangar and avoid risks associated with the presence of toxic fumes from the combustion of Lithium-Ion batteries inside the hangar.

SYSTEM CERTIFICATIONS

System tested and certified by the Applus laboratory for the control and suppression of Lithium-Ion Battery Fires in bicycles inside the Hangar:

- Complete hangar protection for 60 minutes.

Key milestones achieved during testing:

- Flame control within the first 2 minutes after system activation.
- Complete fire suppression after 5 minutes of water and Cold Fire discharge.
- The system completely prevented the re-ignition of the flame.

DITE Certificate: Technical Suitability Document with a number certifying its suitability for the suppression of Lithium-Ion battery fires.

Applus laboratories

FIRE EXTINGUSHING BY GAS

INERT GASES: IG01, IG55, IG100 E IG541

Inert gases do not undergo chemical reactions under normal pressure and temperature conditions. They are not harmful to the environment and are safe for human exposure. These gases are economically competitive, and the cylinders can be placed at a distance from the area to be protected.
The main inert gases used in fire protection are nitrogen (N), argon (Ar), and, in small amounts, carbon dioxide (CO).

IG01. 100% argon.
IG100. 100% nitrogen.
IG55. 50% argon + 50% nitrogen.
IG541 52% nitrogen + 40% argon + 8% carbon dioxide.

FEATURES AND ADVANTAGES.

- Constant pressure discharge technology, reducing pressure to 40/60 bar at the valve outlet.
- Quiet discharge.
- Allows the use of low-pressure collectors and pipes, reducing installation costs and simplifying the process.
- Cylinders of 80L or 140L with working pressures of 200 and 300 bar.
- UL and FM certification.
- Solenoid activation.
- No residues, nothing to clean up after discharge.
- No chemical reactions.
- Wide range of nozzles, including silence nozzle for noise reduction during discharge.
- Safe for the environment.

CLEAN AGENT FK-5-1-12

EXTINGUISHING AGENT FK-5-1-12.

Fire extinguishing systems using the clean agent FK-5-1-12 provide a proven, rapid, and safe extinguishing solution for use in occupied areas.

The options to operate with two working pressures of 25 bar or 50 bar provide flexibility in installations and adaptability to various types of risks.

The system is environmentally friendly, with zero ozone depletion potential (ODP) and a global warming potential (GWP) of 1, indicating it is negligible.

CLEAN AGENT FK-5-1-12

PRIMARY APPLICATIONS.

- Data processing centers (DPC).
- Museums, archive rooms.
- Industries, transportation, aviation.
- Healthcare facilities, universities, and educational centers.

FEATURES AND COMPONENTS.

- Cylinders capacity from 30L to 180L.
- Two working pressures of 25 or 50 bar.
- Filling ratio up to 1.2 kg/L.
- Results in space savings compared to inert gases and CO2.
- Reduction in installation and maintenance costs.
- No residues after discharge.
- Completely safe for humans.
- Same hardware for two technologies, NOVEC 1230 and FK-5-1-12.

ADVANTAGES.

- Non-conductive electrically
- Rapid discharge, only 10 seconds.
- No residues, nothing to clean up.
- Easy to refill.
- Safe for the environment.

ILP AND DLP SOLUTIONS FOR PCI SYSTEMS

FIRE SUPPRESSION SYSTEMS FOR ELECTRICAL PANELS

The new Engineered Fire Piping suppression systems allow for the rapid detection of heat or flame and the discharge of FK5-1-12 extinguishing agent for fire suppression. This gas is completely colorless and non-conductive, and is considered a clean agent due to its zero environmental impact and the absence of visible residues after use.

Depending on the discharge type of the FK5-1-12 agent, there are two systems:

DLP SYSTEM:

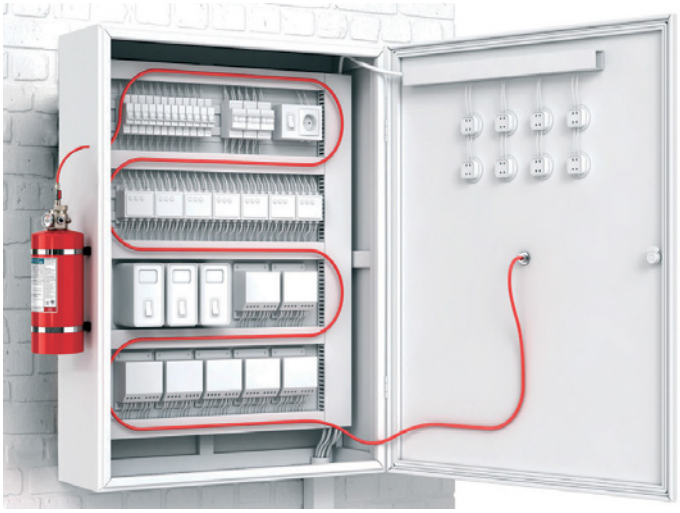
These systems are equipped with a pneumatic tube designed for direct detection of heat or flame generated at any point within the electrical panel. Exposure to heat or fire causes the tube to rupture, triggering the immediate and targeted release of the extinguishing gas at the fire's source, ensuring a fast and effective intervention.

ILP SYSTEM:

These systems also include pneumatic detection tubes for heat or flame. Their rupture activates and opens a differential pressure valve, allowing the extinguishing gas to be discharged through a nozzle network, ensuring proper dispersion and effectiveness within the electrical panel.

DLP AND ILP SYSTEM

DLP SYSTEM



Direct Low Pressure Technology

- LPCB certification available on request.
- Effective for any type of electrical panel.
- Full volume protection.
- Adaptable to the layout of the electrical panel.
- Automatic detection.
- Available in two capacities depending on the FK-5-1-12 extinguishing agent load: 1.36 kg and 3.18 kg.
- Pressurized at 16 bar for fast and effective gas discharge.
- Designed for volumes up to 2 m³ according to LPCB Standard LPS 1666.

ILP SYSTEM

Indirect Low Pressure Technology

- UL and FM certification available on request.
- Effective for any type of electrical panel.
- Full volume protection.
- Adaptable to the layout of the electrical panel.
- Various capacities available.
- Automatic detection.
- Available in three capacities.
- Pressurized at 25 bar for fast and effective gas discharge.
- Designed for volumes up to 10.2 m³ according to FM.

LOW PRESSURE WATER MIST

LOW PRESSURE WATER MIST EXTINGUISHING SYSTEM

Low-pressure water mist represents an advancement in fire extinguishing compared to high-pressure water mist. The concept is similar to traditional high-pressure systems operating at 100 bars, but it functions at pressures close to 16 bars, offering several advantages.

ADVANTAGES.

- High extinguishing capacity.
- Thinner piping and significantly lower power demand.
- Greater simplicity in installation and reduced assembly costs.
- Water savings of 60% to 80%.
- Reduction of water damage.

FM APPROVED

PRODUCTS

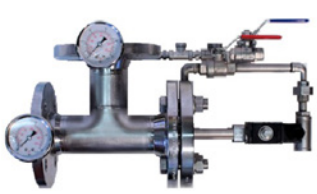
All our products have been successfully tested by fire testing laboratories with ISO 17025 certification and approved by third parties to meet international approval standards for components of water mist systems for fire protection.

Wide range of low-pressure water mist products approved by FM and certified according to EN 14972 for commercial and industrial applications.

- Medium and high-speed water mist nozzles, FM approved for heavy industrial and offshore applications.
- Space machineries of up to 4,610 m.
- Sidewall water mist nozzle, allowing horizontal discharge.
- Complete low-pressure water mist system solution approved by FM for the protection of data centers rooms/corridors, including false ceilings and floors, in accordance with FM standards.
- Certified Nozzles for risk protection, OH1, up to 6 m and 12 m heights, OH2, OH3.
- Special applications such as hangars, road tunnels, cable galleries, parking garages, wind turbines, atriums.
- Wide range of low-power pressure groups, with all pump components in contact with water made of stainless steel.
- Stainless steel Deluge and pre-action valves.

FM APPROVED VALVES (PART OF THE SYSTEM)

- Deluge valves.
- Pre-action valves.
- Non-return valves.



ACCESORIES AND VALVES

GROOVED COUPLINGS AND FITTINGS

Our accessories are UL and FM approved. Available in Red RAL3000 painted finish and hot-dip galvanized. Also available in any RAL color upon request.

Rigid and flexible coupling

Mecanical T and flange adaptors

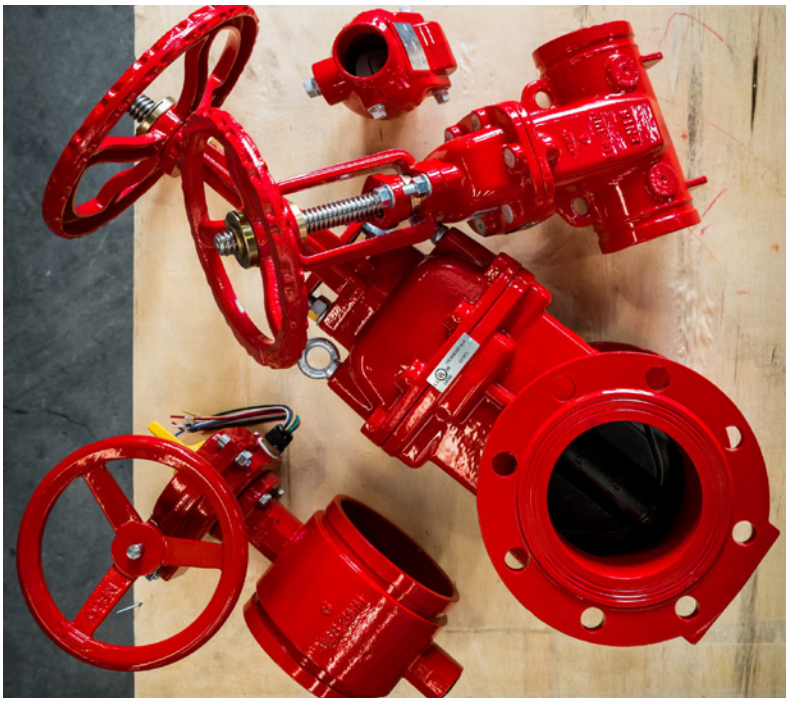
Outlet for sprinkler

TEE - Elbow 90º - Elbow 45º

Concentric reducer

Caps

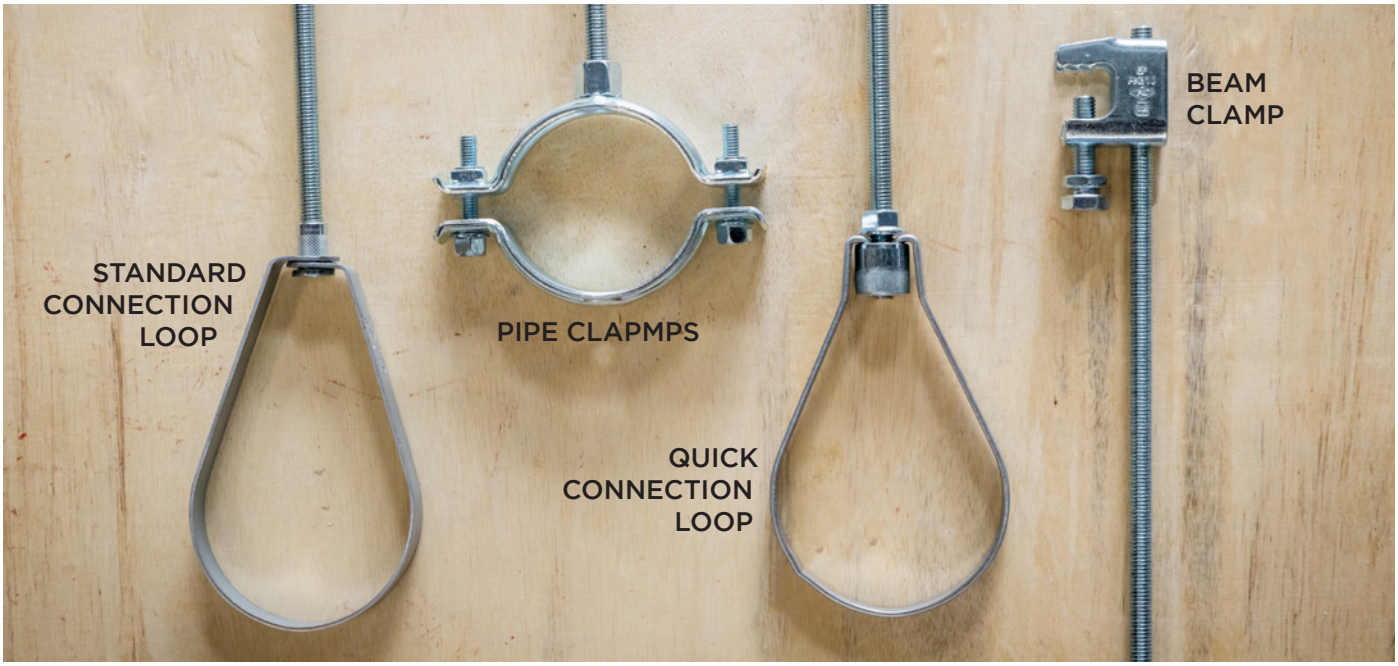
VALVES



Valves

- Grooved butterfly.
- Grooved gate valves os&y.
- Gate valves os&y flange.
- Grooved check valves.

SUPPORTS



SEISMIC BRACING

The technical specification CEN/TS-17551 specifies the seismic protection requirements for automatic sprinkler systems and piping systems and requires the protection in earthquake zones in accprdance to EN 1998-1:2004 3.2.1 and for areas subject to peak ground acceleration above 9% of G.

nVent CADDY product range is designed to offer superior performance at seismic loads, meeting the requirements of FM, NFPA and the new CEN/TS.

Bar joist attachment.

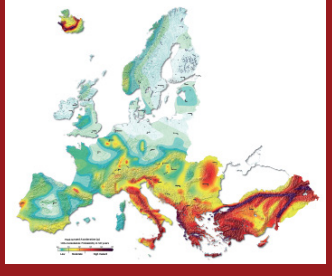
Adjustable i-beam adaptor

Quick grip lateral sway brace.

Cable bracing.

SEISMIC RISK

In areas with seismic risk it is important to protect fire extinguishing systems against damage caused by earthquakes.



HYDRANTS AND CABINETS

4” DRY BARREL HYDRANT (DN100)

- Column hydrant with automatic draining for frost protection.
- Easy connection of hoses and firefighting equipment.
- With one 4” BSP firefighter coupling (FV factor DE 187) + two 2 1/2” BSP outlets (FV factor 130) with forged aluminum Barcelona couplings.
- Service pressure of 16 bar and test pressure of 25 bar.
- Exclusive use by firefighters.

4” UNDEGROUND HYDRANT (DN100)

Fire Protection undeground hydrant with 1 or 2 outlets according to UNE 23400. Straight entrance to flange pipe DIN PN-16 of 4”, painted in red. Product marked CE caccording to Construction Products Directive 89/106 CE and manufactured according to Standard UNE-EN.

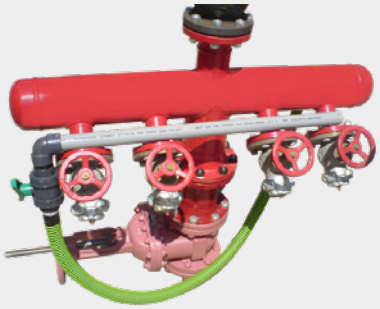
1 OUTLET
(100 MM - PUMPER OUTLET AND CAP)

2 OUTLETS
(70 MM - OUTLETS WITH BARCELONA COUPLING AND CAPS)

WET BARREL FIRE PROTECTION HYDRANTS AND STRAINERS FOR PETROCHEMICAL USE

Temporary and permanent refinery gasked strainers.

REPSOL WET BARREL HYDRANT



CEPSA WET BARREL HYDRANT

PETRONOR WET BARREL HYDRANT

OUTSIDE HOSE HOUSE WITH PYRAMIDAL LEG

Set made of reinforced polyester with fiberglass that guarantees a very high resistance to the weather. Hardware in stainless steel material.

Set consisting of two pieces:

1. Cabinet with a canopy built in red polyester resin RAL 3000 reinforced with glass fiber. White reinforced polyester door and white door. (With interior compartment)
2. Pyramidal pedestal to anchor to the ground RAL 3000.

The equipment included is for standard use, according to CEPREVEN.

FOAM EQUIPMENT

• FOAM CHAMBERS FOR TANKS.

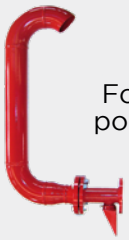
- Material: Carbon Steel or Stainless Steel.
- Foam Maker included.
- Range: From 159 lpm - 2055 lpm.
- Manufacturing of floating roof tanks Rim Seal Deflector

Cone roof tanks

Floating roof tank

• DIKED AREA FOAM POURER.

- Material: Carbon or Stainless Steel.
- Foam Maker included.
- Range: From 159 lpm - 2055 lpm.



Foam pourer.

• WATER/SELF-EDUCTING NOZZLES.

- Material: Bronze or Aluminium.
- Water and Water-Foam Self educting nozzles. Up to 2838 lpm.

Water monitor

Foam monitor nozzle

• WATER SPRAY.

- Material: Brass or Stainless Steel.
- Surface Cooling Range: 1/2” - 1” (BSP-NPT).

Boquilla cortina JET

Boquilla cortina WD

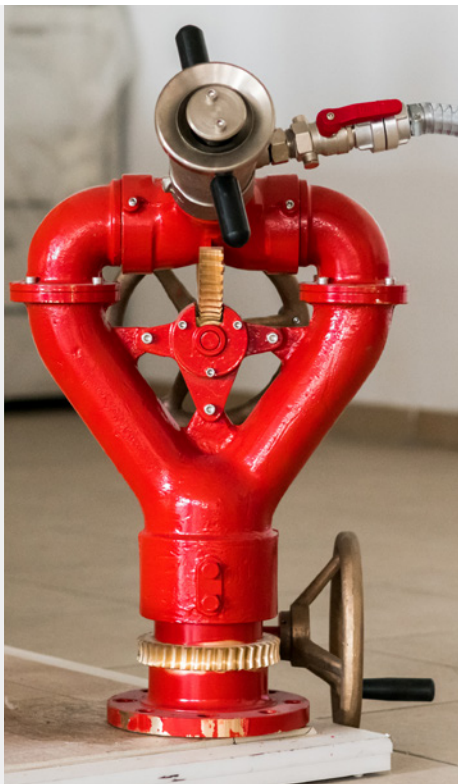
• MONITORS.

- Material: bronze and stainless steel.
- Different models: Handwheel or lever operated monitors.
- Flanges ANSI 150# - DIN PN16 Up to 4500lpm.

M. eFP-900-2V

M. inox eFP palanca

M. Akron Omega



FHR: FIRE HOSE REEL

25 mm Fire Hose Reel, based on its DEV reel with a capacity for 20 or 30 meters of 25 mm semi-rigid hose.

FIRE HOSE REEL WITH CABINET (ON DEMAND).
Based on the DEV reel, mounted inside a cabinet with a hinged door, designed to be fixed to the wall. Cabinet box made of steel (thickness = 0.8 mm - galvanized). Door with concealed hinges made of sheet metal (thickness = 1 mm - painted), solid or with a window. Aluminum frame flush with the wall with a foldable handle.

Fire hose reel with cabinet with window

Fire hose reel with cabinet without window

FIRE HOSE REEL WITHOUT CABINET..
To be mounted directly on the wall, inside niches, or in multifunction cabinets. Includes DEV reel equipped with semi-rigid hose and all components of the fire hose reel.

HORSE REEL ACCESSORIES.

FREE STANDiNG HOSE REEL AND CABiNET

FREE STANDiNG HOSE REEL (WITHOUT CABINET)

CABiNET AND HOSE REEL STAND

ARM: FIRE HOSE REEL (RIA)

RIA WITHOUT CABINET..
Arm Fire Hose Reel based on its DEV-pivoting reel with a capacity for 30 meters of 25 or 33 mm semi-rigid hose. Without a cabinet, it is designed to be mounted directly on the wall, inside niches, or in multifunction cabinets.

25 mm RIA FOR DIRECT MOUNTING WITHOUT CABINET
Includes the DEV-pivoting reel equipped with 30 meters of 25 mm semi-rigid PVC hose in black, 1" chrome-plated brass ball valve operated by lever, brass nozzle with resin coating, and easy-fit pivoting mounting bracket.

33 mm RIA FOR DIRECT MOUNTING WITHOUT CABINET
Includes the DEV-pivoting reel equipped with 30 meters of 33 mm semi-rigid PVC hose in black, 1 1/2" brass ball valve operated by wheel, brass nozzle, and easy-fit pivoting mounting bracket.

RIA WITH CABINET (ON DEMAND)..
RIA based on its DEV-pivoting reel with a capacity for 30 meters of 25 mm semi-rigid hose. With a cabinet designed to be mounted directly on the wall, inside niches, or in multifunction cabinets.

25 mm RIA FOR DIRECT MOUNTING WITH CABINET
Includes the DEV-pivoting reel equipped with 30 meters of 25 mm semi-rigid PVC hose in black, 1" chrome-plated brass ball valve operated by lever, chrome-plated brass nozzle with resin coating, and mounting bracket with pivoting arm and flexible supply hose.

RIA with cabinet without window

RIA with cabinet with window

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