05/2023

TIGRE

Irrigation Line

Technical Catalog and Products

Grupo TIGRE
A better world is at work.

A BETTER TOMORROW FOR EVERYONE. THAT IS HOW WE LEAVE A MARK ON THE WORLD.

Each of our actions or products have a unique purpose: build a better world for everyone.

A better world for our workers who, united and guided by solid values, create innovative solutions to turn people's dreams into reality.

A better world for our customers, who rely on and trust the technology of a world-leading brand.

A better world for the planet, with every drop of its most precious natural resource respected and preserved with care.

We are today a multinational company admired worldwide, with 24 manufacturing sites (10 in Brazil and 14 abroad), operating in over 40 countries. That is the result of the work of over 5,000 dedicated employees.

We are proud of those figures; but what really inspires us, is to know that a better world is at work.

For Tigre, it will become even better for everyone.

Our solutions

Whether you are building or renovating, count on Tigre! We have over 75 years of history and innovation with complete product lines for each stage of your project. As important as having a pioneer and transforming posture is to provide millions of Brazilian homes with solutions that guarantee ease and comfort. Either for home renovation, industrial building works, real property and artistic paining, plumbing fixtures, drainage projects, sanitation, agriculture and livestock, mining, or other applications, Tigre ensures innovative solutions for any stage. And the best part: they are easy to install and very secure.

- Water
- Sewage
- Drainage
- Accessories
- Electrical
- Painting Tools - Real Estate
- Painting Tools - Artistic
- Industry
- Irrigation
- Infrastructure
- Firefighting Systems
- Residential Gas
- Tigre Metais

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Irrigation

Agriculture depends on advanced drainage and irrigation models, with differentiated technological innovations, to operate the systems effectively and rationally. Tigre provides fixed and portable sprinkler systems for water and energy savings, increasing productivity in agribusiness and preserving the environment.

TigreMax Agro

FIXED SYSTEMS

1. TigreMax Agro

TIGRE developed the TigreMax Agro Line as a solution for the conditions of fixed high-pressure water mains in permanent irrigation systems..

1.1. Function/Application

These pipes are designed for conducting and distributing pressurized water in buried piping networks of irrigation and fertigation systems.

1.2. Benefits and Differentials

Productivity
The lower weight and practicality of the JEI joint provides greater speed and agility in the installation and maintenance of networks, in addition to avoiding inventory and lack of rings on site.

Pressure Resistance
Higher pressure classes than traditional PVC pipes.

Mechanical resistance
High impact, fatigue and cracking resistance: Due to the orientation of the molecules and the lamellar structure of PVC-O, it presents high resistance to impact, fatigue, and cracking.

Chemical Resistance
Non-toxic and highly resistant to corrosion and abrasion.

Interchangeability
With cast iron pipes and "Irriga LF DEFoFo" pipes in all their extension.

Guaranteed tightness
The elastic joint system integrated into the pipe pocket eliminates the possibility of its displacement during the execution of the joint.

1.3. Technical Characteristics

1.3.1 Pipes

Material: Pipes made from oriented unplasticized polyvinyl chloride (PVC-O) compound.

Color: White with blue stripes.

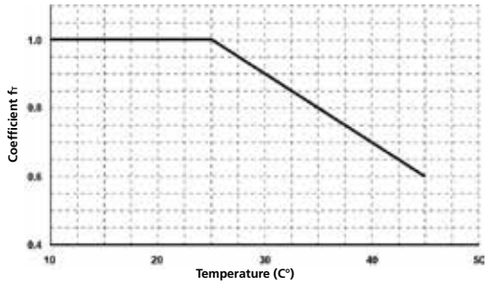
Joints: Integrated Elastic Joint (IEJ).

PIPE GAUGES: The TigreMax Agro line is available in DN 100, DN 150, DN 200, DN 250, DN 300 and DN 350 diameters.

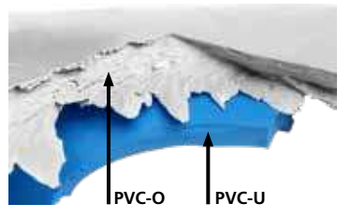
Length of spigot/socket pipe: 6.0 m.

MRS 50: Tigre is the only manufacturer of PVC-O that achieves the minimum required strength of 50 MPa in the TigreMAX product line, resulting in pipes with higher mechanical resistance than required.

Pressure class at 25°C/77°F temperature: PN 14.5 (14.5 Kgf/cm²) and PN 18 (18 Kgf/cm²). Additional correction factor "fₜ" for calculating the nominal pressure in case of use with temperatures between 25°C/77°F and 45°C/113°F.



Manufacturing: Process of extruding PVC pipes that, after extrusion, undergoes an orientation process with Molecor® technology, which orients the molecular chains of PVC in the direction of the main stresses (circumferential and longitudinal), forming a lamellar structure.



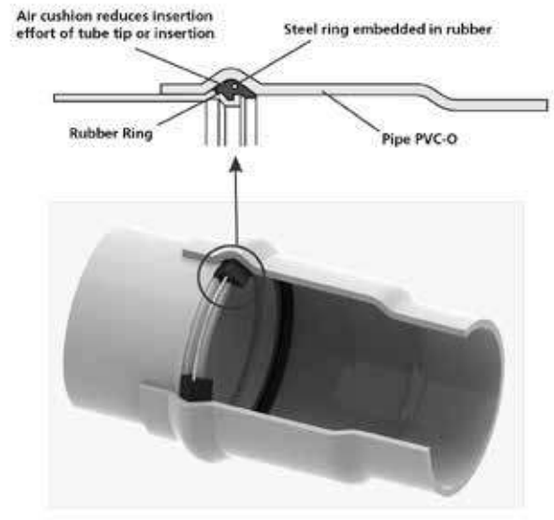
© MolecorTecnología S. L.

1.3.2 Sealing System

Material: Lip ring with metallic core embedded in the rubber.

Color: Black.

Manufacturing: Made of EPDM (ethylene-propylene-diene monomer).



Below is a list of reference standards that govern the manufacture of the TigreMax Agro line. These standards ensure excellent performance and provide a high degree of safety to the installations.

REFERENCE TECHNICAL STANDARDS	
NBR 15750	PVC-O pipes (oriented unplasticized polyvinyl chloride) for pressurized water or sewage transport systems - Requirements and test methods.
NBR 17015	Execution of linear works for the transport of raw and treated water, sewage, and urban drainage, using rigid, semi-rigid, and flexible pipes.
NBR 7676	Elastomeric thermoset sealing elements for pipes, fittings, equipment, components, and accessories for water, sewage, drainage, stormwater, and hot water – Requirements.
ISO 16422	Unplasticized poly(vinyl chloride) (PVC-O) pipes and fittings for the conveyance of water under pressure - Specifications.

1.4. Handling

1.4.1. Transport

Avoid exposing the material to strong impacts and friction with stones, metal objects, and sharp edges in general.

The support surface must be flat since the pipes must not undergo bending efforts for a long time.

In loading and unloading operations, shocks, knocks and friction must be avoided, especially on the tips and pockets. Pipes must always be carried, not dragged.

1.4.2. Storage

It must be in an easily accessible and shady place, free from direct action or continuous exposure to sunlight (sheltered place).

It is very important that the support structure is level and that the pipes have at least one support every 1.5 linear meters.

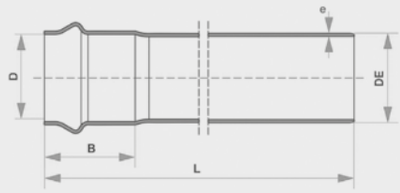
It is recommended to stack them in a firewood or longitudinally aligned shape, in piles that do not exceed 1.5 m in height.

"Irriga LF" pipes should be stored with male and female ends alternated, without the sockets touching each other.

For temporary protection of the pipes, we recommend making a wooden structure that is easy to disassemble and, on top of this, a covering with tiles, in such a way that the pipes are 30 to 50 cm away from the roof, so that the heat does not damage them.

1.5. TigreMax Agro Line Items

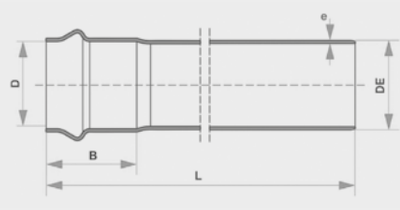
• PVC-O Pipe TigreMax Agro PN 14,5



DIMENSIONS (MM)

CÓDIGO	GAUGE	B	D	DE	e	L
100021420	100	133	119,1	118	2,6	6.142
100021421	150	145	171,3	170	3,7	6.158
100021422	200	163	223,7	222	4,9	6.181
100021423	250	188	276,1	274	6,0	6.209
100021424	300	206	328,5	326	7,2	6.231
100021425	350	227	380,8	378	8,3	6.256

• PVC-O Pipe TigreMax Agro PN 18



DIMENSIONS (MM)

CÓDIGO	GAUGE	B	D	DE	e	L
100021426	100	133	119,1	118	2,9	6.142
100021427	150	145	171,3	170	4,1	6.158
100021428	200	163	223,7	222	5,4	6.181
100021429	250	188	276,1	274	6,7	6.209
100021430	300	206	328,5	326	8,0	6.231
100021431	350	227	380,8	378	9,2	6.256

HDPE

FIXED SYSTEMS

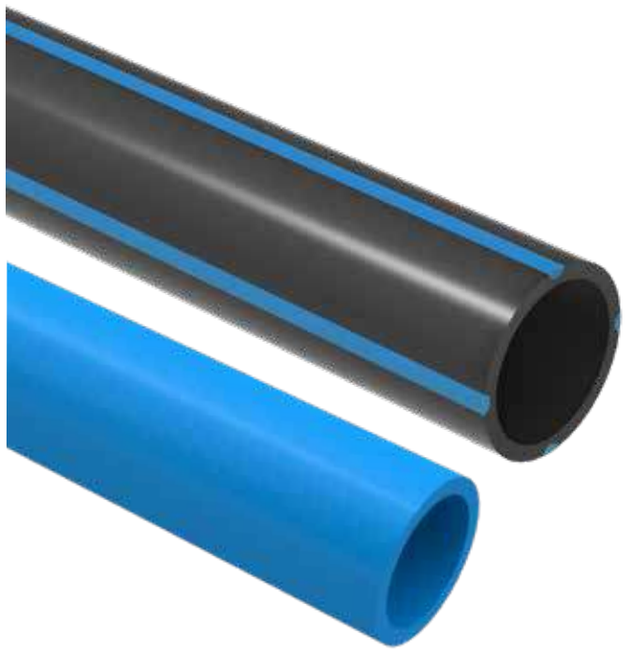
2. HDPE

TIGRE has a polyethylene pipe system that ensures greater flexibility in water and sewage network projects. Polyethylene is a thermoplastic material intended for various applications due to its characteristics of low roughness, corrosion resistance, high flexibility, among others.

Its service life is at least 50 years, a time proven through tests carried out by the raw material supplier and by Tigre S/A itself, always using high-quality virgin raw material.

2.1. Function/Application

Transport of water and sanitary sewage in pressurized networks.



2.2. Benefits and Differentials

Resistant
It has resistance to stress-cracking and impact resistance, in addition to high chemical and abrasion resistance.

Flexible
Lightweight and flexibility, allowing for long radius bends in the trench (20xED).

Tightness
Excellent weldability.

Corrosion resistance
HDPE pipes are immune to corrosion and are not affected by galvanic corrosion or aggressive soil action.

Better hydraulic performance
Excellent hydraulic characteristics due to the smooth inner surface.

Durable
High service life. Tigre guaranteed quality.

Non-toxic
The material does not impart any taste or odor to the water.

Lightweight
Ease of transport and handling due to the lightness of the bars.

2.3. Technical Characteristics

Color: Blue and Black with Blue stripes.

Supply: Coils and Bars.

Pressure classes: PN 8 to PN 25Kgf/cm2.

Resistance to U.V rays.

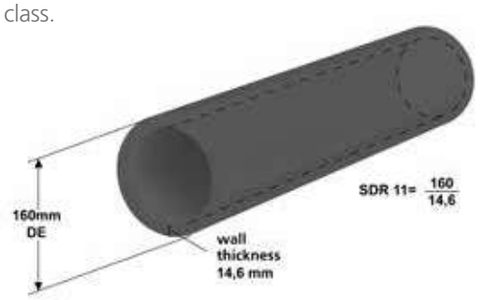
Below is a list of reference standards that govern the manufacture of HDPE. These standards ensure excellent performance and provide a high degree of safety to the installations.

REFERENCE TECHNICAL STANDARDS	
NBR 15561	Polyethylene piping PE 80 and PE 100 for transporting water and sewage under pressure.
NBR 15802	Buried systems for water distribution and sewerage transport under pressure - Requirements for projects using PE 80 and PE 100 polyethylene pipes with nominal external diameter between 63 mm and 1600 mm.
NBR 14464	Plastic pipes and fittings - Butt fusion jointing of polyethylene (PE) pipes and fittings
NBR 14465	Plastic pipes and fittings - Union by electrofusion welding in PE 80 and PE 100 polyethylene pipes and fittings.

2.4. Instructions

2.4.1. Assembly / Installation

SDR (Standard Dimensional Ratio)
It is a dimensionless value that relates to the outside diameter and minimum wall thickness of the pipe. Each SDR associated with the compound in which the pipe (PE 80 and PE 100) was manufactured represents a pipe pressure class.



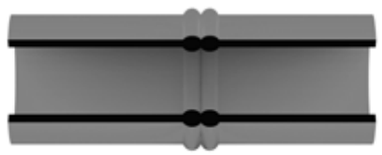
2.4.2. Weldable Joints

- Polyethylene, despite not accepting any type of plastic adhesive, is easily fusible under the effect of temperature.
- Weldable joints can be made by electrofusion or thermo-fusion process (butt weld). These processes fuse the materials in contact, forming a unique set.

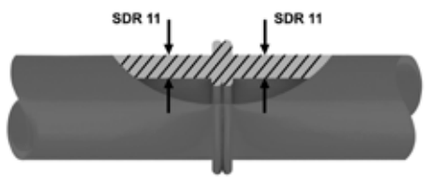
Note: We do not recommend socket welding.

2.4.3. Butt Fusion Welding

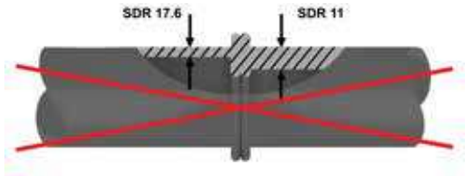
A welding process that makes use of specific equipment, in which two ends of pipe/fittings are simultaneously heated and pressed against each other. The result is the fusion of the two ends. One way to verify the quality of the weld is by observing the weld bead that forms on the bottom and exterior of the pipe.



Products with the same SDR and the same compound or with the same SDR and different compounds (PE 80, PE 100) can have their joint made by butt fusion welding. In the case of butt fusion welding with the same SDR and different PE, verify the pressure conditions of the network.



Products of different SDR cannot have their joint performed by thermofusion (butt weld).

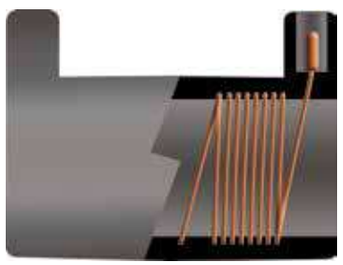


It is recommended to protect the area to be welded against the weather.

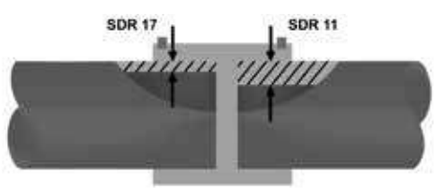
2.4.4. Electrofusion

Welding process in which a controlled intensity electric current passes through a resistance present in the fitting, heating it and transferring sufficient energy to the pipe to fuse the two elements.

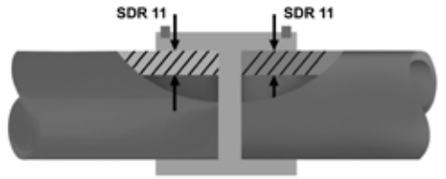
The execution of electrofusion welding is performed using a device (electrofusion machine) that controls the voltage supplied to the fitting (39.5V) and the time required to reach the fusion temperature and cooling of the elements.



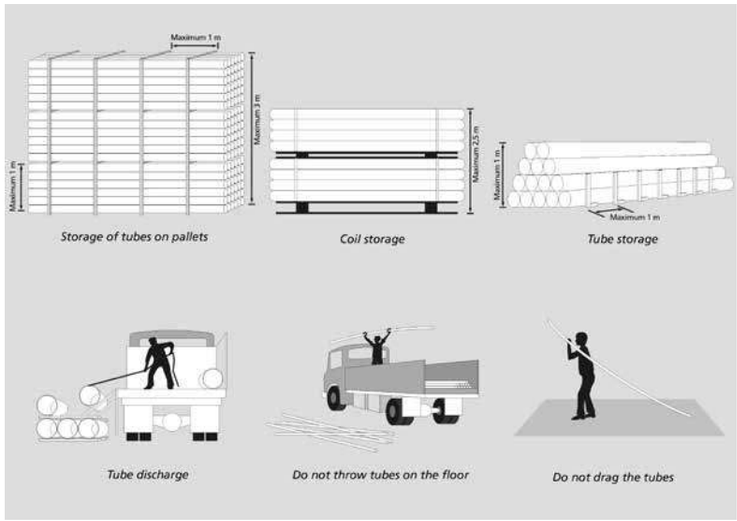
Products of different SDR can be electrofusion welded.



Products of the same SDR and different compounds can be electrofusion welded.



2.4.5. Handling



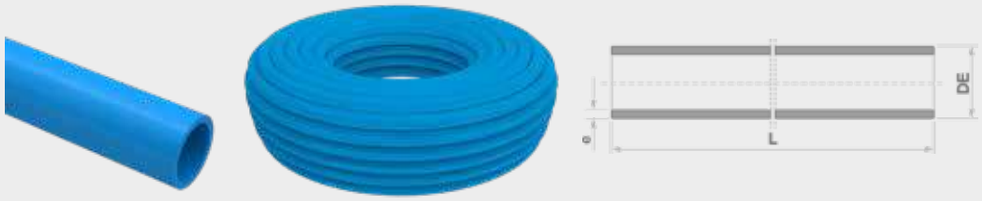
- Store the materials in the packages, in covered areas, protecting them from the weather, preferably in flat places, free of stones or sharp materials that could damage the surface of the pipes.
- Store materials with maximum heights and maximum support spacing allowed.

2.4.6. Storage

- Storage of coils: maximum height: 1.5 m or two layers (whichever is smaller).
- Pipe storage: maximum height: 1.8 m or 12 layers (whichever is less).
- Storage of pipes on pallets: maximum height: 3 m, segmented in layers of 1 m.

2.5. HDPE Line Items

• HDPE Pipe Extension Building PE 80 / PN 10 - Blue



DIMENSIONS (MM)

CÓDIGO	GAUGE	DE	e	L
10101395	20	20	2,3	50.000
10101417	20	20	2,3	100.000
10101352	32	32	3	50.000
10101344	32	32	3	100.000

• HDPE Pipe Extension Building PE 100 / PN 12 - Blue

DIMENSIONS (MM)

CÓDIGO	GAUGE	DE	e	L
100021323	20	20	2,3	50.000
100021325	20	20	2,3	100.000
100021324	32	32	3	50.000
100020805	32	32	3	100.000

• HDPE Pipe Extension Building PE 80 / PN 10 - Black

DIMENSIONS (MM)

CÓDIGO	GAUGE	DE	e	L
10101441	20	20	2,3	50.000
10101433	20	20	2,3	100.000
10101530	32	32	3	50.000
10101522	32	32	3	100.000

• HDPE Pipe Extension Building PE 100 / PN 12 - Black

DIMENSIONS (MM)

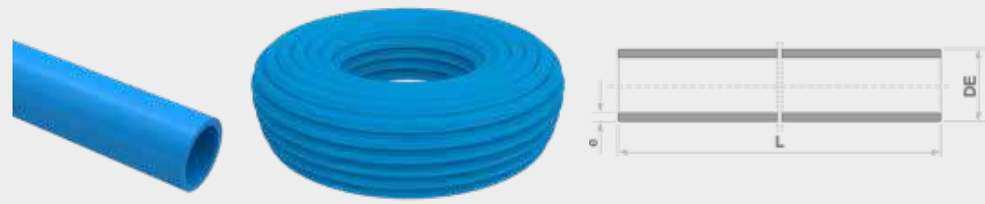
CÓDIGO	GAUGE	DE	e	L
100021320	20	20	2,3	50.000
100021322	20	20	2,3	100.000
100021321	32	32	3	50.000
10101537	32	32	3	100.000

• HDPE Pipe Distribution PE 80 / PN 8 - Blue

DIMENSIONS (MM)

CÓDIGO	GAUGE	DE	e	L
10058894	63	63	4,7	6.000
10068240	63	63	4,7	50.000
10068258	63	63	4,7	100.000
10059872	90	90	5,4	6.000
10068320	90	90	5,4	50.000
10068339	90	90	5,4	100.000
10054882	110	110	6,6	6.000
10068363	110	110	6,6	50.000
10068371	110	110	6,6	100.000

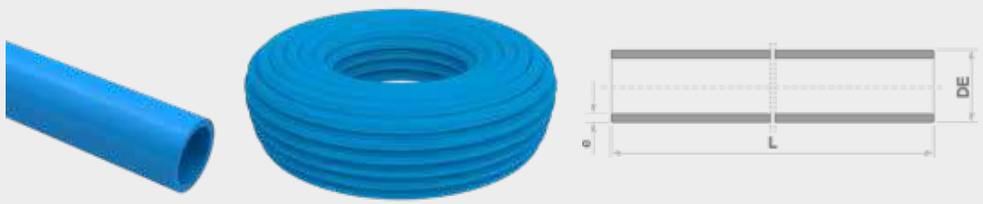
• HDPE Pipe Distribution PE 80 / PN 10 - Blue



DIMENSIONS (MM)

CÓDIGO	GAUGE	DE	e	L
10068525	63	63	3,8	6.000
10068533	63	63	3,8	50.000
10068541	63	63	3,8	100.000
10068614	90	90	6,7	6.000
10068622	90	90	6,7	50.000
10068630	90	90	6,7	100.000
10068665	110	110	8,1	6.000
10068673	110	110	8,1	50.000
10068681	110	110	8,1	100.000

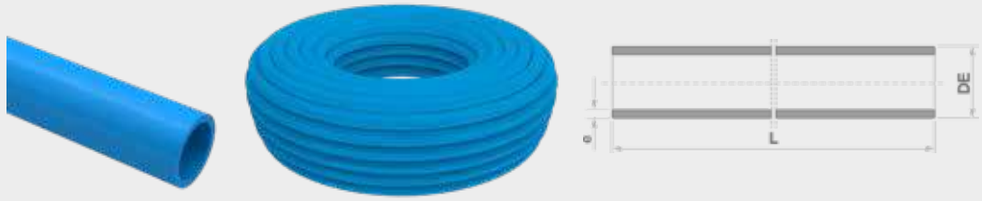
• HDPE Distribution Pipe PE 80 / PN 12.5 - Blue



DIMENSIONS (MM)

CÓDIGO	GAUGE	DE	e	L
10058650	63	63	5,8	6.000
10068835	63	63	5,8	50.000
10068843	63	63	5,8	100.000
10059602	90	90	8,2	6.000
10068878	90	90	8,2	50.000
10068886	90	90	8,2	100.000
10054649	110	110	10	6.000
10068940	110	110	10	50.000
10068959	110	110	10	100.000

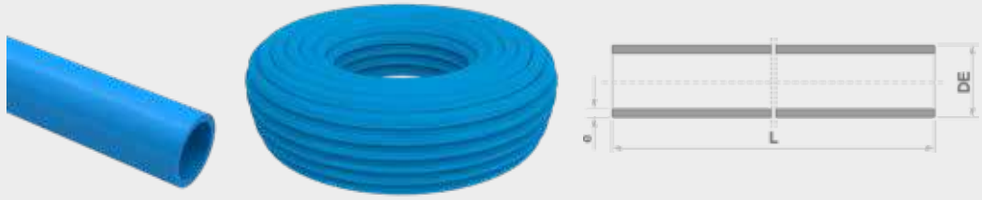
• HDPE Pipe Distribution PE 80 / PN 16 - Blue



DIMENSIONS (MM)

CÓDIGO	GAUGE	DE	e	L
10058664	63	63	7,1	6.000
10058663	63	63	7,1	50.000
10058661	63	63	7,1	100.000
10059616	90	90	10,1	6.000
10059615	90	90	10,1	50.000
10059613	90	90	10,1	100.000
10054664	110	110	12,3	6.000
10054663	110	110	12,3	50.000
10054661	110	110	12,3	100.000

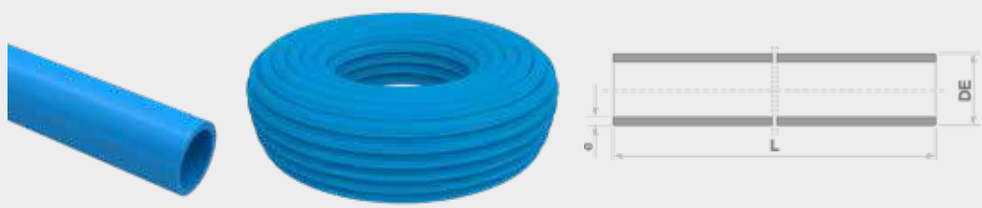
• 80 / PN 20 HDPE Distribution Pipe - Blue



DIMENSIONS (MM)

CÓDIGO	GAUGE	DE	e	L
10058711	63	63	8,6	6.000
10058710	63	63	8,6	50.000
10058708	63	63	8,6	100.000
10059683	90	90	12,3	6.000
10059682	90	90	12,3	50.000
10059680	90	90	12,3	100.000
10054707	110	110	15,1	6.000
10054706	110	110	15,1	50.000
10054704	110	110	15,1	100.000

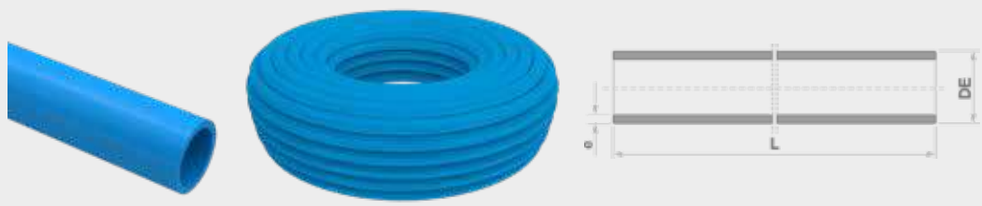
• HDPE Pipe Distribution PE 100 / PN 10 - Blue



DIMENSIONS (MM)

CÓDIGO	GAUGE	DE	e	L
10064747	63	63	3,8	6.000
10064746	63	63	3,8	50.000
10064744	63	63	3,8	100.000
10065814	90	90	5,4	6.000
10065813	90	90	5,4	50.000
10065811	90	90	5,4	100.000
10060129	110	110	6,6	6.000
10060128	110	110	6,6	50.000
10060126	110	110	6,6	100.000

• HDPE Pipe Distribution PE 100 / PN 12.5 - Blue



DIMENSIONS (MM)

CÓDIGO	GAUGE	DE	e	L
10064760	63	63	4,7	6.000
10064758	63	63	4,7	50.000
10064756	63	63	4,7	100.000
10065823	90	90	6,7	6.000
10065822	90	90	6,7	50.000
10065820	90	90	6,7	100.000
10060140	110	110	8,1	6.000
10060139	110	110	8,1	50.000
10060138	110	110	8,1	100.000

• HDPE Pipe Distribution PE 100 / PN 16 - Blue

DIMENSIONS (MM)

CÓDIGO	GAUGE	DE	e	L
10064778	63	63	5,8	6.000
10064777	63	63	5,8	50.000
10064787	63	63	5,8	100.000
10065842	90	90	8,2	6.000
10065841	90	90	8,2	50.000
10065839	90	90	8,2	100.000
10060175	110	110	10	6.000
10060174	110	110	10	50.000
10060173	110	110	10	100.000

• HDPE Pipe Distribution PE 100 / PN 20 - Blue

DIMENSIONS (MM)

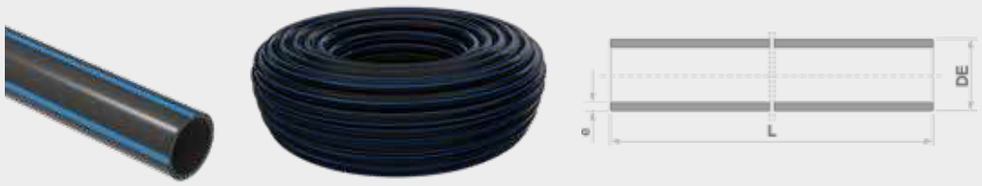
CÓDIGO	GAUGE	DE	e	L
10064798	63	63	7,1	6.000
10064797	63	63	7,1	50.000
10064795	63	63	7,1	100.000
10065862	90	90	10,1	6.000
10065861	90	90	10,1	50.000
10065859	90	90	10,1	100.000
10060194	110	110	12,3	6.000
10060193	110	110	12,3	50.000
10060191	110	110	12,3	100.000

• HDPE Pipe Distribution PE 100 / PN 25 - Blue

DIMENSIONS (MM)

CÓDIGO	GAUGE	DE	e	L
10064836	63	63	8,6	6.000
10064835	63	63	8,6	50.000
10064833	63	63	8,6	100.000
10065900	90	90	12,3	6.000
10065899	90	90	12,3	50.000
10065897	90	90	12,3	100.000
10060212	110	110	15,1	6.000
10060211	110	110	15,1	50.000
10060209	110	110	15,1	100.000

• HDPE Pipe Distribution PE 80 / PN 8 - Black with Blue Stripes



DIMENSIONS (MM)

CÓDIGO	GAUGE	DE	e	L
10058895	63	63	3,8	6.000
10461260	63	63	3,8	50.000
10461464	63	63	3,8	100.000
10059875	90	90	5,4	6.000
10461286	90	90	5,4	50.000
10461480	90	90	5,4	100.000
10054885	110	110	6,6	6.000
10060211	110	110	6,6	50.000
10060209	110	110	6,6	100.000

• HDPE Pipe Distribution PE 80 / PN 10 - Black with Blue Stripes

DIMENSIONS (MM)

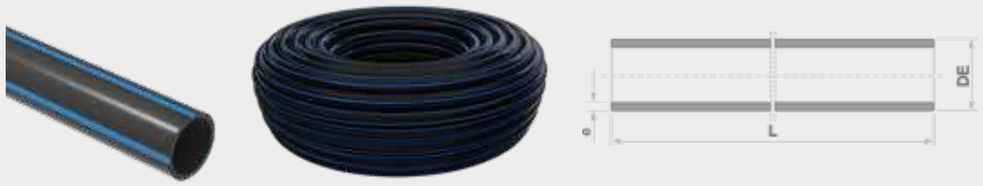
CÓDIGO	GAUGE	DE	e	L
10064597	63	63	4,7	6.000
10064651	63	63	4,7	50.000
10064716	63	63	4,7	100.000
10064600	90	90	6,7	6.000
10462088	90	90	6,7	50.000
10059594	90	90	6,7	100.000
10054624	110	110	8,1	6.000
10462096	110	110	8,1	50.000
10064759	110	110	8,1	100.000

• HDPE Pipe Distribution PE 80 / PN 12.5 - Black with Blue Stripes

DIMENSIONS (MM)

CÓDIGO	GAUGE	DE	e	L
10058653	63	63	5,8	6.000
10058652	63	63	5,8	50.000
10061559	63	63	5,8	100.000
10059606	90	90	8,2	6.000
10059605	90	90	8,2	50.000
10059603	90	90	8,2	100.000
10054653	110	110	10	6.000
10054652	110	110	10	50.000
10054650	110	110	10	100.000

• HDPE Pipe Distribution PE 80 / PN 16 - Black with Blue Stripes



DIMENSIONS (MM)

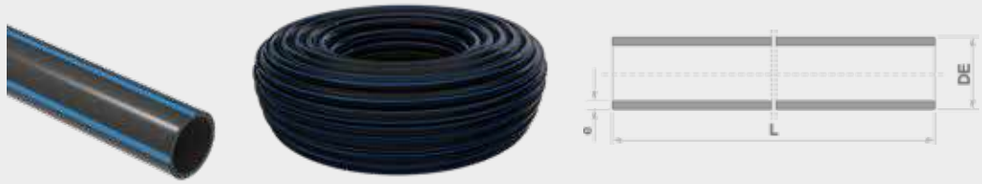
CÓDIGO	GAUGE	DE	e	L
10058668	63	63	7,1	6.000
10058667	63	63	7,1	50.000
10058665	63	63	7,1	100.000
10059620	90	90	10,1	6.000
10059619	90	90	10,1	50.000
10059617	90	90	10,1	100.000
10054668	110	110	12,3	6.000
10054667	110	110	12,3	50.000
10054665	110	110	12,3	100.000

• HDPE Pipe Distribution PE 80 / PN 20 - Black with Blue Stripes

DIMENSIONS (MM)

CÓDIGO	GAUGE	DE	e	L
10058716	63	63	8,6	6.000
10058715	63	63	8,6	50.000
10058713	63	63	8,6	100.000
10059688	90	90	12,3	6.000
10059687	90	90	12,3	50.000
10059685	90	90	12,3	100.000
10054712	110	110	15,1	6.000
10054711	110	110	15,1	50.000
10054709	110	110	15,1	100.000

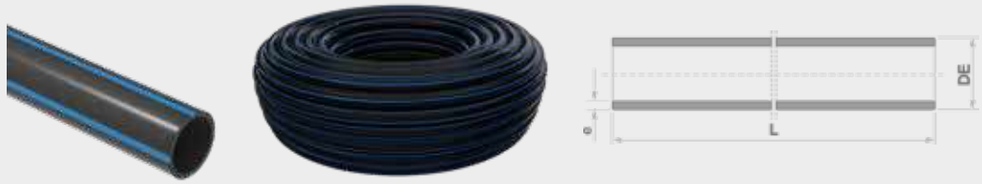
• HDPE Pipe Distribution PE100 / PN 10 - Black with Blue Stripes



DIMENSIONS (MM)

CÓDIGO	GAUGE	DE	e	L
10064749	63	63	3,8	6.000
10064748	63	63	3,8	50.000
10065089	63	63	3,8	100.000
10423607	90	90	5,4	6.000
10065011	90	90	5,4	50.000
10065046	90	90	5,4	100.000
10060131	110	110	6,6	6.000
10060130	110	110	6,6	50.000
10065054	110	110	6,6	100.000

• HDPE Pipe Distribution PE100 / PN 12.5 - Black with Blue Stripes



DIMENSIONS (MM)

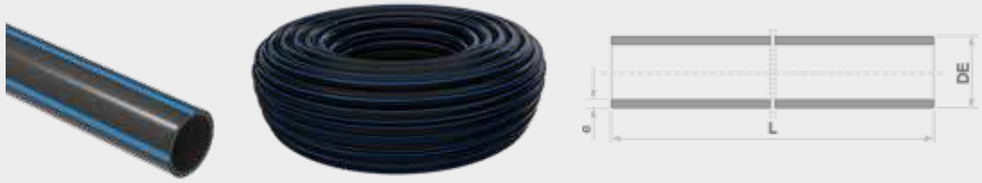
CÓDIGO	GAUGE	DE	e	L
10064764	63	63	4,7	6.000
10064763	63	63	4,7	50.000
10064761	63	63	4,7	100.000
10065827	90	90	6.7	6.000
10065826	90	90	6.7	50.000
10065824	90	90	6.7	100.000
10060144	110	110	8.1	6.000
10060143	110	110	8.1	50.000
10060141	110	110	8.1	100.000

• HDPE Pipe Distribution PE100 / PN 16 - Black with Blue Stripes

DIMENSIONS (MM)

CÓDIGO	GAUGE	DE	e	L
10064781	63	63	5,8	6.000
10064780	63	63	5,8	50.000
10064779	63	63	5,8	100.000
10424792	90	90	8,2	6.000
10065844	90	90	8,2	50.000
10065843	90	90	8,2	100.000
10060178	110	110	10	6.000
10060177	110	110	10	50.000
10060176	110	110	10	100.000

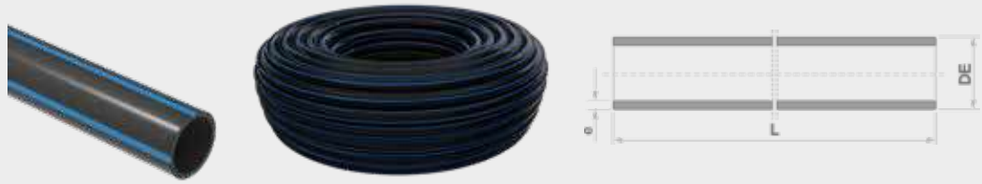
• HDPE Pipe Distribution PE100 / PN 20 - Black with Blue Stripes



DIMENSIONS (MM)

CÓDIGO	GAUGE	DE	e	L
10064802	63	63	7,1	6.000
10064801	63	63	7,1	50.000
10064799	63	63	7,1	100.000
10065866	90	90	10,1	6.000
10065865	90	90	10,1	50.000
10065863	90	90	10,1	100.000
10060198	110	110	12,3	6.000
10060197	110	110	12,3	50.000
10060195	110	110	12,3	100.000

• HDPE Pipe Distribution PE100 / PN 25 - Black with Blue Stripes



DIMENSIONS (MM)

CÓDIGO	GAUGE	DE	e	L
10064841	63	63	8,6	6.000
10064840	63	63	8,6	50.000
10064838	63	63	8,6	100.000
10065904	90	90	12,3	6.000
10065903	90	90	12,3	50.000
10065901	90	90	12,3	100.000
10060217	110	110	15,1	6.000
10060216	110	110	15,1	50.000
10060214	110	110	15,1	100.000

Irriga LF

PERMANENT SYSTEMS

3. Irriga LF

TIGRE developed the Irriga LF Line to offer rational solutions to different permanent lines in permanent irrigation systems.

Destined to buried or partially exposed permanent lines, the Irriga LF Line is for localized irrigation and sprinkler irrigation systems.

3.1. Function/Application

PVC pipes and fittings with butt weld or bell and spigot joints for buried or partially exposed permanent lines, for localized irrigation systems (drip or micro-sprinkler systems) and semi-permanent sprinkler systems. Used in main lines and branch lines.

3.2. Benefits and Differential Factors

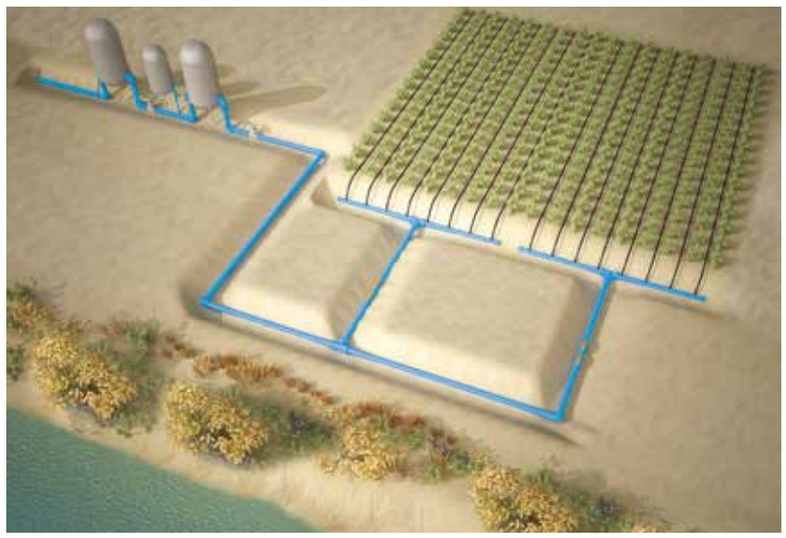
Ease of installation
With butt weld joint or bell and spigot joint.

Complete line
Meets different installation needs.

Lightweight
Ease of transport, storage, and handling.

Resistance
Resists to chemicals used in fertirrigation and contaminated soils.

Easy maintenance
The installation can be performed in different locations and configurations, whether point to point or in kits.



3.3. Technical Characteristics

Material: Pipes and fittings manufactured in PVC, Poly(vinyl chloride).

Color: Blue.

Joints: Butt weld (adhesive) and gasket (rubber seal ring)

Gages: The Irriga LF line is available in 35, 50, 75, 100,150, and 200 mm diameters.

Pipe length: 6.0 m.

Pressure class: PN 40 (40 m.c.a.), PN 60 (60 m.c.a.), PN 80 (80 m.c.a.) and PN 125 (125 m.c.a.).

Stiffness Class:

- PN 40 = 1800 Pa
- PN 60 = 4800 Pa
- PN 80 = 8500 Pa
- PN 125 = 15000 Pa

Nota:
Pa – Pascal – The International System of Units' standard pressure unit.

Below is the list of reference standards concerning the manufacturing of the Irriga LF line that ensure excellent performance, providing the installations with high safety.

REFERENCE STANDARDS	
ABNT NBR 14312	Irrigation and drainage - PVC pipes with solvent gluing or elastic joint PN 40 and PN 80 for permanent irrigation systems.

3.4. Instructions

3.4.1 Butt weld joints

1. Chamfer the bell end of pipe. Sand the bell end and spigot end of pipe with a 100 grit sandpaper and mark the depth of the spigot

2. Prepare the surfaces to be welded using the TIGRE Priming Fluid.

3. Apply the TIGRE Plastic Adhesive in the bell end and spigot.

4 Align and attach the bell end tothe spigot end, removing any excess plastic adhesive.

3.4.2 Elastic Joints

1 Chamfer the bell end of pipe. Measure the depth of the spigot end and mark it to the bell end.

2 After cleaning the bell end and spigot end of the pipe, house the gasket in the ferrule.

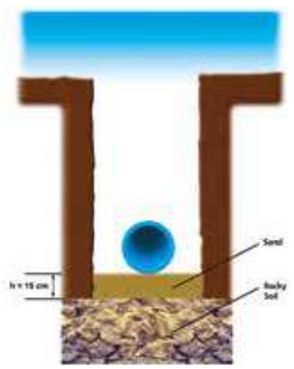
3 Apply the TIGRE Lubricant Paste to the gasket and the bell end of the pipe.

4 Align the pipes and attach the bell end to the spigot end. Pull 1 cm back, using the marking on the pipe as a reference.

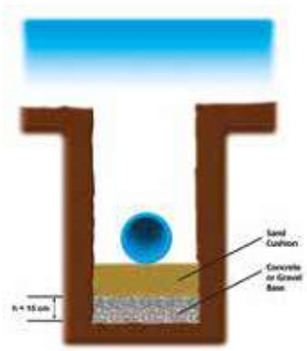
3.5. Installation in the Ditch

3.5.1 Digging, Excavation, Preparation, and Leveling of Ditch Bottom

1) Ditch excavation should be such that the debris is far from the edge of the ditch, thereby avoiding landslides when handling the piping.



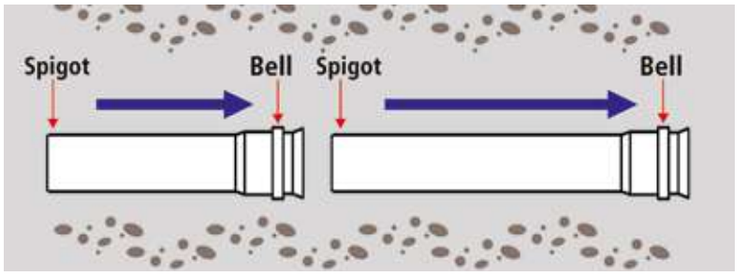
2) For rocky soils (decomposed rock, loose rock, and bedrock), a sand cushion (free of rocks, avoiding bumps) of a minimum height of 15 cm over the pipes, is necessary.



3) When the ditch bottom is composed of saturated clay, peat, or mud, without minimum mechanical conditions for laying the pipes, a gravel or concrete base, properly piled, is necessary. Laying of pipes over said bases must be on a sand cushion or an equivalent material.

3.5.2 Piping Laying, Jointing

1) The mounting direction must preferably be from the bell end to the spigot end of the pipes.

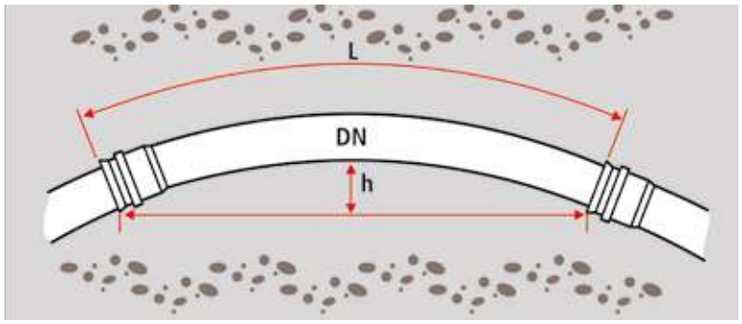


2) Heating the pipes for formation of curves, spigots, or holes, is not permitted.

3) Lay the pipes with a slight sinuosity over the axis of the ditch.

4) For elastic joints, always use lubricant paste, since oil or grease can damage the rubber seal ring.

5) In piping with smaller diameters, a little deflection in the pipes (see Table 1) is possible, provided that the region of the splice is aligned by propping with wooden paddocks.



Important:
When deflecting the pipes, provide the anchoring of the piping such that the spigots are free from bending stress.

Note: When the conditions are such that the pipes are subject to bending (especially those with larger diameters), use slip couplings.

Table 1 - Pipe Deflection

DIAMETER (DN)	H (M)
50	0.075
75	0.065
100	0.055
125	0.045
150	0.040

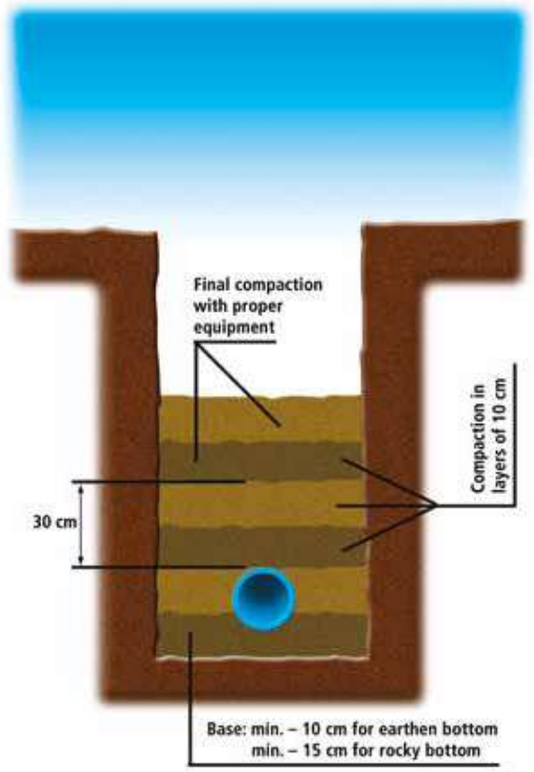
3.5.3 Pavement Backfill and Restoration

1) Before performing the backfill, all the joints must be checked for their watertightness. Inspections must be made, preferably between branch pipes and at most, every 500 meters.

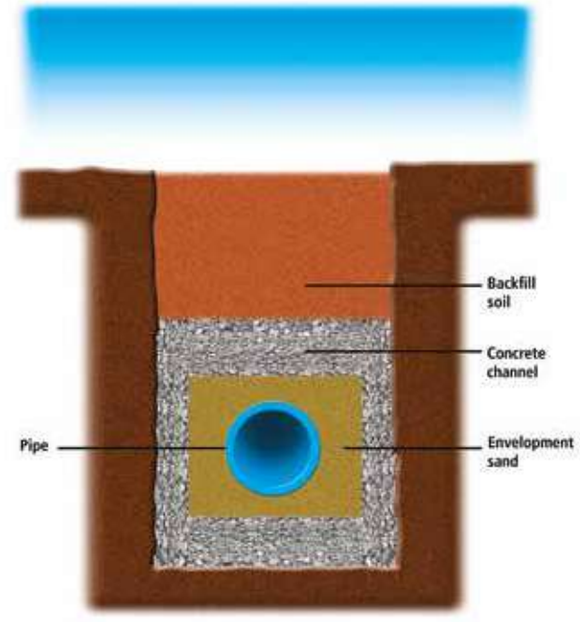
2) The piping with be covered with selected materials (free of rocks) at least up to 30 cm above the top generating line. Compaction must be in successive layers of 10 cm, and, until achieving the height of the pipe, compaction must be made manually only on the sides of the pipe.

3) The rest of the material should be poured in successive layers of 30 cm, and compacted so that they achieve the same ground condition as the sides of the ditch.

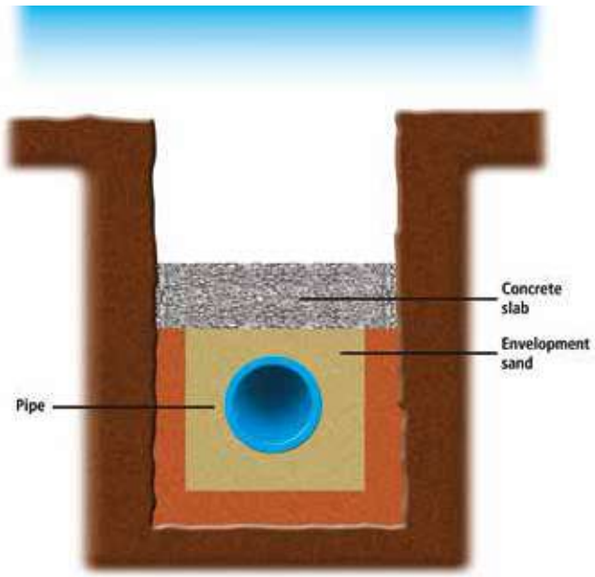
4) Observe the indications of the project and never use wheeled machines when compacting the ditch.



5) When the depth of the ditch is below 80 cm or when the pipeline goes through areas with heavy traffic loads, special measures for protecting the pipeline are necessary, such as making channels with the pipes inside, enveloped in granular material and a proper reinforced concrete cover (situation A), or a proper reinforced concrete slab (situation B).



SITUATION A



SITUATION B

6) Direct enveloping of PVC pipes with concrete is not recommended as the concrete may break and reach the pipes. However, when the designer chooses this solution, he must dimension the concrete envelope, providing it with reinforcement to guarantee its performance as a continuous beam.

3.6. Recommendations

3.6.1 Connection to equipment or other materials

Threaded adapters, available for this TIGRE product line, allow easy interconnection to equipment or other materials.

3.6.2 Types of Joints

Irriga LF pipes and fittings and interconnected using two types of joints.

Elastic Joints

If the line is not buried, special devices (couplings) that prevent the pipes from decoupling are not necessary. Laying of bell and spigot pipes with an elastic joint (rubber seal ring) is preferable.

Note:
For buried lines, an elastic joint (JE) is preferable, as its sealing is obtained with a rubber seal ring.

Butt weld joints

For assembling small exposed sections of permanent lines, usually sections of interconnections to equipment and other materials and surface branch pipes, a butt weld joint (with adhesive) is necessary.

Butt weld joints welded with adhesive is not recommended for lengths above 20 meters, due to longitudinal stresses that may occur as a consequence of thermal effects (expansion and contraction of materials subject to temperature variations).

Table 2 - Consumption of Lubricant Paste

Gages	Lubricant Paste	Adhesive	Cleaning Solution
DN	(g / joint)	(g / joint)	(cm3 / joint)
35	NA	4,5	6,2
50	10	6.2	11.0
75	15	14.2	26.0
100	25	20.8	40.0
125	30	25.4	46.0
150	35	26.0	50.0

3.6.3 Head Loss Tables

Below are the head loss tables for the Irriga LF pipes, which are useful for dimensioning the lines when preparing the projects.

The calculation of head loss was based on the Colebrook Equation, the Universal Head Loss Equation, the Reynolds Number, and the Continuity Equation. Our results are deemed the most accurate according to the current concepts and technical resources of computer processing.

Colebrook Equation

$$\frac{1}{\sqrt{f}} = -2 \log_{10} \left(0{,}27 \frac{K}{D} + \frac{2{,}51}{R \sqrt{f}}\right)$$

Continuity Equation

$$Q = \frac{\pi D^2}{4} \qquad V = Cte.$$

Reynolds Equation

$$R = \frac{VD}{v}$$

Universal Head Loss Equation

$$hf = f. \frac{L}{D} \frac{V^2}{2g}$$

3.7. Head Loss Tables - M/100m

3.7.1. PN 40 Irrigation Rigid PVC Pipes

Conduit inner area

DN 40 = 0,00100 m²

Flow rate (L/s)	Speed (m/s)	Head Loss (m/100m)
0,150	0,150	0,102
0,225	0,225	0,217
0,300	0,300	0,369
0,375	0,375	0,557
0,450	0,450	0,781
0,525	0,524	1,039
0,600	0,599	1,330
0,675	0,674	1,653
0,750	0,749	2,009
0,825	0,824	2,396
0,900	0,899	2,815
0,975	0,974	3,264
1,050	1,049	3,744
1,125	1,124	4,254
1,200	1,199	4,793
1,275	1,274	5,362
1,350	1,349	5,960
1,425	1,424	6,587
1,500	1,499	7,242
1,575	1,573	7,927
1,650	1,648	8,639
1,725	1,723	9,379
1,800	1,798	10,148
1,875	1,873	10,944
1,950	1,948	11,767
2,025	2,023	12,618
2,100	2,098	13,497
2,175	2,173	14,402
2,250	2,248	15,334
2,325	2,323	16,293
2,400	2,398	17,279
2,475	2,473	18,291
2,550	2,547	19,329
2,625	2,622	20,394
2,700	2,697	21,485
2,775	2,772	22,602
2,850	2,847	23,745
2,925	2,922	24,914
3,000	2,997	26,109
3,075	3,072	27,329

DN 50 = 0,00181 m²

Flow rate (L/s)	Speed (m/s)	Head Loss (m/100m)
0,200	0,110	0,041
0,325	0,179	0,100
0,450	0,248	0,183
0,575	0,316	0,288
0,700	0,385	0,414
0,825	0,454	0,561
0,950	0,523	0,728
1,075	0,592	0,916
1,200	0,660	1,122
1,325	0,729	1,348
1,450	0,798	1,593
1,575	0,867	1,856
1,700	0,936	2,137
1,825	1,004	2,437
1,950	1,073	2,755
2,075	1,142	3,091
2,200	1,211	3,444
2,325	1,280	3,815
2,450	1,348	4,203
2,575	1,417	4,608
2,700	1,486	5,030
2,825	1,555	5,470
2,950	1,623	5,926
3,075	1,692	6,399
3,200	1,761	6,888
3,325	1,830	7,394
3,450	1,899	7,916
3,575	1,967	8,455
3,700	2,036	9,010
3,825	2,105	9,581
3,950	2,174	10,169
4,075	2,243	10,772
4,200	2,311	11,391
4,325	2,380	12,026
4,450	2,449	12,677
4,575	2,518	13,344
4,700	2,587	14,026
4,825	2,655	14,724
4,950	2,724	15,438
5,075	2,793	16,167

Conduit inner area
DN 75 = 0,00412 m²

Flow rate (L/s)	Speed (m/s)	Head Loss (m/100m)
0,300	0,073	0,012
0,600	0,145	0,042
0,900	0,218	0,089
1,200	0,291	0,152
1,500	0,363	0,230
1,800	0,436	0,322
2,100	0,509	0,428
2,400	0,581	0,548
2,700	0,654	0,682
3,000	0,727	0,829
3,300	0,799	0,989
3,600	0,872	1,161
3,900	0,945	1,347
4,200	1,017	1,544
4,500	1,090	1,755
4,800	1,163	1,977
5,100	1,235	2,212
5,400	1,308	2,459
5,700	1,381	2,717
6,000	1,453	2,988
6,300	1,526	3,270
6,600	1,599	3,564
6,900	1,671	3,869
7,200	1,744	4,186
7,500	1,817	4,515
7,800	1,889	4,854
8,100	1,962	5,206
8,400	2,035	5,568
8,700	2,107	5,941
9,000	2,180	6,326
9,300	2,253	6,721
9,600	2,325	7,128
9,900	2,398	7,546
10,200	2,471	7,974
10,500	2,543	8,413
10,800	2,616	8,863
11,100	2,689	9,324
11,400	2,761	9,796
11,700	2,834	10,278
12,000	2,907	10,771

DN 100 = 0,00748 m²

Flow rate (L/s)	Speed (m/s)	Head Loss (m/100m)
0,400	0,053	0,005
0,900	0,120	0,021
1,400	0,187	0,048
1,900	0,254	0,084
2,400	0,321	0,129
2,900	0,388	0,183
3,400	0,454	0,246
3,900	0,521	0,317
4,400	0,588	0,396
4,900	0,655	0,483
5,400	0,722	0,578
5,900	0,789	0,681
6,400	0,855	0,791
6,900	0,922	0,910
7,400	0,989	1,035
7,900	1,056	1,168
8,400	1,123	1,309
8,900	1,190	1,457
9,400	1,256	1,612
9,900	1,323	1,774
10,400	1,390	1,943
10,900	1,457	2,119
11,400	1,524	2,303
11,900	1,591	2,493
12,400	1,657	2,690
12,900	1,724	2,895
13,400	1,791	3,106
13,900	1,858	3,323
14,400	1,925	3,548
14,900	1,992	3,779
15,400	2,058	4,017
15,900	2,125	4,262
16,400	2,192	4,513
16,900	2,259	4,771
17,400	2,326	5,035
17,900	2,393	5,306
18,400	2,459	5,583
18,900	2,526	5,867
19,400	2,593	6,158
19,900	2,660	6,455

Conduit inner area
DN 125 = 0,01130 m²

Flow rate (L/s)	Speed (m/s)	Head Loss (m/100m)
0,500	0,044	0,003
1,250	0,111	0,014
2,000	0,177	0,034
2,750	0,243	0,061
3,500	0,309	0,095
4,250	0,376	0,136
5,000	0,442	0,183
5,750	0,508	0,237
6,500	0,575	0,298
7,250	0,641	0,364
8,000	0,707	0,437
8,750	0,774	0,516
9,500	0,840	0,601
10,250	0,906	0,692
11,000	0,973	0,788
11,750	1,039	0,890
12,500	1,105	0,998
13,250	1,172	1,112
14,000	1,238	1,231
14,750	1,304	1,356
15,500	1,371	1,486
16,250	1,437	1,622
17,000	1,503	1,763
17,750	1,569	1,910
18,500	1,636	2,062
19,250	1,702	2,219
20,000	1,768	2,382
20,750	1,835	2,550
21,500	1,901	2,723
22,250	1,967	2,901
23,000	2,034	3,085
23,750	2,100	3,273
24,500	2,166	3,467
25,250	2,233	3,666
26,000	2,299	3,870
26,750	2,365	4,079
27,500	2,432	4,293
28,250	2,498	4,512
29,000	2,564	4,736
29,750	2,630	4,965

DN 150 = 0,01628 m²

Flow rate (L/s)	Speed (m/s)	Head Loss (m/100m)
0,750	0,046	0,002
2,000	0,123	0,014
3,250	0,200	0,034
4,500	0,276	0,062
5,750	0,353	0,098
7,000	0,430	0,141
8,250	0,507	0,190
9,500	0,583	0,247
10,750	0,660	0,311
12,000	0,737	0,381
13,250	0,814	0,458
14,500	0,890	0,541
15,750	0,967	0,630
17,000	1,044	0,726
18,250	1,121	0,827
19,500	1,197	0,935
20,750	1,274	1,049
22,000	1,351	1,169
23,250	1,428	1,295
24,500	1,504	1,427
25,750	1,581	1,564
27,000	1,658	1,708
28,250	1,735	1,857
29,500	1,811	2,012
30,750	1,888	2,172
32,000	1,965	2,338
33,250	2,042	2,510
34,500	2,118	2,688
35,750	2,195	2,870
37,000	2,272	3,059
38,250	2,349	3,253
39,500	2,425	3,452
40,750	2,502	3,657
42,000	2,579	3,867
43,250	2,656	4,083
44,500	2,732	4,304
45,750	2,809	4,530
47,000	2,886	4,762
48,250	2,963	4,999
49,500	3,039	5,241

3.7.2 PN 60 Irrigation Rigid PVC Pipes

Conduit inner area

DN 35 = 0,00097 m²

Flow rate (L/s)	Speed (m/s)	Head Loss (m/100m)
0,150	0,153	0,108
0,210	0,215	0,201
0,270	0,276	0,321
0,330	0,337	0,465
0,390	0,398	0,633
0,450	0,460	0,825
0,510	0,521	1,040
0,570	0,582	1,277
0,630	0,644	1,537
0,690	0,705	1,819
0,750	0,766	2,122
0,810	0,828	2,447
0,870	0,889	2,793
0,930	0,950	3,160
0,990	1,012	3,547
1,050	1,073	3,955
1,110	1,134	4,383
1,170	1,195	4,832
1,230	1,257	5,300
1,290	1,318	5,788
1,350	1,379	6,296
1,410	1,441	6,823
1,470	1,502	7,370
1,530	1,563	7,936
1,590	1,625	8,522
1,650	1,686	9,126
1,710	1,747	9,750
1,770	1,809	10,392
1,830	1,870	11,053
1,890	1,931	11,733
1,950	1,992	12,431
2,010	2,054	13,148
2,070	2,115	13,883
2,130	2,176	14,637
2,190	2,238	15,409
2,250	2,299	16,199
2,310	2,360	17,007
2,370	2,422	17,833
2,430	2,483	18,678
2,490	2,544	19,540

DN 50 = 0,00178 m²

Flow rate (L/s)	Speed (m/s)	Head Loss (m/100m)
0,200	0,112	0,042
0,325	0,182	0,104
0,450	0,252	0,190
0,575	0,322	0,300
0,700	0,392	0,431
0,825	0,462	0,584
0,950	0,532	0,759
1,075	0,602	0,954
1,200	0,672	1,169
1,325	0,741	1,404
1,450	0,811	1,659
1,575	0,881	1,933
1,700	0,951	2,226
1,825	1,021	2,538
1,950	1,091	2,869
2,075	1,161	3,219
2,200	1,231	3,587
2,325	1,301	3,973
2,450	1,371	4,377
2,575	1,441	4,799
2,700	1,511	5,239
2,825	1,581	5,697
2,950	1,651	6,172
3,075	1,721	6,664
3,200	1,791	7,174
3,325	1,861	7,701
3,450	1,931	8,245
3,575	2,001	8,806
3,700	2,070	9,384
3,825	2,140	9,979
3,950	2,210	10,591
4,075	2,280	11,219
4,200	2,350	11,864
4,325	2,420	12,526
4,450	2,490	13,204
4,575	2,560	13,898
4,700	2,630	14,609
4,825	2,700	15,335
4,950	2,770	16,079
5,075	2,840	16,838

Conduit inner area

DN 75 = 0,00401 m²

Flow rate (L/s)	Speed (m/s)	Head Loss (m/100m)
0,300	0,075	0,013
0,550	0,137	0,038
0,800	0,199	0,077
1,050	0,262	0,127
1,300	0,324	0,189
1,550	0,386	0,261
1,800	0,448	0,345
2,050	0,511	0,438
2,300	0,573	0,542
2,550	0,635	0,657
2,800	0,697	0,781
3,050	0,760	0,914
3,300	0,822	1,058
3,550	0,884	1,211
3,800	0,946	1,373
4,050	1,009	1,545
4,300	1,071	1,726
4,550	1,133	1,916
4,800	1,195	2,116
5,050	1,258	2,324
5,300	1,320	2,541
5,550	1,382	2,767
5,800	1,445	3,002
6,050	1,507	3,246
6,300	1,569	3,499
6,550	1,631	3,760
6,800	1,694	4,030
7,050	1,756	4,308
7,300	1,818	4,595
7,550	1,880	4,890
7,800	1,943	5,194
8,050	2,005	5,506
8,300	2,067	5,827
8,550	2,129	6,156
8,800	2,192	6,493
9,050	2,254	6,838
9,300	2,316	7,192
9,550	2,378	7,553
9,800	2,441	7,923
10,050	2,503	8,301

DN 100 = 0,00723 m²

Flow rate (L/s)	Speed (m/s)	Head Loss (m/100m)
0,400	0,055	0,005
0,900	0,124	0,023
1,400	0,193	0,052
1,900	0,262	0,091
2,400	0,332	0,140
2,900	0,401	0,198
3,400	0,470	0,266
3,900	0,539	0,343
4,400	0,608	0,429
4,900	0,677	0,523
5,400	0,746	0,626
5,900	0,815	0,738
6,400	0,884	0,858
6,900	0,953	0,986
7,400	1,022	1,122
7,900	1,091	1,266
8,400	1,161	1,419
8,900	1,230	1,579
9,400	1,299	1,747
9,900	1,368	1,923
10,400	1,437	2,106
10,900	1,506	2,297
11,400	1,575	2,496
11,900	1,644	2,702
12,400	1,713	2,916
12,900	1,782	3,137
13,400	1,851	3,366
13,900	1,920	3,602
14,400	1,989	3,845
14,900	2,059	4,096
15,400	2,128	4,354
15,900	2,197	4,619
16,400	2,266	4,891
16,900	2,335	5,171
17,400	2,404	5,457
17,900	2,473	5,751
18,400	2,542	6,052
18,900	2,611	6,359
19,400	2,680	6,674
19,900	2,749	6,996

Conduit inner area

DN 125 = 0,01097 m²

Flow rate (L/s)	Speed (m/s)	Head Loss (m/100m)
0,500	0,046	0,003
1,250	0,114	0,015
2,000	0,182	0,036
2,750	0,251	0,065
3,500	0,319	0,102
4,250	0,387	0,146
5,000	0,456	0,197
5,750	0,524	0,255
6,500	0,592	0,321
7,250	0,661	0,392
8,000	0,729	0,471
8,750	0,797	0,555
9,500	0,866	0,647
10,250	0,934	0,744
11,000	1,002	0,848
11,750	1,071	0,958
12,500	1,139	1,075
13,250	1,208	1,197
14,000	1,276	1,325
14,750	1,344	1,460
15,500	1,413	1,600
16,250	1,481	1,746
17,000	1,549	1,898
17,750	1,618	2,056
18,500	1,686	2,219
19,250	1,754	2,389
20,000	1,823	2,564
20,750	1,891	2,744
21,500	1,959	2,931
22,250	2,028	3,123
23,000	2,096	3,320
23,750	2,164	3,523
24,500	2,233	3,732
25,250	2,301	3,946
26,000	2,369	4,165
26,750	2,438	4,390
27,500	2,506	4,621
28,250	2,575	4,857
29,000	2,643	5,098
29,750	2,711	5,345

DN 150 = 0,01583 m²

Flow rate (L/s)	Speed (m/s)	Head Loss (m/100m)
0,500	0,032	0,001
1,500	0,095	0,009
2,500	0,158	0,022
3,500	0,221	0,042
4,500	0,284	0,066
5,500	0,347	0,096
6,500	0,410	0,131
7,500	0,474	0,171
8,500	0,537	0,215
9,500	0,600	0,265
10,500	0,663	0,319
11,500	0,726	0,377
12,500	0,789	0,440
13,500	0,852	0,507
14,500	0,916	0,579
15,500	0,979	0,655
16,500	1,042	0,735
17,500	1,105	0,820
18,500	1,168	0,908
19,500	1,231	1,001
20,500	1,294	1,098
21,500	1,358	1,199
22,500	1,421	1,305
23,500	1,484	1,414
24,500	1,547	1,527
25,500	1,610	1,645
26,500	1,673	1,766
27,500	1,736	1,891
28,500	1,800	2,020
29,500	1,863	2,153
30,500	1,926	2,290
31,500	1,989	2,431
32,500	2,052	2,576
33,500	2,115	2,725
34,500	2,178	2,877
35,500	2,242	3,033
36,500	2,305	3,193
37,500	2,368	3,357
38,500	2,431	3,524
39,500	2,494	3,695

3.7.3 PN 80 Irrigation Rigid PVC Pipes

Conduit inner area

DN 50 = 0,00171 m²

Flow rate (L/s)	Speed (m/s)	Head Loss (m/100m)
0,200	0,117	0,047
0,325	0,190	0,116
0,450	0,263	0,211
0,575	0,336	0,332
0,700	0,409	0,478
0,825	0,482	0,648
0,950	0,555	0,841
1,075	0,628	1,057
1,200	0,701	1,296
1,325	0,774	1,556
1,450	0,847	1,839
1,575	0,920	2,143
1,700	0,992	2,468
1,825	1,065	2,814
1,950	1,138	3,181
2,075	1,211	3,569
2,200	1,284	3,977
2,325	1,357	4,405
2,450	1,430	4,853
2,575	1,503	5,321
2,700	1,576	5,808
2,825	1,649	6,316
2,950	1,722	6,842
3,075	1,795	7,388
3,200	1,868	7,954
3,325	1,941	8,538
3,450	2,014	9,141
3,575	2,087	9,763
3,700	2,160	10,404
3,825	2,233	11,064
3,950	2,306	11,742
4,075	2,379	12,439
4,200	2,452	13,154
4,325	2,525	13,887
4,450	2,598	14,639
4,575	2,671	15,409
4,700	2,744	16,196
4,825	2,817	17,002
4,950	2,890	17,826
5,075	2,963	18,668

DN 75 = 0,00390 m²

Flow rate (L/s)	Speed (m/s)	Head Loss (m/100m)
0,300	0,077	0,013
0,550	0,141	0,041
0,800	0,205	0,082
1,050	0,269	0,136
1,300	0,333	0,202
1,550	0,397	0,280
1,800	0,461	0,369
2,050	0,525	0,470
2,300	0,589	0,581
2,550	0,653	0,703
2,800	0,717	0,836
3,050	0,781	0,979
3,300	0,845	1,133
3,550	0,909	1,297
3,800	0,973	1,471
4,050	1,037	1,655
4,300	1,102	1,849
4,550	1,166	2,052
4,800	1,230	2,266
5,050	1,294	2,489
5,300	1,358	2,722
5,550	1,422	2,964
5,800	1,486	3,216
6,050	1,550	3,477
6,300	1,614	3,747
6,550	1,678	4,027
6,800	1,742	4,316
7,050	1,806	4,614
7,300	1,870	4,921
7,550	1,934	5,238
7,800	1,998	5,563
8,050	2,062	5,897
8,300	2,126	6,241
8,550	2,190	6,593
8,800	2,254	6,954
9,050	2,318	7,324
9,300	2,382	7,702
9,550	2,446	8,090
9,800	2,510	8,486
10,050	2,575	8,891

Conduit inner area

DN 100 = 0,00699 m²

Flow rate (L/s)	Speed (m/s)	Head Loss (m/100m)
0,400	0,057	0,006
0,900	0,129	0,025
1,400	0,200	0,056
1,900	0,271	0,098
2,400	0,343	0,152
2,900	0,414	0,215
3,400	0,486	0,289
3,900	0,557	0,372
4,400	0,629	0,465
4,900	0,700	0,568
5,400	0,772	0,680
5,900	0,843	0,801
6,400	0,914	0,931
6,900	0,986	1,070
7,400	1,057	1,218
7,900	1,129	1,374
8,400	1,200	1,540
8,900	1,272	1,713
9,400	1,343	1,896
9,900	1,414	2,087
10,400	1,486	2,286
10,900	1,557	2,493
11,400	1,629	2,709
11,900	1,700	2,933
12,400	1,772	3,165
12,900	1,843	3,405
13,400	1,915	3,653
13,900	1,986	3,909
14,400	2,057	4,173
14,900	2,129	4,445
15,400	2,200	4,725
15,900	2,272	5,013
16,400	2,343	5,308
16,900	2,415	5,612
17,400	2,486	5,923
17,900	2,558	6,241
18,400	2,629	6,568
18,900	2,700	6,902
19,400	2,772	7,243
19,900	2,843	7,592

DN 150 = 0,015393 m²

Flow rate (L/s)	Speed (m/s)	Head Loss (m/100m)
0,500	0,032	0,001
1,500	0,097	0,009
2,500	0,162	0,024
3,500	0,227	0,045
4,500	0,292	0,071
5,500	0,357	0,103
6,500	0,422	0,141
7,500	0,487	0,183
8,500	0,552	0,231
9,500	0,617	0,284
10,500	0,682	0,341
11,500	0,747	0,404
12,500	0,812	0,471
13,500	0,877	0,543
14,500	0,942	0,620
15,500	1,007	0,702
16,500	1,072	0,788
17,500	1,137	0,878
18,500	1,202	0,973
19,500	1,267	1,073
20,500	1,332	1,177
21,500	1,397	1,285
22,500	1,462	1,398
23,500	1,527	1,515
24,500	1,592	1,637
25,500	1,657	1,762
26,500	1,721	1,892
27,500	1,786	2,026
28,500	1,851	2,165
29,500	1,916	2,307
30,500	1,981	2,454
31,500	2,046	2,605
32,500	2,111	2,760
33,500	2,176	2,919
34,500	2,241	3,083
35,500	2,306	3,250
36,500	2,371	3,421
37,500	2,436	3,597
38,500	2,501	3,776
39,500	2,566	3,960

3.7.4 PN 125 Irrigation Rigid PVC Pipes

Conduit inner area

DN 50 = 0,0016836 m²

Flow rate (L/s)	Speed (m/s)	Head Loss (m/100m)
0,200	0,119	0,049
0,325	0,193	0,121
0,450	0,267	0,220
0,575	0,342	0,346
0,700	0,416	0,498
0,825	0,490	0,676
0,950	0,564	0,877
1,075	0,638	1,102
1,200	0,713	1,351
1,325	0,787	1,623
1,450	0,861	1,918
1,575	0,935	2,235
1,700	1,010	2,574
1,825	1,084	2,935
1,950	1,158	3,317
2,075	1,232	3,721
2,200	1,307	4,147
2,325	1,381	4,593
2,450	1,455	5,060
2,575	1,529	5,548
2,700	1,604	6,057
2,825	1,678	6,586
2,950	1,752	7,135
3,075	1,826	7,705
3,200	1,901	8,294
3,325	1,975	8,903
3,450	2,049	9,532
3,575	2,123	10,181
3,700	2,198	10,849
3,825	2,272	11,537
3,950	2,346	12,244
4,075	2,420	12,971
4,200	2,495	13,716
4,325	2,569	14,481
4,450	2,643	15,265
4,575	2,717	16,068
4,700	2,792	16,889
4,825	2,866	17,730
4,950	2,940	18,589
5,075	3,014	19,467

DN 75 = 0,0037718 m²

Flow rate (L/s)	Speed (m/s)	Head Loss (m/100m)
0,250	0,066	0,010
0,500	0,133	0,038
0,750	0,199	0,079
1,000	0,265	0,135
1,250	0,331	0,204
1,500	0,398	0,286
1,750	0,464	0,381
2,000	0,530	0,488
2,250	0,597	0,606
2,500	0,663	0,737
2,750	0,729	0,879
3,000	0,795	1,033
3,250	0,862	1,197
3,500	0,928	1,373
3,750	0,994	1,560
4,000	1,060	1,758
4,250	1,127	1,967
4,500	1,193	2,186
4,750	1,259	2,416
5,000	1,326	2,657
5,250	1,392	2,908
5,500	1,458	3,169
5,750	1,524	3,441
6,000	1,591	3,722
6,250	1,657	4,014
6,500	1,723	4,316
6,750	1,790	4,629
7,000	1,856	4,951
7,250	1,922	5,283
7,500	1,988	5,625
7,750	2,055	5,977
8,000	2,121	6,338
8,250	2,187	6,709
8,500	2,254	7,090
8,750	2,320	7,481
9,000	2,386	7,881
9,250	2,452	8,291
9,500	2,519	8,710
9,750	2,585	9,139
10,000	2,651	9,577

Conduit inner area
DN 100 = 0,0068514 m²

Flow rate (L/s)	Speed (m/s)	Head Loss (m/100m)
0,400	0,058	0,006
0,900	0,131	0,026
1,400	0,204	0,059
1,900	0,277	0,104
2,400	0,350	0,160
2,900	0,423	0,227
3,400	0,496	0,304
3,900	0,569	0,392
4,400	0,642	0,490
4,900	0,715	0,598
5,400	0,788	0,716
5,900	0,861	0,844
6,400	0,934	0,981
6,900	1,007	1,127
7,400	1,080	1,283
7,900	1,153	1,448
8,400	1,226	1,622
8,900	1,299	1,805
9,400	1,372	1,997
9,900	1,445	2,198
10,400	1,518	2,407
10,900	1,591	2,626
11,400	1,664	2,853
11,900	1,737	3,089
12,400	1,810	3,333
12,900	1,883	3,586
13,400	1,956	3,847
13,900	2,029	4,117
14,400	2,102	4,395
14,900	2,175	4,682
15,400	2,248	4,977
15,900	2,321	5,280
16,400	2,394	5,591
16,900	2,467	5,910
17,400	2,540	6,238
17,900	2,613	6,574
18,400	2,686	6,917
18,900	2,759	7,269
19,400	2,832	7,629
19,900	2,904	7,997

DN 125 = 0,0103868 m²

Flow rate (L/s)	Speed (m/s)	Head Loss (m/100m)
0,500	0,048	0,003
1,250	0,120	0,017
2,000	0,193	0,041
2,750	0,265	0,075
3,500	0,337	0,117
4,250	0,409	0,167
5,000	0,481	0,225
5,750	0,554	0,292
6,500	0,626	0,366
7,250	0,698	0,448
8,000	0,770	0,538
8,750	0,842	0,635
9,500	0,915	0,739
10,250	0,987	0,851
11,000	1,059	0,970
11,750	1,131	1,095
12,500	1,203	1,228
13,250	1,276	1,368
14,000	1,348	1,515
14,750	1,420	1,668
15,500	1,492	1,829
16,250	1,564	1,996
17,000	1,637	2,169
17,750	1,709	2,350
18,500	1,781	2,537
19,250	1,853	2,730
20,000	1,926	2,930
20,750	1,998	3,137
21,500	2,070	3,350
22,250	2,142	3,569
23,000	2,214	3,795
23,750	2,287	4,027
24,500	2,359	4,266
25,250	2,431	4,510
26,000	2,503	4,761
26,750	2,575	5,018
27,500	2,648	5,282
28,250	2,720	5,551
29,000	2,792	5,827
29,750	2,864	6,109

Conduit inner area
DN 150 = 0,0149571 m²

Flow rate (L/s)	Speed (m/s)	Head Loss (m/100m)
0,500	0,033	0,001
1,500	0,100	0,010
2,500	0,167	0,026
3,500	0,234	0,048
4,500	0,301	0,076
5,500	0,368	0,111
6,500	0,435	0,151
7,500	0,501	0,196
8,500	0,568	0,248
9,500	0,635	0,304
10,500	0,702	0,366
11,500	0,769	0,433
12,500	0,836	0,505
13,500	0,903	0,583
14,500	0,969	0,665
15,500	1,036	0,753
16,500	1,103	0,845
17,500	1,170	0,942
18,500	1,237	1,044
19,500	1,304	1,151
20,500	1,371	1,262
21,500	1,437	1,379
22,500	1,504	1,499
23,500	1,571	1,625
24,500	1,638	1,755
25,500	1,705	1,890
26,500	1,772	2,030
27,500	1,839	2,174
28,500	1,905	2,322
29,500	1,972	2,475
30,500	2,039	2,632
31,500	2,106	2,794
32,500	2,173	2,961
33,500	2,240	3,131
34,500	2,307	3,306
35,500	2,373	3,486
36,500	2,440	3,670
37,500	2,507	3,858
38,500	2,574	4,050
39,500	2,641	4,247

DN 200 = 0,0265904 m²

Flow rate (L/s)	Speed (m/s)	Head Loss (m/100m)
0,750	0,028	0,001
2,500	0,094	0,006
4,250	0,160	0,017
6,000	0,226	0,032
7,750	0,291	0,051
9,500	0,357	0,075
11,250	0,423	0,102
13,000	0,489	0,134
14,750	0,555	0,169
16,500	0,621	0,208
18,250	0,686	0,251
20,000	0,752	0,297
21,750	0,818	0,347
23,500	0,884	0,400
25,250	0,950	0,457
27,000	1,015	0,518
28,750	1,081	0,581
30,500	1,147	0,648
32,250	1,213	0,719
34,000	1,279	0,793
35,750	1,344	0,870
37,500	1,410	0,950
39,250	1,476	1,034
41,000	1,542	1,121
42,750	1,608	1,211
44,500	1,674	1,304
46,250	1,739	1,401
48,000	1,805	1,501
49,750	1,871	1,603
51,500	1,937	1,709
53,250	2,003	1,818
55,000	2,068	1,930
56,750	2,134	2,045
58,500	2,200	2,164
60,250	2,266	2,285
62,000	2,332	2,409
63,750	2,397	2,537
65,500	2,463	2,667
67,250	2,529	2,800
69,000	2,595	2,936

3.8. Handling

3.8.1. Maintenance

Maintenance operations with Irriga LF PVC pipes, can be carried out by using rigid PVC slip couplings.

The damaged section must be replaced with a segment of the same type of pipe. Use two slip couplings, one at each end.

3.8.2. Transport

Avoid strong impacts and friction with stones, metal objects, and sharp edges.

The supporting surface must be flat, as the pipes must not sustain bending stresses for a long time.

In loading and unloading operations, avoid shock, bumps, and friction, especially in the bell and spigot ends of the pipes. Always carry, and do not drag, the pipes.

3.8.3. Storage

Store at an easily accessible, shaded location, away from direct or continuous sunlight (covered area).

The supporting structure must be leveled and the pipes must have a brace every 1.5 meter.

Stack the pipes in the shape of a bonfire or aligned lengthwise, in stacks not exceeding 1.5 m high.

Irriga LF pipes must be stored with their male and female ends alternated such that the spigots do not touch each other.

For temporary protection, we recommend a wooden structure that is easy to disassemble, and covering it with tiles so that the pipes are 30 to 50 cm away from the roof so that the heat does not damage them.

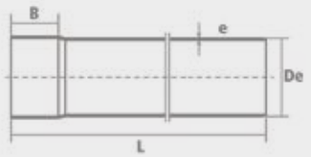
3.9. Irriga LF Line Items

• Irriga Pipe LF PN 40 PBL

DIMENSIONS (MM)

CÓDIGO	GAGE	B	De	L	E
15202009	35	32	38,1	6032	1,2
15202050	50	50	50,5	6050	1,2
15202041	75	70	75,5	6070	1,5
15202165	100	86	101,6	6086	2
15202203	125	100	125	6100	2,5
15202254	150	115	150	6115	3

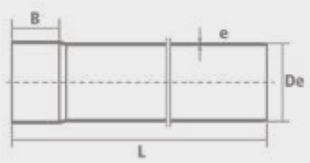
• Irriga Pipe LF PN 60 PBL



DIMENSIONS (MM)

CÓDIGO	GAGE	B	De	L	E
15284218	35	32	38,1	6032	1,4
15284234	50	50	50,5	6050	1,4
15284250	75	70	75,5	6070	2
15284277	100	86	101,6	6086	2,8
15284307	125	100	125	6100	3,4
15284323	150	115	150	6115	4

• Irriga Pipe LF PN 80 PBL



DIMENSIONS (MM)

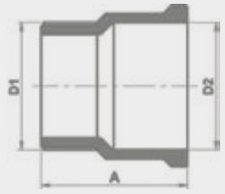
CÓDIGO	GAGE	B	De	L	E
15181974	50	50	50,5	6050	1,9
15202025	75	70	75,5	6070	2,5
15202157	100	86	101,6	6086	3,5
15292083	150	115	150	6115	5

• Irriga Pipe LF PN 125 PBL

DIMENSIONS (MM)

CÓDIGO	GAGE	B	De	L	E
15284927	50	50	50,5	6050	2,1
15284935	75	70	75,5	6070	3,1
15284943	100	86	101,6	6086	4,1
15284951	125	100	125	6100	5
15284960	150	115	150	6115	6

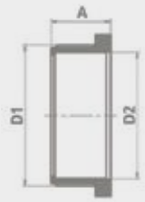
• Irriga LF BS x PR Long Adapter



DIMENSIONS (MM)

CÓDIGO	GAGE	A	D1	D2
34652686	50 x 1.1/2"	64,7	1.1/2"	50,6
34652767	75 x 2.1/2"	86,3	2.1/2"	75,4

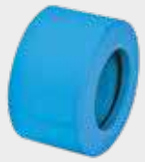
• Irriga LF BS x RM Short Adapter

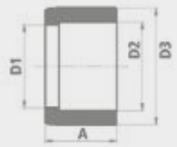


DIMENSIONS (MM)

CÓDIGO	GAGE	A	D1	D2
34054509	35 x 1.1/2"	35,5	1.1/2"	38,1
34801509	50 x 2"	29,8	2"	50,6
34801754	75 x 3"	33,2	3"	75,4
34802009	100 x 4"	47,5	4"	101,6
34055769	150 x 6"	90	6"	150

• Irriga LF Reducing Bush, Short





DIMENSIONS (MM)

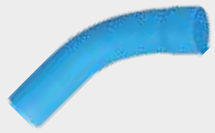
CÓDIGO	GAGE	A	D1	D2	D3
34058008	50 x 35	31	35,6	38,1	50,5
34722102	75 x 50	43,5	44,6	50,6	75,4

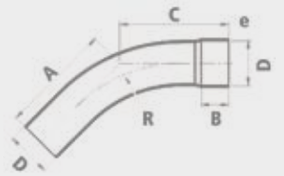
• Irriga LF Weldable Pipe End Cap

DIMENSIONS (MM)

CÓDIGO	GAGE	A	D
34080356	35	25	38,1
34731969	50	43,7	50,6
34732019	75	34	101,6
34732060	100	74	101,6
34080569	125	87	125
34080623	150	72	150

• Irriga LF 45º Weldable Pipe Bend PTA/BSA

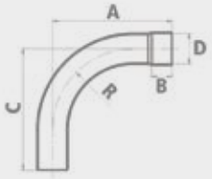




DIMENSIONS (MM)

CÓDIGO	GAGE	A	B	C	D	R
34134006	35	91,4	25	89,4	38,1	100
34802505	50	126	31	123	50,6	168
34802750	75	194	43,5	189	75,4	204
34803005	100	219	57	212	11,6	241
34134502	125	287	68,5	287	125	250
34134537	150	342	81	342	150	300

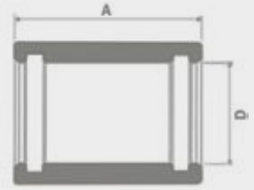
• Irriga LF 90° Weldable Pipe Bend PTA/BSA



DIMENSIONS (MM)

CÓDIGO	GAGE	A	B	C	D	R
34135002	35	148	25	150	38,1	100
34803501	50	188	31	191	50,6	125
34803757	75	279	43,5	284	75,4	190
34804001	100	329	57	336	101,6	216
34135509	125	404	68,5	464	125	250
34135533	150	605	81	605	150	300

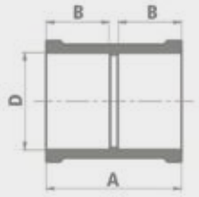
• Irriga LF Slip Coupling



DIMENSIONS (MM)

CÓDIGO	GAGE	A	D
34336032	50	93,5	51,7
34336067	75	100	76,6
34336091	100	103	102,7
34336121	125	163	126,1
34336156	150	196	151,1

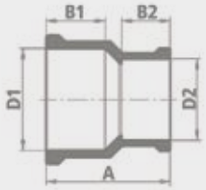
• Irriga LF Socket Weld Coupling



DIMENSIONS (MM)

CÓDIGO	GAGE	A	B	D
34334005	35	53	25	38,1
34805504	50	66	31	50,6
34805750	75	91	43,5	75,4
34806004	100	119	57	101,6
34334501	125	153	68,5	125
34334536	150	181	81	150

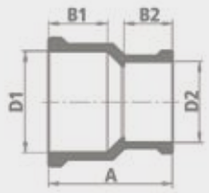
• Irriga Socket Weld Reducing Coupling LF PN 80



DIMENSIONS (MM)

CÓDIGO	GAGE	A	B1	B2	D1	D2
34454000	50 x 35	64,6	31,5	25,0	50,6	38,1
34808007	75 x 50	111,0	43,5	31,0	75,4	50,6
34807507	100 x 50	120,0	57,0	31,5	101,6	51,6
34807752	100 x 75	120,7	57,0	44,0	101,6	75,4
34454507	125 x 100	143,0	68,5	55,0	125,0	101,6
34454523	150 x 100	170,0	81,0	55,0	150,0	101,6
34454531	150 x 125	170,7	81,0	68,5	150,0	125,0

• Irriga Socket Weld Reducing Coupling LF PN 125

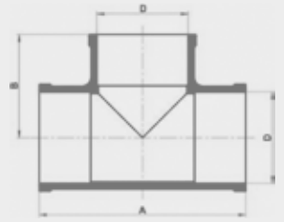


DIMENSIONS (MM)

CÓDIGO	GAGE	A	B1	B2	D1	D2
34455023*	75 x 50	91	43,5	31	75,4	50,6
34455031*	100 x 50	119,8	57	31,5	101,6	50,6
34455040*	100 x 75	120,7	57	43,5	101,6	75,4

* Fitting coated with fiberglass.

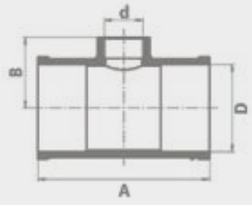
• Irriga LF Socket Weld Tee



DIMENSIONS (MM)

CÓDIGO	GAGE	A	B	D
34774005	35	96,5	48,3	38,1
34808503	50	122,5	61,2	50,6
34808759	75	174	87	75,4
34809003	100	229,5	114,8	101,6
34775001	125	322	161	125
34775036	150	372	186	150

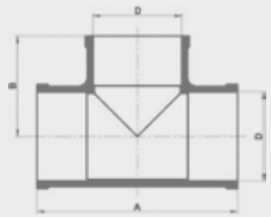
• Irriga LF Reducing Tee



DIMENSIONS (MM)

CÓDIGO	GAGE	A	B	D	d
34774501	35 x 1"	96,5	48,3	38,1	1"
34772657	50 x 3/4"	96,5	47,8	50,6	3/4"
34772690	50 x 1"	102,5	51,8	50,6	1"
34772681	50 x 1.1/2"	116,5	55,8	50,6	1.1/2"
34772762	75 x 1.1/2"	143,5	68	75,4	1.1/2"
34772789	75 x 2.1/2"	170,5	77,5	75,4	2.1/2"
34772800	100 x 1.1/2"	200,5	82,3	101,6	1.1/2"

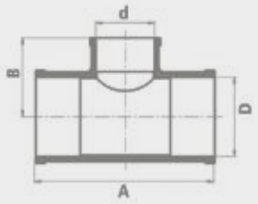
• Irriga LF Socket Weld Tee Coupling BSA PN 125



DIMENSIONS (MM)

CÓDIGO	GAGE	A	B	D
34776520	50	122,5	95,8	50,6
34776539	75	174	135,5	75,4
34776547	100	229,5	177,3	101,6

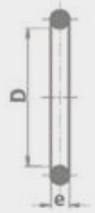
•Irriga LF Socket Weld Reducing Tee



DIMENSIONS (MM)

CÓDIGO	GAGE	A	B	D	d
34808228	75 x 50	147,5	74,5	75,4	50,6
34808279	100 x 50	229,5	88,8	101,6	50,6
34808287	100 x 75	229,5	101,3	101,6	75,4
34775044	150 x 100	324	162	150	101,6
34775052	150 x 125	324	173,5	150	125

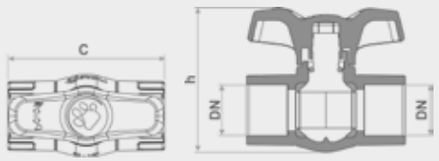
•Irriga LF Rubber Seal Ring



DIMENSIONS (MM)

CÓDIGO	GAGE	D	e
37353507	50	49,6	6,5
37353752	75	74,4	7
37354007	100	100,6	8,5
37354252	125	124	8
37354503	150	149,8	9,2

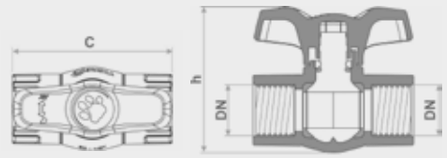
• Irriga Socket Weld Ball Valve VS



DIMENSIONS (MM)

CÓDIGO	GAGE	C	DN	h
34812993	20	62,4	20	56,5
34813019	25	69,6	25	63,3
34813027	32	89,8	32	77,5
34813035	35	104	35	88,6
34811121	50	119,8	50	109,1
34811130	75	182	75	175,4

• Irriga Threaded Ball Valve VS



DIMENSIONS (MM)

CÓDIGO	GAGE	C	DN	h
100017567	3/4"	69,6	3/4"	63,3
100017568	1"	89,8	1"	77,4
100017569	1.1/2"	119,8	1.1/2"	109
100017570	2"	142	2"	123,2

• Lubricant Paste

INFORMATION

CÓDIGO	WEIGHT (G)
53201814	160
53201830	400
53201849	1000

• Priming Fluid Bottle

INFORMATION

CÓDIGO	WEIGHT (G)
54001207	200
54010001	1000

• PVC Adhesive Tube, Colorless

INFORMATION

CÓDIGO	DESCRIPTION
53010229	PVC Adhesive Tube, Colorless 17g
53001025	PVC Adhesive Tube, Colorless 75g

• Adesivo PVC Frasco Incolor

INFORMATION

CÓDIGO	DESCRIPTION
53020151	PVC Adhesive Bottle, Colorless 175g
53020178	PVC Adhesive Bottle, Colorless 850g

• Fita Veda Rosca

DIMENSIONS (MM)

CÓDIGO	SIZE
54501854	18 mm x 10 m
54501900	18 mm x 25 m
54501951	18 mm x 50 m

Notes

Irriga LF DEFoFo

PERMANENT SYSTEMS

4. Irriga LF DEFoFo Line

Irriga LF DEFoFo Line pipes are used in permanent lines of irrigation systems, since they are an essential component in the system in every all methods.

In those cases, we observed that TIGRE PVC pipes were rarely used in the system, because they are in buried permanent lines.

4.1. Function/Application

Water conveyance for irrigation systems at room temperature, used in water pipelines in irrigation and fertirrigation systems.

4.2. Benefits and Differential Factors

Quick installation
More productivity while reducing the costs (joints already built in the pipe).

Integrated Elastic Joint
Avoids ring displacement during assembly.

Reduced insertion force

Durability
Increased useful life.

Chemical Resistance
Can be used in aggressive soils and fertirrigation.

Increased productivity
Faster laying (m/day).

Easiness
Simplified inventory control (in a single product).

Interchangeable
With cast iron systems.

4.3. Technical Characteristics

Material: Pipes and fittings manufactured in PVC, Poly(vinyl chloride).

Color: Blue.

Gage Diameter: DN100, DN150, DN200, DN250, DN300, DN350, DN400, and DN500.

Pipe length: 6.0 m.

Sealing: SBR (styrene-butadiene) rubber.

Elastic Joint: JEI (Integrated Elastic Joint), rubber ring not removable by hand.

Working pressure:

- PN 60 (6,0 kgf/cm² or 60 m.c.a.)
- PN 80 (8,0 kgf/cm² or 80 m.c.a.)
- PN 125 (12,5 kgf/cm² or 125 m.c.a.)

Stiffness Class:

- PN 60 = 2700 Pa
- PN 80 = 4000 Pa
- PN 125 = 16000 Pa

Note: Pa – Pascal – The International System of Units' standard pressure unit.

List of reference standards concerning the manufacturing of the Irriga LF DEFoFo line that ensure excellent performance, providing the installations with high safety.

REFERENCE STANDARDS	
ABNT NBR 7665/2007	Systems for water pipelines and water distribution. – PVC12 DEFoFo pipes with elastic joint.
ABNT NBR 14311	Irrigation and drainage - PVC Pipes DEFOFO PN60, 80 and 125 with elastic joint to permanent irrigation systems.
ABNT NBR 9822	Laying of rigid PVC pipes for water pipelines and water systems.

4.4. Integrated Elastic Joint

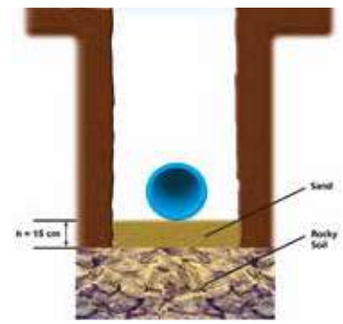
This is the element that incorporates the sealing ring during the manufacturing process. While the conventional technology required manual placement of the rings while laying the pipes, the JEI technology eliminates that task. That ensures more reliability and safety of the joint and increases productivity and savings during the installation. The JEI technology was developed in Norway and became a solution accepted worldwide.

4.5. Instructions

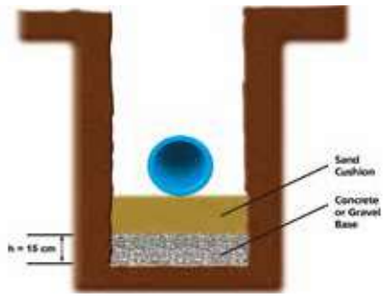
4.5.1. Digging, Excavation, Preparation, and Leveling of Ditch Bottom

1) Ditch excavation should be such that any debris from pavement digging or any base from soil cladding is far from the edge of the ditch, thereby avoiding improper use in the envelopment.

2) For rocky soils (decomposed rock, loose rock, and bedrock), a sand cushion (free of rocks) of a minimum height of 15 cm over the pipes, is necessary. The ditch bottom must be uniform, with no bumps. For such use sand or equivalent materials.



3) When the ditch bottom is composed of saturated clay, peat, or mud, without minimum mechanical conditions for laying the pipes, a gravel or concrete base, properly piled, is necessary. Laying of pipes over said bases must be on a sand cushion or an equivalent material.



4.5.2. Laying Length

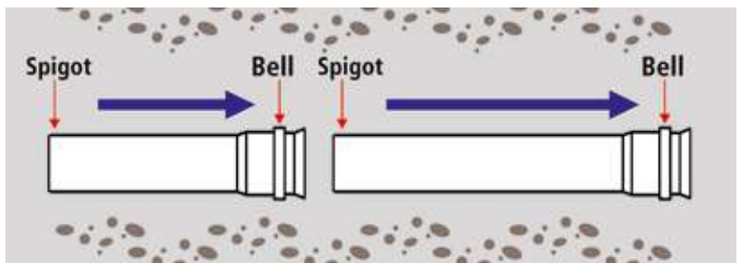
Table 3 presents the laying length for the pipes, which must be taken into account when preparing projects and determining the quantity of materials, per ABNT.

Table 3 - Minimum Laying Length

DN	DE	Minimum laying length (m)
100	118	5,83
150	170	5,83
200	222	5,75
250	274	5,75
300	326	5,75
400	429	5,68
500	532	5,68

4.5.3. Piping Laying and Jointing

1) The mounting direction must preferably be from the bell end to the spigot end of the pipes.



2) Heating the pipes for formation of curves, spigots, or holes, is not permitted.

3) Lay the pipes with a slight sinuosity over the axis of the ditch.

4) In piping with smaller diameters, a little deflection in the pipes (see Table 4) is possible, provided that the region of the splice is aligned by propping with wooden paddocks.

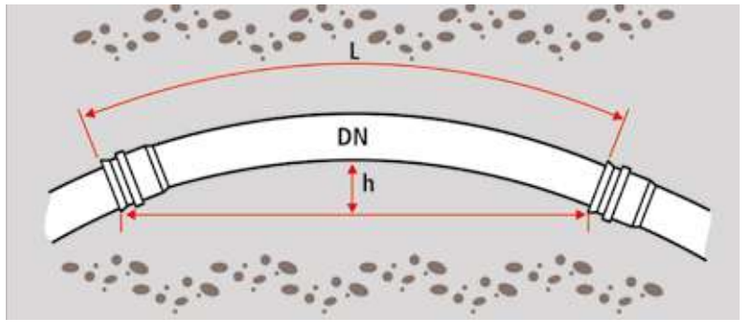


Table 4 - Allowed Pipe Bending*

DN	DE (mm)	h (m)
100	118	0,1
150	170	0,035
200	222	0,020
250	274	0,015
300	326	0,015
400	429	0,01
500	532	0,01

* Anchoring of spigots is necessary.

5) Always use Lubricant Paste in the elastic joint, since oil or grease can damage the rubber seal ring.

6) After inserting the chamfered end into the bottom of the spigot end, set it back approximately 1 cm, to create a span that allows any piping movement from expansion and settlement of the soil. To facilitate the process, mark the depth of the spigot end in the end of the pipe.

7) Elastic joint fittings must be anchored with anchor blocks designed such that they can resist to any longitudinal and transversal stresses since the elastic joint does not absorb such stresses.

8) Equipment must be anchored in the direction of the weight and any possible longitudinal stress, so that these parts can work free of any stress or strain.

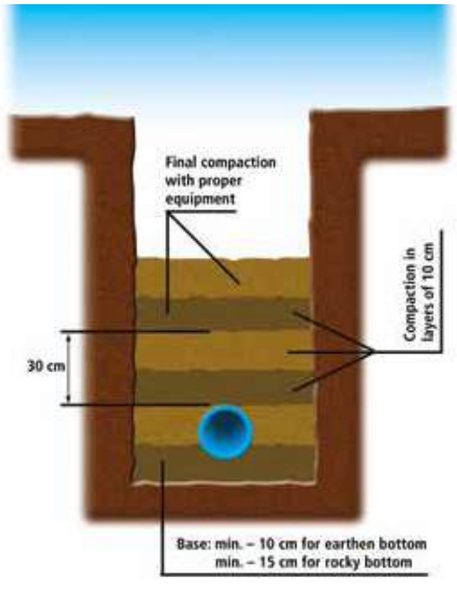
4.5.4. Pavement Backfill and Restoration

1) Before performing the backfill, all the joints must be checked for their watertightness. Inspections must be made, preferably between branch pipes and at most, every 500 meters.

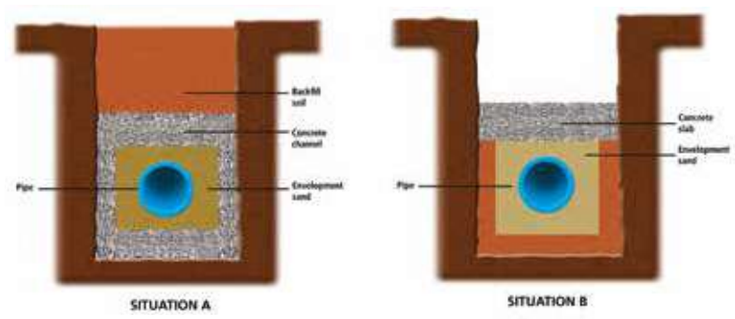
2) The piping with be covered with selected materials (free of rocks) at least 30 cm above the top generating line. Compaction must be in successive layers of 10 cm, and, until achieving the height of the pipe, compaction must be made manually only on the sides of the pipe.

3) The rest of the material should be poured in successive layers of 30 cm, and compacted so that they achieve the same ground condition as the sides of the ditch.

4) Observe the indications of the project and never use wheeled machines when compacting the ditch.



5) When the depth of the ditch is below 80 cm or when the pipeline goes through streets with heavy traffic load, railways, etc., special measures for protecting the pipeline are necessary, such as making channels with the pipes inside, enveloped in granular material and a proper reinforced concrete cover (situation A), or a proper reinforced concrete slab (situation B).



6) Direct enveloping of PVC pipes with concrete is not recommended as the concrete may break and reach the pipes. However, if the designer chooses this solution, he must dimension the concrete envelope, providing it with reinforcement to guarantee its performance as a continuous beam.

4.6. Recommendations

4.6.1. Watertightness tests

The test must be carried out every 500 of piping with water at a room temperature of 20°C.

The pressure must not exceed 1.5 times the maximum working pressure of the pipe, applied during over 1 hour, and, under no circumstances, over 24 hours.

Check the pipes and fittings for their anchoring. The pipe should be filled with water from the lowest point so that it expels the air from its inside. After waiting 24 hours with static pressure inside the pipe, pressurize the piping with a hand pump (slowly) until reaching the test pressure.

Table 5 - Consumption of Lubricant Paste

Gages	Lubricant Paste
DN	(g / joint)
100	25
150	40
200	50
250	60
300	70
400	90
500	110

4.6.2. Head Loss Tables

Below are the head loss tables for the Irriga LF DE- FoFo pipes, which are useful for dimensioning the lines when preparing the projects.

The calculation of head loss was based on the Colebrook Equation, the Universal Head Loss Equation, the Reynolds Number, and the Continuity Equation. Our results are deemed the most accurate according to the current concepts and technical resources of computer processing.

Colebrook Equation

$$\frac{1}{\sqrt{f}} = -2 \log_{10} \left(0{,}27 \frac{K}{D} + \frac{2{,}51}{R\sqrt{f}}\right)$$

Continuity Equation

$$Q = \frac{\pi D^2}{4} \qquad V = Cte.$$

Reynolds Equation

$$R = \frac{VD}{v}$$

Universal Head Loss Equation

$$hf = f. \frac{L}{D} \frac{V^2}{2g}$$

4.7. Head Loss Tables - M/100m

4.7.1. PN 60 Irrigation Rigid PVC Pipes

Conduit inner area

DN 100 = 0,00995 m² | **DN 150 = 0,02066 m²**

Flow rate (L/s)	Speed (m/s)	Head Loss (m/100m)	Flow rate (L/s)	Speed (m/s)	Head Loss (m/100m)
0,500	0,050	0,004	0,750	0,036	0,001
1,250	0,126	0,019	2,250	0,109	0,010
2,000	0,201	0,046	3,750	0,181	0,025
2,750	0,276	0,083	5,250	0,254	0,046
3,500	0,351	0,129	6,750	0,327	0,074
4,250	0,427	0,185	8,250	0,399	0,107
5,000	0,502	0,250	9,750	0,472	0,145
5,750	0,577	0,324	11,250	0,544	0,189
6,500	0,653	0,406	12,750	0,617	0,239
7,250	0,728	0,497	14,250	0,690	0,293
8,000	0,803	0,596	15,750	0,762	0,353
8,750	0,879	0,704	17,250	0,835	0,418
9,500	0,954	0,819	18,750	0,907	0,487
10,250	1,029	0,943	20,250	0,980	0,562
11,000	1,105	1,074	21,750	1,053	0,641
11,750	1,180	1,214	23,250	1,125	0,725
12,500	1,255	1,361	24,750	1,198	0,814
13,250	1,331	1,516	26,250	1,270	0,908
14,000	1,406	1,679	27,750	1,343	1,006
14,750	1,481	1,849	29,250	1,416	1,109
15,500	1,557	2,026	30,750	1,488	1,217
16,250	1,632	2,212	32,250	1,561	1,329
17,000	1,707	2,404	33,750	1,633	1,445
17,750	1,783	2,604	35,250	1,706	1,566
18,500	1,858	2,811	36,750	1,779	1,692
19,250	1,933	3,026	38,250	1,851	1,822
20,000	2,008	3,247	39,750	1,924	1,956
20,750	2,084	3,476	41,250	1,996	2,095
21,500	2,159	3,712	42,750	2,069	2,238
22,250	2,234	3,955	44,250	2,142	2,386
23,000	2,310	4,205	45,750	2,214	2,537
23,750	2,385	4,463	47,250	2,287	2,693
24,500	2,460	4,727	48,750	2,359	2,854
25,250	2,536	4,998	50,250	2,432	3,018
26,000	2,611	5,276	51,750	2,504	3,187
26,750	2,686	5,561	53,250	2,577	3,360
27,500	2,762	5,853	54,750	2,650	3,537
28,250	2,837	6,152	56,250	2,722	3,719
29,000	2,912	6,457	57,750	2,795	3,904
29,750	2,988	6,770	59,250	2,867	4,094

Conduit inner area

DN 200 = 0,03529 m²

Flow rate (L/s)	Speed (m/s)	Head Loss (m/100m)
1,000	0,028	0,001
3,250	0,092	0,005
5,500	0,156	0,014
7,750	0,220	0,026
10,000	0,283	0,041
12,250	0,347	0,060
14,500	0,411	0,082
16,750	0,475	0,107
19,000	0,538	0,136
21,250	0,602	0,167
23,500	0,666	0,201
25,750	0,729	0,238
28,000	0,793	0,278
30,250	0,857	0,320
32,500	0,921	0,366
34,750	0,984	0,414
37,000	1,048	0,465
39,250	1,112	0,519
41,500	1,176	0,575
43,750	1,239	0,634
46,000	1,303	0,696
48,250	1,367	0,760
50,500	1,431	0,827
52,750	1,494	0,896
55,000	1,558	0,968
57,250	1,622	1,043
59,500	1,686	1,120
61,750	1,749	1,200
64,000	1,813	1,282
66,250	1,877	1,366
68,500	1,941	1,453
70,750	2,004	1,543
73,000	2,068	1,635
75,250	2,132	1,729
77,500	2,196	1,826
79,750	2,259	1,926
82,000	2,323	2,027
84,250	2,387	2,131
86,500	2,450	2,238
88,750	2,514	2,347

DN 250 = 0,05374 m²

Flow rate (L/s)	Speed (m/s)	Head Loss (m/100m)
1,000	0,019	0,000
4,500	0,084	0,003
8,000	0,149	0,010
11,500	0,214	0,019
15,000	0,279	0,031
18,500	0,344	0,046
22,000	0,409	0,064
25,500	0,474	0,084
29,000	0,540	0,106
32,500	0,605	0,131
36,000	0,670	0,159
39,500	0,735	0,189
43,000	0,800	0,221
46,500	0,865	0,255
50,000	0,930	0,292
53,500	0,995	0,330
57,000	1,060	0,372
60,500	1,126	0,415
64,000	1,191	0,460
67,500	1,256	0,508
71,000	1,321	0,558
74,500	1,386	0,610
78,000	1,451	0,664
81,500	1,516	0,720
85,000	1,581	0,778
88,500	1,647	0,839
92,000	1,712	0,901
95,500	1,777	0,965
99,000	1,842	1,032
102,500	1,907	1,100
106,000	1,972	1,171
109,500	2,037	1,243
113,000	2,102	1,318
116,500	2,168	1,395
120,000	2,233	1,473
123,500	2,298	1,553
127,000	2,363	1,636
130,500	2,428	1,720
134,000	2,493	1,807
137,500	2,558	1,895

4.7.2. PN 60 Irrigation Rigid PVC Pipes

Conduit inner area

DN 300 = 0,076062 m²

Flow rate (L/s)	Speed (m/s)	Head Loss (m/100m)
1,500	0,020	0,000
6,500	0,085	0,003
11,500	0,151	0,008
16,500	0,217	0,016
21,500	0,283	0,026
26,500	0,348	0,039
31,500	0,414	0,053
36,500	0,480	0,070
41,500	0,546	0,089
46,500	0,611	0,109
51,500	0,677	0,132
56,500	0,743	0,157
61,500	0,809	0,184
66,500	0,874	0,212
71,500	0,940	0,243
76,500	1,006	0,275
81,500	1,071	0,309
86,500	1,137	0,345
91,500	1,203	0,383
96,500	1,269	0,423
101,500	1,334	0,464
106,500	1,400	0,507
111,500	1,466	0,552
116,500	1,532	0,599
121,500	1,597	0,647
126,500	1,663	0,697
131,500	1,729	0,749
136,500	1,795	0,803
141,500	1,860	0,858
146,500	1,926	0,915
151,500	1,992	0,973
156,500	2,058	1,034
161,500	2,123	1,096
166,500	2,189	1,159
171,500	2,255	1,224
176,500	2,320	1,291
181,500	2,386	1,360
186,500	2,452	1,430
191,500	2,518	1,501
196,500	2,583	1,575

DN 350 = 0,10224 m²

Flow rate (L/s)	Speed (m/s)	Head Loss (m/100m)
1,500	0,015	0,000
9,000	0,088	0,003
16,500	0,161	0,008
24,000	0,235	0,016
31,500	0,308	0,026
39,000	0,381	0,038
46,500	0,455	0,053
54,000	0,528	0,070
61,500	0,602	0,089
69,000	0,675	0,111
76,500	0,748	0,134
84,000	0,822	0,159
91,500	0,895	0,186
99,000	0,968	0,216
106,500	1,042	0,247
114,000	1,115	0,280
121,500	1,188	0,315
129,000	1,262	0,352
136,500	1,335	0,391
144,000	1,408	0,431
151,500	1,482	0,474
159,000	1,555	0,518
166,500	1,629	0,564
174,000	1,702	0,612
181,500	1,775	0,662
189,000	1,849	0,713
196,500	1,922	0,766
204,000	1,995	0,821
211,500	2,069	0,878
219,000	2,142	0,937
226,500	2,215	0,997
234,000	2,289	1,059
241,500	2,362	1,122
249,000	2,435	1,188
256,500	2,509	1,255
264,000	2,582	1,323
271,500	2,656	1,394
279,000	2,729	1,466
286,500	2,802	1,540
294,000	2,876	1,615

Conduit inner area

DN 400 =0,13163 m²

Flow rate (L/s)	Speed (m/s)	Head Loss (m/100m)
2,000	0,015	0,000
11,000	0,084	0,002
20,000	0,152	0,006
29,000	0,220	0,012
38,000	0,289	0,020
47,000	0,357	0,029
56,000	0,425	0,041
65,000	0,494	0,053
74,000	0,562	0,068
83,000	0,631	0,084
92,000	0,699	0,102
101,000	0,767	0,121
110,000	0,836	0,142
119,000	0,904	0,164
128,000	0,972	0,187
137,000	1,041	0,213
146,000	1,109	0,239
155,000	1,177	0,267
164,000	1,246	0,296
173,000	1,314	0,327
182,000	1,383	0,359
191,000	1,451	0,393
200,000	1,519	0,428
209,000	1,588	0,464
218,000	1,656	0,502
227,000	1,724	0,541
236,000	1,793	0,581
245,000	1,861	0,623
254,000	1,930	0,666
263,000	1,998	0,710
272,000	2,066	0,756
281,000	2,135	0,803
290,000	2,203	0,851
299,000	2,271	0,900
308,000	2,340	0,951
317,000	2,408	1,003
326,000	2,476	1,057
335,000	2,545	1,111
344,000	2,613	1,167
353,000	2,682	1,224

DN 500 = 0,20252 m²

Flow rate (L/s)	Speed (m/s)	Head Loss (m/100m)
2,000	0,010	0,000
11,000	0,054	0,001
20,000	0,099	0,002
29,000	0,143	0,004
38,000	0,188	0,007
47,000	0,232	0,010
56,000	0,277	0,014
65,000	0,321	0,019
74,000	0,365	0,024
83,000	0,410	0,029
92,000	0,454	0,036
101,000	0,499	0,042
110,000	0,543	0,050
119,000	0,588	0,057
128,000	0,632	0,066
137,000	0,676	0,074
146,000	0,721	0,084
155,000	0,765	0,094
164,000	0,810	0,104
173,000	0,854	0,115
182,000	0,899	0,126
191,000	0,943	0,138
200,000	0,988	0,150
209,000	1,032	0,163
218,000	1,076	0,176
227,000	1,121	0,189
236,000	1,165	0,204
245,000	1,210	0,218
254,000	1,254	0,233
263,000	1,299	0,249
272,000	1,343	0,265
281,000	1,387	0,281
290,000	1,432	0,298
299,000	1,476	0,315
308,000	1,521	0,333
317,000	1,565	0,351
326,000	1,610	0,370
335,000	1,654	0,389
344,000	1,699	0,409
353,000	1,743	0,429

4.7.3. PN 80 Irrigation Rigid PVC Pipes

Conduit inner area

DN 100 = 0,009816 m²

Flow rate (L/s)	Speed (m/s)	Head Loss (m/100m)
0,500	0,051	0,004
1,250	0,127	0,020
2,000	0,204	0,047
2,750	0,280	0,086
3,500	0,357	0,134
4,250	0,433	0,192
5,000	0,509	0,259
5,750	0,586	0,335
6,500	0,662	0,420
7,250	0,739	0,514
8,000	0,815	0,617
8,750	0,891	0,728
9,500	0,968	0,848
10,250	1,044	0,976
11,000	1,121	1,112
11,750	1,197	1,257
12,500	1,273	1,409
13,250	1,350	1,570
14,000	1,426	1,738
14,750	1,503	1,914
15,500	1,579	2,098
16,250	1,655	2,290
17,000	1,732	2,489
17,750	1,808	2,696
18,500	1,885	2,910
19,250	1,961	3,133
20,000	2,037	3,362
20,750	2,114	3,599
21,500	2,190	3,843
22,250	2,267	4,095
23,000	2,343	4,354
23,750	2,419	4,620
24,500	2,496	4,894
25,250	2,572	5,175
26,000	2,648	5,463
26,750	2,725	5,758
27,500	2,801	6,060
28,250	2,878	6,369
29,000	2,954	6,686
29,750	3,030	7,009

DN 150 = 0,020408 m²

Flow rate (L/s)	Speed (m/s)	Head Loss (m/100m)
0,750	0,037	0,001
2,250	0,110	0,010
3,750	0,184	0,026
5,250	0,257	0,048
6,750	0,331	0,076
8,250	0,404	0,110
9,750	0,478	0,150
11,250	0,551	0,195
12,750	0,625	0,246
14,250	0,698	0,302
15,750	0,772	0,364
17,250	0,845	0,430
18,750	0,919	0,502
20,250	0,992	0,579
21,750	1,066	0,661
23,250	1,139	0,748
24,750	1,213	0,839
26,250	1,286	0,936
27,750	1,360	1,037
29,250	1,433	1,143
30,750	1,507	1,254
32,250	1,580	1,369
33,750	1,654	1,490
35,250	1,727	1,614
36,750	1,801	1,744
38,250	1,874	1,878
39,750	1,948	2,016
41,250	2,021	2,159
42,750	2,095	2,307
44,250	2,168	2,459
45,750	2,242	2,615
47,250	2,315	2,776
48,750	2,389	2,941
50,250	2,462	3,111
51,750	2,536	3,285
53,250	2,609	3,463
54,750	2,683	3,645
56,250	2,756	3,832
57,750	2,830	4,024
59,250	2,903	4,219

Conduit inner area
DN 150 = 0,02040 m²

Flow rate (L/s)	Speed (m/s)	Head Loss (m/100m)
0,750	0,037	0,001
2,250	0,110	0,010
3,750	0,184	0,026
5,250	0,257	0,048
6,750	0,331	0,076
8,250	0,404	0,110
9,750	0,478	0,150
11,250	0,551	0,195
12,750	0,625	0,246
14,250	0,698	0,302
15,750	0,772	0,364
17,250	0,845	0,430
18,750	0,919	0,502
20,250	0,992	0,579
21,750	1,066	0,661
23,250	1,139	0,748
24,750	1,213	0,839
26,250	1,286	0,936
27,750	1,360	1,037
29,250	1,433	1,143
30,750	1,507	1,254
32,250	1,580	1,369
33,750	1,654	1,490
35,250	1,727	1,614
36,750	1,801	1,744
38,250	1,874	1,878
39,750	1,948	2,016
41,250	2,021	2,159
42,750	2,095	2,307
44,250	2,168	2,459
45,750	2,242	2,615
47,250	2,315	2,776
48,750	2,389	2,941
50,250	2,462	3,111
51,750	2,536	3,285
53,250	2,609	3,463
54,750	2,683	3,645
56,250	2,756	3,832
57,750	2,830	4,024
59,250	2,903	4,219

DN 200= 0,03476 m²

Flow rate (L/s)	Speed (m/s)	Head Loss (m/100m)
1,000	0,029	0,001
3,500	0,101	0,006
6,000	0,173	0,017
8,500	0,244	0,032
11,000	0,316	0,051
13,500	0,388	0,075
16,000	0,460	0,102
18,500	0,532	0,134
21,000	0,604	0,169
23,500	0,676	0,208
26,000	0,748	0,251
28,500	0,820	0,298
31,000	0,892	0,348
33,500	0,964	0,402
36,000	1,035	0,459
38,500	1,107	0,519
41,000	1,179	0,583
43,500	1,251	0,651
46,000	1,323	0,722
48,500	1,395	0,796
51,000	1,467	0,874
53,500	1,539	0,955
56,000	1,611	1,039
58,500	1,683	1,126
61,000	1,754	1,217
63,500	1,826	1,311
66,000	1,898	1,408
68,500	1,970	1,508
71,000	2,042	1,611
73,500	2,114	1,718
76,000	2,186	1,828
78,500	2,258	1,940
81,000	2,330	2,056
83,500	2,402	2,175
86,000	2,474	2,297
88,500	2,545	2,422
91,000	2,617	2,550
93,500	2,689	2,682
96,000	2,761	2,816
98,500	2,833	2,953

Conduit inner area
DN 300 = 0,07499 m²

Flow rate (L/s)	Speed (m/s)	Head Loss (m/100m)
1,500	0,020	0,000
7,000	0,093	0,003
12,500	0,167	0,010
18,000	0,240	0,020
23,500	0,313	0,032
29,000	0,387	0,047
34,500	0,460	0,065
40,000	0,533	0,086
45,500	0,607	0,109
51,000	0,680	0,134
56,500	0,753	0,162
62,000	0,827	0,193
67,500	0,900	0,226
73,000	0,973	0,261
78,500	1,047	0,299
84,000	1,120	0,338
89,500	1,193	0,381
95,000	1,267	0,425
100,500	1,340	0,472
106,000	1,414	0,520
111,500	1,487	0,571
117,000	1,560	0,625
122,500	1,634	0,680
128,000	1,707	0,738
133,500	1,780	0,797
139,000	1,854	0,859
144,500	1,927	0,923
150,000	2,000	0,989
155,500	2,074	1,057
161,000	2,147	1,128
166,500	2,220	1,200
172,000	2,294	1,274
177,500	2,367	1,351
183,000	2,440	1,429
188,500	2,514	1,510
194,000	2,587	1,592
199,500	2,660	1,677
205,000	2,734	1,763
210,500	2,807	1,852
216,000	2,880	1,942

DN 350 = 0,10161 m²

Flow rate (L/s)	Speed (m/s)	Head Loss (m/100m)
1,500	0,015	0,000
8,000	0,079	0,002
14,500	0,143	0,006
21,000	0,207	0,012
27,500	0,271	0,020
34,000	0,335	0,030
40,500	0,399	0,042
47,000	0,463	0,055
53,500	0,526	0,070
60,000	0,590	0,087
66,500	0,654	0,105
73,000	0,718	0,125
79,500	0,782	0,146
86,000	0,846	0,169
92,500	0,910	0,193
99,000	0,974	0,219
105,500	1,038	0,246
112,000	1,102	0,275
118,500	1,166	0,305
125,000	1,230	0,337
131,500	1,294	0,370
138,000	1,358	0,405
144,500	1,422	0,440
151,000	1,486	0,478
157,500	1,550	0,517
164,000	1,614	0,557
170,500	1,678	0,598
177,000	1,742	0,641
183,500	1,806	0,685
190,000	1,870	0,731
196,500	1,934	0,778
203,000	1,998	0,826
209,500	2,062	0,876
216,000	2,126	0,927
222,500	2,190	0,979
229,000	2,254	1,032
235,500	2,318	1,087
242,000	2,381	1,144
248,500	2,445	1,201
255,000	2,509	1,260

Conduit inner area

DN 400 = 0,13144 m²

Flow rate (L/s)	Speed (m/s)	Head Loss (m/100m)
2,000	0,015	0,000
11,000	0,084	0,002
20,000	0,152	0,006
29,000	0,221	0,012
38,000	0,289	0,020
47,000	0,358	0,029
56,000	0,426	0,041
65,000	0,494	0,054
74,000	0,563	0,068
83,000	0,631	0,084
92,000	0,700	0,102
101,000	0,768	0,121
110,000	0,837	0,142
119,000	0,905	0,164
128,000	0,974	0,188
137,000	1,042	0,213
146,000	1,111	0,240
155,000	1,179	0,268
164,000	1,248	0,297
173,000	1,316	0,328
182,000	1,385	0,361
191,000	1,453	0,394
200,000	1,522	0,429
209,000	1,590	0,466
218,000	1,658	0,504
227,000	1,727	0,543
236,000	1,795	0,583
245,000	1,864	0,625
254,000	1,932	0,668
263,000	2,001	0,713
272,000	2,069	0,758
281,000	2,138	0,806
290,000	2,206	0,854
299,000	2,275	0,904
308,000	2,343	0,955
317,000	2,412	1,007
326,000	2,480	1,060
335,000	2,549	1,115
344,000	2,617	1,171
353,000	2,686	1,229

DN 500= 0,20204 m²

Flow rate (L/s)	Speed (m/s)	Head Loss (m/100m)
2,000	0,010	0,000
17,000	0,084	0,002
32,000	0,158	0,005
47,000	0,233	0,010
62,000	0,307	0,017
77,000	0,381	0,026
92,000	0,455	0,036
107,000	0,530	0,047
122,000	0,604	0,060
137,000	0,678	0,075
152,000	0,752	0,091
167,000	0,827	0,108
182,000	0,901	0,127
197,000	0,975	0,147
212,000	1,049	0,168
227,000	1,124	0,191
242,000	1,198	0,215
257,000	1,272	0,240
272,000	1,346	0,266
287,000	1,420	0,294
302,000	1,495	0,323
317,000	1,569	0,353
332,000	1,643	0,385
347,000	1,717	0,418
362,000	1,792	0,452
377,000	1,866	0,487
392,000	1,940	0,524
407,000	2,014	0,561
422,000	2,089	0,600
437,000	2,163	0,640
452,000	2,237	0,681
467,000	2,311	0,724
482,000	2,386	0,767
497,000	2,460	0,812
512,000	2,534	0,858
527,000	2,608	0,905
542,000	2,683	0,953
557,000	2,757	1,003
572,000	2,831	1,053
587,000	2,905	1,105

4.7.4. PN 125 Irrigation Rigid PVC Pipes

Conduit inner area

DN 100 = 0,00922 m²

Flow rate (L/s)	Speed (m/s)	Head Loss (m/100m)
0,500	0,054	0,004
1,125	0,122	0,019
1,750	0,190	0,043
2,375	0,257	0,076
3,000	0,325	0,117
3,625	0,393	0,166
4,250	0,461	0,223
4,875	0,528	0,287
5,500	0,596	0,359
6,125	0,664	0,438
6,750	0,731	0,524
7,375	0,799	0,617
8,000	0,867	0,717
8,625	0,935	0,824
9,250	1,002	0,938
9,875	1,070	1,059
10,500	1,138	1,186
11,125	1,205	1,320
11,750	1,273	1,461
12,375	1,341	1,608
13,000	1,409	1,761
13,625	1,476	1,921
14,250	1,544	2,087
14,875	1,612	2,260
15,500	1,680	2,439
16,125	1,747	2,624
16,750	1,815	2,815
17,375	1,883	3,012
18,000	1,950	3,216
18,625	2,018	3,425
19,250	2,086	3,641
19,875	2,154	3,863
20,500	2,221	4,090
21,125	2,289	4,324
21,750	2,357	4,564
22,375	2,424	4,809
23,000	2,492	5,061
23,625	2,560	5,318
24,250	2,628	5,581
24,875	2,695	5,850

DN 150 = 0,01921 m²

Flow rate (L/s)	Speed (m/s)	Head Loss (m/100m)
0,625	0,033	0,001
1,875	0,098	0,008
3,125	0,163	0,021
4,375	0,228	0,039
5,625	0,293	0,063
6,875	0,358	0,091
8,125	0,423	0,124
9,375	0,488	0,161
10,625	0,553	0,203
11,875	0,618	0,250
13,125	0,683	0,301
14,375	0,748	0,356
15,625	0,813	0,415
16,875	0,878	0,479
18,125	0,943	0,546
19,375	1,009	0,618
20,625	1,074	0,694
21,875	1,139	0,774
23,125	1,204	0,857
24,375	1,269	0,945
25,625	1,334	1,037
26,875	1,399	1,132
28,125	1,464	1,232
29,375	1,529	1,335
30,625	1,594	1,442
31,875	1,659	1,553
33,125	1,724	1,667
34,375	1,789	1,785
35,625	1,854	1,907
36,875	1,919	2,033
38,125	1,984	2,162
39,375	2,050	2,295
40,625	2,115	2,432
41,875	2,180	2,572
43,125	2,245	2,716
44,375	2,310	2,863
45,625	2,375	3,014
46,875	2,440	3,169
48,125	2,505	3,327
49,375	2,570	3,489

Conduit inner area
DN 200 = 0,03274 m²

Flow rate (L/s)	Speed (m/s)	Head Loss (m/100m)
0,800	0,024	0,000
3,000	0,092	0,005
5,200	0,159	0,015
7,400	0,226	0,028
9,600	0,293	0,046
11,800	0,360	0,067
14,000	0,427	0,092
16,200	0,495	0,121
18,400	0,562	0,153
20,600	0,629	0,189
22,800	0,696	0,228
25,000	0,763	0,270
27,200	0,831	0,316
29,400	0,898	0,365
31,600	0,965	0,417
33,800	1,032	0,472
36,000	1,099	0,531
38,200	1,166	0,592
40,400	1,234	0,657
42,600	1,301	0,725
44,800	1,368	0,795
47,000	1,435	0,869
49,200	1,502	0,946
51,400	1,570	1,025
53,600	1,637	1,108
55,800	1,704	1,194
58,000	1,771	1,282
60,200	1,838	1,374
62,400	1,905	1,468
64,600	1,973	1,565
66,800	2,040	1,665
69,000	2,107	1,768
71,200	2,174	1,874
73,400	2,241	1,982
75,600	2,308	2,094
77,800	2,376	2,208
80,000	2,443	2,325
82,200	2,510	2,444
84,400	2,577	2,567
86,600	2,644	2,692

DN 250= 0,04987 m²

Flow rate (L/s)	Speed (m/s)	Head Loss (m/100m)
1,000	0,020	0,000
4,250	0,085	0,004
7,500	0,150	0,010
10,750	0,216	0,020
14,000	0,281	0,033
17,250	0,346	0,049
20,500	0,411	0,067
23,750	0,476	0,088
27,000	0,541	0,112
30,250	0,607	0,138
33,500	0,672	0,167
36,750	0,737	0,198
40,000	0,802	0,232
43,250	0,867	0,268
46,500	0,932	0,306
49,750	0,997	0,347
53,000	1,063	0,390
56,250	1,128	0,435
59,500	1,193	0,483
62,750	1,258	0,533
66,000	1,323	0,585
69,250	1,388	0,639
72,500	1,454	0,696
75,750	1,519	0,754
79,000	1,584	0,815
82,250	1,649	0,879
85,500	1,714	0,944
88,750	1,779	1,011
92,000	1,845	1,081
95,250	1,910	1,153
98,500	1,975	1,226
101,750	2,040	1,302
105,000	2,105	1,380
108,250	2,170	1,460
111,500	2,236	1,543
114,750	2,301	1,627
118,000	2,366	1,713
121,250	2,431	1,801
124,500	2,496	1,892
127,750	2,561	1,984

Conduit inner area
DN 300 = 0,07059 m²

Flow rate (L/s)	Speed (m/s)	Head Loss (m/100m)
1,500	0,021	0,000
6,000	0,085	0,003
10,500	0,149	0,008
15,000	0,212	0,016
19,500	0,276	0,026
24,000	0,340	0,039
28,500	0,404	0,053
33,000	0,467	0,070
37,500	0,531	0,088
42,000	0,595	0,109
46,500	0,659	0,131
51,000	0,722	0,156
55,500	0,786	0,182
60,000	0,850	0,210
64,500	0,914	0,241
69,000	0,977	0,272
73,500	1,041	0,306
78,000	1,105	0,342
82,500	1,169	0,379
87,000	1,232	0,418
91,500	1,296	0,459
96,000	1,360	0,502
100,500	1,424	0,546
105,000	1,487	0,592
109,500	1,551	0,640
114,000	1,615	0,690
118,500	1,679	0,741
123,000	1,742	0,794
127,500	1,806	0,848
132,000	1,870	0,905
136,500	1,934	0,963
141,000	1,997	1,022
145,500	2,061	1,083
150,000	2,125	1,146
154,500	2,189	1,210
159,000	2,252	1,277
163,500	2,316	1,344
168,000	2,380	1,413
172,500	2,444	1,484
177,000	2,507	1,557

DN 350 = 0,09489 m²

Flow rate (L/s)	Speed (m/s)	Head Loss (m/100m)
1,500	0,016	0,000
8,000	0,084	0,002
14,500	0,153	0,007
21,000	0,221	0,015
27,500	0,290	0,024
34,000	0,358	0,036
40,500	0,427	0,049
47,000	0,495	0,065
53,500	0,564	0,083
60,000	0,632	0,102
66,500	0,701	0,124
73,000	0,769	0,147
79,500	0,838	0,172
86,000	0,906	0,199
92,500	0,975	0,228
99,000	1,043	0,259
105,500	1,112	0,291
112,000	1,180	0,325
118,500	1,249	0,361
125,000	1,317	0,398
131,500	1,386	0,437
138,000	1,454	0,478
144,500	1,523	0,520
151,000	1,591	0,564
157,500	1,660	0,610
164,000	1,728	0,658
170,500	1,797	0,707
177,000	1,865	0,757
183,500	1,934	0,810
190,000	2,002	0,863
196,500	2,071	0,919
203,000	2,139	0,976
209,500	2,208	1,035
216,000	2,276	1,095
222,500	2,345	1,156
229,000	2,413	1,220
235,500	2,482	1,285
242,000	2,550	1,351
248,500	2,619	1,419
255,000	2,687	1,488

Conduit inner area

DN 400 = 0,12229 m²

Flow rate (L/s)	Speed (m/s)	Head Loss (m/100m)
2,000	0,016	0,000
10,000	0,082	0,002
18,000	0,147	0,006
26,000	0,213	0,012
34,000	0,278	0,019
42,000	0,343	0,029
50,000	0,409	0,039
58,000	0,474	0,052
66,000	0,540	0,066
74,000	0,605	0,081
82,000	0,671	0,098
90,000	0,736	0,117
98,000	0,801	0,137
106,000	0,867	0,158
114,000	0,932	0,181
122,000	0,998	0,205
130,000	1,063	0,231
138,000	1,128	0,258
146,000	1,194	0,286
154,000	1,259	0,316
162,000	1,325	0,347
170,000	1,390	0,379
178,000	1,456	0,413
186,000	1,521	0,448
194,000	1,586	0,484
202,000	1,652	0,521
210,000	1,717	0,560
218,000	1,783	0,600
226,000	1,848	0,642
234,000	1,913	0,685
242,000	1,979	0,728
250,000	2,044	0,774
258,000	2,110	0,820
266,000	2,175	0,868
274,000	2,241	0,917
282,000	2,306	0,967
290,000	2,371	1,018
298,000	2,437	1,071
306,000	2,502	1,124
314,000	2,568	1,179

DN 500= 0,18811 m²

Flow rate (L/s)	Speed (m/s)	Head Loss (m/100m)
2,000	0,011	0,000
14,500	0,077	0,001
27,000	0,144	0,004
39,500	0,210	0,009
52,000	0,276	0,015
64,500	0,343	0,022
77,000	0,409	0,031
89,500	0,476	0,041
102,000	0,542	0,052
114,500	0,609	0,064
127,000	0,675	0,077
139,500	0,742	0,092
152,000	0,808	0,108
164,500	0,874	0,125
177,000	0,941	0,143
189,500	1,007	0,162
202,000	1,074	0,183
214,500	1,140	0,204
227,000	1,207	0,227
239,500	1,273	0,250
252,000	1,340	0,275
264,500	1,406	0,301
277,000	1,473	0,328
289,500	1,539	0,356
302,000	1,605	0,385
314,500	1,672	0,415
327,000	1,738	0,446
339,500	1,805	0,478
352,000	1,871	0,511
364,500	1,938	0,545
377,000	2,004	0,580
389,500	2,071	0,616
402,000	2,137	0,653
414,500	2,203	0,691
427,000	2,270	0,730
439,500	2,336	0,770
452,000	2,403	0,811
464,500	2,469	0,853
477,000	2,536	0,896
489,500	2,602	0,940

4.8. Handling

4.8.1. Maintenance

The damaged section must be replaced with a segment of the same type of pipe.

Maintenance operations in Irriga LF DEFoFo pipes must be easily carried out using Vinilfer Slip Couplings.

We recommend anchoring the slip coupling, so that only the piping can move.

4.8.2. Transport

Loading of trucks must be carried out so that the pipes do not sustain any damage or strain during the transport. They must be supported over their length, and avoid overlapping the spigot ends, bending the pipes, swinging them, or throwing them to the ground. Remember that pipes should not be dragged or bumped.

4.8.3. Storage

Provide a location to store the material near the construction site, and the pipes must not be exposed to weather for a prolonged time.

Stacking must be on sides, with either struts or stacks in the shape of a bonfire, without exceeding the maximum height of 1.5 m.

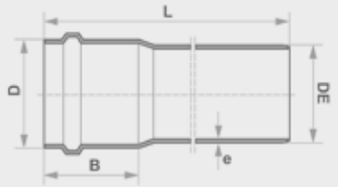
The first layer of the pipes must be fully supported, and the spigot ends of the pipes must be free.

We recommend protecting the spigot ends from sunlight as they have rubber seal rings that may damage.

For temporary protection, we recommend a wooden structure that is easy to disassemble, and covering it with tiles so that the pipes are 30 to 50 cm away from the roof so that the heat does not damage them.

4.9. Irriga DEFoFo LF Line Items

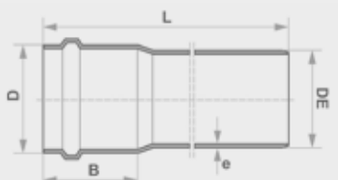
• Irriga LF DEFoFo Rigid PVC pipe JEI PN 60



DIMENSIONS (MM)

CÓDIGO	GAGE	B	D	DE	e	L
15293527	100	122,8	124,2	118	2,7	6.000
15293543	150	150,1	178,8	170	3,9	6.000
15293560	200	177,8	233	222	5,0	6.000
15293586	250	187,8	287,4	274	6,2	6.000
15293608	300	207,1	341,8	326	7,4	6.000
15293616	350	223,5	396,7	378	8,6	6.000
15293624	400	237,6	451,1	429	9,8	6.000
15293632	500	278,5	559,2	532	12,1	6.000

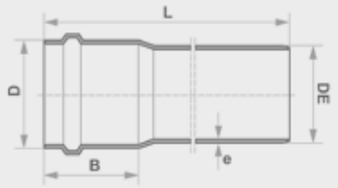
• Irriga LF DEFoFo Rigid PVC pipe JEI PN 80



DIMENSIONS (MM)

CÓDIGO	GAGE	B	D	DE	e	L
15293012	100	122,8	125	118	3,1	6.000
15293039	150	150,1	179,8	170	4,4	6.000
15293055	200	177,8	234,6	222	5,8	6.000
15293071	250	187,8	289,2	274	7,1	6.000
15293098	300	207,1	344	326	8,5	6.000
15293101	350	223,5	399,3	378	9,9	6.000
15293110	400	237,6	453,9	429	11,2	6.000
15293128	500	278,5	562,8	532	13,9	6.000

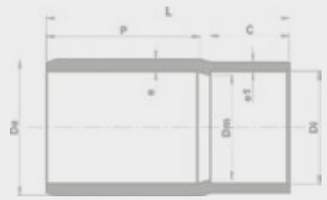
• Irriga LF DEFoFo Rigid PVC pipe JEI PN 125



DIMENSIONS (MM)

CÓDIGO	GAGE	B	D	DE	e	L
15305002	100	128	128,4	118	4,8	6.000
15305037	150	147,1	184,6	170	6,8	6.000
15305061	200	177,8	240,8	222	8,9	6.000
15305096	250	187,8	297	274	11,0	6.000
15305126	300	207,1	353,2	326	13,1	6.000
15305134	350	223,5	409,9	378	15,2	6.000
15305150	400	237,6	465,9	429	17,2	6.000
15305185	500	278,5	577,6	532	21,3	6.000

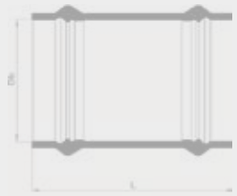
• Irriga LF DeFoFo BS x PR Pipe Adapter PN125, Long



DIMENSIONS (MM)

CÓDIGO	GAGE	C	De	Di	Dm	e	e1	L	P
34054320	118 x 101	86	118	101,6	98,5	6,0	5	240	140
34054355	170 x 150	115	170	150,0	145	8,5	7	294	170

• Irriga LF DEFoFo PVC Slip Coupling JEI PN125



DIMENSIONS (MM)

CÓDIGO	GAGE	L	Db
20803410	100	295	118,8
20803436	150	345	171
20803452	200	400	223
20803479	250	450	275
20803495	300	490	327

• Lubricant Paste

INFORMATION

CÓDIGO	WEIGHT (G)
53201814	160
53201830	400
53201849	1000

Irriga EP e ES

PORTABLE SYSTEMS

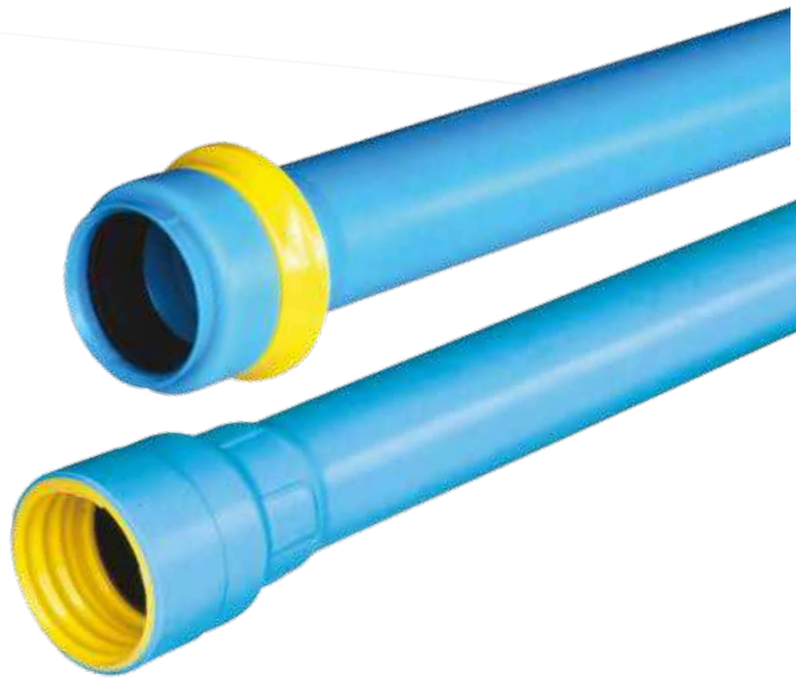
5. Irriga EP and ES Lines

With the modernization of agricultural techniques, irrigation plays an important role to contribute with increased productivity and profitability. We developed special quick coupling connectors for different sprinkler irrigation applications, especially farm produce.

The Plastic Thread Coupling and Metal Coupling, known by the acronyms EP and ES, respectively, are lines that are easy to assemble and disassemble and that remain with the same features after a prolonged time.

5.1. Function/Application

PVC pipes and fittings with plastic threaded coupling (EP) or metal coupling (ES), for irrigation systems that convey water at room temperature in mobile irrigation systems. Used in portable or semipermanent irrigation systems using conventional aspersion or cannon sprinklers. Can also be used in main lines in localized location system.



5.2. Benefits and Differential Factors

Complete line
Pipes and fittings that meet different installation needs.

Easy installation
Manually coupled without any tools due to the type of coupling.

Quick installation
Quicker assembly and disassembly, for use in several areas, reducing installation costs.

Resistance
Manufactured in PVC, pipes and fittings have high resistance to weather and chemicals used in fertirrigation.

Easy maintenance
There is no loss of pipes when performing corrective maintenance, thanks to the male and female bell ends and simple spigot end.

5.3. Technical Characteristics

Material: Components manufactured in PVC, Poly(vinyl chloride).

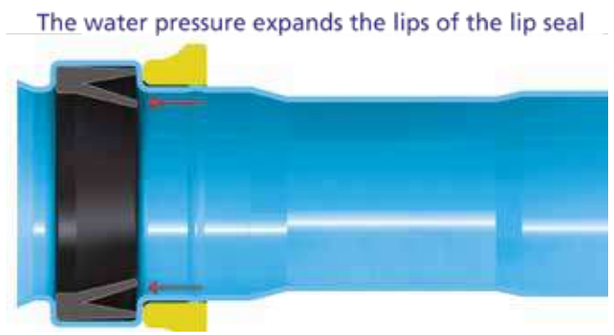
Color: Blue.

Service pressure: PN 80 (80 m.c.a).

Pipe Length: 6.0 m.

Sealing: Double lip seal.

Sealing obtained by the expansion of the ring when the system reaches the working pressure, offering good tightness.



Note: the ring already comes built in the pipes and fittings. When replacing, check for its proper positioning.

5.3.1. Characteristics of the Irriga EP Line

Coupling: PVC, threaded.

Color: yellow.

Type of coupling: Long pitch.

Pipes: With threaded bell and spigot.

Thread: Moving male thread (bell) and fixed female thread (spigot).

Available on diameters: 50(2") mm and 75(3") mm.

Pipe systems with an "EP" plastic coupling are one of the most sought-after products by farmers working with temporarily permanent systems, with pipes mounted in all branch pipes, throughout the entire crop cycle.

This irrigation system is most used in crops with very superficial root systems, where irrigation occurs by applying small layers of water with less frequency (reducing watering schedules), in which the movement of piping has been avoided to reduce labor and damage to the plants.

5.3.2. Characteristics of the Irriga ES Line

Coupling: Metal quick coupling (ES), PVC, yellow backing ring.

Type of coupling: Galvanized steel coupling.

Pipes: With threaded bell and spigot.

Available on diameters: 50(2") mm, 75(3") mm, and 100(4") mm.

The "ES" Metal Coupling is commonly used in crops of plants with a deeper root system, in which the piping must have their position changed more often.

In addition to easy assembly and disassembly, the line allows direct interchangeability with aluminum or steel pipes from other manufacturers who adopt the same basic coupling design and compatible dimensions.

In addition to excellent finish and increased resistance, the system has devices that limit the movement of the locking tilting rod. Thus, the tilting rod does not hit the pipe wall, avoiding damage to the piping.

Important:
Pipes and fittings of portable lines must not be buried due to the sealing system and their type of coupling.

Below is the list of reference standards concerning the manufacturing of the Irriga EP and ES lines that ensure excellent performance, providing the installations with high safety.

REFERENCE STANDARDS	
ABNT NBR 15282: 2005	PN 80 PVC pipes with quick joint to mobile irrigation systems

5.4. Instructions

5.4.1. Irriga EP

Systems must be assembled by threading the pipes and fittings by hand with the threads clean and free of soil particles.

The double lip seal used in the inside of the spigot of the female ends of the EP pipes, allows a small leakage when the pressure is below 0.5 Kgf/cm² (5 m.c.a.), therefore, likely to happen when starting and stopping the pumping system. The EP threads (BSP profile) do not promote tightness, and serve to attach the parts between each other.

The direction of the water flow from the male end to the female end is very important to provide a perfect sealing of the double lip seal.

Sprinkler riser pipes must be properly anchored to prevent them from falling down.

Pipes and fittings of the Irriga EP line must be always installed, and never buried, on the surface of the terrain.

5.4.2. EP Joint

1 Align the pipes and check the sealing ring for its proper position.

2 Attach the bell end of the pipe into the spigot end and tighten the end nut as usual.

3 Joint completed.

5.4.3. Irriga ES

Systems must be assembled by attaching pipes and fittings by hand with the bell end spigot ends clean and free of soil particles.

The direction of the water flow from the male end to the female end is very important to provide a perfect sealing of the double lip seal.

Sprinkler riser pipes must be properly anchored to prevent them from falling down.

Pipes and fittings of the Irriga ES line must be always installed, and never buried, on the surface of the terrain.

5.4.4. ES Joint

1 Align the pipes and check the sealing ring for its proper position.

2 Attach the bell end of the pipe into the spigot end and attach the metal coupling.

Note: pull the pipes, eliminating the clearance between the coupling and the yellow coupling ring.

3 Joint completed.

5.5. Recommendations

5.5.1 Sprinkler Valve and Quick Coupling

The valve and quick coupling for sprinklers facilitate the work of farmers, allowing them to quickly change a sprinkler from one point to another in an irrigation branch pipe.

In vegetable farming, using irrigation systems with several branch pipes installed at the same time is quite common, by chanting the sprinklers from one to another branch pipe.

In this case, using the valve and quick coupling for the sprinkler will be the best solution for changing the sprinklers, without any need cut off the water supply.

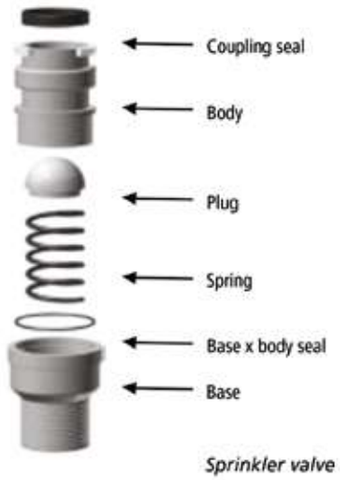
The valve and quick coupling for the sprinkler are sold separately, allowing the installation of valves in all branch pipes (in several sprinkler outlet points), making it possible to work with a reduced number of sprinklers.

Quick coupling for sprinkler

Valve for sprinkler

5.5.2. Installation and Operation

The sprinkler valve, with a 1" thread on its base, must be threaded over the sprinkler outlet.



Sprinkler valve

The quick coupling with a 1" female thread on the top must be threaded to the sprinkler riser pipe.

When coupling the assembly already mounted: sprinkler quick coupling + rise pipe + sprinkler over the valve, the water flows from the branch line to the sprinkler.

When decoupling the valve assembly to transfer it to another point, the valve closes automatically.

5.5.3. Head Loss Tables

Calculations based in the Colebrook Equation, in conjunction with the Continuity Equation, Reynolds Equation, and Universal Head Loss Equation, adopting a roughness K of 0.66 mm for the PVC.

Colebrook Equation:

$$\frac{1}{\sqrt{f}} = -2 \log_{10} \left(0{,}27 \frac{K}{D} + \frac{2{,}51}{R\sqrt{f}}\right)$$

Continuity Equation:

$$Q = \frac{\pi D^2}{4} \qquad V = Cte.$$

Reynolds Equation:

$$R = \frac{VD}{v}$$

Universal Head Loss Equation:

$$hf = f. \frac{L}{D} \frac{V^2}{2g}$$

5.6. Irrigation Rigid PVC Pipes

3.8.1 PN ES 2"

DN 2" = 0,0017202 m²

Flow rate (L/s)	Speed (m/s)	Head Loss (m/100m)
0,200	0,116	0,047
0,325	0,189	0,114
0,450	0,262	0,209
0,575	0,334	0,329
0,700	0,407	0,473
0,825	0,480	0,641
0,950	0,552	0,832
1,075	0,625	1,046
1,200	0,698	1,282
1,325	0,770	1,540
1,450	0,843	1,820
1,575	0,916	2,121
1,700	0,988	2,443
1,825	1,061	2,785
1,950	1,134	3,148
2,075	1,206	3,532
2,200	1,279	3,935
2,325	1,352	4,359
2,450	1,424	4,803
2,575	1,497	5,266
2,700	1,570	5,748
2,825	1,642	6,250
2,950	1,715	6,771
3,075	1,788	7,312
3,200	1,860	7,871
3,325	1,933	8,449
3,450	2,006	9,046
3,575	2,078	9,662
3,700	2,151	10,296
3,825	2,224	10,949
3,950	2,296	11,620
4,075	2,369	12,310
4,200	2,442	13,017
4,325	2,514	13,743
4,450	2,587	14,487
4,575	2,660	15,249
4,700	2,732	16,029
4,825	2,805	16,826
4,950	2,878	17,641
5,075	2,950	18,474

3.8.2 PN ES 3"

DN 3" = 0,0038925 m²

Flow rate (L/s)	Speed (m/s)	Head Loss (m/100m)
0,300	0,077	0,014
0,550	0,141	0,041
0,800	0,206	0,083
1,050	0,270	0,137
1,300	0,334	0,204
1,550	0,398	0,282
1,800	0,462	0,372
2,050	0,527	0,473
2,300	0,591	0,585
2,550	0,655	0,708
2,800	0,719	0,842
3,050	0,784	0,986
3,300	0,848	1,141
3,550	0,912	1,306
3,800	0,976	1,481
4,050	1,040	1,666
4,300	1,105	1,861
4,550	1,169	2,067
4,800	1,233	2,282
5,050	1,297	2,506
5,300	1,362	2,741
5,550	1,426	2,985
5,800	1,490	3,238
6,050	1,554	3,501
6,300	1,618	3,773
6,550	1,683	4,055
6,800	1,747	4,346
7,050	1,811	4,646
7,300	1,875	4,955
7,550	1,940	5,274
7,800	2,004	5,602
8,050	2,068	5,938
8,300	2,132	6,284
8,550	2,196	6,638
8,800	2,261	7,002
9,050	2,325	7,374
9,300	2,389	7,756
9,550	2,453	8,146
9,800	2,518	8,545
10,050	2,582	8,952

3.8.3 PN ES 4”

DN 4” = 0,006998

Flow rate (L/s)	Speed (m/s)	Head Loss (m/100m)	Flow rate (L/s)	Speed (m/s)	Head Loss (m/100m)
0,500	0,071	0,008	10,500	1,500	2,326
1,000	0,143	0,030	11,000	1,572	2,536
1,500	0,214	0,064	11,500	1,643	2,753
2,000	0,286	0,108	12,000	1,715	2,978
2,500	0,357	0,164	12,500	1,786	3,212
3,000	0,429	0,229	13,000	1,857	3,454
3,500	0,500	0,305	13,500	1,929	3,704
4,000	0,572	0,390	14,000	2,000	3,961
4,500	0,643	0,485	14,500	2,072	4,227
5,000	0,714	0,590	15,000	2,143	4,501
5,500	0,786	0,703	15,500	2,215	4,782
6,000	0,857	0,826	16,000	2,286	5,071
6,500	0,929	0,958	16,500	2,357	5,368
7,000	1,000	1,099	17,000	2,429	5,673
7,500	1,072	1,248	17,500	2,500	5,986
8,000	1,143	1,407	18,000	2,572	6,306
8,500	1,214	1,574	18,500	2,643	6,634
9,000	1,286	1,749	19,000	2,715	6,969
9,500	1,357	1,933	19,500	2,786	7,312
10,000	1,429	2,126	20,000	2,858	7,663

5.7. Handling

5.7.1 Maintenance - Irriga EP

Preventive: we recommend cleaning the pipes and fittings with water jets when changing the installation.

Corrective: if repairing is required, remove the damaged part and weld an EP female bell end and/or male bell end, as applicable (see sequence below):

1. Chamfer the bell end of pipe. Sand the bell end and spigot end of pipe with a 100 grit sandpaper a nd mark the depth of the spigot end. Prepare the surfaces to be welded using the TIGRE Priming.

2. Apply the TIGRE plastic adhesive to the bell end of the pipe and the spigot end of the fitting.

3. Attach the bell end of the pipe to the spigot end of the fitting and remove any excess adhesive and then insert the bell end into the spigot end.

4. Repair completed.

5.7.2 Maintenance - Irriga ES

Preventive: we recommend cleaning the pipes and fittings with water jets when changing the installation.

Corrective: if repairing is required, remove the damaged part and weld ES female bell end and/or male bell end to redo de installation, as applicable (see sequence below):

1. Chamfer the bell end of pipe. Sand the bell end and spigot end of pipe with a 100 grit sandpaper and mark the depth of the spigot end. Prepare the surfaces to be welded using the TIGRE Priming.

2. Apply the TIGRE plastic adhesive to the bell en d of the pipe and the spigot end of the fitting.

3 Attach the bell end of the pipe to the spigot end of the fitting and remove any excess adhesive and then insert the bell end into the spigot end.

4 Repair completed.

5.7.3 Transport

Avoid strong impacts and friction with stones, metal objects, and sharp edges, to preserve the integrity of the pipes, especially the male/female ends.

The supporting surface must be flat, as the pipes must not sustain bending stresses for a long time.

In loading and unloading operations, avoid shock, bumps, and friction, especially in the male/female ends.

Always carry, and do not drag, the pipes, to preserve the integrity of the pipes.

5.7.4. Storage

For good preservation, the supporting structure must be leveled and the pipes must must have a brace every 1.5 meter.

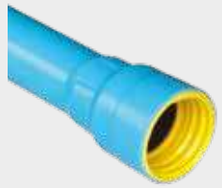
We recommend storing the pipes in the shade.

Stacking should not exceed 1.5 m high (we recommend stacking the pipes in the shape of a bonfire or aligned lengthwise).

Irriga ES or EP pipes must be stored with their male and female ends alternated such that the spigots do not touch each other.

5.8. Irriga EP Line Items

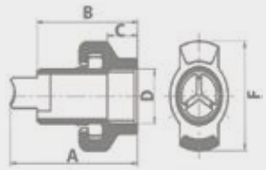
• Irriga EP Pipe



DIMENSIONS (MM)

CÓDIGO	BITOLA	B	C	D	e	L
15001968	2"	86,5	53	50,6	1,9	6.000
15002018	3"	90	53	75,4	2,5	6.000

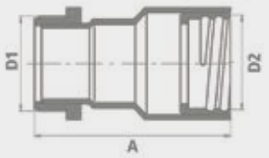
• Irriga EP Sprinkler Quick Coupling



DIMENSIONS (MM)

CÓDIGO	BITOLA	A	B	C	D	F
34462054	1"	95	75	22	1"	65

• Irriga EP Female Adapter



DIMENSIONS (MM)

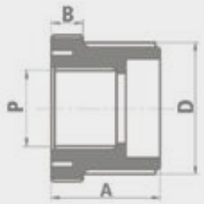
CÓDIGO	BITOLA	A	D1	D2
34021961	2"	129	2"	61,5
34052689	2"x 1.1/2"	154	1.1/2"	61,5
34022011	3"	144,5	3"	87,1
34052808	3"x 2.1/2"	185	2.½"	87,1

• Irriga EP Male Adapter

DIMENSIONS (MM)

CÓDIGO	BITOLA	A	D	DR
34001960	2"	162,5	50,6	2"
34042683	2"x 1.1/2"	190	50,6	2"x 1.1/2"
34002010	3"	161,5	75,4	3"

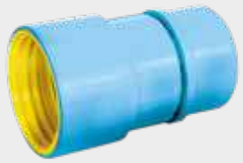
• Reducing Bush for Sprinkler Outlet Irriga EP

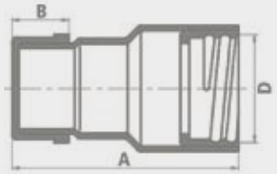


DIMENSIONS (MM)

CÓDIGO	BITOLA	A	B	D	d
34712620	1.1/2" x 1"	35,5	11	1.1/2"	1"

• Female Pipe End Cap Irriga EP

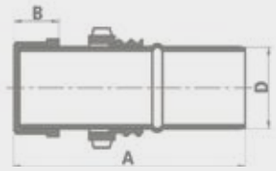




DIMENSIONS (MM)

CÓDIGO	BITOLA	A	B	D
34081964	2"	130	43,7	61,5
34082014	3"	150	34	87,1

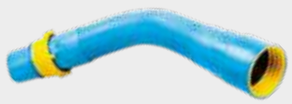
• Male Pipe End Cap Irriga EP

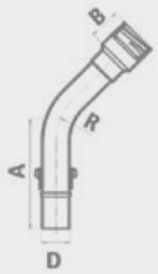


DIMENSIONS (MM)

CÓDIGO	BITOLA	A	B	D
34061963	2"	165	43,7	50,6
34062013	3"	168	34	75,4

• 45° Bend Irriga EP





DIMENSIONS (MM)

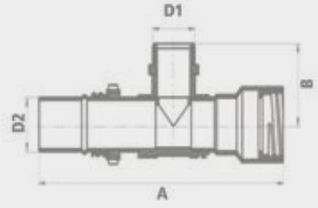
CÓDIGO	BITOLA	A	B	D	R
34101965	2"	225	55	50,6	145
34102015	3"	275	55	75	217

• 90° Bend Irriga EP

DIMENSIONS (MM)

CÓDIGO	BITOLA	A	B	R	DN
34121966	2"	280	280	135	2"
34122016	3"	370	370	170	3"

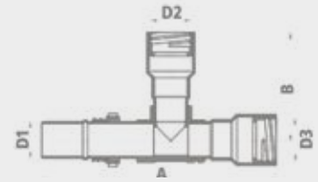
• Irriga EP Gas Branch Pipe



DIMENSIONS (MM)

CÓDIGO	BITOLA	A	B	D1	D2
34182698	2"x 2"	356,3	91	2"	50,6
34262772	3"x 2"	385,9	57	2"	75,4

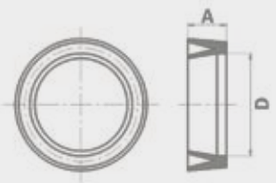
• Irriga EP Female Outlet Branch Pipe



DIMENSIONS (MM)

CÓDIGO	BITOLA	A	B	D1	D2	D3
34161968	2"	356,3	156	50,6	61,5	61,5
34162018	3"	412,4	185,9	75,4	87,1	87,1
34232776	3"x 2"	385,9	169,3	75,4	61,5	87,1

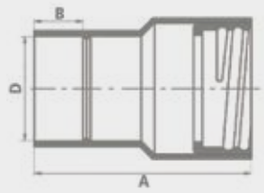
• Irriga EP/ ES Rubber Seal Ring



DIMENSIONS (MM)

CÓDIGO	BITOLA	A	D
37351962	2"	20	52,5
37352012	3"	20	77
37352063	4"	20	104

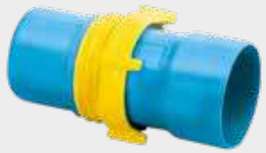
• Female Bell End Fitting Irriga EP

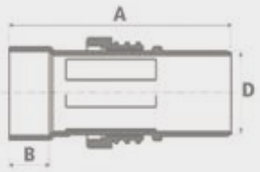


DIMENSIONS (MM)

CÓDIGO	BITOLA	A	B	D
34381968	2"	121,9	31	50,6
34382018	3"	138,6	43,5	75,4

• Male Bell End Fitting Irriga EP

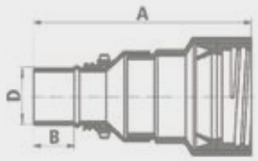




DIMENSIONS (MM)

CÓDIGO	BITOLA	A	B	D
34361967	2"	165	31	50,6
34362017	3"	179	43,7	75,4

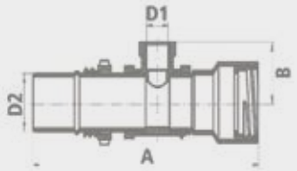
• Female/Male Reducer Irriga EP



DIMENSIONS (MM)

CÓDIGO	BITOLA	A	B	D
34432775	3"x 2"	328,5	53	50,6

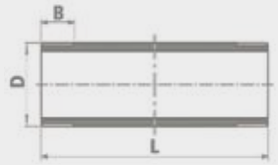
• Sprinkler Outlet Irriga EP



DIMENSIONS (MM)

CÓDIGO	BITOLA	A	B	D1	D2
34462658	2"x 3/4"	330,3	47,8	3/abr	50,6
34462666	2"x 1"	350,3	66,8	1"	50,6
34462682	2"x 1.1/2"	350,3	55,8	1"x 1.1/2"	50,6
34462763	3"x 1.1/2"	381,9	68	1"x 1.1/2"	75,4
34462780	3"x 2.1/2"	408,9	77,5	2"x 1.1/2"	75,4

• Irriga EP Threaded Riser Pipe



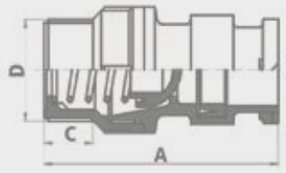
DIMENSIONS (MM) | VERSION 0.5M

CÓDIGO	BITOLA	B	D	L
34475008	3/4"	14,5	3/4"	500
34475202	1"	16,8	1"	500

DIMENSIONS (MM) | VERSION 0.5M

CÓDIGO	BITOLA	B	D	L
34475059	3/4"	14,5	3/4"	1000
34475253	1"	16,8	1"	1000

• Sprinkler Valve Irriga EP



DIMENSIONS (MM)

CÓDIGO	BITOLA	A	C	D
34462062	1"	115	24,5	1.1/2"

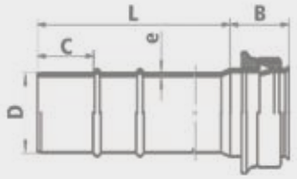
• Lubricant Paste

INFORMATION

CÓDIGO	WEIGHT (G)
53201814	160
53201830	400
53201849	1000

5.9. Irriga ES Line Items

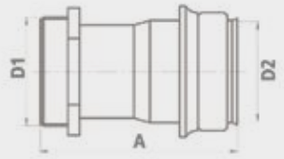
• Irriga ES Pipe Without Coupling



DIMENSIONS (MM)

CÓDIGO	BITOLA	B	C	D	e	L
15323205	2"	60	57	50,6	1,9	6.000
15323221	3"	75	71	75,4	2,5	6.000
15323248	4	85	81	101,6	3,6	6.000

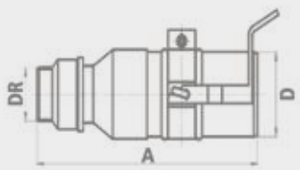
• Irriga ES Female Adapter



DIMENSIONS (MM)

CÓDIGO	BITOLA	A	D1	D2
34810044	2"	143	2"	51,7
34810052	3"	166,5	3"	77,8
34810109	4"	173	4"	102,8

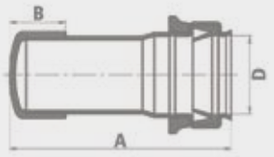
• Irriga ES Male Adapter



DIMENSIONS (MM)

CÓDIGO	BITOLA	A	D	DR
34810028	2"	163	50,6	2"
34810010	3"	186,5	75,4	3"
34810001	4"	213	101,6	4"

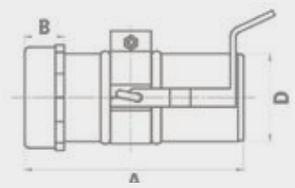
• Female Pipe End Cap Irriga ES



DIMENSIONS (MM)

CÓDIGO	BITOLA	A	B	D
34810079	2"	172,7	43,7	51,7
34810087	3"	168,5	34	77,8
34810095	4"	176,6	41,6	102,8

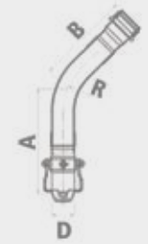
• Male Pipe End Cap Irriga ES



DIMENSIONS (MM)

CÓDIGO	BITOLA	A	B	D
34810370	2"	182,7	43,7	50,6
34810389	3"	188,5	34	75,4
34810400	4"	216,6	41,6	101,6

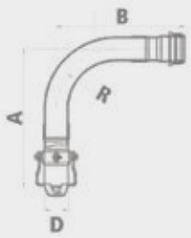
• 45° Bend Irriga ES



DIMENSIONS (MM)

CÓDIGO	BITOLA	A	B	D	R
34810532	2"	255	230	50,6	150
34810540	3"	341	311	75,4	200
34810559	4"	392	357	101,6	240

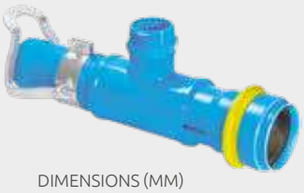
• 90° Bend Irriga ES

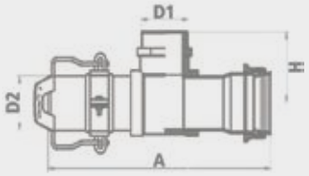


DIMENSIONS (MM)

CÓDIGO	BITOLA	A	B	D	R
34810630	2"	300,4	295	50,6	125
34810648	3"	431	401	75,4	190
34810656	4"	509	474	101,6	216

• Irriga ES Gas Branch Pipe

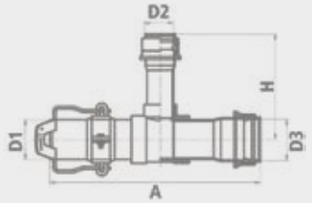




DIMENSIONS (MM)

CÓDIGO	BITOLA	A	D1	D2	H
34810931	3"x 2"	406,5	2"	75,4	97,2
34810958	4"x 2"	495,5	2"	101,6	118,6
34810974	4"x 3"	495,5	3"	101,6	118,6

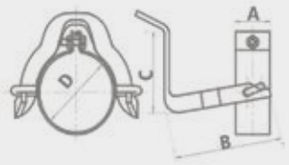
• Irriga ES Female Outlet Branch Pipe



DIMENSIONS (MM)

CÓDIGO	BITOLA	A	D1	D2	D3	H
34810737	2"x 2"	360,5	50,6	51,7	51,7	170,2
34810850	3"x 2"	410,5	75,4	51,7	77,8	183,5
34810745	3"x 3"	437	75,4	77,8	77,8	208,5
34810869	4"x 2"	495,5	101,6	51,7	102,8	197,8
34810877	4"x 3"	495,5	101,6	77,8	102,8	222,8
34810753	4"x 4"	495,5	101,3	102,8	102,8	227,8

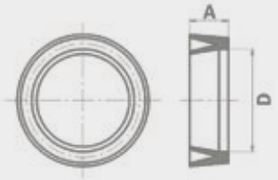
• Irriga ES Metal Coupling



DIMENSIONS (MM)

CÓDIGO	BITOLA	A	B	C	D
300000017	2"	35	101	60	50,5
300000018	3"	35	108	79	75,5
300000019	4"	35	127,3	88	101,6

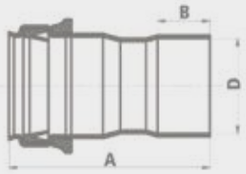
• Irriga EP/ ES Rubber Gasket



DIMENSIONS (MM)

CÓDIGO	BITOLA	A	D
37351962	2"	20	52,5
37352012	3"	20	77
37352063	4"	20	104

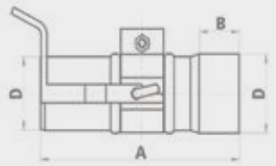
• Female Bell End Fitting Irriga ES



DIMENSIONS (MM)

CÓDIGO	BITOLA	A	B	D
34811580	2"	135	31	50,6
34811598	3"	160	43	75,4
34811601	4"	195	57	101,6

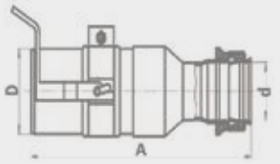
• Male Bell End Fitting Irriga ES



DIMENSIONS (MM)

CÓDIGO	BITOLA	A	B	D
34811539	2"	160	31	50,6
34811547	3"	190	43	75,4
34811555	4"	230	57	101,6

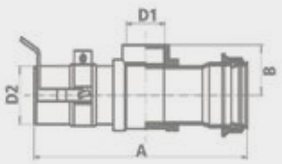
• Irriga ES Male/ Female Reducer



DIMENSIONS (MM)

CÓDIGO	BITOLA	A	D	p
34812403	3"x 2"	321,3	75,4	51,7
34812454	4"x 3"	357	101,6	77,8

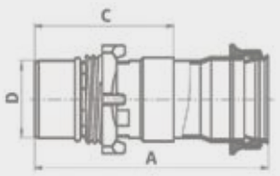
• Sprinkler Outlet Irriga ES



DIMENSIONS (MM)

CÓDIGO	BITOLA	A	B	D1	D2
34811717	2"x 3/4"	334,5	47,8	3/4"	50,6
34811725	2"x 1"	354,5	66,8	1"	50,6
34811733	2"x 1.1/2"	354,5	55,8	1.1/2"	50,6
34811741	3"x 1"	406,5	79	1"	75,4
34811687	3"x 1.1/2"	406,5	68	1.1/2"	75,4
34811709	3"x 2.1/2"	433,5	77,5	2.1/2"	75,4
34811750	4"x 1"	466,5	93,3	1"	101,6
34811776	4"x 1.1/2"	466,5	82,3	1.1/2"	101,6
34811792	4"x 2.1/2"	466,5	90,2	2.1/2"	101,6

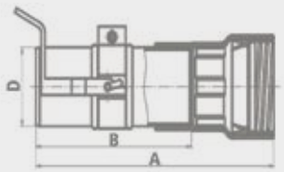
• Irriga ES x EP Female/ Male Transition Fitting



DIMENSIONS (MM)

CÓDIGO	BITOLA	A	C	D
34812853	3"	300,3	179	75,4

• Male/Female Transition Fitting Irriga ES x EP



DIMENSIONS (MM)

CÓDIGO	BITOLA	A	B	D
34811636	3"	280,1	185	75,4

• Lubricant Paste

CÓDIGO	INFORMATION WEIGHT (G)
53201814	160
53201830	400
53201849	1000

Notes

Agropecuária PVC

AGRICULTURE AND LIVESTOCK SYSTEMS

6. Agropecuária PVC Line

Agriculture and livestock are important industries for the economy and the environment. This industry is responsible for farming plants and animals for food. Tigre has solutions with excellent technology to convey water in an effective way for agriculture and livestock. Those systems are applied in rural properties to increase productivity and preserve the environment.

6.1. Function/Application

Tigre is expanding its Agropecuária PVC Line to meet different installation needs in agriculture. The line consists of blue pipes and fittings with diameters of 20, 25, 32, and 40 mm, and working pressure of 60 m.c.a.

6.2. Benefits and Differential Factors

Complete line
Meet the needs in the field.

Ease of installation
Uses adhesive weld joints, not requiring tools.

Lightweight
Lightweight pipes and fittings, facilitating handling, transport, and storage.

Resistance
Resists to chemicals used in fertirrigation and contaminated soils.

6.3. Technical Characteristics

Material: Components manufactured in PVC, Poly(vinyl chloride).

Color: Blue.

Working pressure (at 20ºC): 6.0 Kgf/cm² (60m.c.a.).

Pipes: Bell and spigot pipe.

Pipe length: 6.0 m.

Available on diameters: 20, 25, 32, and 40mm.

List of reference standards concerning the manufacturing of the Agropecuária PVC line that ensure excellent performance, providing the installations with high safety.

REFERENCE STANDARDS	
NBR 14654	Irrigation and drainage PVC pipes with solvent gluing PN 60 and PN 80
NBR 5648	Cold water supply in buil dings PVC pipes and fittings

***Note:** NBR 5648 standard used for dimensional reference. The product must not be applied in buildings.

6.4. Instructions

6.4.1. Assembly

Butt weld joints:

1. Sand the surfaces to be welded using TIGRE sandpiper.

2. Note that the attachment must be tight, which is almost impossible without the adhesive, because without pressure, the parts cannot

3. Clean the surfaces sanded of any dirt and grease with TIGRE Cleaning solution. Spread the adhesive evenly with a brush or the tip of the tube in the spigot and bell ends to be joined.

4. Attach the ends to the joined by making, while attaching, a slight rotating movement of 1/4 turn between the parts until they reach the position desired. Attach the parts and remove any excess adhesive, and wait for one hour to fill the pipe with water and 12 hours for carrying out the pressure test.

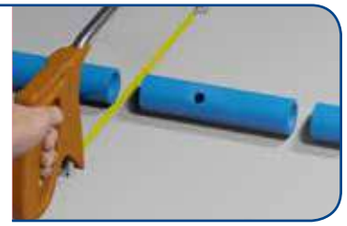
Installing the threaded fittings:

- Apply the thread seal tape in a sufficient quantity.
- Do not use too much, as it causes the fitting to break.
- Do not tighten too much, as it does not ensure sealing and breaks the fitting.
- Do not use PVC adhesive in the threads.
- Before threading the parts, check the male metal fitting for its size; if it is larger than the size of the spigot end, cut the excess; otherwise, do not thread the part beyond the stopper of the spigot end.

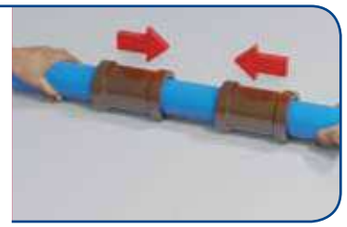
6.4.2. Maintenance

1. To solve problems that occur in points located in pipes in installations already completed, in consequence of small accidents (nail or drilled holes), or leakage in joints poorly made, TIGRE offers the Slip Coupling to its customers.

2 The TIGRE Slip Coupling is small and has a coupling system that allows interconnection between two fixed points. The wall must be open only in a small section, near the affected point.



3 Troubleshooting with Slip Couplings do not require adhesive and threads, since the slips have rubber seal rings. The damaged section must be replaced with a segment of the same type of pipe. Use two slip couplings, one at each end.



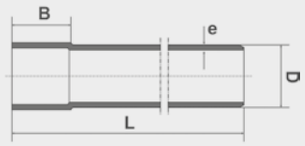
4 Moreover, the TIGRE Slip Coupling can also be used in exposed pipelines that have large straight sections, to correct or prevent any problem resulting from expansion and contraction. In that case, precautions are required to avoid displacement. The Slip Coupling must be secured so that only the pipe can move.

6.4.3 Storage

- Store at an easily accessible, shaded location, away from direct or continuous sunlight.
- We recommend stacking at a maximum height of 1.5 meter.
- Avoid strong impacts and friction with stones, metal objects, and sharp edges.
- In loading and unloading operations, avoid shock, bumps, and friction in the packaging, to avoid breakage.

6.5. Agropecuária PVC Line Items

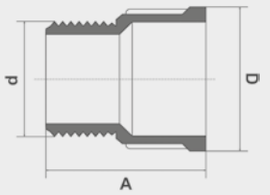
• TIGRE Pipe Agropecuária PVC PN60



DIMENSIONS (MM)

CÓDIGO	GAGE	B	D	e	L
15010002	20	32	20	1,5	6000
15010045	25	32	25	1,7	6000
15010088	32	32	32	2,1	6000
15010126	40	40	40	2,4	6000

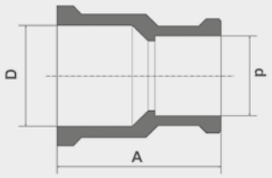
• TIGRE Agropecuária PVC Bell/Spigot Adapter, Short



DIMENSIONS (MM)

CÓDIGO	GAGE	A	D	d
100018855	25x3/4"	40,3	25	3/4"
100018878	32x1"	40,3	25	3/4"

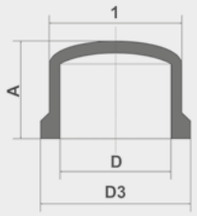
• Tigre Agropecuária PVC Adapter LF



DIMENSIONS (MM)

CÓDIGO	GAGE	A	D	d
34600155	35x32	53	35	32
34600392	50x25	66,6	50	25
34600430	50x32	66,8	50	32
34600782	75x32	92,7	75	32

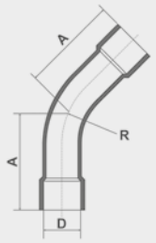
• TIGRE End Pipe Cap Agropecuária PVC



DIMENSIONS (MM)

CÓDIGO	GAGE	A	D	D3	1
100018856	20	16	20	28,5	24,8
100018857	25	18,5	25	34	30,2
100018858	32	22	32	43	37,8
100018859	40	26	40	52	46,5

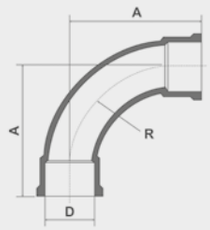
• TIGRE Agropecuária PVC 40° Bend



DIMENSIONS (MM)

CÓDIGO	GAGE	A	D	R
100018841	20	42	20	35
100018842	25	51	25	50
100018860	32	65	32	60

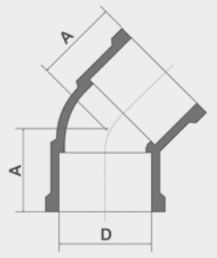
• TIGRE Agropecuária PVC 90° Bend



DIMENSIONS (MM)

CÓDIGO	GAGE	A	D	R
100018861	20	56	20	40
100018862	25	68,5	25	56,3
100018863	32	86	32	64

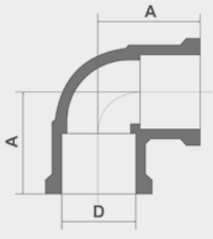
• TIGRE Agropecuária PVC 45° Elbow



DIMENSIONS (MM)

CÓDIGO	GAGE	A	D
100018865	20	22,3	20
100018866	25	25	24,5
100018867	32	32	29,5
100018868	40	40	35,5

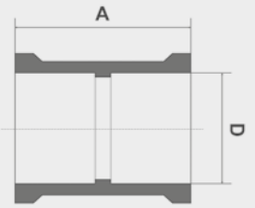
• TIGRE Agropecuária PVC 90° Elbow



DIMENSIONS (MM)

CÓDIGO	GAGE	A	D
100018854	20	27	20
100018853	25	32	25
100018851	32	39	32
100018852	40	47	40

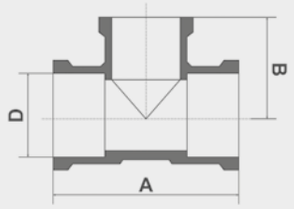
• Tigre Sleeve Agropecuária PVC



DIMENSIONS (MM)

CÓDIGO	GAGE	A	D
100018869	20	35	20
100018844	25	42	25
100018845	32	48	32
100018870	40	56	40

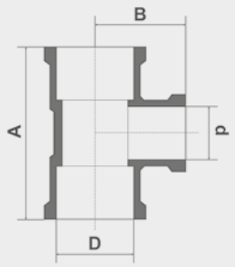
• TIGRE 90° Tee Agropecuária PVC



DIMENSIONS (MM)

CÓDIGO	GAGE	A	B	D
100018871	20	54	27	20
100018846	25	64	32	25
100018847	32	78	39	32
100018848	40	94	47	40

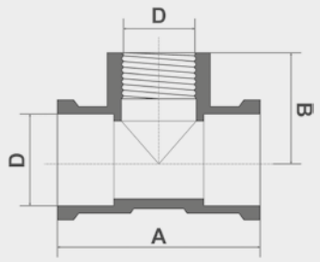
• TIGRE Agropecuária PVC 90° Reducing Tee



DIMENSIONS (MM)

CÓDIGO	GAGE	A	B	D	d
100018849	25x20	63	31	25	20
100018850	32x25	78	39	32	25

• TIGRE Agropecuária PVC 90° Mixed Tee



DIMENSIONS (MM)

CÓDIGO	GAGE	A	B	D	d
100018874	20x1/2"	53	29,5	20	1/2"
100018876	25x1/2"	61	34	25	1/2"
100018875	25x3/4"	58	32,5	25	3/4"
100018877	32x3/4"	78	35,5	32	3/4"

Notes

Sprinklers

7. TIGRE Sprinklers

7.1. TIGRE Impact Sprinkler Line

TIGRE Impact Sprinklers have deliver water to the soil, in the form of artificial rain, to water the crops as required, ensuring more efficiency and more control in weather and soil conditions. A water jet, released under pressure, by a nozzle, sprays the water.

7.1.1. Function/Application

Application in different types of terrain and topography Moreover, TIGRE sprinklers can be used for irrigating different crops and in any type of soil. Does not require systematization of the irrigated terrain, but can be part of an automated irrigation system. Products available for several situations, such as the 360° sprinkler, which irrigates all the surrounding area, and the sectoral sprinkler, indicated for situations where regulated irrigation is necessary, such as on property borders, plantation edges, or road edges. Among other applications, they allow the use of fertilizers and pesticides diluted in water.

7.1.2. Benefits and Differential Factors

Wide flow range
Meet the needs in the field.

Efficiency
External jet breaker to regulate the rage and spraying of the water jet.

Savings
Durability, low cost, and proper water distribution.

UV Resistance
Thermoplastic additive against UV radiation.

7.1.3. Technical Characteristics

7.1.3.1. Characteristics - Tigre Pingo Mini Sprinkler

The Tigre Pingo mini sprinkler is ideal for irrigation systems requiring less flow and regulated irrigation.

Working pressure (at 20ºC): 6.0 Kgf/cm² (60m.c.a.).
Flow range: 0.32 to 1.86 m³/h.
Models available: 360° and sectoral.
Irrigation diameters: 19 to 24 meters.
Colored nozzles with engraved diameter in millimeters: easy identification.
Connection: threaded ½" male ISO 7.
360° sprinkler: with spraying angle of 25° and 20°.
Sectoral sprinkler: with spraying angle of 25°.

7.1.3.2. Characteristics - Tigre Midi Sprinkler

Sprinklers with intermediate flow and reach, for irrigation systems requiring regulated irrigation.

Flow range: 0.7 to 3.91 m³/h.
Models available: 360° and sectoral.
Irrigation diameters: 25 to 37 meters.
Colored nozzles with engraved diameter in millimeters: easy identification.
Connection: threaded 3/4" and 1" female ISO 7.
Spraying angles: 23° and 18°.

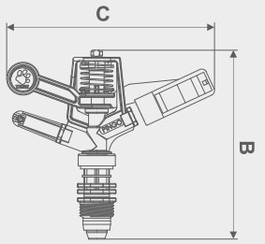
7.1.3.3. Characteristics - Tigre Eco Sprinkler

Sprinklers for any irrigation system requiring higher flow and reach of the jet water.

Flow range: 1.29 to 7.20m³/h.
Models available: 360°.
Irrigation diameters: 26 to 38 meters.
Connection: threaded 1" female ISO 7.
Spraying angles: 23°

7.1.4. Impact Sprinkler Line Items

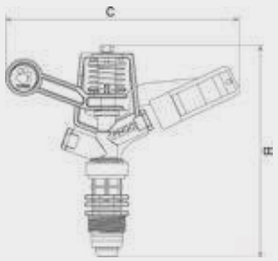
• TIGRE Pingo Mini Sprinkler 360



DIMENSIONS (MM)

CÓDIGO	DESCRIPTION	B	C
100020223	Mini Aspersor Tigre Pingo 360 2400	115	128
100020178	Mini Aspersor Tigre Pingo 360 2420	115	128
100020181	Mini Aspersor Tigre Pingo 360 2600	115	128
100020175	Mini Aspersor Tigre Pingo 360 2624	115	128
100020224	Mini Aspersor Tigre Pingo 360 2800	115	128
100020176	Mini Aspersor Tigre Pingo 360 2824	115	128
100020179	Mini Aspersor Tigre Pingo 360 3026	115	128
100020180	Mini Aspersor Tigre Pingo 360 3226	115	128
100020218	Mini Aspersor Tigre Pingo 360 3426	115	128
100020177	Mini Aspersor Tigre Pingo 360 3600	115	128
100020219	Mini Aspersor Tigre Pingo 360 3628	115	128
100020222	Mini Aspersor Tigre Pingo 360 4032	115	128
100020230	Mini Aspersor Tigre Pingo 360 Sem Bocal	115	128

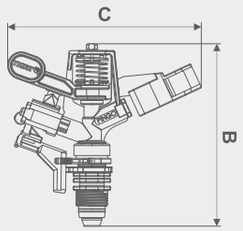
• Pingo Mini Sprinkler 360 Without Screw



DIMENSIONS (MM)

CÓDIGO	DESCRIPTION	B	C
100020140	Mini Aspersor Tigre Pingo 360 2420E	115	128
100020215	Mini Aspersor Tigre Pingo 360 2424E	115	128
100020212	Mini Aspersor Tigre Pingo 360 2620E	115	128
100020174	Mini Aspersor Tigre Pingo 360 2624E	115	128
100020213	Mini Aspersor Tigre Pingo 360 2820E	115	128
100020216	Mini Aspersor Tigre Pingo 360 2824E	115	128
100020214	Mini Aspersor Tigre Pingo 360 3020E	115	128

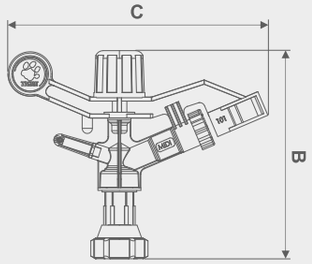
• TIGRE Pingo Sectoral Mini Sprinkler



DIMENSIONS (MM)

CÓDIGO	DESCRIPTION	B	C
100020170	Mini Aspersor Tigre Pingo Setorial 3,0	115	118,8
100020171	Mini Aspersor Tigre Pingo Setorial 3,2	115	118,8
100020210	Mini Aspersor Tigre Pingo Setorial 3,4	115	118,8
100020172	Mini Aspersor Tigre Pingo Setorial 3,6	115	118,8
100020211	Mini Aspersor Tigre Pingo Setorial 3,8	115	118,8
100020173	Mini Aspersor Tigre Pingo Setorial 4,0	115	118,8

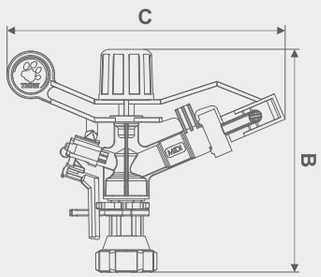
• TIGRE MIDI Sprinklers 360



DIMENSIONS (MM)

CÓDIGO	DESCRIPTION	B	C
100020155	Aspersor Tigre MIDI 360 3/4" F 3626	163	205
100020150	Aspersor Tigre MIDI 360 1" F 3626	163	205
100020156	Aspersor Tigre MIDI 360 3/4" F 4028	163	205
100020153	Aspersor Tigre MIDI 360 1" F 4028	163	205
100020157	Aspersor Tigre MIDI 360 3/4" F 4432	163	205
100020152	Aspersor Tigre MIDI 360 1" F 4432	163	205
100020158	Aspersor Tigre MIDI 360 3/4" F 4832	163	205
100020154	Aspersor Tigre MIDI 360 1" F 4832	163	205
100020194	Aspersor Tigre MIDI 360 1" F 5232	163	205
100020159	Aspersor Tigre MIDI 360 3/4" F 5632	163	205
100020151	Aspersor Tigre MIDI 360 1" F 5632	163	205
100020234	Aspersor Tigre MIDI 360 3/4" Sem Bocal	163	205
100020233	Aspersor Tigre MIDI 360 1" F Sem Bocal	163	205

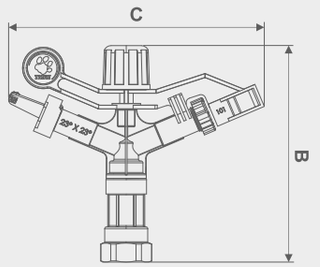
• TIGRE MIDI Sectoral Sprinkler



DIMENSIONS (MM)

CÓDIGO	DESCRIPTION	B	C
100020165	Aspersor Tigre MIDI Setorial 3/4" F 3,6	163	205
100020160	Aspersor Tigre MIDI Setorial 1" F 3,6	163	205
100020161	Aspersor Tigre MIDI Setorial 1" F 4,4	163	205
100020162	Aspersor Tigre MIDI Setorial 1" F 5,2	163	205
100020163	Aspersor Tigre MIDI Setorial 1" F 6,0	163	205
100020164	Aspersor Tigre MIDI Setorial 1" F 7,2	163	205
100020231	Aspersor Tigre MIDI Setorial 3/4" F Sem Bocal	163	205
100020232	Aspersor Tigre MIDI Setorial 1" F Sem Bocal	163	205

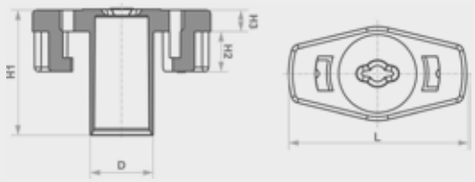
• TIGRE ECO Sprinkler



DIMENSIONS (MM)

CÓDIGO	DESCRIPTION	B	C
100020141	Aspersor Tigre ECO 4028	179,5	205,1
100020142	Aspersor Tigre ECO 4230	179,5	205,1
100020143	Aspersor Tigre ECO 4432	179,5	205,1
100020144	Aspersor Tigre ECO 4832	179,5	205,1
100020145	Aspersor Tigre ECO 5232	179,5	205,1
100020146	Aspersor Tigre ECO 5632	179,5	205,1
100020147	Aspersor Tigre ECO 5836	179,5	205,1
100020148	Aspersor Tigre ECO 6432	179,5	205,1
100020149	Aspersor Tigre ECO 6640	179,5	205,1
100020235	Aspersor Tigre ECO Sem Bocal	179,5	205,1

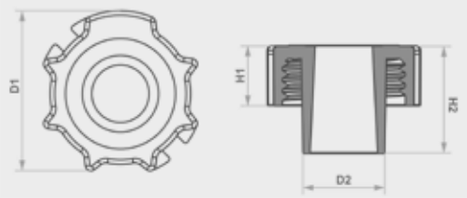
• TIGRE Pingo Nozzle



DIMENSIONS (MM)

CÓDIGO	DESCRIPTION	GAGE	D	H1	H2	H3	L
100020236	Bocal Tigre Pingo 2,4	2,4	7,97	15,7	5	2,7	22,4
100020237	Bocal Tigre Pingo 2,6	2,6	7,97	15,7	5	2,7	22,4
100020238	Bocal Tigre Pingo 2,8	2,8	7,97	15,7	5	2,7	22,4
100020239	Bocal Tigre Pingo 3,0	3,0	7,97	15,7	5	2,7	22,4
100020240	Bocal Tigre Pingo 3,2	3,2	7,97	15,7	5	2,7	22,4
100020241	Bocal Tigre Pingo 3,4	3,4	7,97	15,7	5	2,7	22,4
100020242	Bocal Tigre Pingo 3,6	3,6	7,97	15,7	5	2,7	22,4
100020243	Bocal Tigre Pingo 3,8	3,8	7,97	15,7	5	2,7	22,4
100020244	Bocal Tigre Pingo 4,0	4,0	7,97	15,7	5	2,7	22,4
100020245	Bocal Tigre Pingo Tampão	4,0	7,97	15,7	5	2,7	22,4

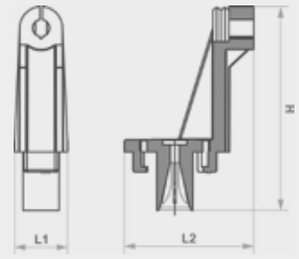
• Tigre ECO/MIDI Sprinkler Nozzle



DIMENSIONS (MM)

CÓDIGO	DESCRIPTION	GAGE	D1	D2	H1	H2
100020258	Bocal Aspersor Tigre ECO/MIDI 2,8	2,8	25,4	14,8	10,8	19,4
100020259	Bocal Aspersor Tigre ECO/MIDI 3,0	3,0	25,4	14,8	10,8	19,4
100020260	Bocal Aspersor Tigre ECO/MIDI 3,2	3,2	25,4	14,8	10,8	19,4
100020261	Bocal Aspersor Tigre ECO/MIDI 3,4	3,4	25,4	14,8	10,8	19,4
100020262	Bocal Aspersor Tigre ECO/MIDI 3,6	3,6	25,4	14,8	10,8	19,4
100020263	Bocal Aspersor Tigre ECO/MIDI 3,8	3,8	25,4	14,8	10,8	19,4
100020264	Bocal Aspersor Tigre ECO/MIDI 4,0	4,0	25,4	14,8	10,8	19,4
100020265	Bocal Aspersor Tigre ECO/MIDI 4,2	4,2	25,4	14,8	10,8	19,4
100020266	Bocal Aspersor Tigre ECO/MIDI 4,4	4,4	25,4	14,8	10,8	19,4
100020267	Bocal Aspersor Tigre ECO/MIDI 4,6	4,6	25,4	14,8	10,8	19,4
100020268	Bocal Aspersor Tigre ECO/MIDI 4,8	4,8	25,4	14,8	10,8	19,4
100020269	Bocal Aspersor Tigre ECO/MIDI 5,0	5,0	25,4	14,8	10,8	19,4
100020270	Bocal Aspersor Tigre ECO/MIDI 5,2	5,2	25,4	14,8	10,8	19,4
100020271	Bocal Aspersor Tigre ECO/MIDI 5,4	5,4	25,4	14,8	10,8	19,4
100020272	Bocal Aspersor Tigre ECO/MIDI 5,6	5,6	25,4	14,8	10,8	19,4
100020273	Bocal Aspersor Tigre ECO/MIDI 5,8	5,8	25,4	14,8	10,8	19,4
100020274	Bocal Aspersor Tigre ECO/MIDI 6,0	6,0	25,4	14,8	10,8	19,4
100020275	Bocal Aspersor Tigre ECO/MIDI 6,2	6,2	25,4	14,8	10,8	19,4
100020276	Bocal Aspersor Tigre ECO/MIDI 6,4	6,4	25,4	14,8	10,8	19,4
100020277	Bocal Aspersor Tigre ECO/MIDI 6,6	6,6	25,4	14,8	10,8	19,4
100020278	Bocal Aspersor Tigre ECO/MIDI 6,8	6,8	25,4	14,8	10,8	19,4
100020279	Bocal Aspersor Tigre ECO/MIDI 7,0	7,0	25,4	14,8	10,8	19,4
100020280	Bocal Aspersor Tigre ECO/MIDI 7,2	7,2	25,4	14,8	10,8	19,4
100020281	Bocal Aspersor Tigre ECO/MIDI 7,6	7,6	25,4	14,8	10,8	19,4
100020282	Bocal Aspersor Tigre ECO/MIDI 8,0	8,0	25,4	14,8	10,8	19,4

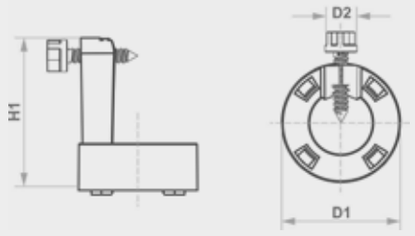
• TIGRE Pingo/MIDI Spray Nozzle



DIMENSIONS (MM)

CÓDIGO	DESCRIPTION	GAGE	H	L1	L2
100020246	Bocal Dispersor Tigre Pingo/MIDI 2,0	2,0	45,2	11,8	28,8
100020247	Bocal Dispersor Tigre Pingo/MIDI 2,4	2,4	45,2	11,8	28,8
100020248	Bocal Dispersor Tigre Pingo/MIDI 2,6	2,6	45,2	11,8	28,8
100020249	Bocal Dispersor Tigre Pingo/MIDI 2,8	2,8	45,2	11,8	28,8
100020250	Bocal Dispersor Tigre Pingo/MIDI 3,0	3,0	45,2	11,8	28,8
100020251	Bocal Dispersor Tigre Pingo/MIDI 3,2	3,2	45,2	11,8	28,8
100020252	Bocal Dispersor Tigre Pingo/MIDI 3,4	3,4	45,2	11,8	28,8
100020253	Bocal Dispersor Tigre Pingo/MIDI 3,6	3,6	45,2	11,8	28,8
100020254	Bocal Dispersor Tigre Pingo/MIDI 3,8	3,8	45,2	11,8	28,8
100020255	Bocal Dispersor Tigre Pingo/MIDI 4,0	4,0	45,2	11,8	28,8
100020256	Bocal Dispersor Tigre Pingo/MIDI 2,0E	2,0	45,2	11,8	28,8
100020257	Bocal Dispersor Tigre Pingo/MIDI 2,4E	2,4	45,2	11,8	28,8

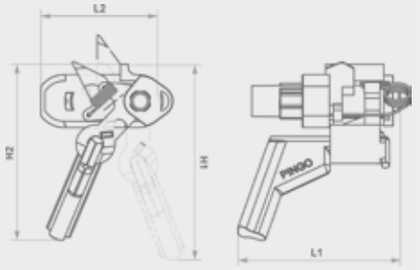
• Jet Breaker



DIMENSIONS (MM)

CÓDIGO	DESCRIPTION	D1	D2	H1
100020283	Quebra Jato ECO/MIDI	33,1	8,8	43,7

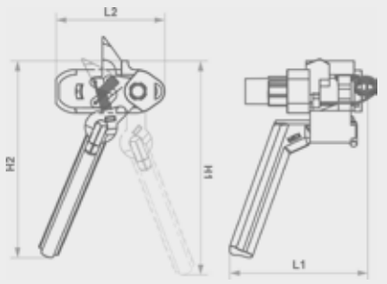
• Pingo Reversing Mechanism



DIMENSIONS (MM)

CÓDIGO	DESCRIPTION	H1	H2	L1	L2
100020339	Mecanismo Reversão Pingo	51,5	46,3	41,8	30

• MIDI Reversing Mechanism



DIMENSIONS (MM)

CÓDIGO	DESCRIPTION	H1	H2	L1	L2
100020340	Mecanismo Reversão MIDI	67,9	62,5	43,1	34

7.1.5. Performance Tables

PINGO MINI SPRINKLER 360°

Tigre Code	Description	Mod.	B	C	Main Nozzle		Spray Nozzle		P (mca)	Q (m³/h)	D (m)	Maximum spacing recommended	
					Measurement	Color	Measurement	Color				A x L (m x m)	peq (mm/h)
100020223	Tigre Pingo Mini Sprinkler 360 2400	360	115	128	2,4	●	0,0	○	20	0,32	19,00	12x12	2,20
									25	0,35	20,00	12x12	2,40
									30	0,39	20,00	12x12	2,70
									35	0,42	20,50	12x12	2,90
100020178	Tigre Pingo Mini Sprinkler 360 2420	360	115	128	2,4	●	2,0	●	20	0,54	19,00	12x12	3,80
									25	0,60	20,00	12x12	4,20
									30	0,66	20,00	12x12	4,60
									35	0,72	20,50	12x15	4,00
100020181	Tigre Pingo Mini Sprinkler 360 2600	360	115	128	2,6	●	0,0	○	20	0,38	20,00	12x12	2,60
									25	0,42	20,00	12x12	2,90
									30	0,46	20,50	12x12	3,20
									35	0,49	21,00	12x12	3,40
100020175	Tigre Pingo Mini Sprinkler 360 2624	360	115	128	2,6	●	2,4	●	20	0,70	20,00	12x12	4,90
									25	0,77	20,00	12x12	5,30
									30	0,84	20,50	12x15	4,70
									35	0,90	21,00	15x15	4,00
100020224	Tigre Pingo Mini Sprinkler 360 2800	360	115	128	2,8	●	0,0	○	20	0,44	20,00	12x12	3,10
									25	0,49	20,50	12x12	3,40
									30	0,53	21,00	12x12	3,70
									35	0,57	21,50	12x12	4,00
100020176	Tigre Pingo Mini Sprinkler 360 2824	360	115	128	2,8	●	2,4	●	20	0,76	20,00	12x12	5,30
									25	0,85	20,50	12x12	5,90
									30	0,94	21,00	12x15	5,20
									35	1,01	21,50	15x15	4,50
100020225	Tigre Pingo Mini Sprinkler 360 3200	360	115	128	3,2	●	0,0	○	20	0,57	21,50	12x12	4,00
									25	0,64	22,00	12x12	4,40
									30	0,69	22,50	12x12	4,80
									35	0,75	23,00	12x12	5,20
100020171	Tigre Pingo Mini Sprinkler 360 3000	360	115	128	3,0	●	0,0	○	20	0,51	20,50	12x12	3,50
									25	0,57	21,00	12x12	4,00
									30	0,62	21,50	12x12	4,30
									35	0,67	22,00	12x12	4,70
100020179	Tigre Pingo Mini Sprinkler 360 3026	360	115	128	3,0	●	2,6	●	20	0,89	20,50	12x12	6,20
									25	1,00	21,00	12x15	5,60
									30	1,10	21,50	15x15	4,90
									35	1,17	22,00	15x15	5,20
100020225	Tigre Pingo Mini Sprinkler 360 3200	360	115	128	3,2	●	0,0	○	20	0,57	21,50	12x12	4,00
									25	0,64	22,00	12x12	4,40
									30	0,69	22,50	12x12	4,80
									35	0,75	23,00	12x12	5,20

PINGO MINI SPRINKLER 360° (continued)

Tigre Code	Description	Mod.	B	C	Main Nozzle		Spray Nozzle		P (mca)	Q (m³/h)	D (m)	Maximum spacing recommended	
					Measurement	Color	Measurement	Color				A x L (m x m)	peq (mm/h)
100020180	Tigre Pingo Mini Sprinkler 360 3226	360	115	128	3,2	●	2,6	●	20	0,96	21,50	12x12	6,70
									25	1,07	22,00	12x15	6,00
									30	1,18	22,50	15x15	5,20
									35	1,27	23,00	15x15	5,70
100020226	Tigre Pingo Mini Sprinkler 360 3400	360	115	128	3,4	●	0,0	○	20	0,65	22,00	12x12	4,50
									25	0,72	22,50	12x12	5,00
									30	0,79	23,00	12x12	5,50
									35	0,86	23,50	12x12	6,00
100020218	Tigre Pingo Mini Sprinkler 360 3426	360	115	128	3,4	●	2,6	●	20	1,05	22,00	12x12	7,30
									25	1,17	22,50	12x15	6,50
									30	1,25	23,00	15x15	5,60
									35	1,34	23,50	15x15	5,90
100020177	Tigre Pingo Mini Sprinkler 360 3600	360	115	128	3,6	●	0,0	○	20	0,72	22,00	12x12	5,00
									25	0,80	22,50	12x12	5,60
									30	0,88	23,00	12x12	6,10
									35	0,96	23,50	12x12	6,70
100020219	Tigre Pingo Mini Sprinkler 360 3628	360	115	128	3,6	●	2,8	●	20	1,17	22,00	12x15	6,50
									25	1,30	22,50	12x15	7,20
									30	1,41	23,00	15x15	6,30
									35	1,51	23,50	15x15	6,70
100020227	Tigre Pingo Mini Sprinkler 360 3800	360	115	128	3,8	●	0,0	○	20	0,81	22,00	12x12	5,60
									25	0,91	22,50	12x12	6,30
									30	1,00	23,00	12x12	6,90
									35	1,08	23,50	12x12	7,50
100020220	Tigre Pingo Mini Sprinkler 360 3828	360	115	128	3,8	●	2,8	●	20	1,26	22,00	12x15	7,00
									25	1,39	22,50	15x15	6,20
									30	1,51	23,00	15x15	6,70
									35	1,64	23,50	15x15	7,30
100020228	Tigre Pingo Mini Sprinkler 360 4000	360	115	128	4,0	●	0,0	○	20	0,89	22,50	12x12	6,20
									25	0,99	23,00	12x12	6,90
									30	1,07	23,50	12x12	7,40
									35	1,16	24,00	12x12	8,10
100020221	Tigre Pingo Mini Sprinkler 360 4028	360	115	128	4,0	●	2,8	●	20	1,31	22,50	12x15	7,30
									25	1,46	23,00	15x15	6,50
									30	1,59	23,50	15x15	7,10
									35	1,70	24,00	15x15	7,60
100020222	Tigre Pingo Mini Sprinkler 360 4032	360	115	128	4,0	●	3,2	●	20	1,44	22,50	12x15	8,00
									25	1,58	23,00	15x15	7,00
									30	1,73	23,50	15x15	7,70
									35	1,86	24,00	15x15	8,30

PINGO MINI SPRINKLER 360° - SPRAY NOZZLE WITHOUT SCREW

Tigre Code	Description	Mod.	B	C	Main Nozzle		Spray Nozzle		P (mca)	Q (m³/h)	D (m)	Maximum spacing recommended	
					Measurement	Color	Measurement	Color				A x L (m x m)	peq (mm/h)
100020140	Tigre Pingo Mini Sprinkler 360 2420E	360	115	128	2,4	●	2,0E	●	20	0,53	19,00	12x12	3,70
									25	0,60	20,00	12x12	4,20
									30	0,65	20,00	12x12	4,50
									35	0,69	20,50	12x15	4,80
100020215	Tigre Pingo Mini Sprinkler 360 2424E	360	115	128	2,4	●	2,4E	●	20	0,60	19,00	12x12	4,20
									25	0,67	20,00	12x12	4,70
									30	0,73	20,00	12X12	5,10
									35	0,79	20,50	12x15	4,40
100020212	Tigre Pingo Mini Sprinkler 360 2620E	360	115	128	2,6	●	2,0E	●	20	0,59	20,00	12x12	4,10
									25	0,66	20,00	12x12	4,60
									30	0,72	21,50	12x15	4,00
									35	0,78	21,00	15x15	3,50
100020174	Tigre Pingo Mini Sprinkler 360 2624E	360	115	128	2,6	●	2,4E	●	20	0,66	20,00	12x12	4,60
									25	0,73	20,00	12x12	5,10
									30	0,80	20,50	12x15	4,40
									35	0,86	21,00	15x15	3,80
100020213	Tigre Pingo Mini Sprinkler 360 2820E	360	115	128	2,8	●	2,0E	●	20	0,64	20,00	12x12	4,40
									25	0,72	20,50	12x12	5,00
									30	0,78	21,00	12x15	4,30
									35	0,85	21,50	15x15	3,80
100020216	Tigre Pingo Mini Sprinkler 360 2824E	360	115	128	2,8	●	2,4E	●	20	0,71	20,00	12x12	4,90
									25	0,79	20,00	12x12	5,50
									30	0,87	20,50	12X15	4,80
									35	0,94	21,00	15x15	4,20
100020214	Tigre Pingo Mini Sprinkler 360 3020E	360	115	128	3,0	●	2,0E	●	20	0,70	20,50	12x12	4,90
									25	0,78	21,00	12x12	5,40
									30	0,86	21,50	12x15	4,80
									35	0,93	22,00	15x15	4,10
100020217	Tigre Pingo Mini Sprinkler 360 3024E	360	115	128	3,0	●	2,4E	●	20	0,77	20,50	12x12	5,35
									25	0,86	21,00	12x15	4,78
									30	0,94	21,50	15x15	4,18
									35	1,02	22,00	15x15	4,53

PINGO SECTORAL MINI SPRINKLER

Tigre Code	Description	Mod.	B	C	Main Nozzle		Spray Nozzle		P (mca)	Q (m³/h)	D (m)	Maximum spacing recommended	
					Measurement	Color	Measurement	Color				A x L (m x m)	peq (mm/h)
100020170	Tigre Pingo SET Mini Sprinkler 3,0	Setorial	115	118,8	3,0	●	•	•	20	0,51	20,50	12x12	3,50
									25	0,57	21,00	12x12	4,00
									30	0,62	21,50	12x12	4,30
									35	0,67	22,00	12x12	4,70
100020171	Tigre Pingo SET Mini Sprinkler 3,2	Setorial	115	118,8	3,2	●	•	•	20	0,57	21,50	12x12	4,00
									25	0,64	22,00	12x12	4,40
									30	0,69	22,50	12x12	4,80
									35	0,75	23,00	12x12	5,20
100020210	Tigre Pingo SET Mini Sprinkler 3,4	Setorial	115	118,8	3,4	●	•	•	20	0,65	22,00	12x12	4,50
									25	0,72	22,50	12x12	5,00
									30	0,79	23,00	12x12	5,50
									35	0,86	23,50	12x12	6,00
100020172	Tigre Pingo SET Mini Sprinkler 3,6	Setorial	115	118,8	3,6	●	•	•	20	0,72	22,00	12x12	5,00
									25	0,80	22,50	12x12	5,60
									30	0,88	23,00	12x12	6,10
									35	0,96	23,50	12x12	6,70
100020211	Tigre Pingo SET Mini Sprinkler 3,8	Setorial	115	118,8	3,8	●	•	•	20	0,81	22,00	12x12	5,60
									25	0,91	22,50	12x12	6,30
									30	1,00	23,00	12x12	6,90
									35	1,08	23,50	12x12	7,50
100020173	Tigre Pingo SET Mini Sprinkler 4,0	Setorial	115	118,8	4,0	●	•	•	20	0,89	22,50	12x12	6,20
									25	0,99	23,00	12x12	6,90
									30	1,07	23,50	12x12	7,40
									35	1,16	24,00	12x12	8,10

MIDI SPRINKLER 360°

Tigre Code	Description	Mod.	B	C	Main Nozzle		Spray Nozzle		P (mca)	Q (m³/h)	D (m)	Maximum spacing recommended	
					Measurement	Color	Measurement	Color				A x L (m x m)	peq (mm/h)
100020155	Tigre MIDI Sprinkler 360 3/4" F 3626	360	163	205	3,6		2,6		20	1,07	25,00	12x18	5,00
									25	1,18	25,00	12x18	5,50
100020150	Tigre MIDI Sprinkler 360 1" F 3626	360	163	205					30	1,29	26,00	12x18	6,00
									35	1,38	26,00	12x18	6,40
100020156	Tigre MIDI Sprinkler 360 3/4" F 4028	360	163	205	4,0		2,8		20	1,29	26,00	12x18	6,00
									25	1,41	27,00	12x18	6,50
100020153	Tigre MIDI Sprinkler 360 1" F 4028	360	163	205					30	1,55	27,00	12x18	7,20
									35	1,67	27,00	18x18	5,20
100020157	Tigre MIDI Sprinkler 360 3/4" F 4432	360	163	205	4,4		3,2		20	1,58	27,00	12x18	7,30
									25	1,76	28,00	12x18	8,10
100020152	Tigre MIDI Sprinkler 360 1" F 4432	360	163	205					30	1,91	30,00	12x18	8,80
									35	2,07	30,00	18x18	6,40
100020158	Tigre MIDI Sprinkler 360 3/4" F 4832	360	163	205	4,8		3,2		20	1,70	28,00	12x18	7,90
									25	1,89	28,00	12x18	8,80
100020154	Tigre MIDI Sprinkler 360 1" F 4832	360	163	205					30	2,07	30,00	18x18	6,40
									35	2,23	30,00	18x18	6,90
100020198	Tigre MIDI Sprinkler 360 3/4" F 5232	360	163	205	5,2		3,2		20	1,91	28,00	12x18	8,80
									25	2,14	29,00	18x18	6,60
100020194	Tigre MIDI Sprinkler 360 1" F 5232	360	163	205					30	2,34	30,00	18x18	7,20
									35	2,55	30,00	18x18	7,90
100020159	Tigre MIDI Sprinkler 360 3/4" F 5632	360	163	205	5,6		3,2		20	2,11	30,00	18x18	6,50
									25	2,36	31,00	18x18	7,30
100020151	Tigre MIDI Sprinkler 360 1" F 5632	360	163	205					30	2,58	32,00	18x18	8,00
									35	2,80	32,00	18x24	6,50
100020199	Tigre MIDI Sprinkler 360 3/4" F 6036	360	163	205	6,0		3,6		20	2,42	31,00	18x18	7,50
									25	2,68	32,00	18x18	8,30
100020195	Tigre MIDI Sprinkler 360 1" F 6036	360	163	205					30	2,94	33,00	18x24	6,80
									35	3,17	33,00	18x24	7,30
100020200	Tigre MIDI Sprinkler 360 3/4" F 6636	360	163	205	6,6		3,6		20	2,64	31,00	18x18	8,10
									25	2,92	33,00	18x24	6,80
100020196	Tigre MIDI Sprinkler 360 1" F 6636	360	163	205					30	3,20	35,00	18x24	7,40
									35	3,45	37,00	24x24	6,00
100020197	Tigre MIDI Sprinkler 360 1" F 7236	360	163	205	7,2		3,6		20	2,96	31,00	18x18	9,10
									25	3,31	33,00	18x24	7,70
100020201	Tigre MIDI Sprinkler 360 3/4" F 7236	360	163	205					30	3,60	35,00	18x24	8,30
									35	3,91	37,00	24x24	6,80

MIDI SECTORAL SPRINKLER

Tigre Code	Description	Mod.	B	C	Main Nozzle		Spray Nozzle		P (mca)	Q (m³/h)	D (m)	Maximum spacing recommended	
					Measurement	Color	Measurement	Color				A x L (m x m)	peq (mm/h)
100020165	Tigre MIDI Sprinkler SET 3/4" F 3,6	Setorial	163	205	3,6		0,0		20	0,70	25,00	12x12	4,90
									25	0,78	25,00	12x12	5,40
100020160	Tigre MIDI Sprinkler SET 1" F 3.6	Setorial	163	205					30	0,86	26,00	12x12	6,00
									35	0,93	26,00	12x18	4,30
100020206	Tigre MIDI Sprinkler SET 3/4" F 4,0	Setorial	163	205	4,0		0,0		20	0,86	26,00	12x12	6,00
									25	0,95	27,00	12x12	6,60
100020202	Tigre MIDI Sprinkler SET 1" F 4.0	Setorial	163	205					30	1,04	27,00	12x12	7,20
									35	1,12	27,00	12x18	5,20
100020166	Tigre MIDI Sprinkler SET 3/4" F 4,4	Setorial	163	205	4,4		0,0		20	1,06	27,00	12x12	7,40
									25	1,19	28,00	12x12	8,30
100020161	Tigre MIDI Sprinkler SET 1" F 4.4	Setorial	163	205					30	1,28	30,00	12x12	8,90
									35	1,38	30,00	12x18	6,40
100020203	Tigre MIDI Sprinkler SET 3/4" F 4,8	Setorial	163	205	4,8		0,0		20	1,20	28,00	12x12	8,30
									25	1,33	28,00	12x12	9,20
100020207	Tigre MIDI Sprinkler SET 1" F 4.8	Setorial	163	205					30	1,44	30,00	12x12	10,00
									35	1,55	30,00	12x18	7,20
100020167	Tigre MIDI Sprinkler SET 3/4" F 5,2	Setorial	163	205	5,2		0,0		20	1,43	28,00	12x12	9,90
									25	1,60	29,00	12x12	11,10
100020162	Tigre MIDI Sprinkler SET 1" F 5.2	Setorial	163	205					30	1,74	30,00	12x18	8,00
									35	1,88	30,00	12x18	8,70
100020168	Tigre MIDI Sprinkler SET 3/4" F 6,0	Setorial	163	205	6,0		0,0		20	1,85	31,00	12x18	8,60
									25	2,06	32,00	18x18	6,40
100020163	Tigre MIDI Sprinkler SET 1" F 6.0	Setorial	163	205					30	2,25	33,00	18x18	6,90
									35	2,45	33,00	18x18	7,60
100020208	Tigre MIDI Sprinkler SET 3/4" F 5,6	Setorial	163	205	5,6		0,0		20	1,65	30,00	12x18	7,60
									25	1,83	31,00	12x18	8,50
100020204	Tigre MIDI Sprinkler SET 1" F 5.6	Setorial	163	205					30	2,00	32,00	12x18	9,30
									35	2,17	32,00	18x18	6,70
100020209	Tigre MIDI Sprinkler SET 3/4" F 6,6	Setorial	163	205	6,6		0,0		20	2,18	31,00	12x18	12,00
									25	2,45	33,00	18x18	9,00
100020205	Tigre MIDI Sprinkler SET 1" F 6.6	Setorial	163	205					30	2,67	35,00	18x18	9,80
									35	2,88	37,00	18x18	10,50
100020169	Tigre MIDI Sprinkler SET 1" F 7.2	Setorial	163	205	7,2		0,0		20	2,59	31,00	12x18	12,00
									25	2,90	33,00	18x18	9,00
100020164	Tigre MIDI Sprinkler SET 3/4" F 7,2	Setorial	163	205					30	3,17	35,00	18x18	9,80
									35	3,40	37,00	18x18	10,50

ECO SPRINKLER 360°

Tigre Code	Description	Mod.	B	C	Main Nozzle		Spray Nozzle		P (mca)	Q (m³/h)	D (m)	Maximum spacing recommended	
					Measurement	Color	Measurement	Color				A x L (m x m)	peq (mm/h)
100020141	Tigre Mini Sprinkler ECO-4028	360	179,5	205,1	4,0		2,8		20	1,29	26,00	12x18	6,00
									25	1,44	27,00	12x18	6,70
									30	1,59	27,00	12x18	7,40
									35	1,73	27,00	18x18	5,30
100020142	Tigre Mini Sprinkler ECO-4230	360	179,5	205,1	4,2		3,0		20	1,36	27,00	12x18	6,30
									25	1,52	28,00	12x18	7,00
									30	1,69	28,00	12x18	7,80
									35	1,84	28,00	18x18	5,70
100020143	Tigre Mini Sprinkler ECO-4432	360	179,5	205,1	4,4		3,2		20	1,59	27,00	12x18	7,40
									25	1,80	28,00	12x18	8,30
									30	1,98	30,00	12x18	9,20
									35	2,13	30,00	18x18	6,60
100020144	Tigre Mini Sprinkler ECO-4832	360	179,5	205,1	4,8		3,2		20	1,81	28,00	12x18	8,40
									25	2,02	28,00	12x18	9,40
									30	2,20	30,00	18x18	6,80
									35	2,39	30,00	18x18	7,40
100020145	Tigre Mini Sprinkler ECO-5232	360	179,5	205,1	5,2		3,2		20	2,02	28,00	12x18	9,40
									25	2,27	29,00	12x18	10,50
									30	2,48	30,00	18x18	7,70
									35	2,69	30,00	18x18	8,30
100020146	Tigre Mini Sprinkler ECO-5632	360	179,5	205,1	5,6		3,2		25	2,44	31,00	18x18	7,50
									30	2,66	31,00	18x18	8,20
									35	2,90	32,00	18x18	9,00
									40	3,08	33,00	18x24	7,10
100020147	Tigre Mini Sprinkler ECO-5836	360	179,5	205,1	5,8		3,6		25	2,72	31,00	18x18	8,40
									30	2,95	33,00	18x18	9,10
									35	3,23	35,00	18x24	7,50
									40	3,45	37,00	24x24	6,00
100020148	Tigre Mini Sprinkler ECO-6432	360	179,5	205,1	6,4		3,2		25	3,08	31,00	18x18	9,50
									30	3,36	33,00	18x24	7,80
									35	3,64	35,00	24x24	6,30
									40	3,90	38,00	24x24	6,80
100020149	Tigre Mini Sprinkler ECO-6640	360	179,5	205,1	6,6		4,0		25	3,53	32,00	18x18	10,90
									30	3,86	33,00	18x24	8,90
									35	4,19	35,00	24x24	7,30
									40	4,52	38,00	24x24	7,80
100020189	Tigre Mini Sprinkler ECO-6844	360	179,5	205,1	6,8		4,4		25	3,79	33,00	18x24	8,80
									30	4,18	33,00	24x24	7,30
									35	4,49	36,00	24x24	7,80
									40	4,83	38,00	24x24	8,40

ECO SPRINKLER 360° (continued)

Tigre Code	Description	Mod.	B	C	Main Nozzle		Spray Nozzle		P (mca)	Q (m³/h)	D (m)	Maximum spacing recommended	
					Measurement	Color	Measurement	Color				A x L (m x m)	peq (mm/h)
100020190	Tigre Mini Sprinkler ECO-7048	360	179,5	205,1	7,0		4,8		25	3,95	33,00	18x24	9,10
									30	4,38	33,00	24x24	7,60
									35	4,75	36,00	24x24	8,20
									40	5,06	38,00	24x24	8,80
100020191	Tigre Mini Sprinkler ECO-7260	360	179,5	205,1	7,2		6,0		25	4,79	33,00	18x24	11,10
									30	5,24	33,00	24x24	9,10
									35	5,65	36,00	24x24	9,80
									40	6,02	38,00	24x24	10,50
100020192	Tigre Mini Sprinkler ECO-7662	360	179,5	205,1	7,6		6,2		25	5,04	34,00	24x24	8,80
									30	5,49	34,00	24x24	9,50
									35	5,95	36,00	24x24	10,30
									40	6,33	38,00	24x24	11,00
100020193	Tigre Mini Sprinkler ECO-8066	360	179,5	205,1	8,0		6,6		25	5,70	36,00	24x24	9,90
									30	6,24	37,00	24x24	10,80
									35	6,74	38,00	24x24	11,70
									40	7,20	39,00	24x24	12,50

7.2. TIGRE SempreVerde Fixed Sprinkler

SempreVerde sprinklers are indicated for permanent systems for irrigation of gardens, lawn, seedling nurseries, garden beds, and greenhouses. As they spray water uniformly with reduced drop diameters, they are indicated for all crops, from the most sensitive to the most resistant ones.

7.2.1. Function/Application

The SempreVerde permanent sprinklers irrigate the soil in the form of artificial rain, ensuring proper application, even in non-uniform areas.

7.2.2. Benefits and Differential Factors

Durability
Brass bonnet.

Efficiency
Allow uniform spraying, with reduced drop diameters; has a screw for slight adjustment of radius and flow.

UV Protection
Produced in engineering thermoplastic that ensure protection against sunlight.

7.2.3. Technical Characteristics

7.2.3.1. Technical Characteristics - SempreVerde 90°

Flow range: 0.13 to 0.36 m³/h.
Irrigation radius: 2.5 to 5.3 m.
Water jet height: 0.9 to 1.9 m.
Fitting: 1/2" female.

7.2.3.2. Características Técnicas SempreVerde 180°

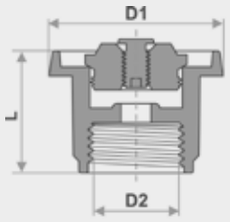
Flow range: 0.24 to 0.55 m³/h.
Irrigation radius: 2.3 to 5 m.
Water jet height: 0.9 to 1.7 m.
Fitting: 1/2" female.

7.2.3.3. Características Técnicas SempreVerde 360°

Flow range: 0.34 to 0.79 m³/h.
Irrigation radius: 1.5 to 5 m.
Water jet height: 0.8 to 1.5 m.
Fitting: 1/2" female.

7.2.4. SempreVerde Line Items

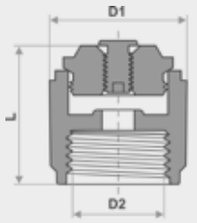
• SempreVerde Grass



DIMENSIONS (MM)

CÓDIGO	DESCRIPTION	D1	D2	L
100020182	SempreVerde Grama TIGRE 90	48	1/2"	28,3
100020184	SempreVerde Grama TIGRE 180	48	1/2"	28,3
100020186	SempreVerde Grama TIGRE 360	48	1/2"	28,3

• SempreVerde Pipe



DIMENSIONS (MM)

CÓDIGO	DESCRIPTION	D1	D2	L
100020183	SempreVerde Tubo TIGRE 90	25,6	1/2"	28,12
100020185	SempreVerde Tubo TIGRE 180	25,6	1/2"	28,12
100020187	SempreVerde Tubo TIGRE 360	25,6	1/2"	28,12

7.2.5. Performance Tables

SempreVerde | **TIGRE 90º**

Base pressure (mca)	Total flow m3/h	Radius (m)	Water jet height* (m)
5	0,13	2,5	0,9
10	0,20	3,7	1,1
15	0,25	4,2	1,3
20	0,29	4,7	1,5
25	0,33	5,1	1,7
30	0,36	5,2	1,9

SempreVerde | **TIGRE 180º**

Base pressure (mca)	Total flow m3/h	Radius (m)	Water jet height* (m)
5	0,24	2,3	0,9
10	0,33	3,2	1,0
15	0,40	3,8	1,1
20	0,45	4,3	1,3
25	0,50	4,7	1,5
30	0,55	5,0	1,7

SempreVerde | **TIGRE 360º**

Base pressure (mca)	Total flow m3/h	Radius (m)	Water jet height* (m)
5	0,34	1,5	0,8
10	0,47	2,7	0,9
15	0,57	3,6	1,1
20	0,65	4,2	1,3
25	0,72	4,7	1,4
30	0,79	5,0	1,5

*Water jet height above the nozzle level.
*Data obtained with the center screw completely opened.

Notes

GRUPO TIGRE

LEGENDA

- TIGRE
- TIGRE-ADS
- TAE
- TIGRE METAIS
- TIGRE FERRAMENTAS E PINTURAS
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