



PATHFINDER
 **PRO**

PATHFINDER
XPRO



PRODUCTS
DRIP IRRIGATION

TITAN PC







THE COMPANY

Grupo Chamsa With more than 50 years of activity in the national and international market, **Grupo Chamsa** has progressed spectacularly to become one of the most important reference organizations in the sector. A company that is committed to **quality, service and technological investment**, integrated into a process of continuous improvement, to achieve the complete satisfaction of all our customers. The company is specialized and focused on the agricultural market. It offers a comprehensive service, based on the solidity of a business group of recognized prestige and that provides all the experience and quality whose manufacturing is subject to ISO 9001 controls that generate the trust that Grupo Chamsa has always offered.

DRIP IRRIGATION TAPE

PATHFINDER
 **PRO**

PATHFINDER
XPRO

ADVANCED MAZES

LARGE NUMBER OF MODELS AND
CONFIGURATIONS

INNOVATION
RESISTANCE
EFFICIENCY
EASY TO INSTALL





Advantages

- + Design of a continuous labyrinth that provides great resistance to clogging, so there is a more rational use of water. The special design of the tape with a constant labyrinth results in a higher performance and uniformity of the emitters.

Characteristics

**The perfect
tapes for
your crop**

- + **Flat asymmetric** non-compensable dripper.
- + Economically viable by optimizing the design.
- + Higher flow characteristics.
- + Excellent cost-performance ratio.
- + Manufacturing without welds for greater resistance.
- + Emitters with great flow uniformity.
- + Double water filtration through its 110 points correctly positioned.
- + Micro opening that eliminates clogging and prevents Let the roots in.
- + The design of the maze that causes great state-of-the-art turbulence.
- + Available in a wide range of thicknesses, distance between emitters and flows.
- + Double color line for better recognition and signaling of the emitters.
- + Great resistance to tension and cracking.
- + Abrasion resistant material reduces damage caused by the terrain.
- + Thanks to its versatility and accuracy, it is easy to installation reducing work times.
- + Manufacturing and quality controls are according to DIN EN ISO 9261:2011.
- + Manufactured by extrusion process granting a superior resistance, making this product even more durable, being resistant to abrasion mechanics for example.



Filtration

Maximum water filtration so continues through its 160 entry points.



Labyrinth

Unlike its predecessor, it contains a much more advanced labyrinth designed especially for waters where the tapes are at greater risk of obstruction.

PATHFINDER PRO/XPRO TAPE APPLICATION LENGTH (in meters)

Depending on the uniformity of the terrain with a constant pressure of 0.7bar and for DN16 pipes.

Emitter Flow	Uniformity	10cm	15cm	20cm	30cm	40cm
0.6L/h	90%	119m	153m	179m	228m	272m
	85%	145m	187m	221m	285m	340m
1.0 L/h	90%	85m	107m	128m	162m	192m
	85%	106m	136m	157m	200m	238m
1.5L/h	90%	30m	39m	43m	55m	68m
	85%	64m	81m	98m	128m	153m

Use and selection

In these times where the conservation of water and resources are a key element, drip irrigation has great value. Installation is cheaper than traditional systems and uses much less water.

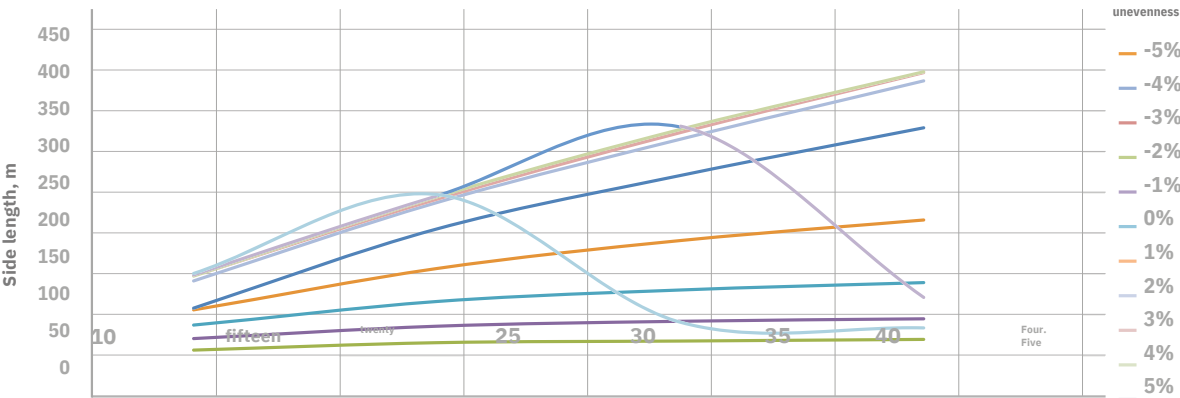
Product range:

- Light wall: Suitable for short crops and sandy soils without rocks.
- Medium wall: They are generally for medium conditions and long-term crops.
- harvest.
- Great thickness wall: They are designed for rocky soils and where insects can harm them. They are suitable for more than one campaign.



Length of the irrigation line according to the distance between emitters

Terrain inclination +/- 5%, uniformity 85%, pressure 0.7bar, ID 16mm.



TECHNICAL DATA

Diameter (ø)	Wall thickness	Inside diameter (ID)	Outside diameter (OD)	Work pressure	Maximum and flushing pressure	Grade of minimal filtration
16mm	6mil (150mic)	16,1mm	16,4mm	0.7bar	0.9bar	100mic / 150 mesh
16mm	8mil (200mic)	16,1mm	16,5mm	0.7bar	1.0bar	100mic / 150 mesh
16mm	10mil (250mic)	16,1mm	16,6mm	0.7bar	1.4bar	100mic / 150 mesh
16mm	12mil (300mic)	16,1mm	16,7mm	0.7bar	2.0bar	100mic / 150 mesh

PRODUCTION RANGE

The table shows the different thicknesses and spacing of emitters. There is the possibility of manufacturing this tape with some special requirement.

The Pathfinder XPRO is available in 20 cm 1 liter spacing.



CODE	PRODUCT	Inside Diameter (ID)	Thickness (mil/mic)	Distance between emitters	Flow L / Emitter	Flow L / Meters	roll length
16060610	Pathfinder Pro 6	16mm	6mil [150mic]	10cm	0,6l/h	6l/h/m	3000m
16060615	Pathfinder Pro 6	16mm	6mil [150mic]	15cm	0,6l/h	4l/h/m	3000m
16060620	Pathfinder Pro 6	16mm	6mil [150mic]	20cm	0,6l/h	3l/h/m	3000m
16060630	Pathfinder Pro 6	16mm	6mil [150mic]	30cm	0,6l/h	2l/h/m	3000m
16080610	Pathfinder Pro 8	16mm	8mil [200mic]	10cm	0,6l/h	6l/h/m	2500m
16080615	Pathfinder Pro 8	16mm	8mil [200mic]	15cm	0,6l/h	4l/h/m	2500m
16080620	Pathfinder Pro 8	16mm	8mil [200mic]	20cm	0,6l/h	3l/h/m	2500m
16080630	Pathfinder Pro 8	16mm	8mil [200mic]	30cm	0,6l/h	2l/h/m	2500m
16061010	Pathfinder Pro 10	16mm	6mil [150mic]	10cm	1,0l/h	10l/h/m	3000m
16061015	Pathfinder Pro 10	16mm	6mil [150mic]	15cm	1,0l/h	6,5l/h/m	3000m
16061020	Pathfinder Pro 10	16mm	6mil [150mic]	20cm	1,0l/h	5l/h/m	3000m
16061030	Pathfinder Pro 10	16mm	6mil [150mic]	30cm	1,0l/h	3,5l/h/m	3000m
16081010	Pathfinder Pro 10	16mm	8mil [200mic]	10cm	1,0l/h	10l/h/m	2500m
1608 1015	Pathfinder Pro 10	16mm	8mil [200mic]	15cm	1,0l/h	6,5l/h/m	2500m
16081020	Pathfinder Pro 10	16mm	8mil [200mic]	20cm	1,0l/h	5l/h/m	2500m
16081030	Pathfinder Pro 10	16mm	8mil [200mic]	30cm	1,0l/h	3,5l/h/m	2500m
16061510	Pathfinder Pro 15	16mm	6mil [150mic]	10cm	1,5l/h	15l/h/m	3000m
16061515	Pathfinder Pro 15	16mm	6mil [150mic]	15cm	1,5l/h	10l/h/m	3000m
16061520	Pathfinder Pro 15	16mm	6mil [150mic]	20cm	1,5l/h	7,5l/h/m	3000m
16061530	Pathfinder Pro 15	16mm	6mil [150mic]	30cm	1,5l/h	5l/h/m	3000m
16081510	Pathfinder Pro 15	16mm	8mil [200mic]	10cm	1,5l/h	15l/h/m	2500m
16081515	Pathfinder Pro 15	16mm	8mil [200mic]	15cm	1,5l/h	10l/h/m	2500m
16081520	Pathfinder Pro 15	16mm	8mil [200mic]	20cm	1,5l/h	7,5l/h/m	2500m
16081530	Pathfinder Pro 15	16mm	8mil [200mic]	30cm	1,5l/h	5l/h/m	2500m

recommended
for crops of:

PATHFINDER
PRO

PATHFINDER
XPRO



* COTTON, ONIONS, HEMP, STRAWBERRIES, HOTALIZAS OPEN FIELD, GREENHOUSE, CORN, POTATOES, BURIED IRRIGATION, TOMATO, PEPPER, BROCCOLI.

IRRIGATION TAPE WITH FLAT DRIPPER

EXCLUSIVE PROTECTION
FILTER

ULTRA



HIGHEST RESISTANCE TO
OBSTRUCTION

FILTRATION
ANTI-CLOGGING
MINI DROPPER
COST/PERFORMANCE



Advantages

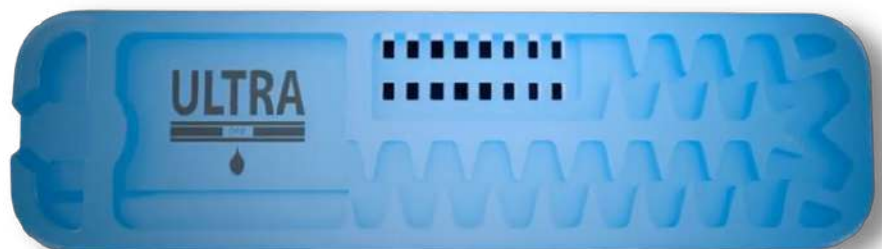
Characteristics

- +Flat asymmetric non-compensable dripper.
- +Economically viable by optimizing the design.
- +Higher flow characteristics.
- +Excellent cost-performance ratio.
- +Excellent clogging resistance, greater than that of other large drippers.

**The best
resistance
to
obstruction**

Specifications

- +Wall Thickness: 5 - 15mil (0.12-0.38mm).
- +Tube diameters 16 and 22mm.
- +Flow rates: 0.6 l/h, 0,68 l/h, 1 l/h, 1.3 l/h, 1.6 l/h
- +Cv <2%.
- +Working pressure: 1 Bar.
- +Recommended filtration: 130/120 micron/ mesh.

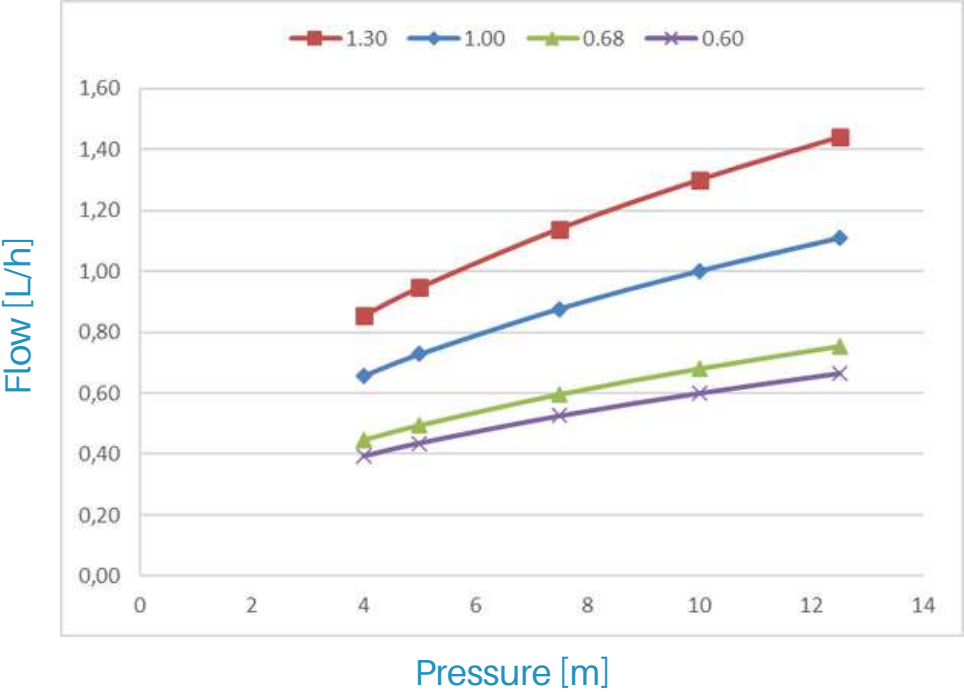


Technical characteristics

Flow [L/h]	Water passage [mm]	Filtration area [mm2]	constant K	exponent X	Micron/Mesh Recommended Filtration	
	Width-Depth-Length					
0.6	0.4*0.48*18	8	0.208	0.46	130/120	
0.68	0.4*0.48 *18	8	0.236	0.46	130/120	
1	0.5*0.60*18	8	0.347	0.46	130/120	
1.3	0.5*0.65*18	8	0.451	0.46	130/120	
Flow vs Pressure						
Pressure	[m]	4	5	7.5	10	12.5
	[8PSI]	5.8	7.3	10.9	14.5	18.1
Flow [L/h]/[gph]	0.60	0.39	0.44	0.53	0.60	0.66
		0.10	0.12	0.14	0.16	0.18
	0.68	0.45	0.49	0.60	0.68	0.75
		0.12	0.13	0.16	0.18	0.20
	1.00	0.66	0.73	0.88	1.00	1.11
		0.17	0.19	0.23	0.26	0.29
	1.30	0.85	0.95	1.14	1.30	1.44
		0.23	0.25	0.30	0.34	0.38

Flow vs Pressure

Excellent cost-performance ratio

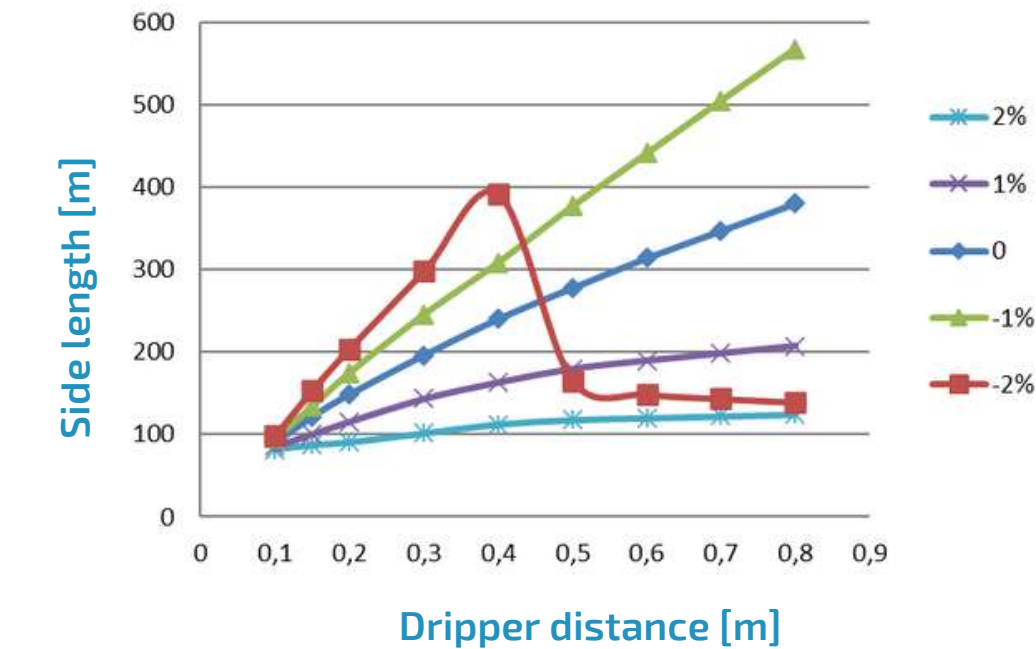


Technical characteristics

0.60 l/h, IDØ16.0 mm, 1.0 bar/14.5 PSI inlet pressure at different dripping distances [m] - 10% flow rate variation, KD 0.1																			
Flow Nominal	unevenness [%]	0.1		0.15		0.2		0.3		0.4		0.5		0.6		0.7		0.8	
		[m]	[passed]	[m]	[passed]	[m]	[passed]	[m]	[passed]	[m]	[passed]	[m]	[passed]	[m]	[passed]	[m]	[passed]	[m]	[passed]
0.60 L/h	2%	82	268	87	285	90	296	101	333	112	369	118	387	120	394	122	401	125	408
	1%	86	282	101	330	116	380	143	470	163	535	180	589	190	622	198	651	207	680
	0	90	295	122	400	149	488	196	643	240	788	278	911	314	1030	347	1139	380	1247
	-1%	95	313	135	441	175	575	246	806	309	1012	377	1236	441	1446	505	1655	568	1861
	-2%	99	323	154	504	204	669	298	976	391	1283	465	1542	549	1748	623	1847	696	2053

0.68 l/h, IDØ16.0 mm, 1.0 bar/14.5 PSI inlet pressure at different dripping distances [m] - 10% flow rate variation, KD 0.1																			
Flow Nominal	unevenness [%]	0.1		0.15		0.2		0.3		0.4		0.5		0.6		0.7		0.8	
		[m]	[passed]	[m]	[passed]	[m]	[passed]	[m]	[passed]	[m]	[passed]	[m]	[passed]	[m]	[passed]	[m]	[passed]	[m]	[passed]
0.68 L/h	2%	73	239	77	251	79	258	89	293	93	306	97	317	98	320	99	324	100	327
	1%	77	254	91	300	105	344	127	417	143	468	155	510	164	537	171	561	175	575
	0	79	258	112	368	138	451	184	602	224	733	259	850	294	964	326	1067	352	1153
	-1%	80	261	122	401	169	554	238	781	306	1002	374	1226	438	1436	504	1652	567	1859
	-2%	87	284	137	450	200	654	296	971	410	1310	516	1579	622	1848	728	2036	834	2224

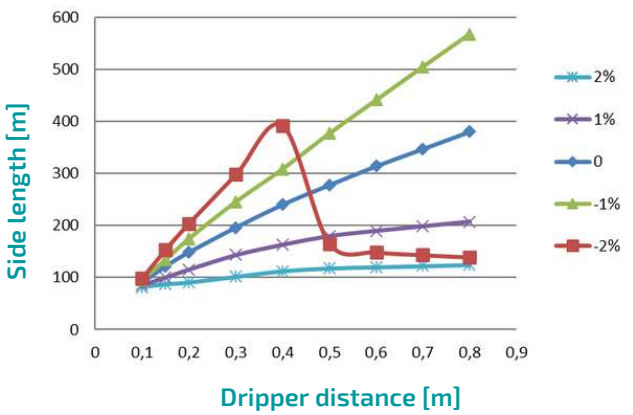
ID 16 mm, 0.60/0.68 l/h, inlet pressure 1.0 bar





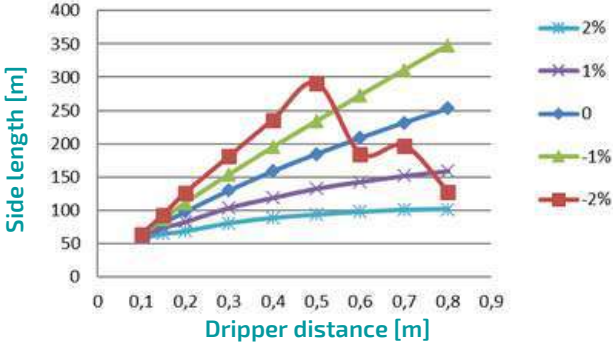
01.00 l/h, IDØ16.0 mm, 1.0 bar/14.5 PSI inlet pressure at different dripping distances [m] - 10% flow rate variation, KD 0.1																			
Flow Nominal	uneven ness [%]	0.1		0.15		0.2		0.3		0.4		0.5		0.6		0.7		0.8	
		[m]	[pass ed]	[m]	[pass ed]	[m]	[pass ed]	[m]	[pass ed]	[m]	[pass ed]	[m]	[pass ed]	[m]	[pass ed]	[m]	[pass ed]	[m]	[pass ed]
1.0 L/h	2%	63	207	70	230	73	239	85	279	93	305	98	321	101	331	104	341	105	344
	1%	67	220	81	266	90	295	112	367	128	420	142	466	152	498	161	528	168	551
	0	68	223	89	292	108	354	144	472	176	577	205	672	231	757	256	839	279	915
	-1%	69	226	97	318	124	407	173	567	219	718	264	866	308	1010	351	1151	394	1292
	-2%	75	246	109	357	142	466	205	672	268	879	333	1092	128	420	119	390	114	374

ID 16 mm, 1.00/ l/h, inlet pressure 1.0 bar



1.3 l/h, IDØ16.0 mm, 1.0 bar/14.5 PSI inlet pressure at different dripping distances [m] - 10% flow rate variation, KD 0.1																			
Flow Nominal	uneven ness [%]	0.1		0.15		0.2		0.3		0.4		0.5		0.6		0.7		0.8	
		[m]	[pass ed]	[m]	[pass ed]	[m]	[pass ed]	[m]	[pass ed]	[m]	[pass ed]	[m]	[pass ed]	[m]	[pass ed]	[m]	[pass ed]	[m]	[passe d]
1.3L/h	2%	58	190	65	213	69	226	81	266	89	292	94	308	98	321	101	331	102	334
	1%	61	200	74	243	83	272	104	341	119	390	133	436	143	469	152	498	159	521
	0	62	203	81	266	98	321	130	426	159	521	185	607	209	685	232	761	253	830
	-1%	63	207	87	285	111	364	154	505	195	639	2.3. 4	767	273	895	311	1020	348	1141
	-2%	64	210	93	305	126	413	181	593	236	774	291	954	385	607	497	646	428	420

ID 16 mm, 1.00/ l/h, inlet pressure 1.0 bar



Recommended
for crops of:



*TOMATOE, COTTON, BLUEBERRIES, ONIONS, HEMP, STRAWBERRIES, GREENHOUSE, CORN, APPLES AND PEARS, POTATOES, VEGETABLES OPEN FIELD, GREENHOUSE, PEPPER.

SELF-COMPENSATING FLAT DRIPPER

EXCLUSIVE PROTECTION
FILTER

— ***TITAN PC*** —

LARGE NUMBER OF MODELS AND
CONFIGURATIONS

PRECISION
RELIABILITY
DURABLE
EASY TO USE



Advantages

+TITAN PC is a self-compensating flat dripper developed with state-of-the-art technology and welded with a high precision laser system. It consists of three parts; the Body with the labyrinth, the Silicone Membrane and the anti-clogging Filter.

+Is ideal for a wide range of thicknesses (12-48 mil) and constant or alternate emitter spacing.

It connects to any type of hose above 13.5 mm.

Excellent coefficient of variation (CV), class A.

Thanks to the ultra-flat design of TITAN PC,

Losses of water due to friction are reduced.

TITAN PC is a latest generation drip line, mainly equipped with three systems that guarantee its long-term functionality with unevenness and sub-irrigation:

1) System "D" (Draining); ensures a constant flow with variable working pressure (0.55-3.50 bar), which depends on the thickness of the pipe. At the end of watering, it drains quickly.

2) "AS" System (Anti-Suction); ideal for underground installation. Minimizes the suction effect, preventing the entry of foreign impurities. The nominal flow rate inside the pipe starts at 0.5 bar pressure. The dripper closes if the pipe pressure is negative, avoiding obstructions.

3) "ND" System (Non-Draining); The irrigation pipe remains full of water when the irrigation process is stopped, ensuring uniform and immediate irrigation in all drip lines, eliminating the effect of repetitive drainage and filling.

+ Accommodates a wide spectrum of hose gauges (12-48 mil).

+ Short in stature, which makes resistance to the passage of water is minimal, which allows covering a greater lengths.

+ The outer labyrinth allows greater flexibility when define the flow according to the nominal value, depending on materials and production parameters.

**Advanced
Dripper for the
Most Difficult
Waters**



GENERAL DESIGN CHARACTERISTICS

- Irrigation water must be analyzed to determine its quality, particle type and size to correctly design the filtration system.
 - Precise elements will be available to control and Measure the system operating pressure. Reduce valves, pressure reducers, pressure gauges...]
 - In buried installations it is very important to have a suction cups to eliminate particle entry when irrigation is finalized.
 - The main, secondary and tertiary pipes will be cleaned, as as well as the side tubes. The system will be designed to Facilitate this task by providing the necessary mechanisms. and accessories in the pipes.
-
- The coils will be protected from humidity and sunlight. They will be kept under cover until used.
 - Do not put excessive tension on the tape during installation. Avoid rub with sharp or abrasive parts.
 - The tape will be installed with the water outlet upwards.
 - Care must be taken to fill the trench to avoid crushing or other damage to connecting pipes.

**A TITAN at the
service of
agriculture**



TECHNICAL DATA

FLOW	1.1	1.5	23	3.8
NOMINAL FLOW	1.1/0.29	1.50/0.40	2.30/0.63	3.8/1.00
COEFFICIENT OF VARIATION CV (%)	3.57	3.57	3.59	3.74
EXPONENT (0)	0.01	0.013	0.03	0.013
MAX. PRESSURE ALLOWED (Bar/PSI)	3.5/50.80	3.5/50.80	3.5/50.80	3.5/50.80
MIN. PRESSURE ALLOWED (Bar/PSI)	0.5/8.0	0.5/8.0	0.5/8.0	0.5/8.0

Pressure range: 0.5- 3.5 bar

Opening pressure: 0.40 bar

Closing pressure: 0.25 bar

Recommended
for crops of:

TITAN PC



*OLIVE OIL, AVOCADOES, BLUEBERRIES, APPLES AND PEARS, UNDERGROUND IRRIGATION, VINEYARDS, SUGAR CANE, COCOA, COFFEE, GREENHOUSES, ALMOND.

DRIP IRRIGATION TAPE

ADVANCED MAZES



LARGE NUMBER OF MODELS AND
CONFIGURATIONS

INNOVATION
RESISTANCE
EFFICIENCY
EASY TO INSTALL



Advantages

- + High-quality resins and true 1-piece construction ensure maximum tensile strength for high-pressure operations, washdown, and reliability in the most extreme conditions.
- + Industry leading, NGR offers more consistent emissions uniformity.

Cylindrical drip line



- + Standard spacing and customer request are available from 15 cm to 200 cm.
- + Ideal applications include buried row crops, cotton, alfalfa, as well as orchards, vineyards and nurseries (especially introduced for fields up to 3% incline).

Technical characteristics

* Filtration by means of discs or sand is necessary when organic contaminants are present.

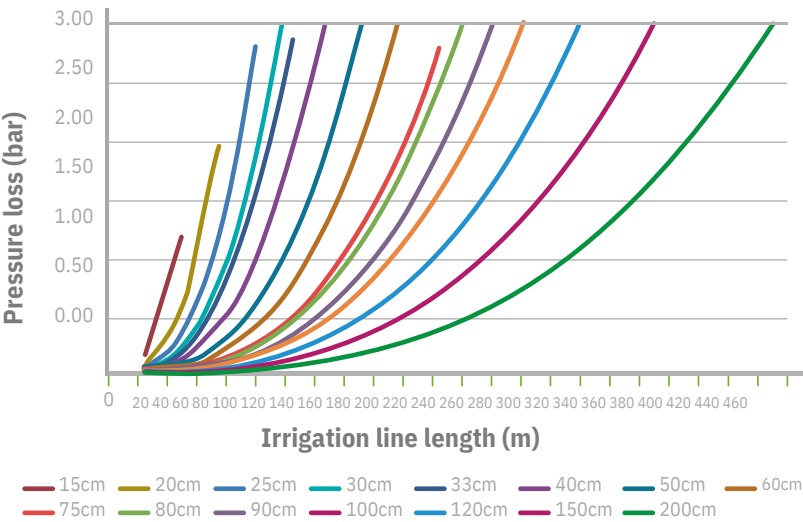
Diameter (ø)	Wall thickness	Inside Diameter (ID)	Outside diameter (OD)	Coil length	Max pressure operating	Required filtration (mesh)
16mm	0.95mm	13.70mm	15.60mm	400m	4.50 bar	120*
20mm	1.10mm	17.50mm	19.70mm	300m	4.50 bar	120*

TECHNICAL DATA NGR 16mm

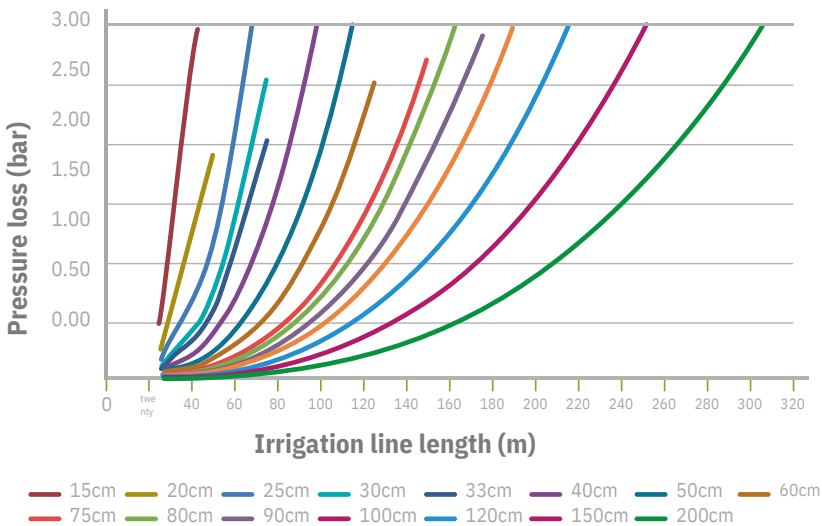
Flow Rate (LPH) at 1bar	Width of the labyrinth (mm)	Labyrinth depth (mm)	Constant (K)* atm	Exponent (x)	Coefficient of Variation (CV)	Friction Factor (Kd)
1.10	0.80	0.80	1.10	0.55	0.03	0.30
2.00	1.00	0.90	2.00	0.53	0.03	0.30
4.00	1.10	1.30	4.00	0.50	0.03	0.30

LATERAL LENGTH vs. PRESSURE LOSS

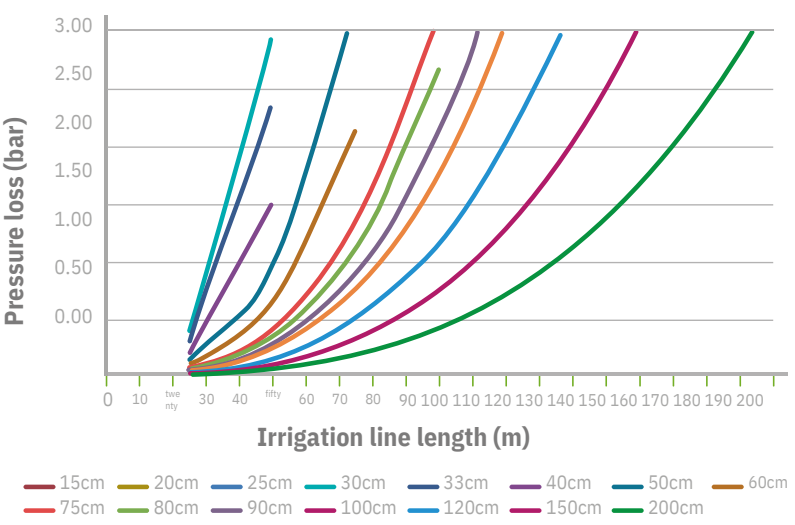
New GR 16mm 1.10 LPH



New GR 16mm 2.00 LPH



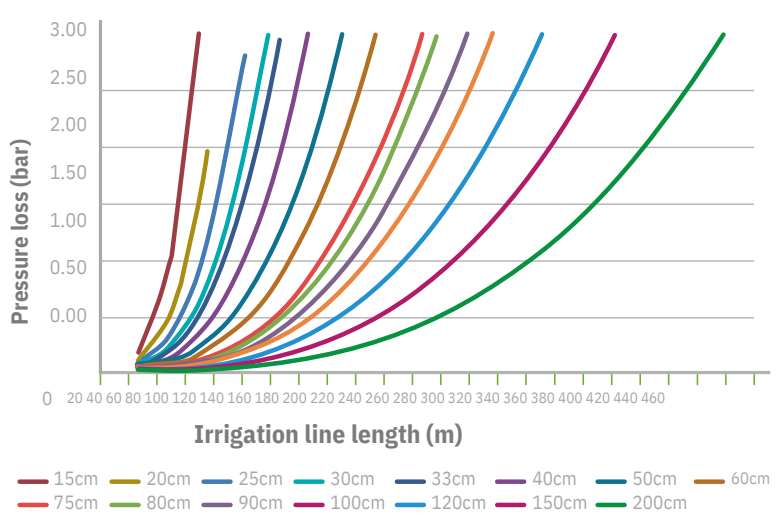
New GR 16mm 4.00 LPH



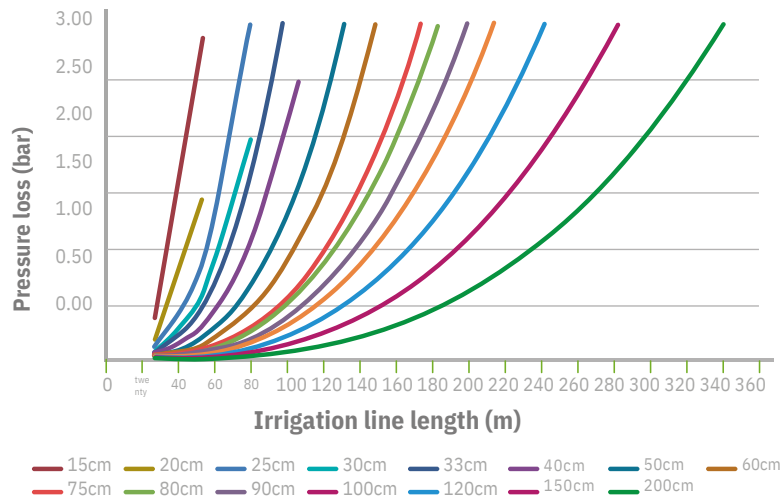
Flow Rate (LPH) at 1bar	Width of the labyrinth (mm)	Labyrinth depth (mm)	Constant (K)* atm	Exponent (x)	Coefficient of Variation (CV)	Friction Factor (Kd)
2.20	0.95	1.05	2.20	0.51	0.03	0.15
3.50	1.06	1.36	3.50	0.49	0.03	0.15

LATERAL LENGTH vs. PRESSURE LOSS

New GR 20mm 2.20 LPH

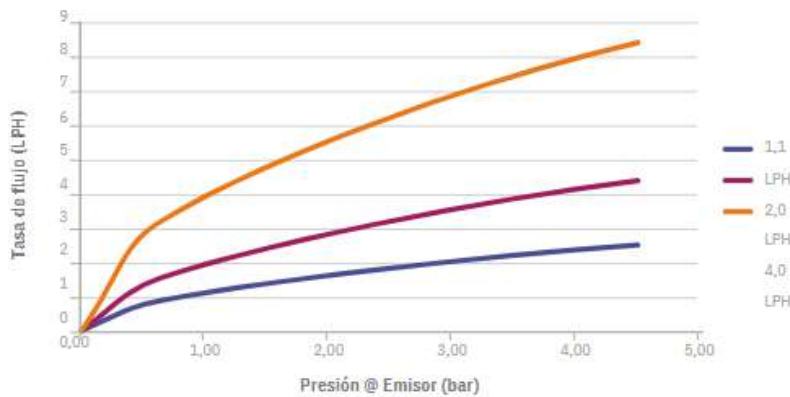


New GR 20mm 3.50 LPH

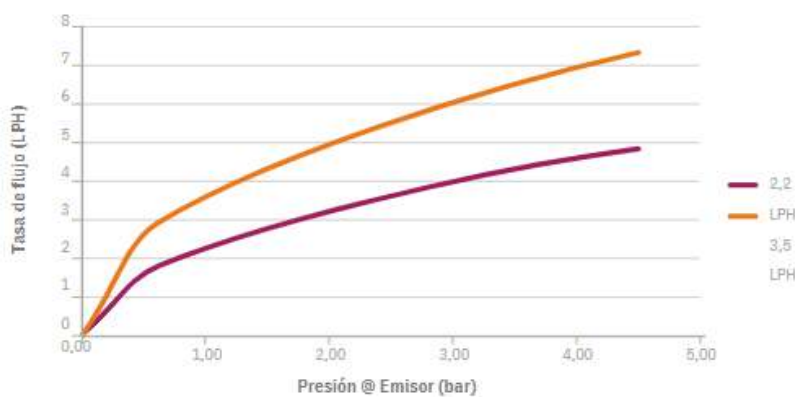


NEW GR CURVES

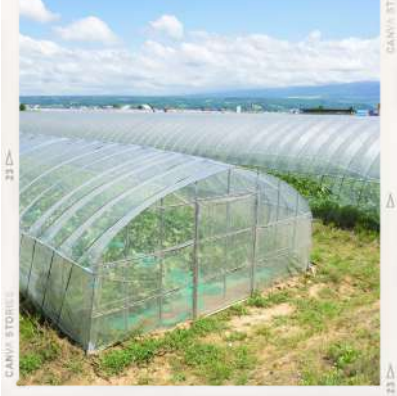
Nuevo GR 16 mm



Nuevo GR 20 mm



Recommended
for crops of:



*OLIVE OIL, AVOCADOES, BLUEBERRIES, APPLES AND PEARS, UNDERGROUND IRRIGATION, VINEYARDS, CHERRY, ALMOND TREE.

DRIP IRRIGATION TAPE

ADVANCED MAZES



LARGE NUMBER OF MODELS AND
CONFIGURATIONS

INNOVATION
RESISTANCE
EFFICIENCY
EASY TO INSTALL



Advantages

Self-compensating drippers with a high-speed turbulent flow labyrinth to avoid sediment decantation, double water inlet and the widest range of compensation in the industry (0'5-4'5 bar) that offer an incomparable performance.

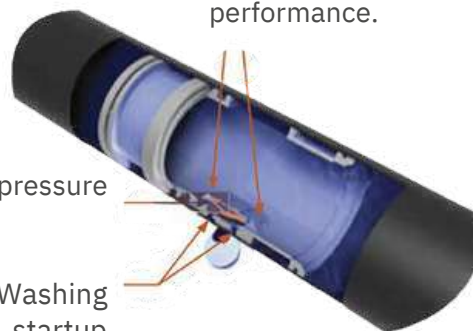


Double self-cleaning mechanism at each start of operations, ensuring low daily and annual maintenance.

+ Ideal applications include buried row crops, cotton, alfalfa, as well as orchards, vineyards and nurseries (especially introduced for fields up to 3% incline).

**Line of
cylindrical
drip**

Dual inlet high turbulent flow emitters and the largest offset pressure range (6-65 psi) in the industry, delivering optimum performance.



PC.2 membrane for pressure compensation

Dual Self-Washing Mechanism at each startup operation, granting low daily and annual maintenance

Technical Specifications Pc2

- Self-compensating drippers with a high-velocity turbulent flow labyrinth to avoid sediment settling, double water inlet and the widest compensation range in the industry (0.5-4.5 bar) that offer unparalleled performance.
- Double self-cleaning mechanism at each start of operations, ensuring low daily and annual maintenance.
- Even with very severe changes in topography, the compensation membrane of the PC2 pipe ensures maximum uniformity in the distribution of water.
- Standard and customer-requested spacings are available from 20cm to 300cm.
- Ideal for applications in woody crops, vegetables, bedding crops, cotton, etc. with undulating terrain.

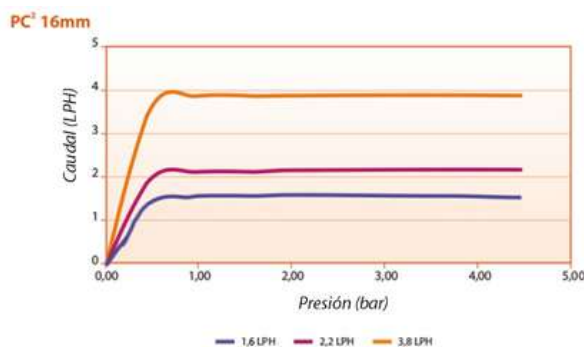
PC2 Technical Specifications

Size tube (mm)	Thickness Wall (mm)	ID(mm)	OD(mm)	Length Bovine (m)	Max Service Pressure (bar)	Filtration Required (mesh)
16	1.05	13.70	15.80	400	5.00	120/150
20	1,2	17.50	19.90	300	5.00	120/150

Specifications Flow PC

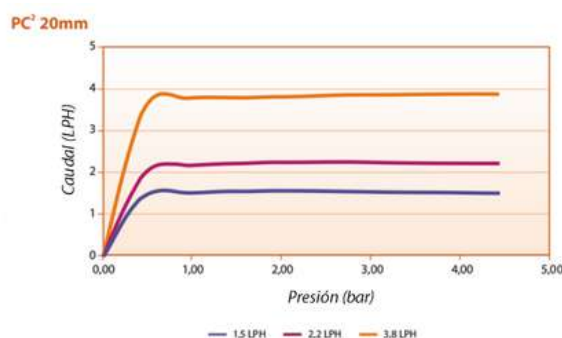
PC2 16mm

Flow Rate (LPH) at 1 bar	Flow Amplitude (mm)	Flow (mm)	Depth	Constant (K) *atm	Exponent (x)	Coefficient of Variation (CV)	Filtration Required (mesh)
16	1.05	13.70		15.80	400	5.00	120/150
twenty	1,2	17.50		19.90	300	5.00	120/150



PC2 22mm

Flow Rate (LPH) at 1 bar	Flow Amplitude (mm)	Flow (mm)	Depth	Constant (K) *atm	Exponent (x)	Coefficient of Variation (CV)	Filtration Required (mesh)
16	1.05	13.70		15.80	400	5.00	120/150
twenty	1,2	17.50		19.90	300	5.00	120/150



Recommended
for crops of:



*OLIVE OIL, AVOCADOES, BLUEBERRIES, APPLES AND PEARS, UNDERGROUND IRRIGATION, VINEYARDS, CHERRY, ALMOND TREE.



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