Advanced
Automation
Systems

Emitter Solutions

We add value to your products

Emitter
Solutions

We design, develop and produce the most advanced emitters in drip irrigation industry. We offer a wide range of emitters in order to address all market needs

Emitter solutions

We design and produce the most advanced emitters in the drip irrigation industry. We offer a wide range of emitters in order to address all market needs. All emitters are designed by our in-house R&D design department and produced in our Cyprus factory in the most advanced and well-maintained injection machines.

Capitalizing our team's knowledge, experience and expertise, and combining that with the latest technology, we design, develop and produce the most advanced emitters in drip irrigation industry combined with the highest possible quality standards. The combination of these two pillars adds value to our partnership, and enables our partners to reduce their production cost by achieving the highest possible production speeds for their driplines. In conjunction with our drip irrigation production lines, the dripline produced with our technology and emitters is the best in their market with the highest quality standards and lowest tolerances. At the same time, our partners reduce their production costs and increase their production capacity with the industry leading integrated solution of technology and emitters of A.A.S.

Our dedicated R&D emitter department is strategically staffed with both highly experienced engineers with a track record of 40 years in the industry and young talents that bring new ideas and the latest technology trends. We offer a wide range of emitters in order to address all market needs. It is common knowledge that the most important element of a dripline is the emitter as it is the apparatus delivering water to the plant. Therefore, a perfectly designed and manufactured emitter will ensure the flawless and lasting operation of the dripline on the field. This is why we constantly improve our emitters and our related production processes, by implementing the latest technologies in every aspect of our operations.

Emitter Name	Design	Special Features	Recommended Thickness	Flow Rates (l/h)	(g/h)
Cyclone PC™ **Cu Cyclone PC™**	Flat Symmetric	Drain, Non-Drain and Anti-Siphon Laser Welding	0,30 - 1,20 mm 12 - 47 mil	1,0 1,5 2,0 2,4 3,8	0,26 0,40 0,53 0,63 1,00
Triton PC™ **Cu Triton PC™**	Cylindrical Ø 16 Symmetric	Drain, Non-Drain and Anti-Siphon	0,65 - 1,20 mm 25 - 47 mil	2,0 4,0	0,53 1,06
Aquarius PC™	On-Line	Drain and Non-Drain	0,90 - 1,20 mm 35 - 47 mil	2,0 4,0 8,0 24,0	0,53 1,06 2,11 6,00
Nano™	Flat Asymmetric	3D Filtration Area	0,13 - 0,30 mm 5 - 12 mil	0,6 1,0 1,6 2,0	0,16 0,26 0,42 0,53
Turbo™ **Cu Turbo™**	Flat Symmetric	Turbo-Flow Technology	0,13 - 0,30 mm 5 - 40 mil	0,8 1,3 1,6 2,0 2,4 3,8	0,21 0,34 0,42 0,53 0,63 1,00
Turbo Compact™ **Cu Turbo Compact™**	Cylindrical Ø 16 Symmetric	Turbo-Flow Technology	0,65 - 1,20 mm 25 - 47 mil	2,0 4,0	0,53 1,06

Emitter range

Pressure Compensating (PC) Emitters

Cyclone PC™

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Triton PC™

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Aquarius PC™

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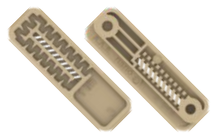
Turbulent Flow (TF) Emitters



Nano™

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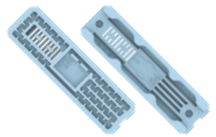

Turbo™

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Turbo Compact™

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Quality Excellence

Cu Emitter Line™

Cu Cyclone PC™

CU Triton PC™

Cu Turbo™

Cu Turbo Compact™

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Cyclone PC™

Flat PC Emitter

Ultra slim high-tech concept, laser welded with long-life material that fits any hose diameter. High accuracy, consistent clog-free performance.

Flow Rates	Pressure Range	Wall Thicknesses	Internal Diameter	Coefficient of Variation (CV)	Emission Uniformity (EU)	Coefficient of Uniformity (CU)
to 1,6 3,8 l/h	to 0,7 4,0 bar	to 12 47 mil	From 13,5 mm	Less than 4%	More than 97%	More than 98%

Pressure Compensating (PC)

PC emitters incorporate a silicone membrane which enables the delivery of precise and equal amounts of water over a broad pressure range. Cyclone PC™ emitters are designed for precision irrigation needs and inclined topography.

Laser Welding Technology

We use state of the art laser welding technology for sealing the two parts of the emitter. By utilizing the latest technology in emitter assembly, we ensure flawless operation under any condition. This welding method prevents leaks in the event of extremely high pressures and prohibits the opening of the emitter during installation and/or retraction of the dripline in the field.

Drain (D), Non-Drain (ND) and Anti-Siphon (AS) Options

The Anti-Siphon (AS) system is a specially designed mechanism that prevents suction of dirt and impurities into the emitter. The AS feature enables Cyclone PC™ to be installed underground (SDI), perfectly maintaining its irrigation characteristics and its multi-year durability. With the Non-Drain system of Cyclone PC™, the dripline remains full of water during irrigation intervals, ensuring immediate and uniform irrigation along the dripline. ND emitters eliminate drainage and refill effect and improve efficiency in pulse irrigation. Non-Drain emitters close when the pressure is below 0,2 bar.

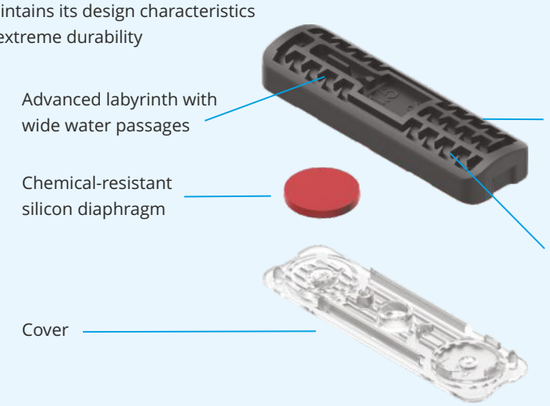
- Wide filtration area
- Low friction losses
- Precision irrigation
- Continuous self-cleaning mechanism
- Uneven terrains
- Pulse irrigation
- Orchards
- Greenhouses
- Subsurface installations (SDI)

Cyclone PC™ Design Characteristics

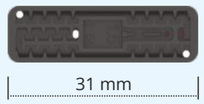
Laser Welding Technology

Cyclone PC™ is the only laser welded emitter available in the industry, ensuring perfect operation since it maintains its design characteristics and extreme durability

Cyclone PC™ emitters have been tested by independent institutes worldwide and achieved the highest ranking for CV, emission uniformity, flow accuracy and clogging resistance



Actual Size



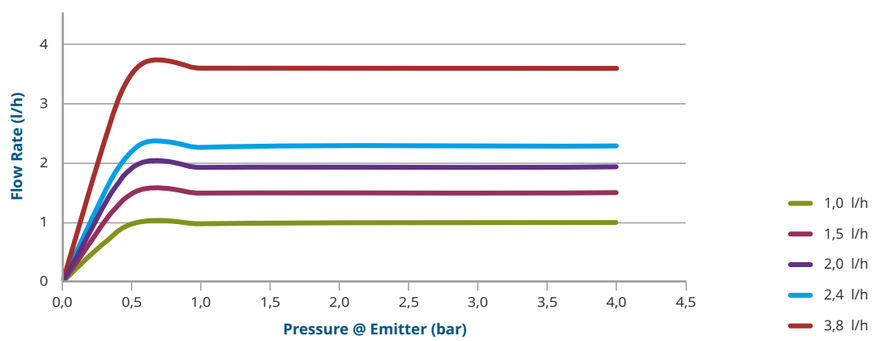
Packaging

Cyclone PC™ Emitter Specifications

Nominal Flow Rate (l/h)	Constant k (bar)	Exponent (x)	Water Passage Width x Depth x Length (mm)	Filtration Area (mm^2)	Recommended Filtration (mesh/micron)
1,0	1,0	0,0	0,82 x 0,76 x 139	37,37	150/100
1,5	1,5	0,0	1,06 x 0,85 x 132	37,37	150/100
2,0	1,9	0,0	1,08 x 0,88 x 93,5	37,37	120/130
2,4	2,3	0,0	1,19 x 0,90 x 89,6	37,37	120/130
3,8	3,6	0,0	1,30 x 0,90 x 78,7	37,37	120/130

Pressure range: 0,7 - 4,0 bar

Cyclone PC™ Emitter Flow Curves



Emitter Solutions

Triton PC™

Cylindrical PC Emitter

The most durable Pressure Compensating emitter, designed for steep and rocky terrain, permanent crops with long laterals, on surface and subsurface applications.

Emitter Diameter	Flow Rates	Pressure Range	Wall Thicknesses	Coefficient of Variation (CV)	Emission Uniformity (EU)	Coefficient of Uniformity (CU)
16 mm	2,0 and 4,0 l/h	0,5 to 4,0 bar	25 to 47 mil	Less than 5%	More than 97%	More than 98%

Pressure Compensating (PC)

PC emitters incorporate a silicone membrane which enables the delivery of precise and equal amounts of water over a broad pressure range. Triton PC™ emitters are designed for precision irrigation needs and inclined topography.

Drain (D), Non-Drain (ND) and Anti-Siphon (AS) Options

The Anti-Siphon (AS) system is a specially designed mechanism that prevents suction of dirt and impurities into the emitter.

The AS feature enables Triton PC™ to be installed underground (SDI), perfectly maintaining its irrigation characteristics and its multi-year durability. With the Non-Drain system of Triton PC™, the dripline remains full of water during irrigation intervals, ensuring immediate and uniform irrigation along the dripline. ND emitters eliminate drainage and refill effect and improve efficiency in pulse irrigation. Non-Drain emitters close when the pressure is below 0,2 bar.

- Precision irrigation
- Continuous self-cleaning mechanism
- High turbulent flow
- Uneven terrains
- Orchards
- Landscaping
- Effluent water reuse
- Pulse irrigation
- Subsurface installations (SDI)

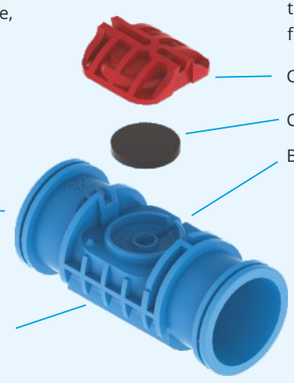
Triton PC™ Design Characteristics

Robust Design

Robust design with no holes or cutouts for housing the silicone membrane, provides perfect symmetry and enables better inserting and drilling at high speed

Advanced water inlet design with industry leading filtration area

The large cross section along with the high turbulent flow path, provides high clogging resistance



Triton PC™ emitters have been tested by independent institutes worldwide and achieved the highest ranking for CV, emission uniformity, flow accuracy and clogging resistance

Symmetrical emitter for easier inserting and drilling. Along with its unique design, it can achieve the highest production speed in the industry

Actual Size

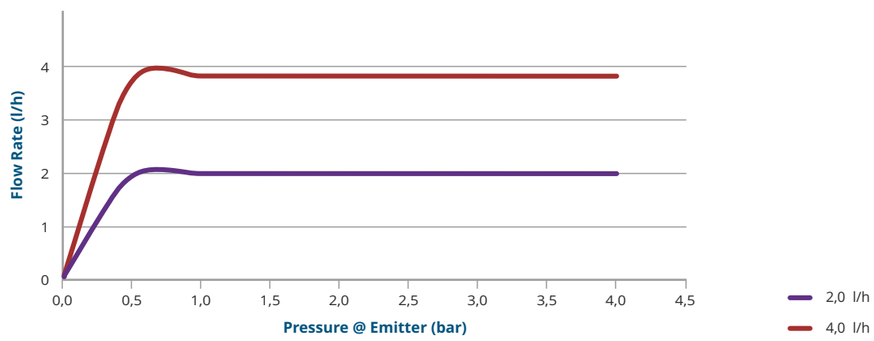
Packaging

Triton PC™ Emitter Specifications

Nominal Flow Rate (l/h)	Constant k (bar)	Exponent (x)	Water Passage Width x Depth x Length (mm)	Filtration Area (mm^2)	Recommended Filtration (mesh/micron)
2,0	2,0	0,0	1,10 x 1,20 x 62,7	14,00	120/130
4,0	3,8	0,0	1,30 x 1,20 x 51,9	14,00	120/130

Pressure range: 0,5 - 4,0 bar

Triton PC™ Emitter Flow Curves



Aquarius PC™

Online PC Emitter

The most versatile and easy to install Pressure Compensating emitter for a great variety of applications.

Flow Rates	Pipe Diameter	Pressure Range	Wall Thicknesses	Coefficient of Variation (CV)	Emission Uniformity (EU)	Coefficient of Uniformity (CU)
to 2 24 l/h	to 12 32 mm	to 0,5 4,0 bar	to 0,9 1,2 mm	Less than 4%	More than 97%	More than 98%

Aquarius PC™ emitters can be installed manually exactly where they are required. The number of emitters can be increased in order to increase water supply aimed at meeting tree growth rate requirements.

Aquarius PC™ design allows the installation of manifold outlet with multiple outputs.

One type of outlet suitable for 3 mm internal diameter micro-tube and for press-fit nipple connectors.

Pressure Compensating (PC)

Aquarius PC™ emitters incorporate a silicone membrane which enables the delivery of precise and equal amounts of water over a broad pressure range.

Aquarius PC™ emitters are designed for precision irrigation needs, ranging from a home garden to the most advanced hydroponic applications.

Drain (D) and Non-Drain (ND) Options

With the Non-Drain system of Aquarius PC™, the pipe remains full of water during irrigation intervals, ensuring immediate and uniform irrigation along the pipe. Non-Drain emitters eliminate drainage and refill effect, and improve efficiency in pulse irrigation. In order to achieve the Non-Drain function, the emitter closes when the pressure is below 0,1 bar.

- Precision irrigation
- Uneven terrains
- Soilless culture
- Continuous self-cleaning mechanism
- Orchards
- Pulse irrigation
- Wide water passages
- Landscaping
- Manifold outlet capability

Aquarius PC™ Design Characteristics

Ultrasonic Welding Technology

The advanced welding process of Aquarius PC™ eliminates the problem all online emitters eventually face, leakage between the body and the cover of the emitter. In our emitter this is prevented by a parallel formation and welding of the cover, around the edge of the body of Aquarius PC™, making it impossible to leak regardless of the climatic or pressure conditions

The design of Aquarius PC™ emitter provides all the benefits of the large online emitters in compact dimensions which make it the perfect choice in terms of value

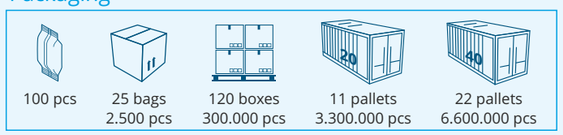
Aquarius PC™ emitters have been tested by independent institutes worldwide and achieved the highest ranking for CV, emission uniformity, flow accuracy and clogging resistance

- Cylindrical labyrinth with wide water passages. Color distinction for different flow rates
- Chemical-resistant silicon diaphragm
- Emitter cover with color distinction for Drain and Non-Drain function

Installation with a 2,8 mm punch tool

Actual Size
28 mm

Packaging



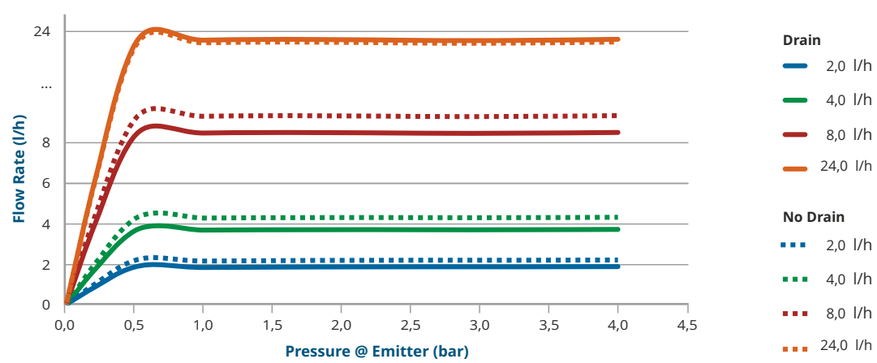
Aquarius PC™ Emitter Specifications

Nominal Flow Rate (l/h)	Constant k (bar) Drain	Constant k (bar) No Drain	Exponent (x)	Water Passage Width x Depth x Length (mm)	Filtration Area (mm^2)	Recommended Filtration (mesh/micron)
2,0	2,0	2,1	0,0	1,00 x 1,00 x 55,4	3,80	120/130
4,0	3,8	4,2	0,0	1,30 x 1,10 x 50,6	3,80	120/130
8,0	8,4	9,0	0,0	1,50 x 1,15 x 46,5	3,80	120/130
24,0	23,5	23,5	0,0	1,35 x 1,20 x 35,0	3,80	120/130

Pressure range: 0,5 - 4,0 bar

24 l/h emitter available with cap

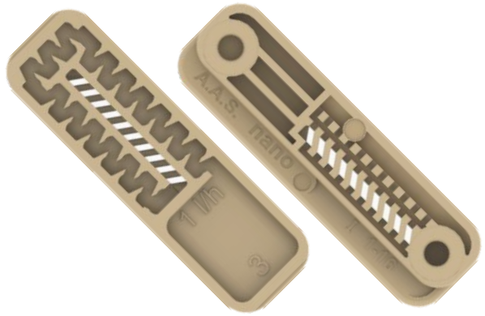
Aquarius PC™ Emitter Flow Curves



Nano™

Flat Turbulent Emitter

The most affordable approach for the end user due to the small weight and dimensions of the emitter.



Flow Rates	Wall Thicknesses	Dripline Diameter	Emitter Spacing	Coefficient of Variation (CV)	Emission Uniformity (EU)	Coefficient of Uniformity (CU)
to 0,6 2,0 l/h	to 5 12 mil	From 12 mm	From 10 cm	Less than 4%	More than 97%	More than 98%

Nano™ is a cost-effective emitter due to its ultra compact design, without compromising any of our high quality and production standards. It is directly comparable to drip tape products since the production cost of a coil is less.

The finished coils contain more meters for the same outer dimensions, resulting at lower logistics costs per meter, compared to other thin wall and tape products.

The small dimensions of Nano™ emitter along with its curved edge design provide a very low kd factor resulting in extremely low friction losses of water flowing inside the dripline.

Emitter Flow Path

One of the most important elements in the design of an emitter is the flow path. Its width, depth and length determine the flow rate of the emitter in liters per hour but most importantly determines their anti-clogging ability. A highly turbulent flow design creates multiple vortexes inside the flow path and therefore prevents clogging.

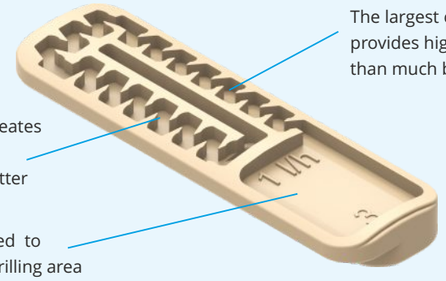
- 3D water inlet
- Cost effective
- Low friction losses
- High production speed
- High turbulent flow
- Wide filtration area
- Row crops
- Vegetables

Nano™ Design Characteristics

3D Filtration Area

The unique 3D filtration area of Nano™ prevents particle insertion into the emitter. The inlet design provides a filtration area larger than much bigger emitters

Nano™ emitters have been tested by independent institutes worldwide and achieved the highest ranking for CV, emission uniformity, flow accuracy and clogging resistance



The largest cross section in the industry provides high clogging resistance, better than much bigger flat emitters

Specially designed labyrinth creates high turbulent flow, therefore preventing clogging of the emitter

Vast drilling tolerance compared to similar emitters due to large drilling area

Actual Size

19 mm

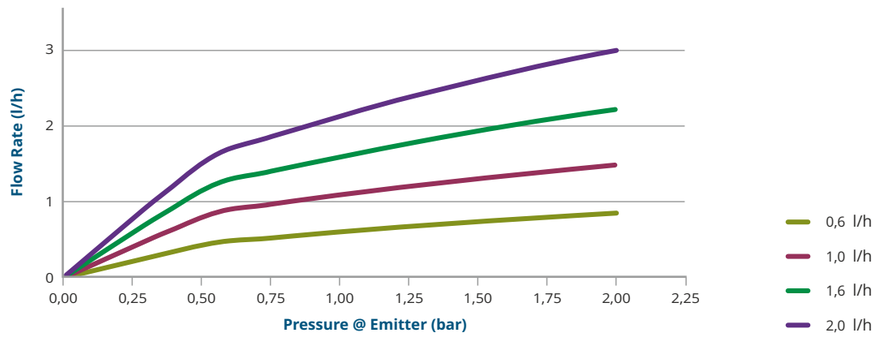
Packaging

50.000 pcs	120 boxes 6.000.000 pcs	11 pallets 66.000.000 pcs	22 pallets 132.000.000 pcs

Nano™ Emitter Specifications

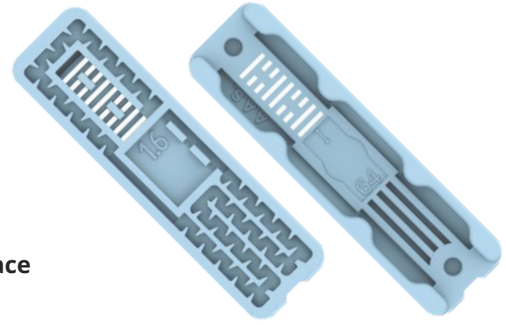
Nominal Flow Rate (l/h @ 1bar)	Constant k (bar)	Exponent (x)	Water Passage Width x Depth x Length (mm)	Filtration Area (mm^2)	Recommended Filtration (mesh/micron)
0,6	0,60	0,48	0,51 x 0,46 x 44,2	28,20	150/100
1,0	1,09	0,46	0,59 x 0,60 x 41,9	28,20	120/130
1,6	1,60	0,47	0,69 x 0,65 x 40,0	28,20	120/130
2,0	2,13	0,49	0,80 x 0,65 x 38,2	28,20	120/130

Nano™ Emitter Flow Curves



Turbo™

Flat Turbulent Emitter



One of the world's most proven and trusted flat emitter, used in both surface and subsurface applications for more than 27 years worldwide.

Flow Rates	Wall Thicknesses	Dripline Diameter	Emitter Spacing	Coefficient of Variation (CV)	Emission Uniformity (EU)	Coefficient of Uniformity (CU)
to 0,8 – 3,8 l/h	to 5 – 47 mil	From 12 mm	From 10 cm	Less than 4%	More than 97%	More than 98%

Turbo™ emitter is extremely versatile since it can be used in many wall thicknesses and pipe diameters. The final product is ideal for single season as well as multi season applications depending on the wall thickness. Moreover, it can be used in subsurface installations (SDI).

The symmetrical design of Turbo™ emitter, allows the highest insertion rates and higher production speed, providing significant cost advantages for the production of the dripline.

Emitter Flow Path

One of the most important elements in the design of an emitter is the flow path. Its width, depth and length determine the flow rate of the emitter in liters per hour but most importantly determines their anti-clogging ability. A highly turbulent flow design creates multiple vortexes inside the flow path and therefore prevents clogging.

- Low friction losses
- High turbulent flow
- Wide filtration area
- Row crops
- Vegetables
- Orchards
- Landscaping
- Gardening
- Subsurface installations (SDI)

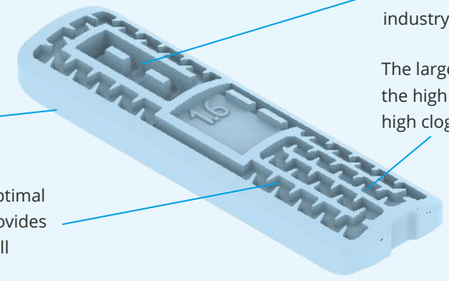
Turbo™ Design Characteristics

The Most Successful Flat Emitter

Turbo™ was designed in 1991 and since then it was installed in numerous fields worldwide making it the most successful flat emitter in the drip irrigation industry. As a result Turbo is also the most copied emitter in the industry

Symmetrical emitter for easier inserting and drilling. Along with its unique design, it can achieve the highest production speed in the industry

The unique design and the optimal dimensions of the emitter provides the ability to insert it in all wall thicknesses and diameters



Turbo™ emitters have been tested by independent institutes worldwide and achieved the highest ranking for CV, emission uniformity, flow accuracy and clogging resistance

Advanced water inlet design with industry leading filtration area

The large cross section along with the high turbulent flow path, provides high clogging resistance

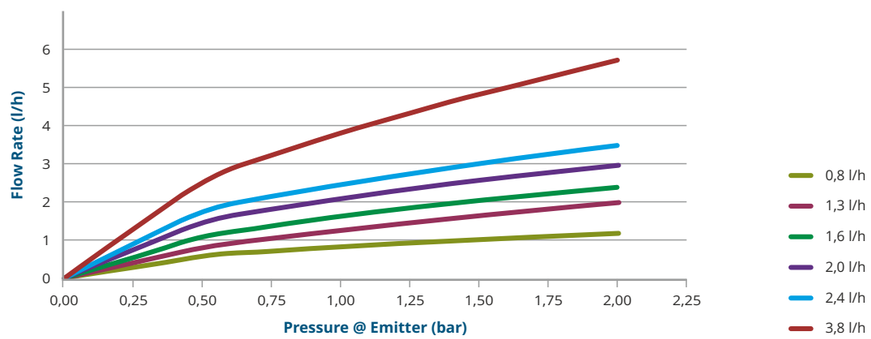
Actual Size

Packaging

Turbo™ Emitter Specifications

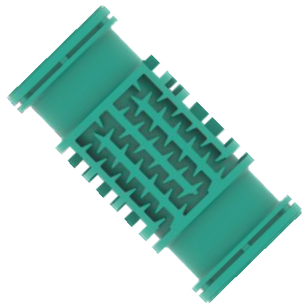
Nominal Flow Rate (l/h @ 1bar)	Constant k (bar)	Exponent (x)	Water Passage Width x Depth x Length (mm)	Filtration Area (mm^2)	Recommended Filtration (mesh/micron)
0,8	0,82	0,48	0,62 x 0,62 x 116	20,00	120/130
1,3	1,25	0,49	0,70 x 0,62 x 106	20,00	120/130
1,6	1,61	0,49	0,70 x 0,67 x 106	20,00	120/130
2,0	2,07	0,47	0,75 x 0,75 x 104	20,00	120/130
2,4	2,46	0,48	0,75 x 0,85 x 104	20,00	120/130
3,8	3,80	0,49	0,97 x 0,85 x 64,4	12,00	120/130

Turbo™ Emitter Flow Curves



Turbo Compact™

Cylindrical Turbulent Emitter



Compact and economical emitter for a wide range of applications. Suitable for permanent crops, multi seasonal usage and in experienced farmers.

Emitter Diameter	Flow Rates	Wall Thicknesses	Coefficient of Variation (CV)	Emission Uniformity (EU)	Coefficient of Uniformity (CU)
16 mm	2,0 and 4,0 l/h	25 to 47 mil	Less than 5%	More than 97%	More than 98%

Turbo Compact™ emitter is designed and developed for multi seasonal applications. The easy installation and low maintenance requirements provide a trouble-free dripline for many years. The high UV resistant along with the extreme resistance to agrochemicals and hard field conditions, make it the best choice for permanent crops.

The advanced water inlet design increases significantly the filtering area of the emitter and prevents particle insertion into the labyrinth. Thus, enhancing the overall anti-clogging performance. Turbo Compact™ emitters can be used in deep subsurface installations (SDI).

Emitter Flow Path

One of the most important elements in the design of an emitter is the flow path. Its width, depth and length determine the flow rate of the emitter in liters per hour but most importantly determines their anti-clogging ability. A highly turbulent flow design creates multiple vortexes inside the flow path and therefore prevents clogging.

- High turbulent flow
- Wide filtration area
- Orchards
- Landscaping
- Gardening
- Row crops
- Effluent water reuse
- Subsurface installations (SDI)

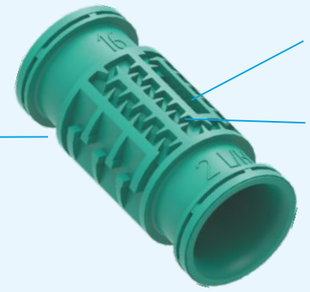
Turbo Compact™ Design Characteristics

Compact and Economical Emitter

Compact and economical emitter for a wide range of both surface and subsurface applications

Turbo Compact™ emitters have been tested by independent institutes worldwide and achieved the highest ranking for CV, emission uniformity, flow accuracy and clogging resistance

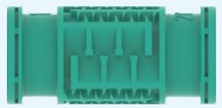
Symmetrical emitter for easier inserting and drilling. Along with its unique design, it can achieve the highest production speed in the industry



Advanced water inlet design with industry leading filtration area

The large cross section along with the high turbulent flow path, provides high clogging resistance

Actual Size

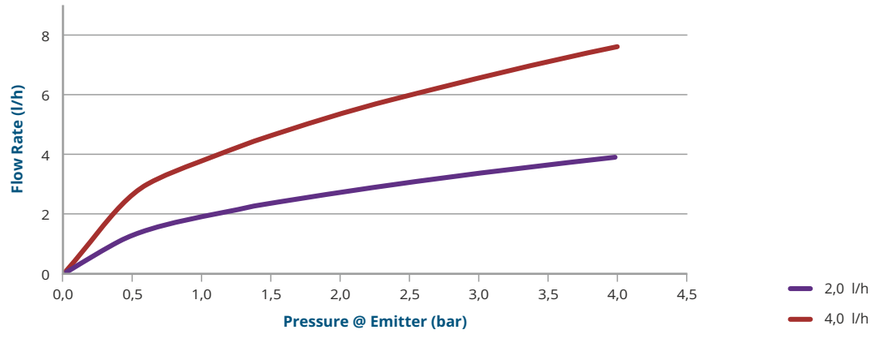


Packaging

Turbo Compact™ Emitter Specifications

Nominal Flow Rate (l/h @ 1bar)	Constant k (bar)	Exponent (x)	Water Passage Width x Depth x Length (mm)	Filtration Area (mm^2)	Recommended Filtration (mesh/micron)
2,0	1,98	0,49	0,95 x 1,00 x 197	20,80	120/130
4,0	3,97	0,49	1,03 x 1,35 x 143	53,00	120/130

Turbo Compact™ Emitter Flow Curves



Cu Emitter Line™

The Ultimate Solution for Subsurface Drip Irrigation (SDI)

Subsurface drip irrigation (SDI) is the most efficient irrigation method, since it delivers water directly to the root zone of plants through a network of buried driplines.
An SDI system offers many advantages over traditional irrigation methods:

1. Water efficiency
- Reduced evaporation
- Precise water application
- Lower water usage

2. Improved crop yields and quality
- Consistent moisture levels
- Nutrient management
- Reduced stress on plants

3. Weed and disease control
- Reduced weed growth
- Lower disease risk

4. Soil health and erosion control
- Minimized soil erosion
- Improved soil structure

5. Labor and energy savings
- Reduced labor costs
- Energy efficiency

6. Flexibility and adaptability
- Suitable for various crops
- Adaptable to different terrains

7. Environmental benefits
- Reduced chemical leaching
- Conservation of water resources

8. Long-term cost savings
- Durability
- Increased profitability

9. Aesthetic and land use benefits
- Unobtrusive
- Land use efficiency

10. Climate resilience
- Drought mitigation
- Adaptation to climate change

The major drawback in SDI is emitter clogging.
Emitters can clog for several reasons:
- Root intrusion
- Algae and bacteria development
- Soil intrusion

Several reasons can lead to root intrusion but the most frequent is the lack of water. When irrigation cycles are not frequent enough, the roots reach for the water available nearby.
The roots of the plant enter the dripline through the outlet hole in order to find the water available in the dripline. This results to partial or full plugging, due to root intrusion into the emitter.
Emitter clogging leads to:
- Inefficient irrigation
- Inefficient fertilizer delivery
- Loss of crop yield
- Loss of plants
- Increased costs
- Reduced income from the lost crop

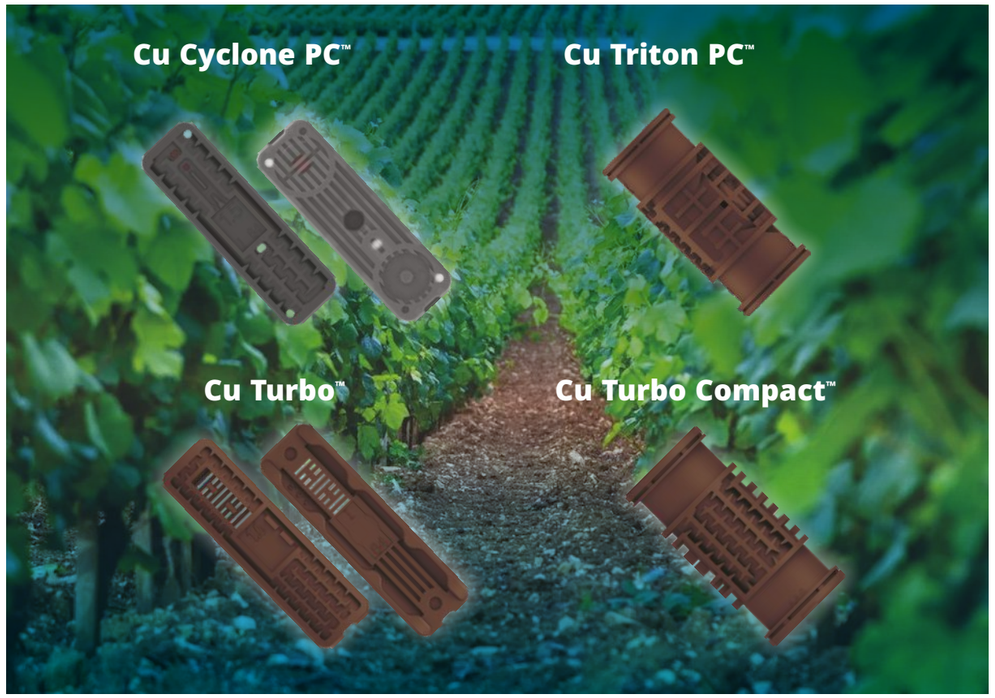
With our Cu Emitter Line™, we provide a solid defense against root intrusion in SDI installations. The copper oxide compound which our emitters contain, act as a barrier to roots and invasive underground rhizomes of the plants. Our Cu Emitter Line™ products use the same injection moulding process as the non Cu emitters, since the PE compound contains the active copper oxide ingredients.

We decided to utilize copper oxide compound because it acts as a natural barrier to roots and at the same time inhibits the growth of algae, bacteria, and fungi, reducing the risk of clogging in the emitters and dripline. It is recognized as the first antimicrobial metal and is widely used in many applications and industries.

The Cu Emitter Line™ product range is a comprehensive solution for SDI installations, since it includes both Pressure Compensating (PC) and Turbulent Flow (TF) emitters.

- Cu Cyclone PC™
- Cu Triton PC™
- Cu Turbo™
- Cu Turbo Compact™

Cu Emitter Line™ in conjunction with our Anti-Siphon (AS) system, available in both Cyclone PC™ and Triton PC™ emitters, provide the best solution for SDI applications. The copper oxide compound prevents root intrusion and the development of algae, bacteria, and fungi, into the emitter, while the AS system prevents suction of dirt and impurities into the emitter during the system shut-off.



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