

# Big advantages

in the **small** details



## UniRam™

### The world's most durable pressure compensating dripperline

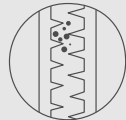
© A patented product since **2001**

More than

**11 billion** UniRam™ drippers

are used worldwide by tens of thousands of satisfied farmers

High proven **resistance** to clogging



even in adverse water conditions and with very low flow rates

A unique wide range of flow rates:



0.7 l/h 1.0 l/h 1.6 l/h 2.3 l/h 3.5 l/h

**100%** uniformity

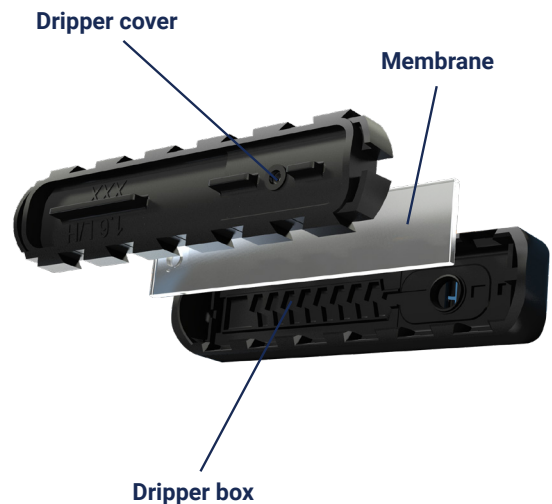
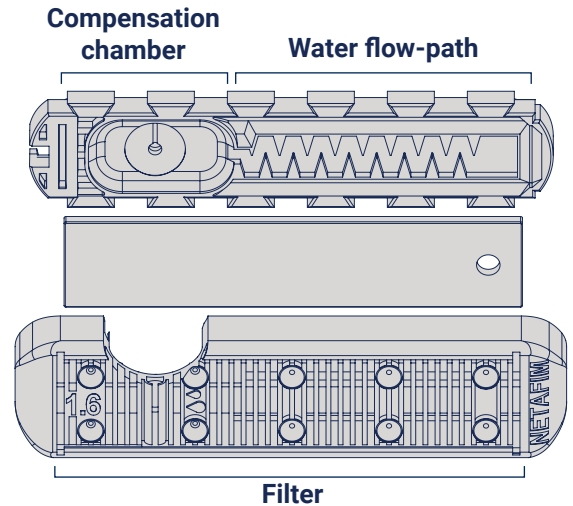


of water and nutrient distribution for years

The **biggest** effective filtration area **in the industry**

Models:

UniRam / UniRam / UniRam / UniRam / UniRam  
**RC / AS / ASXR / CNL / HCNL**



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# Filter

The largest filtration area in the industry



## Large and effective filter area

Prevents penetration of coarse particles inside the flow path



## More protection against clogging

The larger surface area of the filter increase the longevity of the dripper from the possibility of dirt particles settling and clogging the dripper

## Attributes:

- » The largest effective filtration area, significantly larger than any other filter in the market.
- » Many short, deep independent slots connecting in parallel to wide collecting channels.
- » Patent-protected slots and collecting channel structure
- » Water flow in dripperline continually washes the filters.
- » Slot width is smaller than the dripper flow path minimal dimension.

## Impact on Grower:

- » The dripper continues to operate perfectly even when most of the slots are clogged.
- » Uniram offers greater clogging protection, but allowing large particles to pass through.
- » peace of mind and long term performance even in challenging water quality.

## Filter Comparison

UniRam™

Effective filtration area



|             | Fact  | Explanation  | UniRam™             | Others             |
|-------------|---|--|---------------------|--------------------|
| Filter size | The larger the filter, the more dirt load it can handle, making the water inlet less likely to clog | Large filter enables the dripper to operate continuously and perfectly | 130 mm <sup>2</sup> | 17 mm <sup>2</sup> |

## 💡 DID YOU KNOW?



Although it was covered by a lot of accumulated dirt, the flow-rate of this UniRam dripper was 100% the same as a new one. The inlet was only through 3 small holes that were left open!  
This proves the the combination of the independent **slots** and the **wide collecting channels**, creates an exceptional clogging resistance, even in very challenging conditions.

# Flow-path: labyrinth

Designed to maximize turbulence



## Efficient irrigation

Superb clog resistance allows ultra-efficient irrigation with minimum waste of water and nutrients



## Never clogs

Excellent clog resistance for many years even in harsh water conditions


## / Attributes:

- » TurboNet™ labyrinth creates flow detachment, that results in very high local vortexes and strong turbulence.
- » Built to pass relatively low flow in a relatively large flow path.
- » Despite low flow, local vortexes are very high, resulting in strong internal turbulence that prevents the built up of sediment that can cause clogging.
- » Large cross section area (width x depth)
- » High turbulence level (measured as turbulence coefficient "K") creating "self-cleaning" effect.

## / Impact on Grower:

- » Excellent clog resistance even in harsh water conditions.
- » Stronger turbulence reduces the risk of clogging, as particles are better kept in suspension within higher turbulence emitters.

## / Labyrinth Comparison

| UniRam™  | Others   |
|--|--|
|  <p>TurboNet™ labyrinth creates flow detachment thus creating high local velocities and strong turbulence</p> | <p>Meshed or rounded teeth reduce turbulence and lead to smaller flow path and more sedimentation, hence clogging.</p> |

|                        | Fact   | Explanation   | UniRam™<br>0.7 L/H                           | Others*                                       |
|------------------------|--|---|--|---|
| Flow path size         | The larger the flow path, the less risk of clogging.               | A wider flow path prevents dirt accumulation in the labyrinth and determines the efficiency of operation during the irrigation season | Cross section size:<br>~0.64 mm <sup>2</sup> | Cross section size:<br>~0.445 mm <sup>2</sup> |
| Flow path length       | The longer the water passage the more sensitive it is to clogging. | Shorter labyrinth also produces stronger turbulence, which results in better resistance to clogging.                                  | 40 mm  | ~ 50 mm                                       |
| Turbulence coefficient | Higher turbulence coefficient = better clogging resistance         | Higher turbulence coefficient = higher vortexes that prevent dirt sedimentation and accumulation in the labyrinth.                    | 10.4   | N/A   |

\* Others relate to a dripper in the same class from international brand.

## DID YOU KNOW?

Improving resistance to clogging is critical to drip irrigation performance. In fact, the ability to irrigate using low flow rates and poor quality water depends on tackling this issue. High turbulence rates in the dripper's flow path is one of the main ways in which we create efficient flow paths that increase resistance to clogging. **Using a labyrinth with a big water passage and high turbulence coefficient gives us the best known solution for addressing the clogging problem.**



# Compensation chamber

The world's most reliable pressure compensating mechanism



## PC mechanism

Maintains a constant low pressure differential inside the labyrinth



## Double protection

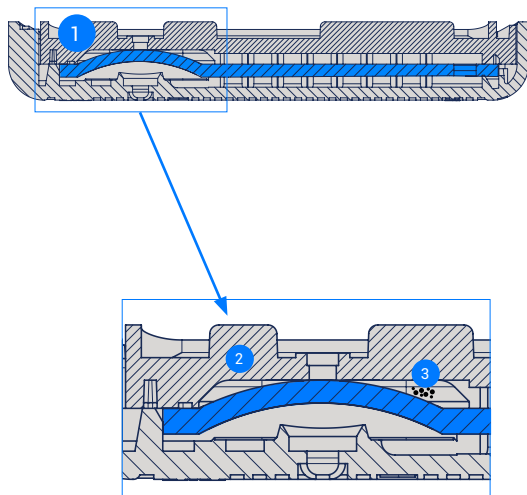
Double anti-clogging protection  
Self-flushing and continuous self-cleaning mechanisms

## Attributes:

- » Large, deep chamber > efficient self cleaning at the whole range of inlet pressures.
- » Keeps a constant pressure differential, regardless of the inlet pressure, thus maintaining a constant flow-rate.

## Impact on Grower:

- » High uniformity regardless the field topography and laterals length which leads to higher yields.
- » Save fertilizer and energy due to high uniformity.



- 1 The diaphragm deflects according to pressure differential between both sides.
- 2 The diaphragm forms a small flow path against the compensation hole to neutralize the rest of the inlet pressure, thus keeping constant pressure differential that leads to a constant flow rate.
- 3 In case of full or partial clogging, flow is reduced, the labyrinth loses less pressure and the diaphragm deflects less, opening a larger flow path to the compensation hole for the dirt to be flushed out. **This is self-flushing!**

# Sedimentation zones

Zones between dripper parts where dirt settles due to non-turbulent flow (non-turbulence)



## Minimum sedimentation area along the flow path

Short sedimentation zones reduces dirt accumulation.



## Short non turbulent zones

Direct connection between water flow path and compensation chamber.

## / Attributes:

- » Minimal, short sedimentation zones prevent dirt accumulation.
- » Flat dripper > no side to side water passage.
- » Direct connection between water flow path and compensation chamber > no sedimentation zones.

## / Impact on Grower:

- » Minimal sedimentation.
- » Excellent clog resistance.
- » Ability to irrigate uniformly even in harsh water conditions

## / Sedimentation zones - Comparison

| Cylindrical drippers   | Uniram™  | Others drippers  |
|--|--|--|
| <ul style="list-style-type: none"> <li>» Water entry and compensation chamber on one side</li> <li>» Side to side movement, back and forth, slow laminar flow allows for sedimentation</li> <li>» The labyrinth is welded to inner face of the pipe on the other side</li> </ul> | Labyrinth and compensation chamber are covered by one diaphragm direct flow path, resulting in no sedimentation! | Small diaphragm so water leaves the labyrinth through a connecting hole to a connecting pool. Connecting hole welded to the pipe (where dirt particles may accumulate) and through another hole to the compensation chamber. |

## UniRam vs. Leading competitor

This chart helps you explain the advantages of UniRam versus the leading competitor in HWD products

| Attribute                       | Factual Data                                      | Impact on Grower  |
|---------------------------------|---|---|
| Emitter Flow Path Cross Section | UniRam has 23.5% more cross-sectional area        | UniRam offers more protection against clogging as larger particles can pass through   |
| Emitter Filtration Area         | UniRam has 833% more open slot area               | As water quality gets worse, UniRam continues to irrigate, whereas leading competitor will eventually clog                  |
| Turbulence                      | UniRam has 45% more turbulence inside the emitter | More turbulence reduces the risk of clogging. Particles are better kept in suspension in higher turbulence emitters.        |
| Flow Path Length                | UniRam has 17% shorter flow path                  | Longer Flow Path emitters have physically more places to clog. Longer emitters have less turbulence which leads to clogging |

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