

K-Line™ Mid Effluent For efficient effluent disposal

What You Need.

The process starts with a visit from your consultant to plan the K-Line™ effluent system. The consultant will examine the shape and size of your property, land disposal area, the quality and quantity of the effluent supply, effluent rotation and the soil types involved.

Your requirements together with hydraulic analysis, pressure requirements, pump sizes, power systems and budget, will determine the options. As K-Line™ Mid only distributes the liquid portion of the effluent and has 6.35mm nozzles, it is important to eliminate solids over 5mm. Solids can be removed by either a weeping wall (drying bed), multiple pond systems or solid separators.

The system typically consists of a pump, main line, sub main and K-Lines.

Assembly is so simple many people choose to install the sub main, feed and sprinkler lines themselves.

Happy Farmer!



Happy Cows!



K-Line Effluent



Cows Enter Shed



Dairy Shed



Stone Trap

or



Weeping Wall / Drying Bed



Solid Separators



Pump System



Storage Pond

Layout of the system

The shift pattern is quite different compared to a K-Line™ irrigation system. With an irrigation system it is important to shift the system when it is running. This is not practical when the system is filled with effluent. The K-Line™ Mid lines are therefore shifted when they are not running. The K-Line™ Mid lines themselves are generally made with 40mm or 45mm K-Pipe™ and have the same fittings at each end, so the lines can be connected to the submain at either end of the line. The K-Lines need to be pulled directly from one end to the other. Because the lines are short and only a few pods this process is very easy. The process works for paddocks of all shapes and sizes.

The simple process is as follows:

Go to the submain (valve) end of the sprinkler line (1) (point (A) in Figure 3). Uncouple the line (1) from the submain, then connect the tow rope onto the K-Line™ then tow towards point (B). The K-Line™ will end up in position (D). Unhook, install a plug end then re-couple the K-Line back at the submain. Repeat this shifting process for line (2) uncouple at point (A) then tow the line toward point (B), Install the plug then re-couple at point (A).

When the field has been irrigated completely (point (C), disconnect the sprinkler line from the feed line, tow the sprinkler line into a new paddock and you're ready to start the disposal rotation again.

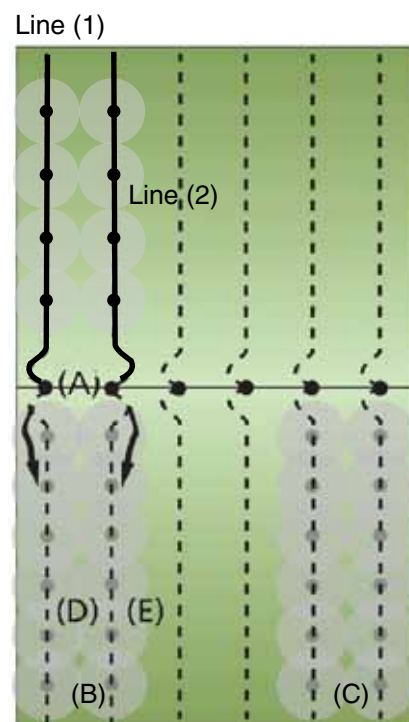


Figure 3. Shifting rotation within a typical paddock (8 pods at 25 metre spacings) Line 1 moves to D Line 2 moves to E

Best management practice

To apply a consent application of 15mm depth, run the system for 3-4 hours. It is recommended that the effluent disposal area should be 8ha/100cows as best management practice.

Selection Criteria for your K-Line™ Mid System

Selection of a suitable K-Line™ pod and a successful installation is very much dependent on the degree of separation of the solids from the liquids. For the K-Line™ Mid Effluent pod the nozzle selection is 6.35mm therefore the separation of the solids would need to be better than 5mm. The minimum requirement for successful use would be a two pond system. If your effluent system has better separation than this then of course this product will be most suitable also.



	Requirements		Benefits		
	Minimum Filtration	Palatability	Distribution	Application Rate	Nutrient Management
K-Line™ Std Naan 5022 430 x 230mm The K-Line™ standard has a Naan 5022 sprinkler with a 4mm nozzle and therefore requires the best liquid quality.		Optimum	Optimum	Optimum	Optimum
K-Line™ Mid Senninger 5023 560 x 290mm The K-Line™ mid has a senninger 5023 sprinkler and a nozzle up to 6.35mm, therefore it can handle a slightly less liquid quality.		Optimum	Optimum	Optimum	Excellent
K-Line™ Max⁷⁰ Senninger 7025 860 x 590mm The K-Line™ Max ⁷⁰ has a senninger 7025 sprinkler and a nozzle up to 9.53mm. It can therefore it can handle a lower liquid quality.		Medium	Excellent	Optimum	Good
K-Line™ Max⁸⁰ Senninger 8025 860 x 590mm The K-Line™ Max ⁸⁰ has a senninger 8025 sprinkler and a nozzle up to 15.88mm. It can therefore it can handle the lowest liquid quality.		Satisfactory	Excellent	Optimum	Okay



K-Line™ Mid Effluent



Whether you are storing, transporting or distributing water or wastewater RX Plastics has the solution for you, with manufacturing facilities New Zealand wide and selections of strong supporting brands RX Plastics can assist whatever your requirements.

We've got what you need

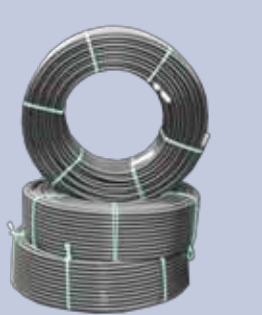
RX Plastics has a wide range of products to support your water and wastewater distribution.



Tanks
RX has tanks from 135 litres - 33,000 litres. Whatever your requirements, RX has it .



Farm Troughs
RX has troughs from 12 litres - 1,200 litres to suit your animals water requirements.



Polyethylene Pipe (Polypipe) and PVC Pipe
RX has a range from 15mm - 450mm to suit many tanks. Pipe is rated 5bar (72 psi) - 25bar (375psi).

What is K-Line™?

- K-Line™ is a flexible hose line sprinkler system originally designed for irrigation. However, the low application rate makes the K-Line™ system well suited to effluent distribution. At the heart of the system is a series of tough plastic pods protecting a sprinkler, firmly attached to special K-Line™ low density polyethylene pipe
- K-Line™ provides an excellent method of liquid disposal options from the many and varied sources
- K-Line™ systems are all designed to operate at low pressure
- K-Line™ provide a number of product choices which gives you maximum flexibility in a customised effluent disposal system for your farm
- K-Line™ will suit any paddock shape, size or terrain
- K-Line™ is easily moved by any quad-bike or farm vehicle
- K-Line™ is a low application rate system

Farmer Benefits

- Low capital cost
- Ease of installation use and shifting
- Tailor application to staff availability
- Low application rate to remove the risk of ponding and run-off, allowing better filtering by the soil of bacteria resulting in better compliance to regional council requirements
- Better retention of nutrients lowers fertiliser requirements
- Control of application with automated timers
- During busy times (e.g. calving) effluent irrigation can be avoided
- Best possible use of the nutrients in farm diary effluent

Production Benefits

- Farmers say that K-Line™ provides them with greater pasture growth rates
- K-Line™ provides a more uniform application compared to travelling irrigators
- More palatable pasture compared with effluent applied by a travelling irrigator
- Trials show the losses of phosphorus and bacteria to drainage water are only 5-7% of the losses of a travelling irrigator when soil is near field capacity
- It also shows nitrogen levels in the drainage are minimised to almost nil (figure 1)

Drainage from a 'Mole and Tile' drained paddock after effluent application

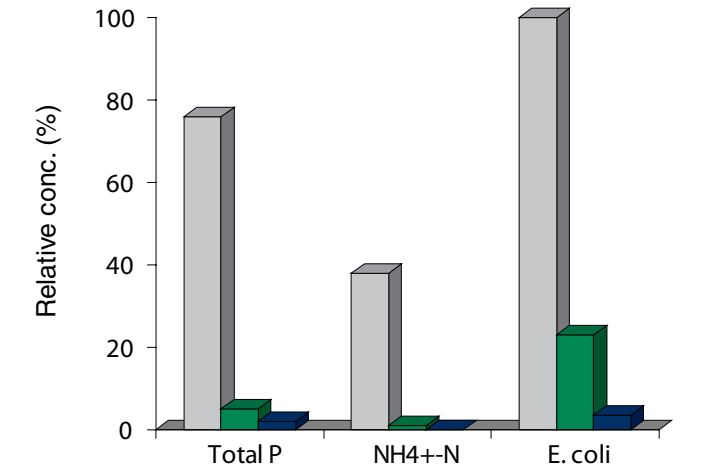


Figure 1.
 Legend:
 - Rotating twin gun (grey)
 - K-Line™ (green)
 - K-Line™, intermittent pumping (blue)



Why use K-Line™ Mid Effluent?

- Low rate of application
- No leaching or run-off
- No ponding
- Cost effective
- Easily shifted
- Low maintenance
- Meets all regional council requirements
- Virtually no contamination of pasture

Senninger 5023 Sprinkler

- The Senninger 5023 ¾" full-circle sprinklers distribute effluent over a 25m diameter
- Senninger 5023 sprinklers can achieve application rates down to as low as 2mm per hour. This reduces the risk of ponding and run-off and other forms of preferential flow. The soil has time to filter nutrients and bacteria
- Outlasts and costs less than brass or aluminium sprinklers
- Built for strength and durability using high-impact engineering-grade thermoplastics and top quality stainless steel components
- Pressure range between 1.5 bar and 3 bar
- Standard lower bearing pipe thread: ¾" male thread
- 27° angle for maximum distance of throw
- Single nozzle design minimizes clogging

Sprinkler Operation

- Senninger 5023 sprinklers have a range of nozzles down to 5.16mm in size that are suitable for effluent. However the recommendation is to use the 6.35 nozzle
- The figure to the right shows the flow rate and diameter of throw of the recommended black K-Line™ Std sprinkler nozzles and also the next two smaller nozzles
- Complete flow rates: 1.4 - 3.5 m³/hr

K-Line™ Mid Effluent components

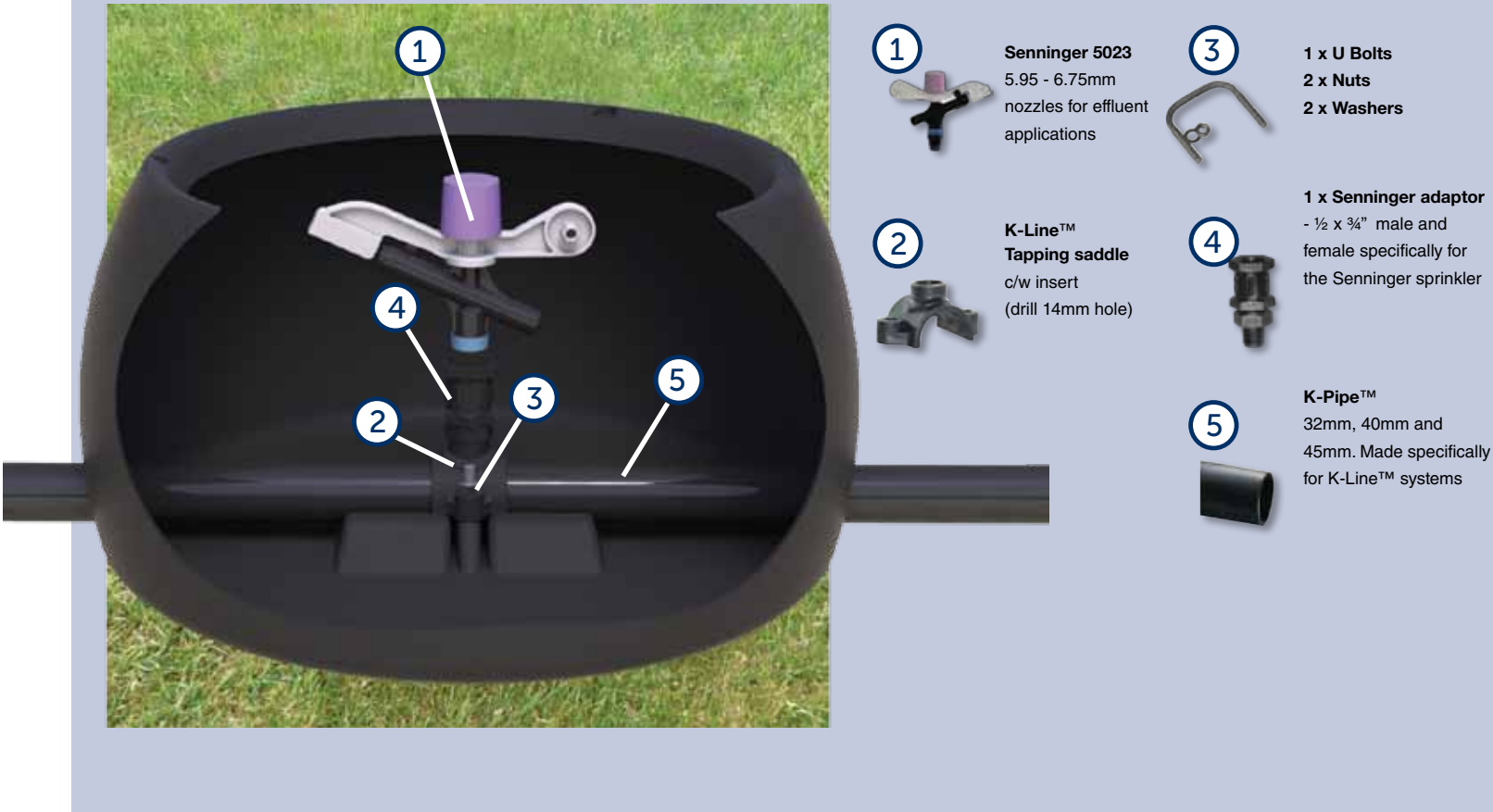


Figure 2. Pressure and flows of the Senninger 5023

Pressure (bar)	2.0	2.5	3.0
#15 Nozzle (5.95mm)			
(m³/hr)	1.9	2.1	2.3
Diameter (metres)	24.6	27.0	29.0
#16 Nozzle (6.35mm)			
(m³/hr)	2.1	2.4	2.6
Diameter (metres)	25.0	27.0	30.0
#17 Nozzle (6.75mm)			
(m³/hr)	2.4	2.7	2.9
Diameter (metres)	25.0	28.0	30.0

System components

- The K-Line™ Mid pod comes complete with the sprinkler, riser assembly and saddle to connect your K-Pipe™ to the pod
- K-Line™ provides a complete series of K-Pipe™ solutions
- To ease shifting K-Line™ also provides end tow units

Spacing and Pipe System

- Special 32, 40, 45mm K-Pipe™ is available to complete your new K-Line™ Mid effluent pods. The K-Pipe™ is simply threaded through the K-Line™ pod then with a 14mm drill and 13mm socket you are able to assemble your system. The special K-Pipe™ is designed to be flexible but highly resilient to the shifting process