

NETAFIM USA

FOR BENEFICIAL REUSE & DISPERSAL OF WASTEWATER

WASTEWATER PRODUCTS

 **NETAFIM™**

OVERVIEW

We face a global challenge to responsibly use and protect our finite supply of fresh water, yet all too often we overlook ways to guard and extend this precious resource.

Of all fresh water, $\frac{2}{3}$ is tied up in ice caps and $\frac{1}{3}$ is groundwater. Surface water only accounts for 0.025%. Of that, 20% is in the Great Lakes and 20% is in Lake Baikal in southern Siberia. That means much of the water we use has been recycled from some prior use. For example, a city treating wastewater through its municipal sewage treatment plant collects wastewater through a network of pipes, treats and disinfects it to near potable levels and then discharges it into lakes, rivers, streams and oceans where much of tomorrow's water is drawn. Today the new goal is to take that same treated water and return it through separate piping networks to homes and businesses where it can be used in outdoor applications that do not require pure drinking water such as irrigation. By doing so we reduce the strain on our potable water by using clean, but not potable water, for uses where pure drinking water is not needed.

In areas where municipal treatment is not available, "onsite systems" are used. These systems support approximately 25% of all the homes in North America today, (about 50% of all suburban homes in the U.S.) they process about 3½ billion gallons of wastewater per day, and their numbers are on the rise as communities grapple with the infrastructure strain that new housing and commercial development puts on existing municipal treatment systems. Most commonly known as "septic tank" systems, these units provide basic treatment to the waste stream and deliver the effluent to a drainfield.

These basic systems are not very sophisticated and are prone to failure rates as high as 25% as reported by the USEPA. They have been notorious for causing pollution of lakes, rivers and streams, not to mention surfacing issues that can occur in the drainfield. As they fail, many regulatory agencies are requiring that more effective treatment systems be installed in their place.

In order to meet the increasing need for clean water, and the world population outstripping nature's ability to deliver it, we must seek out and implement smart practices that provide sustainable solutions.





NETAFIM BIOLINE® DRIPPERLINE

The good news is that today more sophisticated advanced treatment units are available and do a far better job of treating the waste stream. Along with them, products like Netafim Bioline® further support the treatment process by precisely delivering the effluent into the soil.

Soil is one of nature's most sophisticated purification tools. Whether clay, loam or sand, soil is an extremely effective treatment tool. When we deliver just the right amount of wastewater to it, at just the right time, the soil effectively provides additional and critical treatment before it reaches surface water or groundwater supplies. The key to success is delivering just the right amount of wastewater at just the right time to just the right spot. This is where other techniques fail and Netafim Bioline® succeeds.

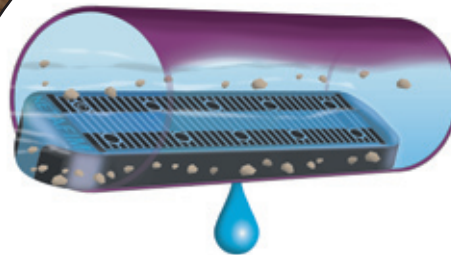
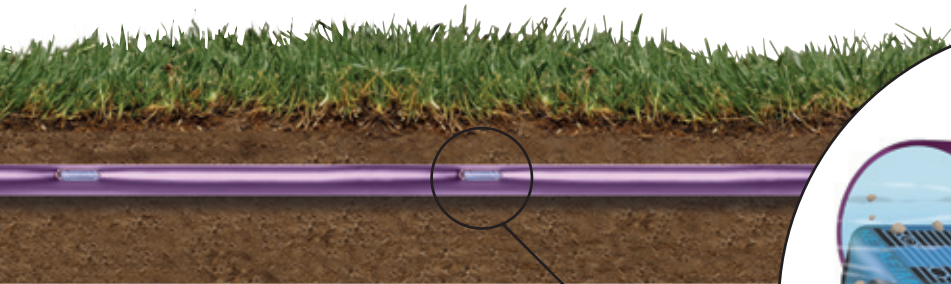
While most people are aware of septic tanks and how they operate, most do not consider what happens to the wastewater once it has passed through the tank.

Septic tanks are nothing more than large chambers that allow wastewater to settle and separate. When the resulting liquid portion, or "effluent" leaves the tank, it moves to a drainfield. The field was typically built by digging out the soil and replacing it with stone and perforated pipe, or chambers of PVC pipe with holes under the chambers. These technologies are becoming less popular today because they do not provide the precision needed to properly disperse the wastewater into the soil. Instead, they simply dispose of it, and often in an unbalanced way.

On the other hand, Netafim Bioline® dripperline delivers the effluent into the soil with great precision, ensuring that the effluent does not flood an area or become exposed to people or animals. By distributing the effluent into the 'biologically active soil horizon', we not only allow the soil to break down the effluent, we also allow plants, trees, bushes and grass to use it, along with its nitrogen and phosphorus content – two of the three ingredients in fertilizer. This ecologically sound process helps protect against the contamination of lakes, rivers, streams and drinking water sources, it prevents objectionable odors, and it provides an important benefit – the "wastewater" is no longer "wastewater". It is reusable, renewable and beneficial water that becomes a supplement to or replacement for an irrigation system. What does not get used by the plants is effectively treated by the soil so that when it does reach groundwater or other bodies of water, you can be assured that it will not cause harm to our ecosystem.

HOW NETAFIM BIOLINE DRIPPERLINE WORKS

DISPERSAL AND TREATMENT VS. DISPOSAL



Emitter is welded to the inside of the purple dripperline. Wastewater is discharged through the pressure compensating emitters ensuring an even, slow distribution of effluent into the soil.

Bioline® dripperline is comprised of highly sophisticated emitters mounted inside flexible polyethylene tubing. Each emitter delivers a slow, precise amount of wastewater into the soil. Thanks to the "pressure compensation" feature built into each Bioline® emitter, the delivery of effluent is very well-balanced in the area, regardless of the length of dripperline or the property's topography.

The result? Instead of disposing of the wastewater, and the associated issues of surfacing and pollution of nearby bodies of water, the wastewater is dispersed evenly into the soil, providing not only important additional treatment but providing for beneficial reuse of the nutrient-rich water by the landscape.

DESIGN AND INSTALLATION ARE EASY

The system designer and installer match the right Bioline® to the individual design, thus creating and maintaining the perfect environment for further treatment and beneficial reuse of the effluent.

Netafim Bioline® is used with confidence in virtually any soil, topography or climate; because the area does not need to be dug up during installation with heavy equipment, landscape disruption is minimized.

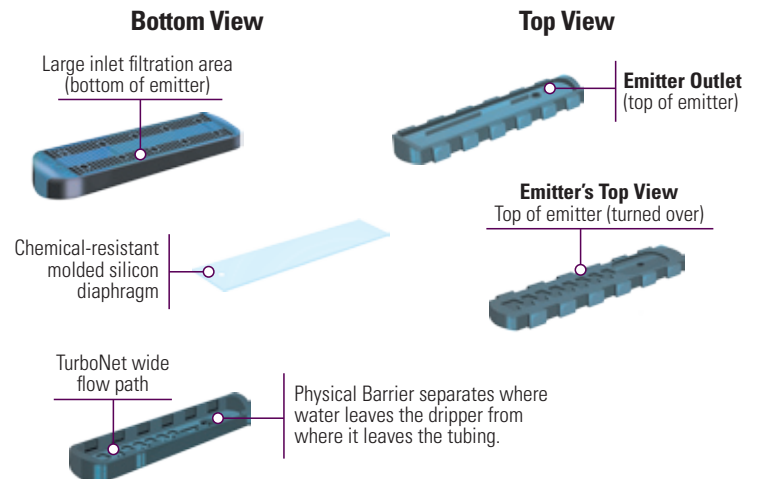




NETAFIM BIOLINE® ADVANTAGES:

- Allows for development and building in locations previously unsuitable
- Ideal for difficult site conditions such as clay, shallow soils, steep slopes, or high water tables
- Ideal for small lots
- Ideal for sites near bodies of water and other environmentally-challenging areas
- Can be an important part of any 'green' construction project
- Provides the best technology available for recycling water, allowing the landscape to use available nutrients such as nitrogen and phosphorus potentially reducing the dependence on fertilization
- Eliminates the risks associated with disposal methods such as gravel drainfields
- Requires a minimum of soil depth below the dripperline
- Achieves a balanced water distribution by applying the effluent to the soil's biologically active zone
- Scheduled dose and rest cycles throughout the day take full advantage of the treatment capability of the soil - cleaner water ultimately enters our waterways and groundwater supplies
- Minimum landscape disruption during installation
- Pressure compensating, continuous self-flushing emitters ensure a precise, slow distribution of wastewater into the soil and provide for long system life

EXPLODED VIEW OF BIOLINE EMITTER



Bioline® dripperline emitters are pressure compensating - delivering the water uniformly into the soil for further treatment or for reuse by the landscape. These unique emitters allow the tubing to be installed on flat topography or steep slopes.

Bioline emitters are protected against microbial slime. Each emitter is impregnated with an antimicrobial agent to resist biological build-up.

Netafim emitters are continuously self-cleaning during operation, not just at the beginning and end of a cycle. The result is dependable, clog-free operation, year after year.

TYPICAL SUBSURFACE WASTEWATER SYSTEM LAYOUT

A wastewater drip dispersal network distributes effluent directly into the soil through a network of dripperlines installed below the ground's surface. The system typically consists of a wastewater treatment system, pump tank, filter, drip tubing and controls.

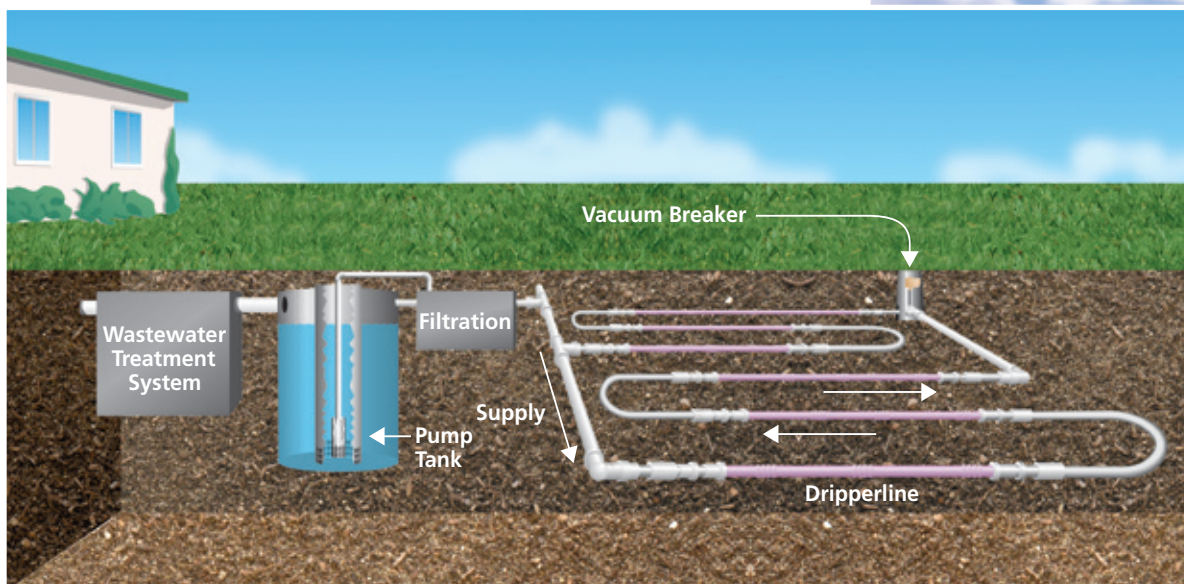
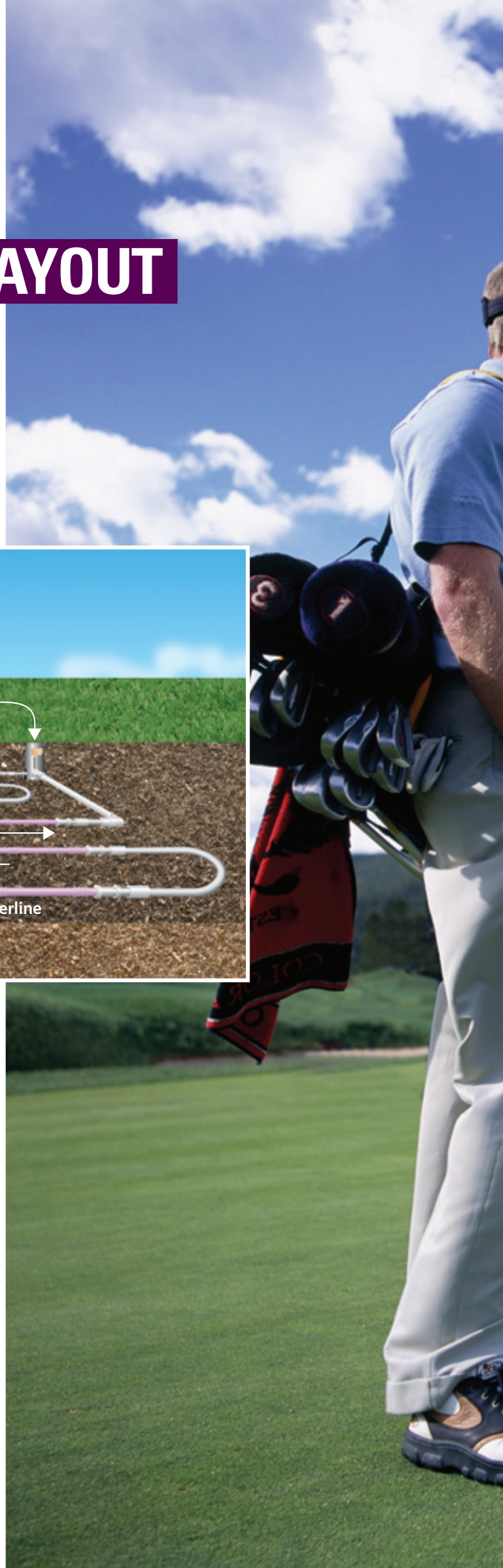


Illustration courtesy of Texas Cooperative Extension

The type of wastewater treatment process is generally determined by someone familiar with the best solution for the conditions. Although Netafim recommends secondary treatment levels, Bioline® is often suitable for use with residential strength septic tank effluent.

- Effluent leaving the treatment tank is stored in a pump tank until being dosed into the drip field.
- The pump delivers the water from the pump tank through the filtering device to the drip field for dispersal.





FREQUENTLY ASKED QUESTIONS ABOUT DRIP DISPERSAL

WHAT ABOUT INSTALLATION?

Installation is easy and does not disrupt the natural or modified landscape of the property. Vibratory or static plows or small trenchers typically install Bioline® 6" - 12" below the surface, eliminating the need for deep trenches and heavy equipment. Installation is just as easy on slopes and in irregularly shaped or segmented areas, taking full advantage of the available space. In short, none of the mess and disruption of other techniques requiring wide trenches.

CAN BIOLINE BE INSTALLED IN FREEZING CLIMATES?

YES. Many Bioline® systems are installed in the cold climates of North America. Since Bioline dripperline drains after each dosing cycle, there is little effluent left in the tubing after dosing. By following simple design and installation procedures, cold weather is not a problem.

WHAT ABOUT PLUGGING?

Bioline® emitters are designed with a unique continuous self-flushing mechanism that purges particles out of the emitter before they can cause a problem. In addition, each emitter is impregnated with a chemical that prevents the formation of microbial slime.

IS ROOT INTRUSION A PROBLEM?

NO! A physical barrier is built into each Bioline® emitter that helps prevent root intrusion. In addition, the frequent dosing cycles of a typical dispersal system create a saturated soil condition directly around the emitter outlet that makes the soil too wet to support roots. Lastly, Netafim offers Techfilter® for those who want even greater assurance of root protection. Techfilter® uses a renewable root growth preventer to deliver minute amounts of trifluralin into the soil immediately adjacent to the dripper. The chemical stops roots from entering into an area where it is present.

Netafim guarantees Bioline® against clogging from root intrusion for a period of ten full years, without the addition of other chemicals. When used in conjunction with Techfilter®, and when the prescribed Techfilter maintenance procedures are followed, Netafim offers a limited lifetime warranty against root intrusion for Bioline.

HOW CAN I LEARN MORE ABOUT NETAFIM WASTEWATER DIVISION PRODUCTS?

Visit us on the web at www.netafimusa.com. Learn more about our extensive line of products for wastewater and feel free to download or order any of our literature. In addition, design information and even a design calculator are available.

NETAFIM, THE PIONEER OF DRIP IRRIGATION

Drip irrigation was originally developed by Netafim for agricultural applications in the 1960's as a way to improve the delivery of water to plants, especially in areas where water is scarce. Today Netafim is the world leader in drip and drip applications. Our drippers, dripperlines, filters, valves, meters, air vents and other products have become the industry standard around the world.

Netafim USA's Wastewater Division offers the industry's most comprehensive resources for drip dispersal including Bioline® dripperline, filters, valves, water meters, air vents and fittings. Our products provide flexibility in design to deliver cost effective wastewater dispersal from the simplest residential system to the most complex commercial or institutional system.



NETAFIM USA
5470 E. HOME AVE.
FRESNO, CA 93727
CS 888 638 2346
F 800 695 4753

www.netafimusa.com

W071 5/09