



## Onsite Wastewater Treatment Systems

# Septic Tank Additives Fact Sheet

EPA Publication 830-F-24-003 (Updated 2024)

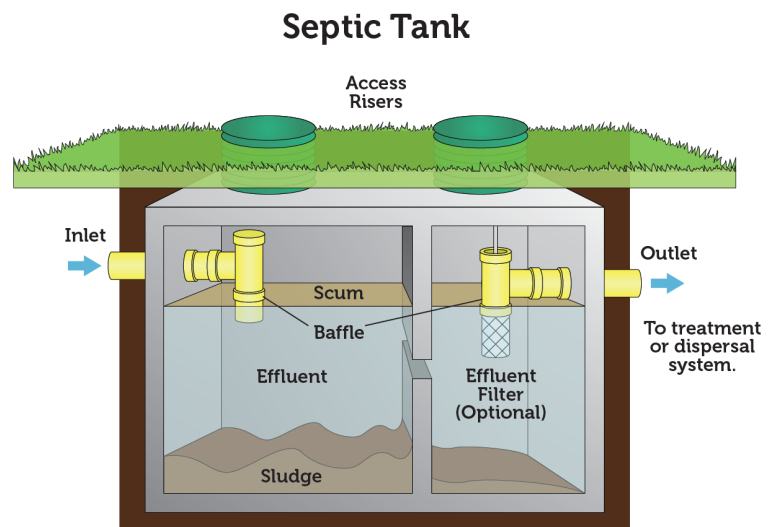
## Overview

Onsite wastewater treatment systems (commonly referred to as septic systems) treat human and domestic waste before returning the water to the environment. Septic tank additives containing bacteria or chemicals are commonly marketed to improve system performance. However, use of these additives is not recommended for domestic wastewater treatment because there is already a significant presence of bacteria, enzymes, yeasts, fungi, and other microorganisms in onsite wastewater treatment systems (U.S. EPA, 2002). Additive products can be ineffective or even harm system operation and the environment. Any operational issues should be assessed by a septic system professional or local regulator.

## Potential Issues Associated with Septic Tank Additives

The U.S. Environmental Protection Agency does not recommend the use of septic system additives containing bacteria or chemicals for the following reasons:

- **Potentially harmful impacts.** Some of these products may interfere with the breakdown of waste, contribute to system clogging, and contaminate groundwater and receiving waters (Pradhan et al., 2011; Lee & Coyne, 2012).
- **Unnecessary for operation.** Homeowners can save money by avoiding products that are marketed to improve system performance. Onsite wastewater treatment systems already contain the bacteria, enzymes, yeasts, fungi, and microorganisms needed to function properly (Harwood, 2006).
- **Limited research.** Consumer goods sold as septic system cleaners, decomposers, deodorizers, organic digesters, or enhancers may have only limited third-party research demonstrating manufacturer claims (Pradhan et al., 2011).
- **Local limitations.** Many individual states and localities have information on the proper operation of septic systems, including lists of approved additives per their rules and/or regulations. Check with your local and/or state department of health or department of environmental protection for additional information on allowable septic system additives in your area.

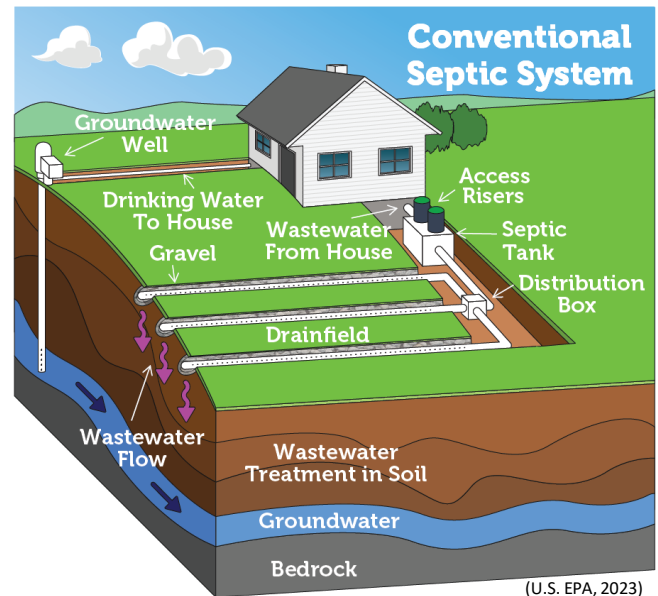


Please note: The number of compartments in a septic tank vary by state and region.  
(U.S. EPA, 2023)

# Basics of Septic System Performance

A septic system consisting of a septic tank and drainfield is the most typical onsite wastewater treatment system in the United States (Yates, 2011). Septic systems are designed to perform several important functions, including:

- **Removing oils, grease, and solids.** The septic tank is designed to allow solids to sink to the bottom of the tank and allow floatable materials, such as oils and grease, to rise to the surface (U.S. EPA, 2002).
- **Storing settleable and floatable material.** Tanks are sized according to wastewater flow amounts. Over time, sludge and scum accumulate naturally in the tank (U.S. EPA, 2002).
- **Digesting/decomposing organic matter.** Septic tanks provide an environment with little oxygen to help bacteria reduce organic molecules to compounds and gases, including hydrogen sulfide and methane (U.S. EPA, 2002).
- **Removing remaining compounds.** Drainfields filter and break down remaining compounds in wastewater, such as nutrients, harmful bacteria, viruses, and some chemicals. The water is treated as it moves through the soil before returning to the groundwater (Lee & Coyne, 2012).



Please note: Septic systems vary. Diagram is not to scale.

## Tips for Homeowners on Maintaining a Septic System

**HOW.** Septic systems can be maintained through the following actions:

- Use water in your home efficiently.
- Properly dispose of waste in the trash instead of down the drains.
- Have the septic system inspected and the tank pumped regularly.
- Keep the drainfield free of trees or heavy objects such as vehicles. Do not drain gutters or sump pumps nearby.
- Always follow the manufacturer's guidelines.

\* Maintenance guides can be found on the EPA's website, <https://www.epa.gov/septic/septic-smart-education-materials>.



**WHEN.** The time between pumping and inspections is typically three to five years, depending on household size and sludge and scum accumulation (Harwood, 2006).



Some advanced systems with electrical float switches, pumps, or other mechanical parts may require more frequent inspections. Contact your local permitting authority to find your inspection requirements.

Contact your local septic system professional to determine if your system needs to be serviced.

## References

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# Common Types of Additives

The following table provides an overview of common septic system additives and challenges associated with each.

Additive Description	Associated Challenges
<p><b>Septic System Line/Drainfield Cleaners</b>            These products usually contain strong acids or alkalis and are promoted for their ability to open clogged drains. Product ingredients (e.g., sulfuric acid, lye) are similar to those used in popular commercial drain cleaners.</p>	<p>These products can negatively affect how bacteria break down waste and damage pipes, septic tanks, and other system components (U.S. EPA, 2002). Hydrogen peroxide was once promoted as a drainfield reconditioner, but it was found to break down soil structure and compromise the life of the septic system (Harwood, 2006).</p>
<p><b>Degreasers</b>            These products often contain ingredients such as chlorinated hydrocarbons (e.g., methylene chloride, trichloroethylene), which are commonly used as degreasers. They are marketed for their ability to break down oils and grease.</p>	<p>Organic solvents represent significant risks to groundwater and onsite wastewater treatment. These products can destroy decomposers and other helpful microorganisms in the treatment system. Use of products containing organic solvents in onsite wastewater treatment systems is banned in many states (U.S. EPA, 2002).</p>
<p><b>Biological Additives</b>            Many biological additives contain bacteria and enzymes mixed with other chemicals or nutrient solutions, and are often identified as biobased, bioactive, or 100% natural. These products may contain live or active cultures of billions of colony-forming units of bacteria, but the specific bacteria strains included in the product are often not identified on the label. Enzymes are non-living proteins such as cellulase and protease that are marketed for their ability to break down organic matter.</p>	<p>Some biological additives can reduce septic tank scum and sludge. However, the impact of long-term use of these products on the ability of soils to treat wastewater is unknown. Some studies suggest that material degraded by additives may cause changes in treated wastewater effluent quality (Pradhan et al., 2011).</p>
<p><b>Odor Control Products</b>            This category of additives is advertised to control septic odors by killing bacteria, which are important to wastewater treatment. They often contain formaldehyde, paraformaldehyde, quaternary ammonia, or zinc sulfate.</p>	<p>Bacteria and other microorganisms are necessary for onsite wastewater systems to function properly (U.S. EPA, 2002). If odor is a problem, the source should be investigated by a septic professional.</p>
<p><b>Phosphorus Removal Products</b>            Phosphorus occurs naturally in wastewater; it is also an essential nutrient for aquatic plant growth. Phosphorus removal products are targeted at septic system owners experiencing nuisance algae blooms in nearby lakes and streams because reducing phosphorus in freshwater environments can help reduce algae growth. Chemicals commonly found in these products include aluminum, ferric iron, ferrous iron, and calcium.</p>	<p>Ingredients such as aluminum (as alum, sodium aluminate, aluminum chloride, and activated alumina), ferric iron (as ferric chloride and ferric sulfate), ferrous iron (as ferrous sulfate and ferrous chloride), and calcium (as lime) have proven to be effective in stripping phosphorus from effluent and settling it to the bottom of the tank. A side effect of this form of treatment can be the unintended removal of beneficial bacteria in the septic tank (Bulson et al., 1984). Because of the potential for sludge buildup, a septic professional should be consulted before using these products.</p>
<p><b>Flocculants</b>            Flocculants, such as baking soda, are products that cause particles to stick together. These additives are marketed to lower the concentration of suspended solids in septic tank effluent, producing clearer and cleaner wastewater.</p>	<p>Research has not demonstrated successful performance of this class of additives. A properly designed and constructed onsite wastewater system allows settling to naturally occur in the septic tank (Lee &amp; Coyne, 2012).</p>