High Performance Tanks Yield More Efficient Delivery and Installation

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Introduction

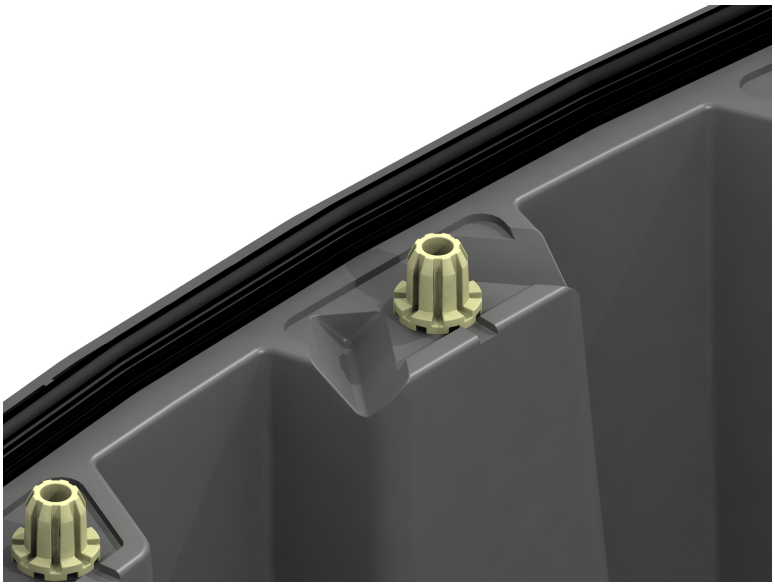
Environmental challenges, market conditions, and regulations all play a role in the evolution of tank design. While the basic function of a septic tank as a storage vessel has not changed, much surrounding the topic has, including usage, production materials, and rules and regulations surrounding tank applications.

Installers face site and regulatory challenges that dictate tank selection including the need to design compact systems for small lots or systems in environmentally sensitive areas. Advanced wastewater treatment for limited or sensitive sites and rainwater harvesting for potable and non-potable water are two major areas demanding a new approach to tank construction and use. The need for large tanks that can be easily transported to often remote sites is another catalyst spurring the move to lightweight and durable plastic tanks.

Tank Materials

Tank materials are essential to the function and usage/purpose of the tank with watertightness being a top priority. While concrete is still the most common material for wastewater tanks, recently plastic and fiberglass tanks have become more common in the marketplace and are preferred for rainwater capture and potable water systems. Plastics and fiberglass are inert to wastewater constituents, a benefit for product longevity, and they are notably lighter making them easier to handle on a jobsite.

Due to new manufacturing technology, plastic tanks now offer not only increased strength, they are also lightweight and easy to transport and install. Plastic tanks that are manufactured by the rotational molding process are typically a one-piece tank and thus minimize leak potential.



Infiltrator IM-Series Tanks are manufactured with continuous gaskets

Additionally, plastic tank designs have been introduced with a new technology of continuous gaskets and the inclusion of a fixed, permanent connector system to lock the seam in place. For these reasons, the evolved plastic tank is quickly becoming accepted by contractors, designers, and homeowners because of the durable design and increased shipping efficiency.

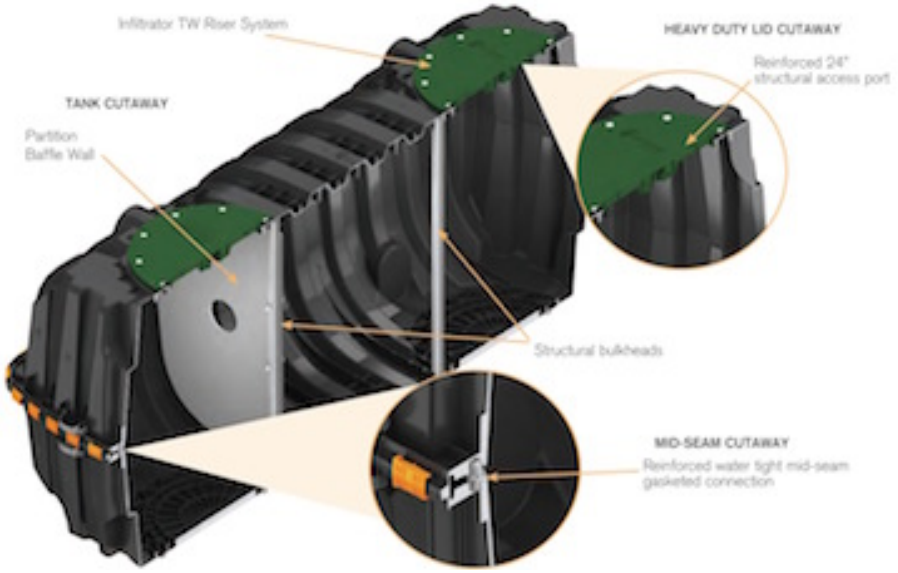
Manufacturing Process Advancements

In most areas of the United States and Canada, codes still state that only a watertight tank shall be provided without verification. This is beginning to change, as some recent code alterations require testing to ensure tank watertightness.

This is where manufacturing processes and technological developments have been designed to meet the new requirements such as The National Precast Concrete Organization of the Septic Tank Manufacturing Best Practices Manual, which explains, "with the increasing regulatory demands for structurally sound and watertight tanks, it is critical for precast concrete manufacturers to continually raise the bar on quality. And, that proper installation of the tank is absolutely critical for maintaining structural integrity and watertightness."

The Top Three Reasons for Watertight Tanks

- Leaking-in: Water (outside from surface or ground water) entering the tank will cause hydraulic overload of the drainfield system and/or may flush solids out causing the drainfield to become plugged
- Leaking-out: Untreated water can pose a health threat to surface or groundwater
- Cracks or open seams allow for roots to penetrate and expand openings



Breakthroughs in injection molding allow construction of larger plastic tanks

Additional advances in the manufacturing process related to plastic tanks have resulted in increased strength and durability over the tanks of the past. The manufacturing process allows the inclusion of corrugations and ribbing to strengthen the tank. Interior structural bulkheads can be included to increase the strength of the tank. Recent, significant, breakthroughs in injection molding have allowed larger tanks (>1500 gallons) to be manufactured and offer many benefits. The tank has a consistent wall thickness and the process allows for a much higher strength plastic material. This yields a high strength yet lightweight tank conveniently manufactured in “halves” allowing them to nest for increased shipping efficiency.

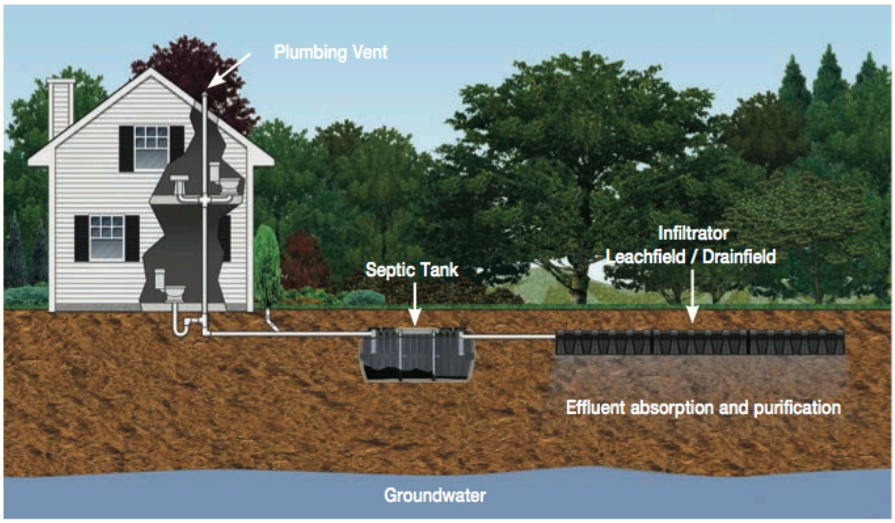
The Green Effect

Improvements in recycling technology and the evolution of manufacturing processes result in the production of a consistently high-quality product. Recycled material streams are put through rigorous testing at varying points in the material processing procedure to ensure that consistent product specifications are obtained.

Evolving Tank Applications

The need for compact septic systems for small lots and for systems in environmentally sensitive areas is serving as a catalyst for tank innovation including increased safeguards to ensure watertightness. On difficult sites, the ability to install a tank in a shallow, low profile configuration to leverage the available space while avoiding rock or problematic soil conditions push designers to be creative and evaluate the use of new technologies.

More stringent regulations in environmentally sensitive areas require single-family residential wastewater treatment systems in ecological hotspots across the country. The vessel that houses the treatment system is the tank. This key component must allow for design flexibility, ease of component installation, and provisions for maintenance. Tank manufacturers are incorporating these design features to address the regulations and provide solutions.



The tank is a key component in residential wastewater treatment systems

Tanks for onsite wastewater treatment are just part of the story. Pump tanks, rainwater harvesting tanks for non-potable and potable use, stormwater runoff storage tanks, and agricultural and chemical storage tanks are also evolving to accommodate new regulations and applications.

Applications such as rainwater harvesting for non-potable and potable use are coming to the forefront of the tank design arena. Economics and increased costs of a depleted resource like water help to increase the popularity of diverse tank designs and related applications. The desirability of whole house potable water systems that collects rainwater from the roof and treats it to potable drinking standards is an area where plastic tanks excel and one growing rapidly in demand in areas where water is scarce.

Infiltrator IM-Series Potable Water Tanks in a rainwater capture and reuse system

With rainwater harvesting homeowners now have options other than using treated potable water for their non-potable uses such as irrigation. During the summer months irrigation demands can be the greatest percentage of water use for a homeowner. Installing a rainwater harvesting system can relieve potable demand stress from a utility district well. During periods of water scarcity many utilities limit lawn watering, car washing, and other water-intensive uses. A rainwater harvesting system offers homeowners alternatives and freedom.

Septic Tank Installation Best Practices Also Evolve

Proper excavation and bedding procedures are essential for a quality tank installation. Regardless of the tank material (concrete, plastic, or fiberglass), appropriate measure should be taken to ensure the excavation is properly prepared and leveled, as shown in image below, prior to the tank being set, and suitable backfill available per the specification outlined in the tank manufacturer's installation instructions.

Preparing the ground for a tank installation

Excavations should be performed in such a manner that over digging is avoided reducing the chance of uneven settling or the need for excessive bedding material. The length and width of the excavation should provide adequate space to allow for proper compaction of the suitable backfill and a safe working environment for the installation crew. Furthermore, inlet, outlet, and delivery lines need to be properly bedded to minimize settling.

Once the tanks are properly backfilled and compacted in lifts with suitable soil per manufacturers installation instructions, topsoil should be placed up to the final grade and sloped to provide positive drainage away from the risers and lids. The site should always be planted with vegetation immediately to minimize erosion and divert surface water.

Backfilling the tanks

Conclusion

While the tanks function of being a storage vessel has not changed, much surrounding the topic of tanks has including usage, production materials, and the rules and regulations surrounding tank applications.

Advances in tank manufacturing have increased the opportunity for larger capacity tank systems for specialized uses such as treatment systems and potable water. These advances have provided tanks that can meet stringent watertight standards. Tanks have evolved to be higher quality, stronger, meet more stringent standards, and to be more versatile.