

It's Only Natural: The Evolution of Effluent Filters

Products must be developed and improved, too, to adapt to market conditions

I learned a lot from my late father, and one thing he taught me was to never start a conversation about religion or politics with someone you don't know very well. So I'm not here to weigh in about creationism, evolution of the human species or intelligent design. But like any other natural process, products and industries also evolve to meet the demands of the market. In the case of effluent filters in particular, the evolution has been concentrated over a relatively short time span.

It's only been 50 years ago that the original filter patent, for the Zabel A100 disc-dam filter invented by Bob Zabel, was issued. Zabel owned and operated a successful septic tank service business in Kentucky and southern Indiana in 1956, when he invented and applied for a patent for the A100, which finally issued in August 1959. Bob was a pumper, and he invented the disc-dam filter because he recognized a problem: by the time many customers called for his service, their drainfield had already been damaged by excessive solids leaving the septic tank. He realized that a product to filter solids would protect drainfields, the backbone of rural onsite systems. Zabel continued to operate his business for many more years, offering his filter product to homeowners and other installers as a means for protecting drainfields.

The increasing popularity of trade shows in the 1970's served to advance the onsite wastewater

industry, as companies had a new venue for showcasing their products and introducing new ones to the marketplace. The annual Environmental Expo, hosted by Cole Publishing in Nashville, quickly became one of the largest shows in the industry, and remains so even today. Bob began exhibiting at the show, introducing his filter to installers from across the country, which increased its use beyond Bob's service area in Kentucky and Indiana to regions across the country.

In the 1980's another company, Orenco Systems, Inc., located on the west coast, entered the onsite market. Harold Ball, Terry Bounds and the founders of Orenco Systems looked at the onsite market from an engineering perspective. They focused on clustering together several point sources of wastewater, bringing them to a common treatment area. These innovators developed systems that are now commonly referred to as decentralized treatment systems.

Clustering several point sources together usually necessitates the addition of pumps to move this wastewater, and to keep down costs, small diameter pressure sewers were utilized. In May of 1982, Harold Ball applied for a United States patent for the original filtered pump vault, which was eventually awarded in March 1984. This product was designed to keep solids larger than a nominal 1/8-inch from reaching high head effluent pumps. Filtered pump vaults continued to evolve through improvements, and in August of 1996, Orenco Systems' Eric Ball was awarded a United States patent for what is now known as the Bio-tube filter.

Once Harry Nurse took over the reins from Bob Zabel, product improvements for the original disc-dam filter were patented, and new products were introduced under the name of a new company, Zabel Environmental Technology. These two companies, Zabel Environmental Technology and Orenco Systems were in two geographically different regions, and their products were developed to meet the needs of two very different types of onsite systems. As the market continued to grow and evolve, however, both companies experienced a cross-over of product sales, and variations of these types of filters were introduced by other



The original Zabel A-100 disc-dam filter, designed by Bob Zabel

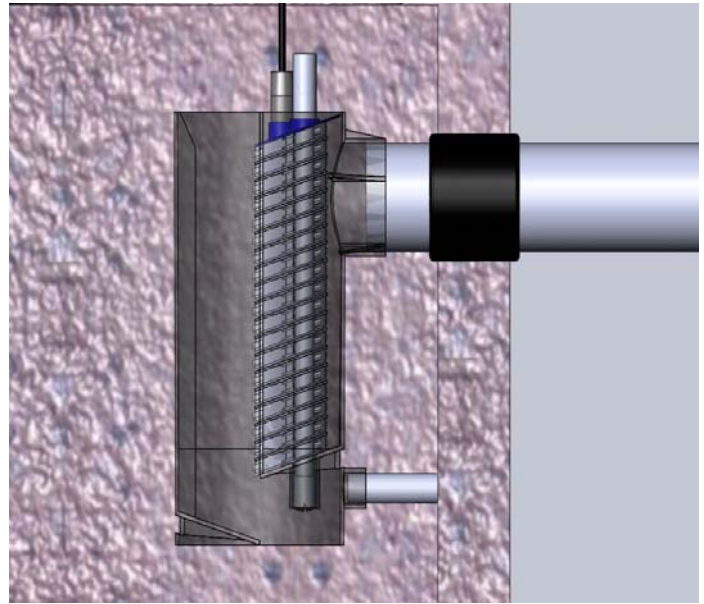
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companies, and the market became more national instead of simply regional in scope.

The first state to require the use of effluent filters in every septic tank was Florida in 1997. Once the potential of this new market was realized, a bevy of other companies entered the marketplace with filter innovations--"new and improved" products to attract buyers. With more companies in the marketplace, there was inevitably more competition for sales and approvals. Cost of production became a strong design influence, which affected new products being brought to the marketplace, and prices for residential effluent filters continued to decline from the highs of the 1990's, when filters were first required in several key states' onsite systems.

In 2005, a new company, Best Technology, entered the marketplace with a competitively-priced filter targeting the commercial and high-performance residential market that had been the domain of the original A100 disc-dam filter for almost fifty years. The Best Technology GF-10 filter offered a conical filter plate promoted as being more self-cleaning than other filters on the market, therefore having an increased service interval. In this instance, a new company entered the filter marketplace with a totally new product, not at the lower-priced end of the spectrum, but with features designed to extend the product's service life, an advantage to homeowners. The GF-10 filter has made tremendous inroads into the market in Wisconsin, where commercial grade filters have been the norm for residential applications for years.

In 2009, another company, Bear Onsite, LLC, entered the market, building on the design of previous screens to incorporate true filtration on three levels in the ML3 filter. The ML3 is a new commercial/residential filter product line, and features a clarification zone at the back of the filter case, which acts to slow down the flow of effluent before it enters the filter cartridge itself, giving solids a chance to fall back into the pretreatment tank. A set of angled baffles at the bottom of the case acts not only as a gas baffle, but directs solids back out of the case to return to the tank for further treatment. Those solids that do find their way into the filter face not only a single screen, but a series of baffle walls sandwiched between inclined settling plates that have a weir both over and under the baffles to progressively remove smaller and smaller solids. The solids that are removed then have the opportunity to slide back down the inclined settling plates, back into the case and eventually back into the pretreatment tank. As was the case with Best Technology, this product was designed to not only better protect the drainfield, but with



The ML3 filter, introduced in 2009 by Bear Onsite, LLC, is totally unique in the market

an extended service life in mind.

As the filter market has grown over the past 50 years, it has been heavily influenced by related industries, such as the national housing market. The ups and downs of that industry, and the inevitable effects of the most recent recession, have resulted in buyouts, with some companies once active in the industry purchased by larger ones, and product lines consolidated among fewer and fewer companies. More recently, however, it appears there's a wrinkle on the evolutionary horizon: innovative smaller companies entering the marketplace, using industry experience and 21st century technology to compete aggressively with larger ones. By offering new inventions, designed to extend the life of the product, and providing additional benefits to the end-user, the homeowner, these smaller companies are poised to change the marketplace. Only time will tell which will become the norm in the effluent filter market: inexpensive, low-performance products, or ones which are high-end performance driven.



By Theo B. Terry, III, R.S.
Bear Onsite, LLC
www.bearonsite.com