



ENVIRONMENTAL PROFILE

AdvanTex[®]

Wastewater Treatment Systems

The Cedar Springs Apartments have LEED for Homes Platinum Certification. An AdvanTex[®] Treatment System handles greywater from sinks, showers, and laundry to meet 100% of non-potable demand for toilet flushing and landscape irrigation at this California development. AdvanTex systems are also designed to treat raw sewage for beneficial reuse.



Environmental Profile

AdvanTex® Wastewater Treatment Systems - Manufactured by Orenco Systems®, Inc.

Background

Many designers, builders, and homeowners want products for residential and commercial construction that reduce impacts on the environment. Wastewater treatment products are no exception. The need for environmentally sound wastewater treatment products is especially great on sensitive building sites, small or isolated sites, sites with high groundwater, and sites with inadequate access to infrastructure. Orenco's AdvanTex® Treatment Systems are an environmentally sustainable wastewater treatment technology for both residential and commercial applications.

Product

Orenco's AdvanTex Treatment Systems are compact, pre-packaged, and pre-engineered products for onsite and decentralized treatment of wastewater to reuse levels. They operate with minimal noise or odor.

Onsite Treatment & Reuse

Excellent treatment: AdvanTex Treatment Systems consistently achieve effluent quality equal to or better than that of municipal treatment plants. AdvanTex effluent averages 5 mg/L or less BOD₅ and TSS when loaded at the same hydraulic loading rate used during NSF Standard 40 testing.¹ The effluent is ideal for further treatment for nonpotable reuse applications, depending on local regulations. And by reusing the effluent, potable water is preserved for other uses.

Water conservation: Onsite treatment and dispersal allows for subsurface irrigation and reuse applications. It also recharges the local aquifer, replenishing water resources.

Energy Efficiency & Sustainability

Energy efficiency: Pumps that recirculate effluent to AdvanTex Residential Treatment Systems rarely exceed 1/2 hp (0.37 kW) and only run about 30 minutes per day. Pumps for AdvanTex Commercial Treatment Systems rarely exceed 1 1/2 hp (1.12 kW). Consequently, power usage for treatment is very low, especially compared with power usage for membrane bioreactors (MBRs) or blowers in suspended-growth treatment systems.²

Long pump life: The pumps used in AdvanTex Treatment Systems can last longer than 25 years,³ far longer than other pumps, especially grinder pumps.⁴ Orenco's pumps can be easily disassembled and have a repairable liquid end, making total pump replacement unnecessary in most cases.

Low power usage: AdvanTex Treatment Systems can reliably treat domestic-strength raw sewage to advanced standards using about 3.17 kWh of electricity per 1000 gallons (3.8 m³).⁵ Power usage is affected by waste strength and the level of disinfection required for a specific reuse application.

Health and Safety

Groundwater safety: AdvanTex Treatment System packages incorporate strong, durable, watertight equipment that prevents wastewater from leaking and surfacing, which can pollute groundwater. Also, AdvanTex systems typically don't require the use of chemicals and are especially safe for areas with high water tables.

Nitrogen reduction: Multiple tests have shown that AdvanTex wastewater treatment reduces nitrogen by 70-75% under real-world conditions with no additional equipment needed.⁶

Installation Impacts on the Environment

Minimal site impact: Smaller AdvanTex systems can be installed with a backhoe, eliminating the need for cranes or other heavy equipment that can disturb the building site.

Modular construction: For the commercial designer and builder, the modular design of larger AdvanTex systems allows additional treatment capacity to be added as needed while avoiding oversized, unneeded infrastructure. Orenco's pre-manufactured components reduce site impact while saving money for developers.



LEED Profile — AdvanTex® Wastewater Treatment Systems

Background

The Leadership in Energy and Environmental Design (LEED) Green Building Certification for new construction and major renovation is an important accreditation for today's environmentally aware engineers, designers, and builders. Orenco's AdvanTex Treatment Systems can help a project qualify for LEED points in several categories.

Sustainable Sites

Construction Activity Pollution Prevention: AdvanTex Treatment Systems are smaller than many wastewater filtration systems, so they don't require heavy-duty equipment to transport. And AdvanTex installation requires minimal excavation, which means less soil erosion and airborne dust.

Open Space: When combined with a neighborhood collection system, AdvanTex Treatment Systems enable developers to cluster homes more closely together than is possible with typical septic systems — and with minimal noise and odor. This conserves existing natural areas and allows for a high ratio of open space to development.

Water Efficiency

Outdoor Water Use Reduction: Treated effluent from an AdvanTex Treatment System can be used for irrigation,* providing an alternative water source that reduces outdoor consumption of potable water.

Indoor Water Use Reduction: Using AdvanTex-treated effluent as an alternative water source for toilet flushing* reduces the indoor use of potable water, which can be reserved for drinking and cooking.

Cooling Tower Water Use: Treated effluent from an AdvanTex Treatment System can be recycled for use in cooling towers.*

Water Metering: Reclaimed water from an AdvanTex Treatment System can be used for irrigation* and monitored via telemetry control panel.

Energy & Atmosphere

Optimize Energy Performance: Pumps that circulate effluent to AdvanTex Treatment Systems rarely exceed 1/2 hp (0.37 kW) for residential systems and 1 1/2 hp (1.12 kW) for commercial systems. These pumps run for just minutes per day and use far less energy than aerobic blowers.⁷

Renewable Energy Production: Off-grid solar panels have been used to power Orenco's low-horsepower (1/2 hp or 0.37 kW) recirculation pumps, like the ones at the LEED Platinum-certified Audubon Education Center in Los Angeles.

Innovation Catalog

Sustainable Wastewater Management: AdvanTex Treatment Systems consistently achieve effluent quality equal to or better than that provided by municipal treatment plants.⁸ The effluent is ideal for further treatment for nonpotable reuse applications, when local regulations allow.

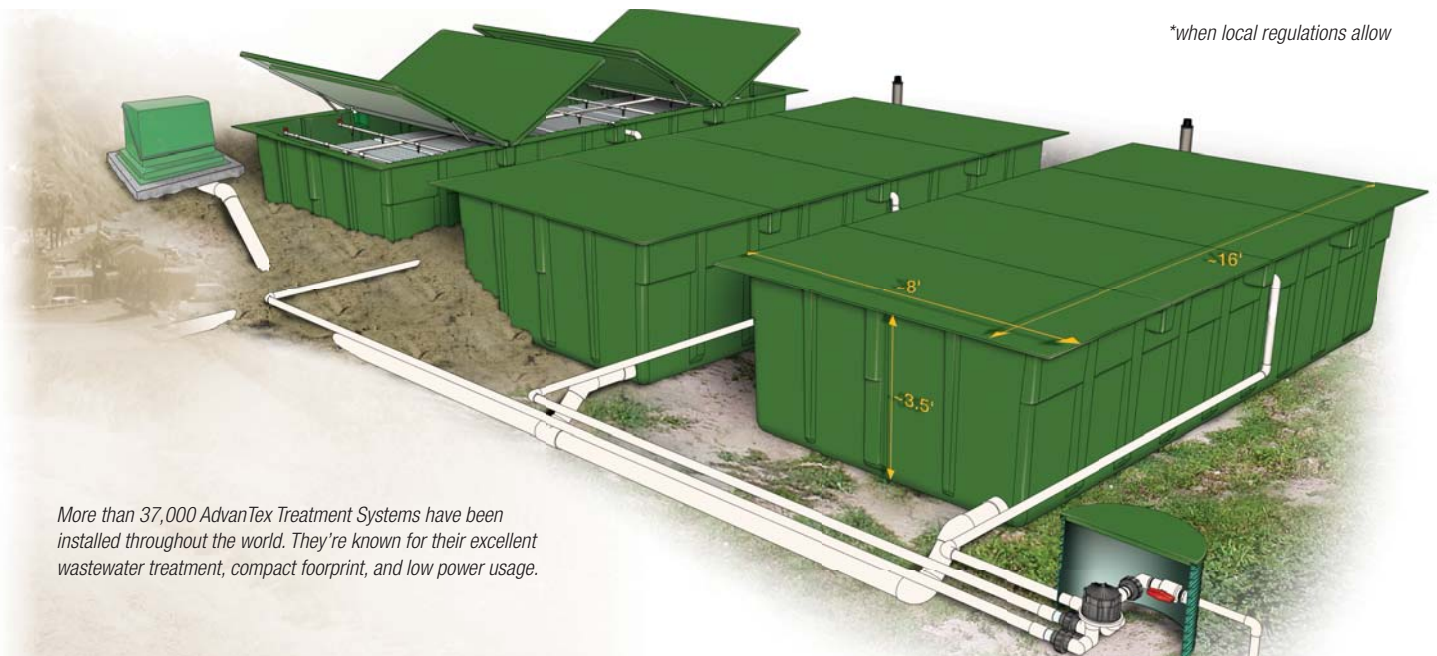
Pilot Credits

Whole Project Water Use Reduction: By reusing treated effluent from an AdvanTex Treatment System, whole-building water use can be significantly reduced as part of a proposed Water Balance Model for the project.

Green Infrastructure (Neighborhood Development)

Wastewater Management: AdvanTex systems can easily be designed to retain and reuse on-site at least 25% of the average annual wastewater generated by a project, via applications like irrigation and toilet-flushing.

**when local regulations allow*



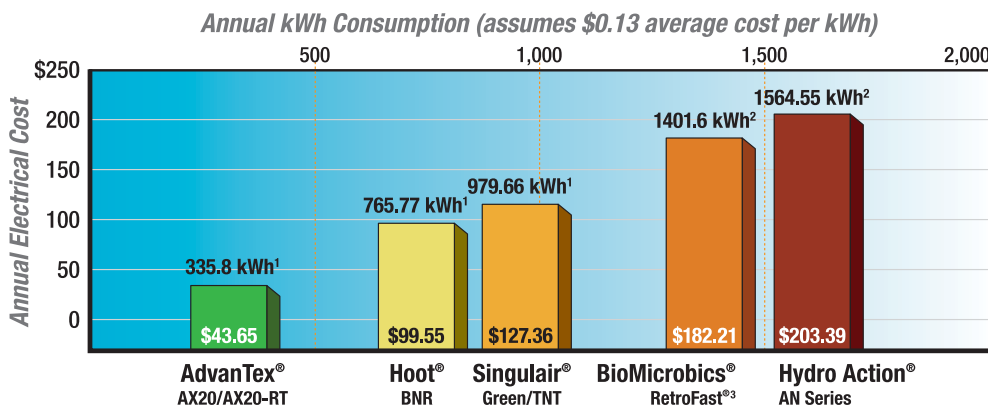
More than 37,000 AdvanTex Treatment Systems have been installed throughout the world. They're known for their excellent wastewater treatment, compact footprint, and low power usage.

Energy Efficient Wastewater Treatment

Environmentally conscious consumers, designers, engineers, and construction professionals want wastewater treatment systems that use minimal electricity yet consistently produce high-quality effluent that's available for reuse. Long-term field trials in both the United States and overseas have proven that Orenco's AdvanTex Treatment Systems use significantly less electricity than other wastewater systems, while providing exceptionally high performance.⁹

Because AdvanTex systems use a media filter instead of a suspended-growth treatment system, they use very little power. The pumps that circulate effluent to residential AdvanTex Treatment Systems rarely exceed 1/2 hp (0.37 kW) and run for just minutes per day, using far less energy than the aerobic blowers required for aeration of suspended growth systems. The graph below shows how the annual power cost of AdvanTex compares to some other types of wastewater treatment systems.

Electrical Usage of Residential Wastewater Treatment Systems*



* Data from the Maryland "Bay Restoration Fund Ranking Documentation" at <http://mde.maryland.gov/programs/Water/BayRestorationFund/OnsiteDisposalSystems/Documents/BAT%20Ranking%20Document.pdf>

¹ Verified by third-party testing

² Reported by pump manufacturer

³ RetroFast unit limited to households of 1-4 occupants with 3 or fewer bedrooms

- Six-month accumulative average from NSF International testing on the AX20N at 500 gpd (1900 L/d), using composite sampling.
- See Electric Power Research Institute (EPRI), "Electricity Use and Management in the Municipal Water Supply and Wastewater Industries," (EPRI: November, 2013), Table 5-2. Also, Maryland Department of the Environment, "Bay Restoration Fund Ranking Documentation" accessed June 29, 2018, <http://mde.maryland.gov/programs/Water/BayRestorationFund/OnsiteDisposalSystems/Documents/BAT%20Ranking%20Document.pdf>
- As seen in the Elkton, Oregon, sewer system.
- Henry S. Albro, "Ownership of Pressure Sewer Systems, a Tale of Two Towns" (Journal of the New England Water Environment Association, spring, 2015), 32.
- Orenco Systems, Inc., "How to Compare Power Consumption of Advanced Treatment Systems," AHO-ATX-POWER-1, 2006.
- Maryland Department of the Environment, "Bay Restoration Fund Ranking Documentation."
- Ibid.
- NSF International testing.
- Maryland Department of the Environment, "Bay Restoration Fund Ranking Documentation" and Environment Bay of Plenty, "Nitrogen reduction trials of advanced on-site effluent treatment systems," accessed June 29, 2018, <https://www.bojrc.govt.nz/media/33112/Report-2006-OSETTrial1-2005-2006.pdf>



The effluent sample on the left, discharged from an Orenco AX100 Treatment System, is as clear as the water sample on the right, taken from a nearby lake.

Company

Orenco Systems has been designing, manufacturing, and distributing leading-edge wastewater equipment since 1981. Most of the company's 300-plus employees work out of a 26-acre (10-ha) headquarters site in Sutherlin, Oregon, that includes sales, manufacturing, engineering, and research facilities. Orenco sells its products through more than 300 points of distribution in North and Central America, Australasia, Europe, and Africa.

For more information about AdvanTex® Treatment Systems, contact Orenco Systems®, Inc.

