



Smith & Loveless Inc.
Above all others.™

Model R OXIGEST®

OXIGEST® System Offers Flexible Treatment Options

Proven in hundreds of installations, the Model R OXIGEST® Treatment System provides stable operation and flexible process options for wastewater applications. Its precursor was originally developed by the engineers at Smith & Loveless for treatment of domestic wastes, but after nearly four decades of continued development and evolution, the OXIGEST® is designed to be a high-performance, custom-designed aerobic system that meets the stringent demands of today's treatment requirements. The OXIGEST® design parameters include flow capacities of 0.1 MGD (380 m³/day) up to 5 MGD (18,925 m³/day) in a single tank with waste strengths of up to 20,000 lbs. BOD per day. It can treat for stream discharge or effluent re-use applications.

The OXIGEST® smart-tank design encompasses complete aeration, clarification and advanced treatment in concentric tankage while allowing these unit processes to be individually separated and controlled. Its circular exterior not only enables the OXIGEST® to fit with other tankage often used at wastewater facilities and plants, but more importantly it maximizes space efficiency in its footprint, thereby preserving precious facility land for other key plant operations. Circular steel tankage is also the most durable package design for retaining large volumes of wastewater while minimizing the use of steel and lowering raw material cost. In colder climates, the OXIGEST®'s all-encompassing tankage minimizes the surface area exposure to the elements, which saves heat and protects the biological operation.

The OXIGEST® is equipped with high performance components that offer advanced process control and automation throughout the plant's operation. Influent wastewater that enters the OXIGEST® system can feed directly into an aeration zone or via one of two other zones: either a moderately aerated equalization zone, for stabilization of flow and organic loading, or a selector zone, which mixes with RAS solids in an anoxic environment to yield short periods of low dissolved oxygen for the prevention of undesirable bacteria.

The influent then passes into the aeration zone, which includes state-of-the-art air diffusion equipment for efficient oxygen transfer, effective mixing and minimal energy usage. Certain diffuser grids can be adjusted within the aeration zone to optimize treatment. The aeration zone also

System Profile



This Smith & Loveless Model R OXIGEST® wastewater treatment system operates with stringent effluent requirements: 4 mg/l BOD, 5 mg/l TSS, 0.5 mg/l ammonia, 0.5 mg/l phosphorus, and 6 mg/l dissolved oxygen. The system incorporates dual stage aeration zones for servicing purposes, sludge holding, and also a selector zone, flocculating clarifier, filtration, post aeration, and two-stage phosphorus treatment all in one tank. This design eliminated external pipes, pumps, service walkways, etc. Everything is serviceable from the walkways, including normal operation and maintenance. Because of the concentric tankage, this OXIGEST® kept the overall project under budget. Smith & Loveless performed the erection and field coating.

contains integral instrumentation for process monitoring of pH, dissolved oxygen, mixed liquor suspended solids (MLSS), and temperature levels, which allows the system's operator to easily control the plant from a remote operations room or on-plant.

Multiple aeration zones can be employed to provide specific activated sludge processes for desired treatment levels, depending on the type of waste treatment required. Processes include multi-stage aeration, complete mixed, plug-flow and nitrification/denitrification. Inlet distribution headers help evenly distribute the incoming load to the biomass within the aeration zones while outlet distributors evenly collect treated wastewater for input to the clarifier. The addition of multiple zones not only offers the benefit of handling variable load conditions but also provides service convenience and continuous operation. If the occasion arises, certain zones can be off-line for draining and service while others are operating.

continued on reverse side

continued from front side

Once the influent wastewater is treated in the aeration phase, it enters the integral clarifier, in the center of the plant. Like the process flexibility featured in the aeration phase, the **OXIGEST®** also offers various clarifier options, including center-feed, peripheral-feed and flocculating with both half-bridge and full-bridge designs available. Each clarifier design offers Smith & Loveless' exclusive skimmer system, which consists of a skimmer arm, anti-rotation arm, and airlift removal. The skimming arm works in concert with the anti-rotation arm to force all surface material toward a scum baffle for removal by an air-driven pump.

Air-driven pumps are also employed for RAS/WAS functions. These air-driven pumps are non-mechanical and stainless constructed, and can be equipped with automation capabilities to easily adjust RAS/WAS rates from a remote location or on-plant. The pumps also allow for sampling of the actual underflow sludge level to determine solids concentration and settleability, and perform microscopic examinations. A flow transmitter can be incorporated for remote monitoring of RAS/WAS rates as well. Additionally, a perimeter walkway encircles the entire clarifier for 24-hour access and up-close examination.

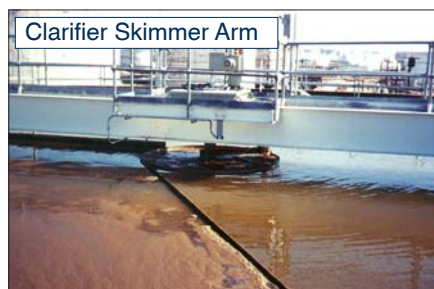
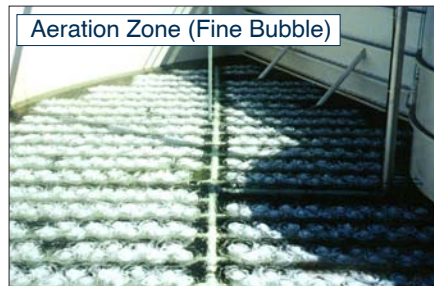
The **OXIGEST®**'s flocculating clarifier offers components (for solids and/or nutrient level control) which accomplish variable G-factor flocculating intensities (for either mechanical and/or air induced flocculating). This affords the end-user an efficient use of flocculants, which results in lower operating costs while enhancing flocculation and settling.

Because the clarifier is integral (see above right), it makes the entire treatment scheme space-efficient for treatment facilities. It also reduces capital costs because its concentric tankage reduces the use of interconnecting piping, external mechanical pumps, valves and the capital costs associated with multiple basins and tanks.

Following clarification, the **OXIGEST®** can be easily designed for inclusion of a variety of post-process variations, including nitrification/denitrification, re-aeration, chlorination, dechlorination, sludge storage, tertiary filtration or other specialized treatment. Most systems incorporate sludge holding, which allows for further bio-degradation and digestion. The **OXIGEST®**'s automated thickening and decanting capability maximizes solids concentration while minimize the sludge volume to be disposed. This automated feature can further reduce operator time and attention and make control more precise.

The Model R **OXIGEST®** from Smith & Loveless is an extremely versatile treatment system that can be built for the end-user incorporating virtually any process desired. Compared to a conventional multi-tank, in-ground, concrete designed system, the **OXIGEST®** reduces concrete use, total plot area (land use), construction time and external piping and pumping. With its smart-tank design, complexity is minimized with integral construction of the treatment processes. All of the treatment zones in one tank decreases energy and maintenance demands, enabling the operator to more easily manage and oversee the system.

Model R OXIGEST® Process Sections



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