

Mixers meet need for true aeration

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Rob Decker, Senior Project Coordinator at Roquette.

Dealing with solids in aeration tanks requires careful consideration for performance and longevity – because looks can be deceiving. At first glance, there can often appear what seems to be plenty of aeration activity in an effluent tank, but in reality, there is sometimes very little happening that is beneficial to the process.

Outdated equipment, such as old surface aerators, can busily create ‘a dancing tank’ with lots of noise and bubbles. However, this type of equipment is only capable of aerating the top part of the tank - often as little as 20% of the total volume. Therefore, despite all the bubbling commotion, solids can and do settle out, resulting in unpleasant septic solids at the bottom of the tank. When a discharge permit violation or an odor problem has been identified, the dancing-effluent-tank scenario seems to become even more frenetic. The tendency is to expend more power, which places added strain on the utility bill. Furthermore, this practice is an unnecessary waste of energy and still results in poor-settling sludge.

A supposed aeration problem is often nothing of the sort; it is simply the need for an efficient and appropriate mixer. When aeration equipment was first installed in wastewater tanks many years ago, the original design may have achieved the required balance, but manufacturing requirements, new process technology and legislation have inevitably seen conditions change.

Wastewater problems caused by changes to production lines that have increased the biological load are a common occurrence. There can also be issues prompted by rises in temperature, seasonal loads, in-factory waste minimization or improvements and additions to upstream processes. Because aeration and mixing are vital to a healthy treatment process, it is best to routinely review the wastewater element as part of the whole manufacturing process so that a fully-mixed and properly-aerated tank is consistently achieved.

Just as problematic as over-aeration is under-aeration. Low dissolved oxygen (DO) in the tank and reduced biological activity will produce bulking sludge, unpleasant odors and, ultimately, failure to meet discharge permits. Under-aeration can also be caused by changes to conditions such as COD (Chemical Oxygen Demand)/ammonia loading and increases in the tank’s temperature.

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**Case Study: Complete clog-free operation**

Searching for new technology to reduce maintenance time and costs associated with his aeration tanks, Rob Decker, Senior Project Coordinator at Roquette, a producer of starch products, syrups and polyols, called in Landia, a supplier of pumping and mixing solutions to many different industries. Landia saw how the use of a diffused air system (fed by large blowers) meant constant cleaning and replacing of diffuser membranes. This included the substantial expense of hiring divers to enter the tanks and perform maintenance so as to not interrupt the 24/7 operation.

Installing a self-aspirating aeration system that incorporates heavy-duty Landia Chopper Pumps has resulted in a completely clog-free operation and a homogenous mixture for higher air-to-water transfer. Energy bills alone at Roquette have been reduced by 30%, and constant laborious maintenance has now become a simple, economic, once-a-year requirement.