

# BioDoc™ Rotary Distributor

Trickling Filter Optimization



**WESTECH®**

# Slow Down that Trickling Filter!

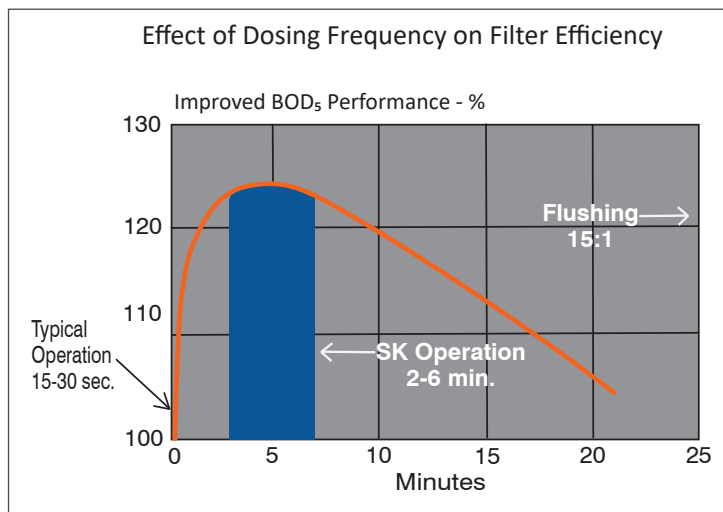


An increasing number of U.S. plants have experienced the benefits of slowing down their trickling filters, such as enhanced BOD<sub>5</sub> removal, reduced cyclic sloughing, fewer odors, and happier neighbors.

## Why Choose BioDoc™?

The BioDoc™ Rotary Distributor is a system for optimizing the performance of trickling filters that includes a motor drive and a programmable logic controller (PLC). The distributor drive is designed to produce the optimal variation in rotation speed and dosing rates, providing benefits such as enhanced BOD<sub>5</sub> removal, reduced cyclic sloughing, and fewer odors. With the dosing rate optimized, the trickling filter can become the most efficient process equipment in the plant and significantly improve overall plant performance.

In the mid-1940s, plant operators in England began to experiment with the speed of the rotary distributor and corresponding effects on the performance of the trickling filter. Orris Albertson, a pioneer in trickling filter optimization, suggested that the efficiency of trickling filters could be improved by slowing down the rotational speed. As a result, an increasing number of U.S. plants have lengthened their dosing cycle and experienced the benefits of slowing down their trickling filters.



The average U.S. trickling filter distributor should be slowed to 5-10 percent of its current rotational rate.

# Proven and Accepted

Slowing the distributor is only the beginning. With the benefit of ongoing research and design efforts, we've learned more in the past few years about enhancing the performance of trickling filters. Three operating procedures for rotary distributors are paramount to improving treatment plant performance:

- A daily flushing cycle to clean the media
- An operating cycle to promote deeper bio-growth
- An operating cycle to encourage maximum wetting during peak load periods

WesTech has designed the BioDoc Rotary Distributor to automatically perform each of these functions, and as a result, the hundreds of BioDoc installations worldwide are significantly more efficient. Side-by-side tests of the BioDoc modulated drive and a conventional unit revealed that, while settled BOD<sub>5</sub> removals were similar, the BioDoc drive kept the media cleaner and improved oxygenation. Results showed a 15 percent higher BOD<sub>5</sub> oxidation and 50 percent increased nitrification.

## Optimizing Through Controlled Dosing

The key to understanding rotary-distributor controlled dosing is to understand SK, an abbreviation for the German word Spülkraft, meaning "flushing intensity." SK is defined as the depth in millimeters of water deposited during the passage of one distributor arm.

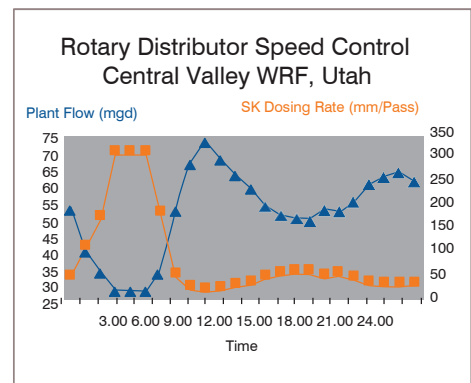
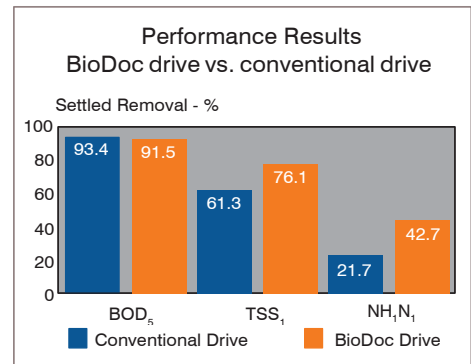
The BioDoc simplifies dosing optimization and allows for consistent implementation of the program throughout the year. The advanced control system is programmable for the specific needs of individual plants. The BioDoc drive, which has a 20:1 speed adjustment range, can regulate the rotary speed to achieve the optimum low and high SKs for any trickling filter.

## Automated Media Flushing

Solids build-up and odors in the filter are controlled by increasing the SK values or flushing intensity through low-frequency dosing. The BioDoc controller slows the rotational speed of the distributor to provide increased flushing intensity (high SK), inversely proportional to plant flow. Thus, the flushing cycle is reserved for off-peak hours when plant flow is the lowest.

A loss in biological performance during the flushing cycle is avoided because of the low filter loading and excess clarification capacity. Daily flushing is critical for keeping the media clean and the air and water passageways clear. In a short time, the BioDoc drive stabilizes the biomass inventory and optimizes the performance of the trickling filter.

The BioDoc is the solution for many municipal and industrial plants where rotary distributors have become inefficient over time, or have never performed well. With a 24-hour operation and a constant loading cycle, industrial filters are prime candidates for the multi-step dosing operation.







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