

Food Manufacturer Resolves Process Complications with a Multi-Vane Scrubber



Synopsis

A major U.S. food manufacturer desired a second particulate abatement system for particulate emissions resulting from manufacturing processes at their dried cereal production facility in the Southeast. The first abatement system, installed by Pollution Systems on the non-gluten production side of the plant, has operated well since 2016, resulting in significant particulate removal to aid in the elimination of biological growth on the facility roof.

Initial Operating Issue

When this food manufacturer first contacted Pollution Systems in 2014, they had unsuccessfully used scrubbers to treat emissions from their product application; however, they had continual problems with these systems due to the build-up of wet, sticky residue on the roof. This build-up required constant, manual removal to maintain performance. The manufacturer sought a viable system with high uptime and reliability to eliminate the problematic discharge and withstand both batch and continuous operating requirements.

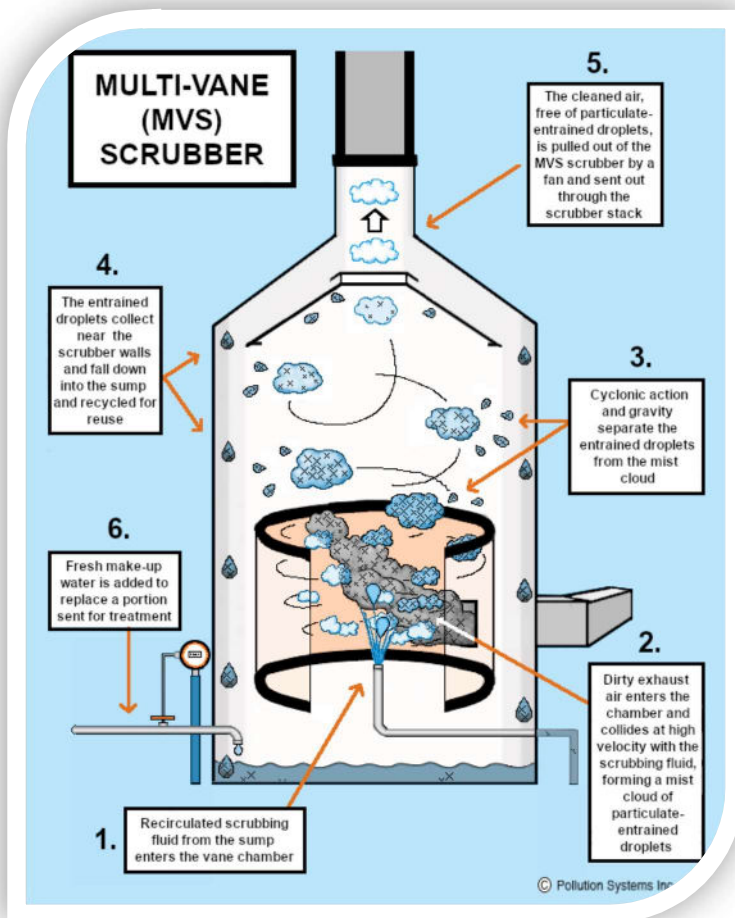
Other system requirements included guaranteed removal efficiency, efficient water & electrical usage, easy maintenance, self-cleaning properties, and incorporated freeze protection.

Proposed Solution

After carefully reviewing the facility process application, Pollution Systems proposed the installation of their Multi-Vane Scrubber System, Model #MVS-54. An advanced scrubber with a proprietary design, the MVS allows for 99% removal efficiency of particulate matter



(PM2.5) from batch and continuous type operations and would solve the issue of sticky build-up and biological growth.



MVS scrubbers are proven technologies with no internal moving parts. Other than a system fan and recirculation pump, the equipment is solid state and therefore simple to maintain.

The Technology: How it Works

The MVS-54 is a self-contained, venturi-style scrubbing system. Its internal multi-vanes act as multiple venturi throats and are engineered for specific particulate removal efficiencies as a function of particle size and pressure drop.

Water is recirculated from the sump and sheared into a fine mist/cloud of droplets in the multiple throats of the system. This high-velocity cloud constantly impinges and impacts the vanes and keeps them clean of particulate build-up.

Downstream of the vanes, cyclonic action removes the particulate-entrained water droplets from the airstream. The liquid droplets are then returned to the integral sump for reuse.

The thoughtful design of the MVS scrubber discourages any particulate build-up on the system parts. Additionally, the MVS system efficiently uses water as the cleansing agent, which is continually recirculated to minimize water usage. These are fundamental characteristics of the MVS.

Implementation

At first, the food manufacturer was skeptical about using another scrubber system, but Pollution Systems offered an MVS Scrubber System pilot unit to demonstrate the technology. Based on the performance of the pilot unit and before committing to a permanent solution, the manufacturer decided to test Pollution Systems' Multi-Vane Scrubber System by installing a unit on one (1) of the four (4) non-gluten roll dryer lines, alongside a competitor's system for comparison. When Pollution Systems' MVS system successfully outperformed the competitor's system and alleviated any remaining concerns, the manufacturer awarded Pollution Systems the project and purchased a custom abatement system for four (4) of their eight (8) roll dryer lines.

Results

After many years, the equipment is operating well and is highly effective at removing the wet, sticky particulate and eliminating the need for constant manual cleaning. In fact, Pollution Systems' MVS scrubber system demonstrated such success in abating the wet sticky fines and flakes that the customer decided to install a second particulate abatement system for the glutenous side of their operations. This new project was a permanent solution for the remaining four (4) of the eight (8) roll dryers.

All preceding equipment criteria were still valid for the new system. Since the Multi-Vane Scrubber #MVS-54 met all these criteria when initially built in 2017 and had continually demonstrated superior performance and >99% DRE, the food manufacturer purchased a second, identical system to complete their process line.

