

Venturi Scrubber Removes Sausage Grease and Particulate from Industrial Cooking Process

Synopsis

A leading Food manufacturer in Alabama operates several pork-sausage cookers that exhaust over 4,000 ACFM of moisture and pork grease. After several poor attempts to treat the exhaust, they reached out to Pollution Systems in hopes of an effective emission control solution.

Initial Operating Issue

The company installed Electrostatic Precipitators (ESPs) to treat the exhaust, but these air pollution control systems performed poorly and generated high maintenance and operating costs. These systems were also outdated and required significant capital investment to be repaired and ultimately replaced.

After the ESPs failed, the manufacturer attempted to use air filters. This alternative solution, however, resulted in a chaotic operation that yielded low removal efficiencies because of the sub-micron particle size distributions of the grease (a primary obstacle in this process).

Any solution for this issue would require adequate particulate removal to meet the operator's existing permit regulations.

Proposed Solution

After carefully reviewing the process application, Pollution Systems recommended a VS-3 Venturi Scrubber System. This system has demonstrated success in similar applications (i.e., successfully reducing particulate matter emissions, such as waste gas streams from meat smokers). A venturi scrubber offers lower initial capital and operating costs than other technologies because of the system components and reduced energy requirements.



The Technology: How it Works

Smoke and grease-laden air from the continuous sausage cooker exhaust is drawn through the VS-3 by the system fan. As the air passes through the venturi section, water from the integral recirculation tank introduces into the air stream, and fine water droplets form. Smoke and grease particulate (< 1 micron in size) are collected on the water droplets and carried with the air stream to the lower portion of the scrubber, where the air velocity reduces, causing particulate-laden droplets to fall into the recirculation liquid. The air then passes through the mist eliminator to remove the remaining water droplets.

Finally, the cleansed air dissipates through the fan, out a stack, and into the atmosphere. Along with freshwater makeup, the “blow-down” of the scrubbing liquid ensures smooth operations without plugging or severe buildup. A series of internal nozzles (complete with piping, valves, and chemical injection ports) provide a Clean-In-Place (CIP) manifold system for periodic preventative maintenance and internal cleanings.



Implementation and Results

Pollution Systems verified process conditions and provided drawings and specifications to the customer upon selecting the solution. A stainless steel, skid-mounted system was fabricated and shipped to the customer for installation. After delivery, the experienced field technicians of Pollution Systems monitored the installment, commissioned the unit, and

provided the appropriate training to the respective company operators.

Subsequent emissions testing and operational experience have proven the unit effective and low maintenance while outperforming the ESPs. Due to the successful implementation of our venturi scrubber system on the first sausage cooker line, the company has purchased additional units for the separate production lines.

