Case Study

Venturi Scrubber Successfully Removes Grease and Particulates from Exhaust After Failed Solutions

OPERATING ISSUE

A leading food manufacturer in Alabama operates several pork-sausage cookers that exhaust over 4,000 ACFM of moisture and pork grease. 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 These systems were also outdated and required significant capital investment to be repaired and ultimately replaced.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 use of air filters was attempted. 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 major obstacle in this process). Furthermore, any solution that was considered for this issue would require adequate particulate removal to meet the operator's existing permit regulations.

PROJECT SOLUTION

After carefully reviewing the process application, Pollution Systems recommended the installation of a *VS-3 Venturi Scrubber System*. Effectiveness of this system has been demonstrated in similar applications; successfully reducing particulate matter emissions, such as waste gas-streams from meat smokers. Also worth considering is that air pollution control using a venturi scrubber offers lower initial capital cost and operating costs than other technologies because of the system components as well as reduced energy requirements.

THE TECHNOLOGY

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 is introduced into the air stream and fine water droplets are formed. Smoke and grease particulate (even less than 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 is reduced. The lower velocities cause the particulate-laden droplets to fall out into the recirculation liquid. The air then passes through the mist eliminator, where remaining water droplets are removed. Finally, the cleansed air dissipates through the fan, out a stack and into the atmosphere. A "blow-down" of the scrubbing liquid along with fresh water make-up 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

Pollution Systems verified process conditions and provided drawings and specifications to the customer upon their selection of this solution. A stainless steel, skid- mounted system was manufactured and shipped to the customer for installation. After delivery, the experienced field technical professionals of Pollution Systems inspected the installation, commissioned the unit, and provided the appropriate training to the respective company operators.

CUSTOMER BENEFIT

The project was completed within the expected time-frame and within budget. Subsequent emissions testing and operational experience have proven the unit to be effective and low maintenance; outperforming the ESPs. Because of the successful implementation of the venturi scrubber system on the first sausage cooker line, the company has purchased additional units for the separate production lines.

Right: The Pollution Systems VS-3 Venturi Scrubber System installed at a pork sausage plant in Alabama

Pollution Systems
2170 Buckthorne Place
Suite 160
The Woodlands, Texas 77380

Phone (713) 574-6661
Fax (713) 456-2666
Email: Sales@PollutionSystems.com
Web: www.PollutionSystems.com