

New Scrubber System Comes On Line At Scott

By: Walter Seefeld, George Amrich,
Joseph Hamberger, and Louis A. Mason

A venturi impactor scrubber system that has produced results exceeding the standards set by the Alabama Air Pollution Control Commission has been installed and started up on a 450 tons-per-day recovery boiler dissolving tank vent at the Scott Paper Company pulp mill in Mobile, Ala.

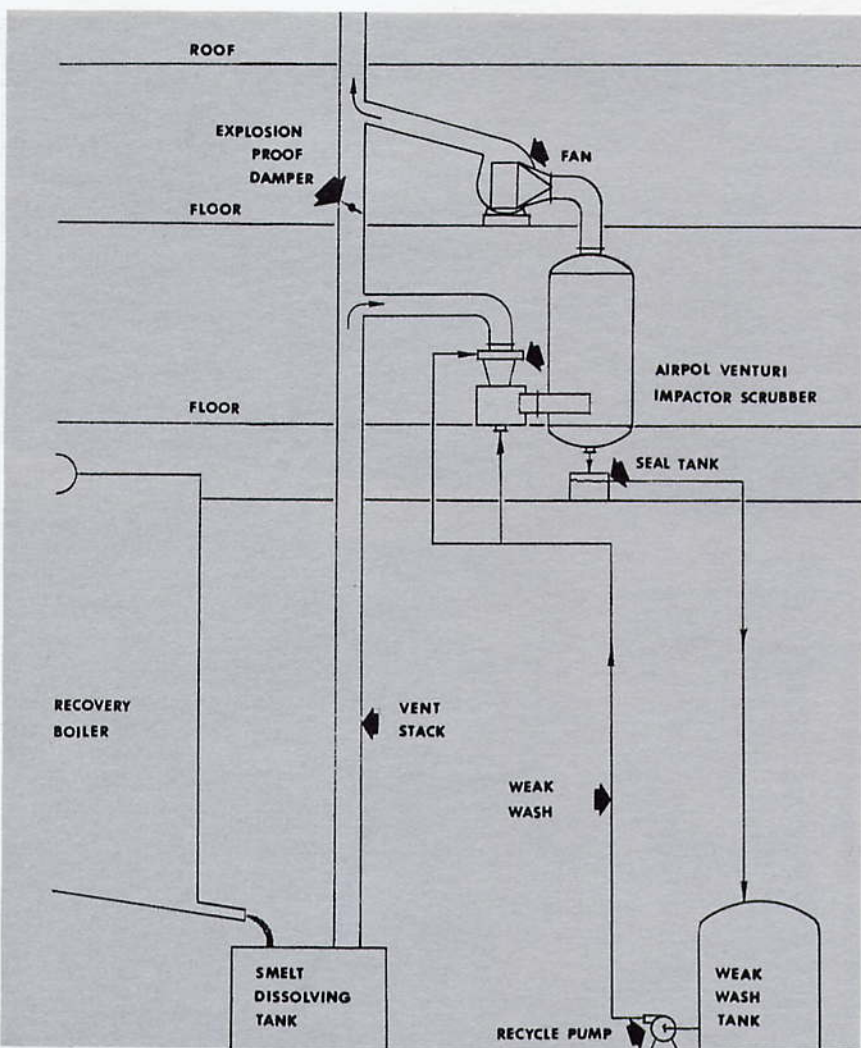
The system, designed and furnished by Air Pollution Industries, Inc. (AirPol), Englewood, N. J., was designed to reduce particulate emissions from the stack to a level below the commission's standard of 0.5 lbs. of particulate per air dry ton of pulp. Test results show that the system is performing better than design levels.

This venturi impactor scrubber was chosen because of reliability, ease of operation, low maintenance, and proven scrubbing action. The system does require more energy input than a packed tower, mesh pad type scrubber or similar scrubber but these systems generally require more maintenance and are less effective in meeting contemporary emission standards.

The dissolving tank can be vented by opening the damper in the stack installed between the inlet to the scrubber system and the point where the scrubbed gases are reintroduced to the stack and discharged to the atmosphere. The damper is also designed to act as a relief valve in case of an explosion or excessive pressure surges in the dissolving tank.

The scrubbing is accomplished with a venturi type scrubber with a

Article was prepared by Walter Seefeld, George Amrich and Joseph Hamberger of Scott Paper Company, and Louis A. Mason of Air Pollution Industries, Inc.



Pictured is AirPol system. Duct from vent stack is connected to venturi scrubber atop impactor. Cyclonic entrainment separator, on left, receives gases from impactor for separation of entrained liquid. Cleaned gas is returned to main stack and scrubbing liquid with recovered chemicals is returned to weak wash tank. The system produces 99+% efficiency on a 450 tons-per-day boiler.

liquid reservoir for impaction. Weak wash from the weak wash storage tank is pumped to tangential nozzles on a liquid distributor ring located above the venturi throat. The reservoir has a liquid dam to provide a liquid level for impaction. The gases are then ducted to a cyclonic separator to separate entrained liquid and then discharged back into the main stack and to the atmosphere. The scrubbing liquid is discharged from the bottom of the scrubber back to the weak wash tank. A centrifugal fan is located between the discharge of the cyclonic separator and the stack provides the energy for the system.

Description of Component Parts

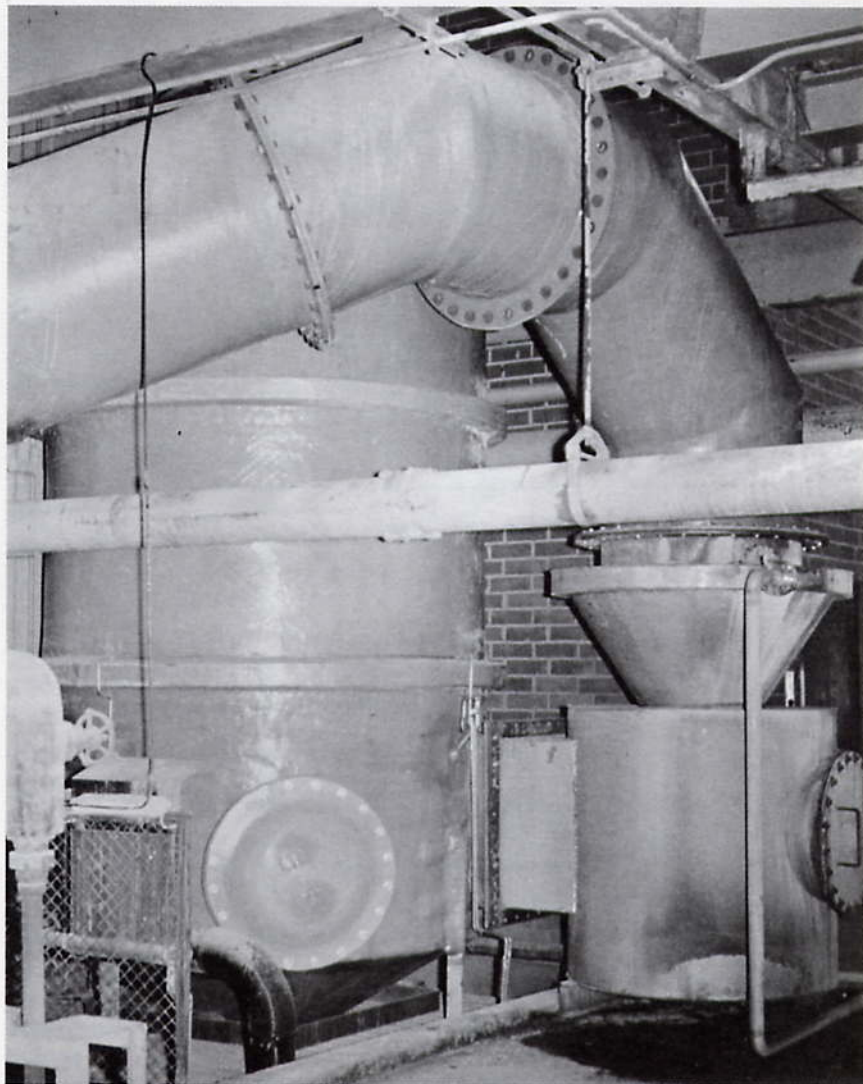
- The venturi impactor scrubber: fixed throat, constructed of 316 stainless steel, capable of operating over range of pressure drops.
- Entrainment separator: cyclonic type with a tangential gas inlet and top outlet. Approximately 7 ft. in diameter by 15 ft. high, constructed of polyester fiberglass with Atlac 711 resin.
- Stack damper: steel construction, epoxy coated, center-hinged with counter weights on external arms for quick opening in case of explosion in smelt tank.
- Duct work: polyester fiberglass construction.
- Exhaust fan: centrifugal type, arrangement 3, center hung with V-belt drive driven by 1800 RPM, 75 HP motor. Constructed of mild steel.

Process Operating Conditions

Boiler rating: 450-500 TPD
Gas volume in vent stack: 22,000-24,000 CFM
Inlet water vapor content: 24-30% by weight
Gas temperature: 190° F
Dust loading: 1.9 grains per standard cubic foot

Scrubbing Performance Conditions

Scrubbing liquid: weak wash
Scrubbing liquid rate: 150 GPM
Scrubbing liquid pH: 10
Outlet gas temperature: 158° F
Design outlet dust loading: .05 GRS/SCF
Actual outlet dust loading: 0.017 GRS/SCF
Actual outlet dust loading: .117 LBS/ADT
Scrubber efficiency: 99+ %



Close-up of AirPol Scrubber Installation at Scott Paper, Mobile, Alabama. Inlet duct from dissolving tank slack enters vent impactor. Gas flows through separator to fan located on operating floor above and discharges through existing stack to atmosphere.