



# Casebook

## New Scrubber Technology Reduces Installation Costs

**A** 100,000-actual-cubic-foot-per-minute (acfm) RotaBed scrubber recently supplied to Tri-Gen Biopower for sulfur dioxide (SO<sub>2</sub>) control at Gilman Paper, St. Mary's, Ga., saved the company an estimated \$150,000 in installation costs. Installation of a heavier packed tower would have required extensive reinforcement of an existing steel support structure, said Ken Schiffner, product/district manager for Bionomic Industries, Mahwah, N.J.

Schiffner estimates the installed cost for the RotaBed typically is between 10 percent and 20 percent less than for a packed tower. "The larger size of the packed tower usually results in larger foundations and/or structure supports, more extensive and complicated access platforms and higher horsepower pumps requiring larger starters," Schiffner says.

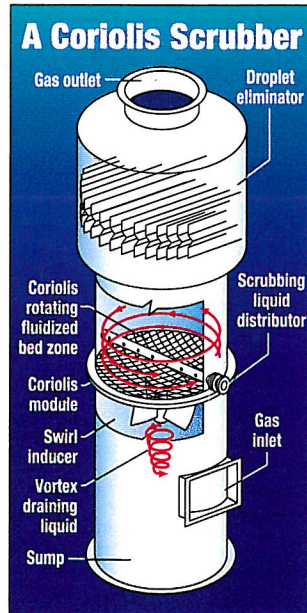
Expected to begin operating early this year, this RotaBed follows a primary particulate collector in the air pollution control system. At other installations, such as bleach plants, a RotaBed may be the primary air pollution control device.

During typical operation, contaminated gas and particulate matter enter the scrubber's gas inlet and flow upward. Scrubbing liquid is introduced simultaneously via fully open, straight pipe inlets leading to the liquid scrubbing distributor and onto the surface of a specially designed, high-open-area grid. This creates a swirl-induced Coriolis effect in the scrubber's turbulent, high-mass-transfer bed, as the upflowing gas

travels an angular path while the draining liquid swirls in a vortex. The resultant high gas throughput with low pressure drop allows efficient mass transfer and particulate capture. Clean air exits the scrubber gas outlet, and absorbed toxic contaminants and/or trapped particulate matter drain into the scrubber's sump.

Because the scrubber can be cleaned quickly, operating costs are reduced. A survey of packed-type bleach plant scrubbers by the Bleaching Committee Technical Section of the Canadian Pulp and Paper Association found

between one and four times per year. The cost of each packing cleanout, in addition to the cost of production downtime, was estimated at between \$10,000 and \$25,000. The RotaBed does not use traditional packing materials, eliminating the cleaning and repacking cost. According to Schiffner, RotaBed can be acid washed in less than an hour without requiring vessel entry by a worker.



**With its swirling fluidized bed, the scrubber works without nozzles or packed media.**

Further long-term cost savings are derived from a 20 percent to 30 percent reduction in pumping horsepower over packed towers. This is made possible by the lower header pressure and the lower height to which the liquid must be pumped. In addition, the RotaBed does not require air compressors or air atomized nozzles, which can plug and or deteriorate. Because of its resistance to plugging, a variety of scrubber chemistries and solutions can be used, including Kraft mill white liquor, lime slurry, soda ash, sodium hydrogen sulfide (NaHS) and Eo filtrate (extraction stage effluent).

Dennis Williams, vice president of engineering and marketing for Tri-Gen Biopower, chose the RotaBed scrubber for the Gilman Paper installation because it could

operate with the available scrubbing liquid created by the bleaching process. "The RotaBed was the only absorber design available that could tolerate the use of a scrubbing media that contains fibers and solids," Williams says. "Results of pilot tests this summer verified the scrubber's performance and surpassed our expectations for its design."

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