Chemical Residue Is No Match For Eaton Mechanically Cleaned Filters

One of the largest custom packagers of consumer products in North America produces and distributes many popular national brands of household and personal care products in plants located across the USA and Canada.

Environmental regulations at their plants require process water to be free of certain specified contaminants prior to being discharged into the public sewer system.

A particular customer was using a large, 24"x 24" filter press equipped with a dozen 40-micron filter pads to remove flocculated contaminants from the wastewater before processing it through an ultrafiltration system prior to discharge. The pads had to be changed twice per day in a messy, labor intense process that resulted in an average of three hours of downtime daily.

Segment:
Custom packagers, personal care products manufacturer

Challenge:
Using a filter press to remove flocculated contaminants from wastewater prior to ultra filtration required the customer to change filter pads twice daily. This was labor intensive, a source of significant downtime and created potential employee health and safety hazards.

Solution:
Replace filter press with an Eaton DCF-800 mechanically cleaned filter.

Results:
The DCF - 800 filter has eliminated both an expensive, messy manual process and the associated downtime. The savings in labor alone will pay for the DCF - 800 in less than a year.

The contaminants collected by the filter pads include oils, zinc oxide particles and silicates that were uncontained once the press was opened, exposing workers to potential irritants and allergens. The mechanical process involved in changing the pads also presented potential safety hazards associated with handling the heavy metal covers on the filter press.

CHALLENGES

"Twenty-one hours of downtime per week in a plant operating 24/7 had become increasingly unacceptable to the customer," said Anita Gupta, product manager of the Eaton distributor, John Brooks Company of Toronto, Ontario, "so they started looking at alternatives like bag filters and manually cleaned cartridge-type filters. They had not considered a self-cleaning automatic filter until we showed them the DCF-800."

The plant processes an average of 400,000 gallons of water per week through the system. Twelve 40-micron filter pads with a total surface area of 48 ft2 removed about 10 pounds of contaminants from the wastewater stream. Two sets were used per day to remove a total of 20 pounds of contaminants.

Given those figures, the customer's engineers were understandably skeptical that the physically small DCF - 800 could successfully replace the large filter press. Gupta's team overcame this by introducing them to another customer using a DCF filter in a similar application who was able to answer their questions and demonstrate the success of the unit in operation.

SOLUTION

Gupta's team replaced the filter press with a DCF - 800 filter with a 38-micron screen. The result was improved protection for the downstream ultrafilter over the old filter press with no adverse impact on flow rates.

DCF series filters are believed to be among the most efficient mechanically cleaned filters currently available. Operating at consistently low differential pressures, they deliver simple, reliable operation with a low initial investment. They are particularly efficient for filtering viscous, abrasive or sticky fluids, making them an ideal choice for this application.

The DCF filter consists of a cylindrical stainless steel housing that holds filter media. Fluid enters the element and flows through to the outlet, depositing any contaminants on the inside wall of the element.

A spring-loaded cleaning disc moves up and down, wiping the filter element clean and depositing the contaminants at the bottom of the housing out of the flow path. Cleaning frequency can be based on time, differential pressure, manual selection or any other application specific criteria. Because the filter remains in service while being cleaned, DCF filters support high process efficiency.

RESULTS

The customer has eliminated an average of three hours per day of downtime and the associated labor cost of maintaining the filter press plus the cost of new filter pads and the disposal of used ones. They have also eliminated the health and safety risks associated with servicing the filter press.

"The ability to reduce significant downtime and create a safer environment is what makes the DCF technology so unique in this application," said Eaton Regional Sales Manager, Aldo Guarneri. "A low differential pressure and lower cost of production was the ultimate goal. The DCF-800 achieved

both and surpassed all expectations," he added.

"Based on labor cost alone, the DCF - 800 will pay for itself in less than a year," Gupta noted, "not even considering the associated savings. And, since the DCF - 800 is now removing particles down to 38 microns, the life of the ultrafilter has been significantly extended, further reducing the company's operating costs."

Building on this successful application, the customer has installed an Eaton filter on another process line to remove any residual contaminants from another product immediately prior to bottling.

"The fact that they trust Eaton filters to safeguard the reputation of a major brand used daily by millions of consumers is the greatest testimonial one could expect," Gupta said.

Reducing waste disposal costs in Canada, where environmentally friendly business practices are strongly encouraged, provides not only financial savings, but also helps the company employ sustainable business practices.

Eaton is now enjoying a mutually beneficial business relationship with a major international business customer, and today supplies 100 percent of the company's liquid filtration products.

Eaton has also launched its new DCF-3000 mechanically cleaned filter that provides a cost-effective filtration solution capable of processing highly viscous liquids in challenging conditions.

The superior filtering performance of the DCF-3000 filter reduces product loss and provides a more thorough contaminant purge in a highly concentrated waste stream. The DCF-3000 filter also eliminates or minimizes the need for disposable filter bags and cartridges, which reduces operator handling, inventory costs and landfill waste. The filter can handle a wide range of filtration needs, including demanding applications that filter thick liquids such as paper coatings, ethanol, machining coolants, detergents, petroleum-based greases, adhesives, hot fry oils, ink and chocolate.

"Without a specialized system, companies running applications that require filtration of highly-viscous liquids like detergents, ink and oil encounter unique challenges," said Mary Jo Surges, vice president and general manager of the Filtration business. "Our DCF-3000 filter solution increases productivity, reduces product loss and operates in a variety of harsh environments," she added.

The dual cleaning disc and twin actuator design of the DCF-3000 mechanically cleaned filter can be fabricated in a variety of materials and options with temperatures up to 400°F. It is ideal for highly viscous, abrasive or sticky liquids with flow rates of up to 500 GPM. For water-like liquids, it can handle flow rates up to 1500 GPM.

Other features include:

- Improves safety by reducing or eliminating operator intervention
- Maximizes uptime by limiting the need for maintenance
- Fits most installations, which lowers capital costs

Eaton's Filtration Division is a leader in liquid filtration that can help companies improve product quality, increase manufacturing efficiency, protect employees and equipment, and help achieve sustainability goals. Eaton employees around the world make a difference for their customers by creating an exceptional customer experience, solving problems with application expertise and developing innovative filtration solutions. Eaton's filtration products are manufactured and sold worldwide.

For more information visit:
www.eaton.com/filtration

Eaton's DCF Self Cleaning Filter: The DCF mechanically cleaned filters operate at a consistently low differential pressure and deliver simple, reliable operation in which a low initial investment is a key driving factor.