Filtration+Separation March/April 2017

Food & beverage

Chocoholics saved by new filtration system

The Indian chocolate industry is valued at US$4.8 billion, so when a global chocolate manufacturing facility in India discovered problems with its liquid chocolate filtration system, it turned to an international manufacturer, specializing in industrial filtration systems.

The Indian chocolate industry is valued at US$4.8 billion. (Image: mchebby)

Chocoholics around the world count on chocolate manufacturers to keep up with demand and consistently deliver sweet treats. A chocolate manufacturing facility in India is helping satisfy those cravings while keeping up with one of the fastest growing confectionary markets in the world.

However, as demand and production increased, the company discovered several shortcomings in its liquid chocolate filtration system including the use of a vibrating gravity screen. The facility's chocolate manufacturing process includes filtering liquid chocolate in an open environment before the moulding stage.

Because the screen in use relied on the force of gravity to flow the fluid through the process, it had to be located on the second floor of the plant, limiting the configuration of the production line. This flaw resulted in decreased productivity and product quality, forcing the company to look for a solution.

Chocolate challenge

Chocolate must be filtered to ensure a high-quality finished product free of contaminants. In addition, there are varying global standards for consistency that create the need for a filtration system capable of handling diverse raw materials.

Increasing productivity and quality by improving flow rate, eliminating external contaminant build-up and reducing operating noise and maintenance time were key to keeping up with increased global demand for this popular confection. Furthermore, ensuring the purity of the

finished product by avoiding exposure of the warm liquid chocolate to the atmosphere was important in the success of this operation.

A pump flow rate of 5 m per hour paired with a relatively high viscosity of the liquid chocolate, 6000 – 8000 centipoise (cP), was no match for the vibrating gravity screen. The screen's frequent clogging, low burst strength, frequent bursting and subsequent repair or replacement, resulted in an excess of unplanned downtime.

The company sought recommendations from Eaton, a global manufacturer whose industrial filtration systems are used successfully around the world in a number of chocolate processing applications, including harvesting, fermentation, shell removal, grinding, pressing, deodorizing, cooling and conching.

Eaton's DCF self-cleaning filter continuously cleans the screen without interrupting production.

Eaton's series of mechanically cleaned filters work well with highly viscous, abrasive materials or liquids with heavy amounts of particulate.

Self-cleaning solution

Eaton recommended a continuous, enclosed filtration system that best matched the customer's operating process and desired goals, which included continuous operation and a high-quality operating environment.

The DCF-800 performs a self-cleaning action by mechanically scraping collected debris from the filter screen with a disc that travels up and down the screen, parallel to the liquid flow. The collection chamber at the bottom of the filter automatically purges collected debris without halting production in a process that takes less than seven-tenths of a second.

Because the DCF-800 continuously cleans the screen without interrupting production, it maintains a consistently high flow rate and provides the highest quality filtering of the selected media. Eaton's DCF-800 mechanically cleaned filter provided several more benefits, including:

- Increased burst strength of 150 psi compared to 110 psi in the customer's former system
- Improved plant working conditions due to a quieter, enclosed system
- More efficient use of space due to filter's compact design
- Virtually maintenance-free operations and less frequent replacement of parts resulting from fewer moving parts

"Higher flow rates have led to reduced contaminants."

Results

The replacement of the vibrating gravity screen with Eaton's DCF-800 mechanically cleaned filter has made the filtration process more efficient and enhanced the quality of the end product. Higher flow rates have resulted in increased productivity and reduced contaminants.

The transition to the DCF-800 has also translated into labour and material savings. The low-maintenance operation of the DCF-800 was a major improvement for the customer as the previous system required the system to be shut down for frequent cleaning and replacement.

The solution put in place by Eaton allowed the customer to better manage the process and reduce the amount of labour required.

The continuously-running production line and the purge valve's open cycle maximum of only seven-tenths of a second has minimized product loss and increased the bottom line.
The customer is so pleased with the successful operation of the DCF-800 that additional units were ordered. ●

www.eaton.com/foodandbev