

Recycled Paper Mill Improves Steam Temperature Control with a Fisher® DFA Desuperheater Valve

RESULTS

- Improved steam temperature control to within 0.5 degrees Fahrenheit of setpoint
- Eliminated valve sticking issues and avoided repair and downtime costs
- Reduced the potential for thermal shock, vibration, and damage to downstream equipment
- Extended valve trim service life by one year and counting



APPLICATION

Temperature control of a steam dryer on a paper machine

CUSTOMER

Recycled paper mill in Tennessee, USA

CHALLENGE

Getting steam to the dryer end of a paper machine typically requires a desuperheater (DSH) unit with an integral or separate spraywater valve (SWV) installed upstream to control steam temperature near saturation. The combination DSH-SWV optimizes drying efficiencies.

Due to its piping configuration and cost position, a recycled paper mill selected an integral solution. But, the non-Fisher DSH-SWV units they installed have experienced chronic problems—resulting in poor temperature control and an increased risk of maintenance or off-spec product. These issues were primarily caused by the fact that the valve trim set is located within the process steam pipes and experiences higher temperature gradients than it was designed to handle.

The temperature differential between the hot steam and the cooling water created “thermal binding” and caused the valve trim to stick. That meant the valve could not control how much water was being fed into the steam line. Sticking had become a serious problem for the competitor units. Because the product was obsolete, the supplier provided virtually no support. The mill’s maintenance manager contacted the Emerson sales office, Experitec, for help and a long-term solution.

“We took the advice of Emerson engineers and implemented a nozzle maintenance program that has helped us avoid the risks and inefficiencies associated with broken or clogged spraywater nozzles. This program is an important part of Emerson’s total solution to improve the uptime and reliability of our steam dryer process.”

Maintenance Supervisor
Recycled Paper Mill

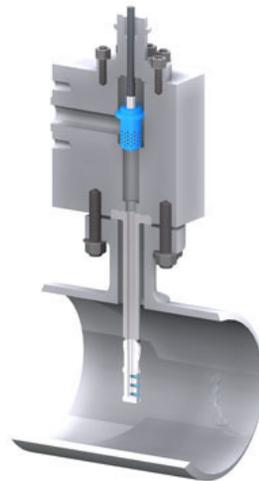


SOLUTION

Experitex engineers studied the application and consulted with paper industry and steam-conditioning experts for Fisher technology. Ultimately, they recommended the Fisher DFA Series desuperheater valve to replace one of the competitor's units.

In the DFA valve, desuperheating and spraywater control elements are packaged together. The assembly—including valve body, trim, and insertion-style desuperheater—addresses thermal transient concerns and incorporates features to optimize performance and reliability. (1) The block body allows the trim to reside outside the steam pipe, separating it from the direct effects of high temperatures and eliminating potential binding issues. (2) An integral liner inside the desuperheater minimizes the potential for thermal shock when cool water is introduced to the steam-heated pipes. (3) The Helix nozzle block geometry minimizes vortex shedding and flow-induced vibration, increasing the unit's service life. (4) To avoid the time and cost of piping changes, Emerson engineered a special DFA unit that would fit directly into the mill's existing piping configuration.

Operating since July 2013, the Fisher DFA desuperheater valve solution has eliminated the valve-sticking issues and minimized unplanned downtime. Emerson engineers also worked with mill personnel to implement best practices that will maintain the new DFA unit and its spray nozzles at peak efficiency. The mill purchased a spare DFA unit for its inventory to address any future issues with the five other competitor units waiting to be replaced.



The Fisher DFA Series desuperheater is used to efficiently control spraywater and reduce the temperature of superheated steam. Featuring variable geometry nozzles, the unit is available with standard or anti-cavitation trim.

RESOURCES



Product Bulletin: DFA Series Desuperheaters

<http://www.documentation.emersonprocess.com/groups/public/documents/bulletins/d103619x012.pdf>



<http://www.Facebook.com/FisherValves>



<http://www.YouTube.com/user/FisherControlValve>



<http://www.Twitter.com/FisherValves>



<http://www.Linkedin.com/groups/Fisher-3941826>

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