

TEXTILE MANUFACTURER IMPROVES PRODUCT QUALITY IN HEAT SET OPERATION

ABSTRACT

A manufacturer of high quality fabric for women's apparel uses a tenter frame to support fabric during a heat set operation. Because of the narrow allowable temperature range, the tenter frame is heated by thermal fluid rather than being direct fired. Multiple tenter frames at the mill are heated by one thermal fluid heater.

PROBLEM STATEMENT

Problems with product quality occur when one product that requires a lower heat set temperature is run. Simple throttling of the thermal fluid flow to reach a lower average temperature results in a situation where the air temperature on the thermal fluid inlet side is too hot and the fabric is scorched. Conversely, the temperature is too low on the thermal fluid outlet side, resulting in inadequate heat set on that side to the web.

CORRECTIVE ACTION

The solution to this problem was to install a pump and a high-flow tempered oil loop. This arrangement allows the fluid being introduced to the tenter frame to be cooled to a temperature that allows a high flow rate to achieve the desired air temperature for heat set. The high flow also results in a lower temperature difference from side to side and improves product consistency. A PLC control system optimizes the temperature of the loop to provide the required heat set at the lowest possible thermal fluid loop temperature.

IMPROVEMENTS NOTED

Product quality issues related to scorch and inadequate heat set were nearly eliminated by this process improvement.

This approach can be applied to a variety of other process with similar results.