AP-21 Pulp & Paper Stock Bleaching

Application: Direct Steam Injection Heating for Pulp Stock Heating & Bleaching

Bleaching in the Pulp and paper industry are the processes that lighten and/or remove lignin from the pulp in order to brighten its appearance. Like most chemical reactions, temperature is a key variable in controlling the effectiveness of the bleaching process. To improve chemical performance, stock is often heated by sparging steam into the pulp line prior to the addition of bleaching chemicals. The high viscosity and fibrous nature of the pulp makes condensing the steam difficult and can lead to noise and vibration. In addition, the spargers can plug with pulp due to low steam pressure available at the sparger downstream of the steam control valve.

There are a variety of bleaching processes including, Chlorine Dioxide, Hydrogen Peroxide , Ozone Delignification, and Oxygen delignification. Bleaching is carried out at a variety of pulp concentrations, but is typically run at the highest possible consistency (10-14%) to reduce energy and chemical costs. Temperatures, like consistency, are run as high as possible, usually 150-190°F.

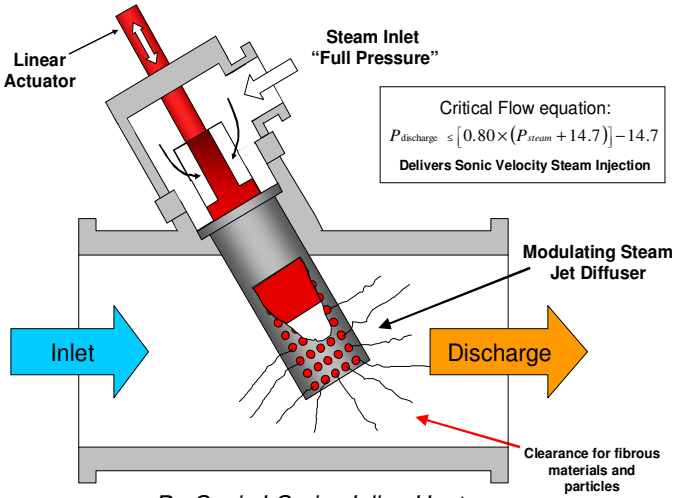
Traditional heating methods can lead to poor temperature control, process upsets resulting from in-efficient steam injection (externally modulated), and excessive maintenance issues resulting from steam hammer & vibration.

PSX I-Series Inline Heater Solution

The PSX Inline Heater may be used to directly heat paper stock in concentrations of up to 12%. The PSX Inline J-series can operate effectively on flows up to 10,000 gpm. The PSX heater utilizes Internal Modulation and a variable position stem plug to operate at choked flow conditions. Choked flow produces sonic, or high velocity steam injection, to assure complete mixing and rapid condensation of the steam. This results in a very uniform bleaching temperature, reducing chemical usage, and improving the bleaching of the pulp.

Single or Multi-Stage Heating – For some applications, including trim heating, single stage heating may be suitable. In some cases, Multi-Stage heating offers more flexible processing options and allows for staging of temperatures rise and staged steam injection in higher concentration stock to optimize the process.

Chemical Heating – On some occasions the chemical streams themselves are heated rather than the pulp. Temperature control of these chemical streams is critical for bleach plant performance. The PSX heater can maintain chemical stream temperature accurately across a broad flow range.



ProSonix I-Series Inline Heater

Fluid Heating – Black liquor filtrate or warm water in the O2 delignification process is often heated to shorten the time required to bring the system online and to increase performance. The PSX heater is well suited to heat fluids from water to heavy slurries and maintain tight temperature requirements.

ProSonix Direct Steam Injection Key Benefits:

- ***Fewer process Upsets*** *- PSX Internal Modulation assures complete mixing and rapid condensation of the steam*
- ***Better temperature control****, typically +/- 1 °F, leads to reduced chemical use*
- ***More reliable heating*** *and steam injection minimizing potential for steam hammer*
- ***Energy savings*** *from lower steam consumption compared to heating methods such as sparging,*
- ***Lower maintenance costs*** *results from reduced damage from steam hammer & vibration*

For additional information, please visit … www.pro-sonix.com

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