



Bleaching

Objective

A heater was required which would precisely control the temperature of the Kraft stock prior to bleaching to maximize chemical efficiency and minimize bleaching costs.

End User

Container board manufacturers and paper mills

Design Conditions

Fluid:	4% Kraft Stock
Flow Rates:	1500-3500 gpm [409-955 m ³ /hr]
Inlet Temperature:	90°F [32°C]
Discharge Temperature:	125°F [52°C]
Fluid Supply Pressure:	20 psig [1.4 barg]
Steam Supply Pressure:	150 psig [10.3 barg]
Steam Superheat:	Yes, to 525°F [274°C]

Process Challenges

Hydro-Thermal® was contacted to design a Hydroheater® to replace a current direct contact steam heating system, an adaptation of a static mixer. Stress cracking in the mixer was caused due to inadequate condensing capabilities, rough operation and vibration. Hammering on startup was severe enough to compromise the mixer and associated piping supports.

Solution

Hydro-Thermal engineers determined that in order to meet the stock flow requirements, a larger Hydroheater would be required than had been previously designed. With winter fast approaching, and with it the complications caused by lower temperatures, Hydro-Thermal was faced with designing and manufacturing a custom Hydroheater in only four months. The decision was made to fabricate the new Hydroheater rather than use stainless castings.

Results

Delivery and installation were accomplished three weeks ahead of schedule. The Kraft stock temperature is precisely controlled within 1°F [.5°C]. All hammering and vibration problems have been eliminated completely, and after six months of operation, no downtime has been encountered.