



## SUMMARY

### Goals:

- Precise temperature control
- Instantaneous hot water on demand for grade changes
- Eliminate lost production
- Eliminate extensive maintenance

### Accomplishments:

- Precise temperature control
- 20% hotter water on startup
- Increased production
- Eliminated extensive maintenance

An upper Midwest, USA, specialty paper mill, that has been in business for over 125 years, needed to heat whitewater and fresh water tanks for paper machines that make multiple grade changes each day. They needed to heat a 25,000 gallon [95,000 Liters] fresh water tank from 40°F [4°C] to 130°F [55°C] for use as whitewater make-up at grade change. The time to temperature it took for the water to reach temperature often exceeded 2 hours. The in-tank sparging system was very slow to heat the tank and running the paper machine cold at startup. This often caused an outage of spec paper and lost production. It also required extensive maintenance.

## CONDITIONS

### 1 - Heat fresh water during tank fill

Fluid:	Fresh water (mill water)
Flow Rate:	900 GPM [204 m <sup>3</sup> /hr]
Inlet Temperature:	40-60°F [4-16°C]
ΔT:	22°F [-6°C]

### 2 - Recirculate side stream until 25,000 gallon tank reaches target temperature. Tank must reach temperature in 2 hours.

Flow Rates:	200 GPM [45 m <sup>3</sup> /hr]
Inlet Temperature:	66°F [19°C]
ΔT:	100-125°F [38-52°C]
Target Temperature:	130-135°F [55-57°C]
Fluid Supply Pressure:	40 psig [3 barg]
Steam Supply Pressure:	160 psig [11 barg]

## SOLUTION

Several options were presented to this mill. The solution they chose was a Solaris® S206 in-line heater for fresh water or tank recirculation. The Solaris, with its straight-through design is appropriate for several types of applications, and it fit well here because of the easy in-line installation with the existing fresh water line.

The tank currently fills 20°F [-7°C] hotter than the old sparge system and total time to temperature of 135°F [57°C] is less than 2 hours. The improved paper machine start-up time on grade changes has resulted in reduced broke generation and less time to change over grades.