

# WHITEWATER HEATING FOR IMPROVED PAPER MACHINE PERFORMANCE

## Location

Heat the whitewater (WW) loop with direct steam injection using plant or waste steam

- Silo
- WW chest
- WW storage tank

Heat other water uses on the paper machine to match WW temperature

- Headbox rolls
- Wire showers
- Press section showers

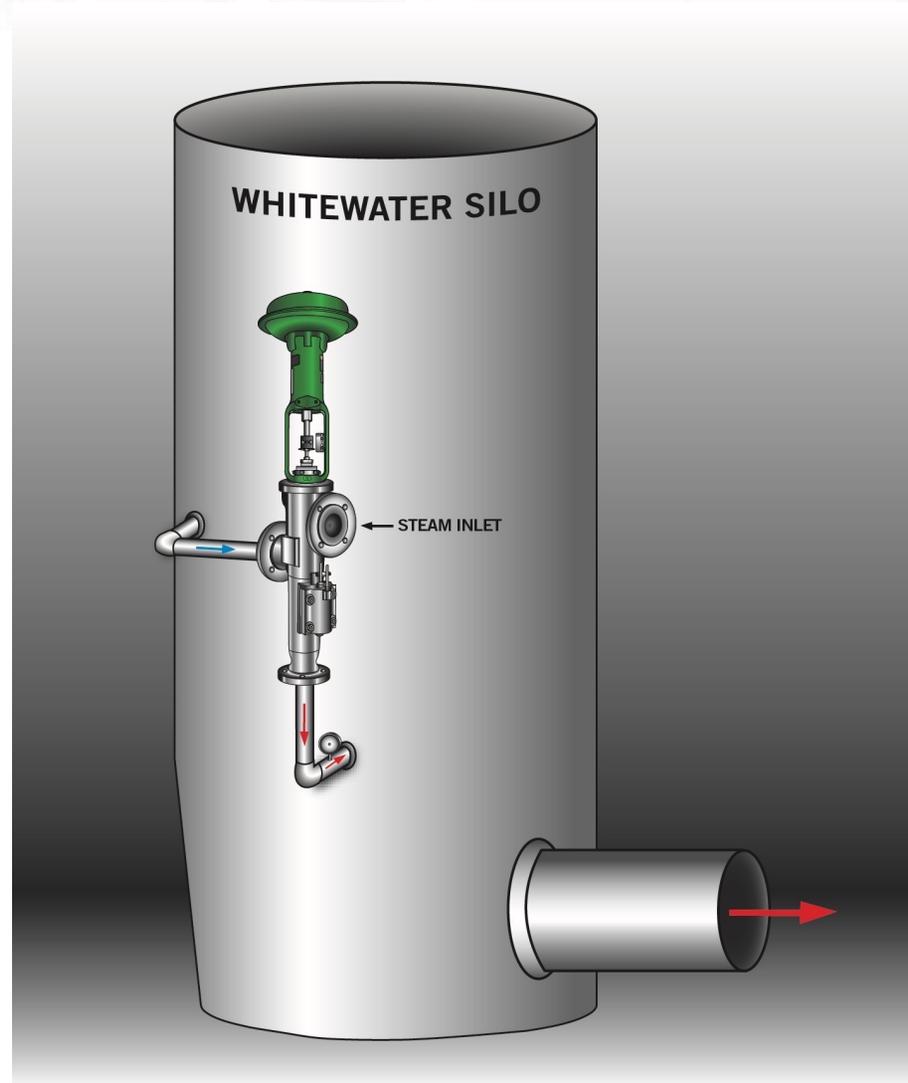
## Why It Works

Targeting operating temperatures of 120–140°F improves drainage rate  
(Refer to viscosity chart)

Heating showers (fresh water streams) eliminates temperature stratification from this normally cold water source

Temperature		Absolute - Dynamic - Viscosity (cp)
(°F)	(°C)	
32	0	1.794
40	4.4	1.546
50	10.0	1.310
60	15.6	1.129
70	21.1	0.982
80	26.7	0.862
90	32.2	0.764
100	37.8	0.682
120	48.9	0.559
140	60.0	0.470
160	71.1	0.401
180	82.2	0.347
200	93.3	0.305

*\*Heating WW to 140°F reduces viscosity in half*



## Benefits

- Improved drainage = increased machine speeds
- Can improve sheet formation
- Faster heat-up cycles
- Quicker start-ups
- Faster and hotter boilouts

## How It Works

The Hydro Thermal engineered heating solution provides:

- Automated valve providing consistent temperature control (+/- 1°F)
- Full steam pressure is used to rapidly condense the steam inside the combining tube
- Heated water is discharged into the silo or tank
- Self pumping (venturi eductor effect) or standard heater installation (*refer to P&ID self-pumping installation*)
- Industrial design provides reliable, low maintenance operation

## Self-Pumping Industrial Hydroheater

At the heart of the application is the Industrial Hydroheater design that uses high velocity steam injection for heating of the whitewater, but also creates the pumping of an eductor. This Venturi effect will provide a self-recirculating flow of whitewater through the Hydroheater and pump it back into the silo or chest. Relatively low pressure steam (35 psig or greater) can be used for heating your whitewater, efficiently capturing this energy that may otherwise be vented as waste steam.

