# Paper Machine Boil-out

White water is a fine particle slurry used throughout the papermaking process. Its name derives from fine fiber particles in the water that give it a milky white appearance. White water drains from the paper stock into pit below the paper machine and is used for a variety of uses in the papermaking process

White water systems must periodically be cleaned to remove bacterial buildup that occurs over time. This process is known as boil-out, in which the white water is raised to near boiling temperatures (around 180-190°F) to kill any bacteria in the system. A caustic solution is sometimes added shorten the process and increase the effectiveness. The water is held at temperature until all bacteria are killed.

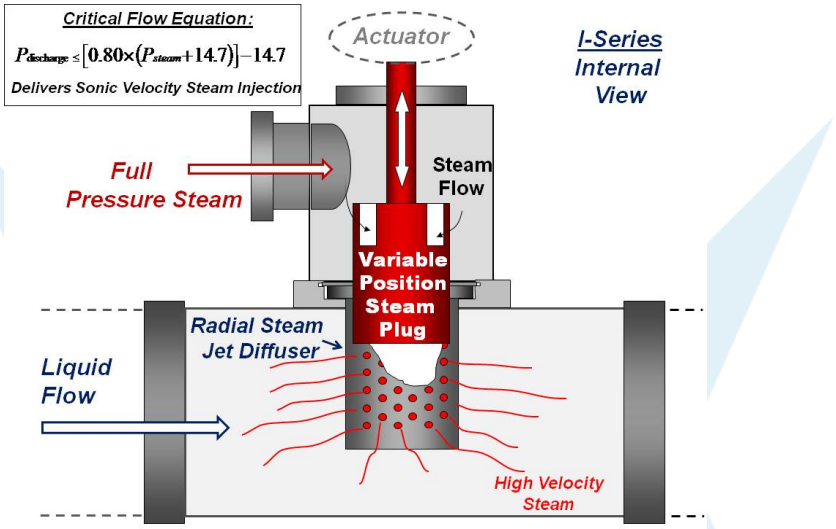
White water systems typically are heated by heating tank contents with steam spargers in the white water chest. Steam Injection Heaters that use a steam pressure reducing valve (PRV) experience a pressure drop in the steam pressure which leads to low velocity steam flow. Low steam velocity leads to poor steam mixing. Externally controlled steam injection heaters may lead to:

- Ineffective condensation of the steam from the spargers, damaging the chest walls leading to expensive repairs.
- Steam escaping from the tanks and venting to atmosphere.
- Hot and cold zones to be present in the whitewater chest, leading to variable stock temperatures at the paper machine head box.

## PSX Heater Solution

A PSX Jet diffuser heater is installed in the whitewater system to quickly raise the whitewater temperature to near boiling and then throttle back to maintain the desired temperature.

ProSonix' unique method of steam injection utilizes an internal steam control to precisely deliver the appropriate mass flow of steam for the required heating. This is achieved via and integral Pneumatic Actuator, and a **variable position stem plug** in the steam jet diffuser. We do not throttle or regulate steam pressure. This design offers a precise method of steam control through a **choked flow control delivery of the steam**. Choked flow is the phenomenon of accelerating a vapor to maximum velocity by creating a pressure differential through an engineered nozzle. By establishing choked flow, the **steam mass flow can be metered** to precisely control the heating of the liquid.




## Key Direct Steam Injection Benefits

- Energy savings resulting from faster tank time and reduced heat loss to atmosphere
- Lower maintenance due to the PSX heater's self-cleaning design
- Improved safety due to better steam injection heating methods (elimination of steam hammer)
- Reduced operating costs by reducing costly machine down time
- Faster tank heat up time (~ 6-8 times that of traditional sparging) equals less machine downtime

**For more information, please visit pro-sonix.com.**