

Boilers: Water Minimization

By James McDonald, CWT, Crown EG, Inc.

Boilers are integral components of many facilities. Boilers supply steam for process heating, space heating, power generation, etc. Boilers require makeup water to function and generate wastewater as blowdown. There are a multitude of technologies, control schemes, operational changes, etc. available to minimize the water usage requirements. The purpose of this T.U.T.O.R. article is to briefly list some boiler water saving methods that can be applied to save water, sewer, and energy costs.

Boilers

High Purity Water Makeup

Pretreatment equipment such as reverse osmosis and demineralization will allow the boiler to operate at higher cycles of concentration than with softened and dealkalized water alone. Operating at higher cycles of concentration means the boiler can operate at a higher conductivity. This will result in lower makeup water and blowdown rates, and less energy consumption to heat the fresh makeup water.

Increased Condensate Return

Condensate is a high purity, high-heat content water that should be returned to the boiler system, if possible. The more condensate that can be returned to the boiler, the higher the cycles of concentration will be and less blowdown, makeup, and heat energy will be required. The value of condensate can quickly pay for the cost to fix a poorly operating condensate pump or install new piping to return the condensate to the boiler system. Reducing steam leaks in a plant is another way to directly conserve water.


Eliminate Condensate Contamination

Perhaps the reason condensate is not being returned is that the condensate is contaminated. The more condensate that can be returned, the better the boiler operations. Improved boiler operations occur because of the value of the condensate to increase boiler cycles. Condensate



“Water Treatment Solutions”

Water Treatment Chemicals
Biocides, Algicides, Scale & Corrosion Inhibitors




Discover Your Options

Multi-sourced distributor for:

- BioLab Water Additives • CDC Products • Dow Chemical
- Polymer Ventures • Technical Automation Service

Manufacturer of:

- Wintrex® and Safe-T-Therm® Heat Transfer Fluid



HOUGHTON CHEMICAL CORPORATION

Allston, Massachusetts
800-777-2466

Carlstadt, New Jersey
800-482-4401

EPA Registered In Most States • Various Package Sizes • Nationwide Delivery
2001 Greater Boston Business of the Year

contamination may be a reason for the boiler to operate at a set conductivity. If it were not for the contamination, the conductivity would be higher. Remember, the higher the conductivity or cycles of concentration in a boiler, the lower the makeup and blowdown rates and energy consumption.

Water Chemistry

It is always good practice to re-examine the boiler water chemistry. If the feed water quality has changed, this may directly impact the number of cycles of concentration the boiler can operate. The impact may be positive or negative, but must be realized none-the-less. New chemistries may be available to allow boilers to operate at higher cycles of concentration.

Blowdown Controller

Many boilers are manually blown down to control conductivity. With manual blowdown, there are times when the conductivity is below the control range and times when it is above the control range. The worse the control, the more the swings occur.

Automatically controlling the blowdown on a boiler ensures the boiler operates within the set conductivity limits. This results in either water savings if the boiler was typically under cycled of concentration or improved steam quality if it was typically over cycled. Some boilers that have blowdown controllers do not use them because they do not function properly. ☹️

Mr. James McDonald, CWT, is a Technical Support Engineer at Crown EG, Inc. He can be contacted by email at jmcdonald@crownsolutions.com, or by phone at (937) 890-4075.

THE CHEM-MET CO.

Manufacturers Of

SODIUM MOLYBDATE

TECHNICAL CRYSTALLINE
LIQUID
ACS REAGENT

CALL
1-800-Na₂MoO₄

PHONE (1-800-622-6664) FAX (301) 868-8946

(301) 868-3355

6419 YOCHELSON PLACE P.O. BOX 819, CLINTON, MD 20735

