
SUBJECT: *Steam Boiler Water Treatment*

This Technical Services Bulletin replaces SB0011 dated December 7, 2000. This bulletin is written to help steam boiler service professionals and end users identify an emerging issue of internal corrosion in cast iron steam boilers. Elevated levels of chlorides (over 200 ppm) in the water of steam boilers will accelerate water side corrosion and shorten the operating life of the boiler. These chlorides are present in boiler make-up water and are not removed from the boiler when the boiler is producing steam. They are only removed by blowing down the boiler. Because chlorides are not removed during the normal operation of the boiler, the level of chlorides in the boiler water increase when make-up water is added to the boiler because of normal maintenance to low water cut-offs and system leaks. Over the last several decades, the level of chlorides in some ground water and city water supplies have increased due to use of salt during the removal of snow and ice from roads and highways, and the increased use of water softeners. If there are high chloride levels in boiler make-up water, boiler water treatment should be considered.

Some boiler water treatment chemicals can promote water level instability. Surging and priming in steam boilers can result even though the boiler was thoroughly cleaned before the treatment was added. In general, cast iron steam boilers do not require water treatment for protection. Systems where treatment should be considered are:

- Process applications
- Contaminated condensate
- Large make-up water requirements
- System components requiring corrosion inhibitor
- Extremely hard water
- Make-up water supply with higher than 30 ppm of chloride

Water treatment chemicals should be thoroughly reviewed before they are introduced into the boiler and heating system. Of particular concern are foaming agents that will interfere with the disengagement of the steam at the boiler waterline. For this reason, foaming agents cannot be tolerated in steam boilers.

To test the boiler water treatment chemicals, prepare a small amount of the chemical intended for the boiler with water. In a ventilated area, put this mixture into a pan and bring to a "rolling boil" on the stove. If the mixture foams, it is not suitable for the boiler.

Recognized treatment compounds used for oxygen scavenging and corrosion protection should not affect the life of the elastomer sealing rings. Asking the treatment supplier to test a sealing ring in the proposed compound can eliminate any doubt. In any case, a compound containing petroleum should not be used.