WATER TREATMENT FOR ALUMINUM CORE BOILERS

Many new hot water boiler construction projects and boiler retrofits are designed with high-efficiency aluminum core boilers. These types of boilers are very sensitive to boiler water pH, and need to be chemically treated very carefully. It is imperative that the water treatment contractor be notified as soon as possible about the installation of aluminum core boilers.

Aluminum is very susceptible to corrosion at higher pH levels, and the use of normal boiler chemicals can be very harmful to the boilers. The boiler manufacturers usually include a warning label that requires the boiler water pH range to be between 6.0 and 8.5. Normal hot water boiler water treatment for non-aluminum boilers requires a pH range of 8.0 to 10.5.

The two most common treatment chemicals (corrosion inhibitors) for hot water boilers are ***nitrite*** and molybdate.

The Problem:

**Nitrite can never be used in aluminum boilers, as it creates a very reactive and corrosive condition in aluminum boilers. Use of nitrite will cause severe damage to aluminum boilers.*

Molybdate-based corrosion inhibitors have pH enhancers to maintain the required pH range of 8.0 to 10.5 for regular boilers. Furthermore, normal untreated city water used to fill the systems already have a pH of approximately 7.5 to 8.2, limiting the amount of "pH buffer" available for the aluminum boiler upper range of 8.5 pH. When the required amount of molybdate treatment is added to the boiler system (to achieve 100-150 ppm of treatment), the resulting pH will far exceed the 8.5 pH limit.

Similarly, these new boiler systems need to be chemically pre-cleaned and flushed prior to the introduction of the regular corrosion inhibitors. Normal cleaning chemicals are very alkaline, with a pH level well above 8.5, and should also be avoided in aluminum boilers.

The Solution:

Arc encourages engineers and mechanical contractors to notify your water treatment contractor immediately if an aluminum boiler is specified and/or installed.

Arc recommends pre-cleaning aluminum boiler systems with a pH neutral detergent formulation that will not harm or react with aluminum boiler cores.

Arc also recommends the use of neutral pH corrosion inhibitors that will provide excellent corrosion protection for aluminum boiler cores and other system metallurgies.