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BOILER PM Using Chemical Heating-product Additives

Discover some tips to help keep fuel-oil tanks, boilers and furnaces properly maintained to run at their optimum.

BY HARVEY GRODJESK

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Boiler-water treatments are recommended by manufacturers to ensure operational longevity. Treatments can help remove sludge, inhibit corrosion and lime scale, and prevent surging, foaming and oxygen pitting.

Using preventive chemical heating-product additives during annual boiler and furnace tune-ups can ensure that customers' equipment performs efficiently throughout the winter heating season. Additives also can help equipment reach its full lifecycle expectancy.

In addition to ensuring proper operation, selling preventive chemical heating-product additives can add more profitability to a service call. If presented properly, customers will appreciate the extra care a service technician takes by suggesting these treatments be applied and explaining what they do.

Boiler-water treatments

While some service technicians may not be proponents of periodic boiler-water treatments, all boiler manufacturers recommend them. Depending upon the inherent water chemistry of local water conditions, a boiler can seemingly operate fine for 5–10 years without a water treatment, however operational longevity may eventually suffer.

Most treatments provide multiple benefits, including:

→Removing sludge and rust scale;
→Inhibiting boiler and steam line corrosion;
→Preventing oxygen pitting;
→Inhibiting lime scale;
→Preventing surging and foaming; and
→Checking water chemistry with built-in color indicators.

One of the most notable benefits of water treatments is the color indicators manufacturers build into them, which are useful for visual water-quality checks. After application, a pinkish-purple water sample indicates a proper pH water chemistry of approximately 8.2, which is neither too alkaline nor acidic. Blue or bluish-green water indicates more water treatment is needed. A complete flushing may be needed if subsequent applications do not generate the proper water color.

Too much alkalinity can cause surging, scale buildup, or eventually "caustic embrittlement," a process that causes the metal to crack. Too much acidity, on the other hand, leads to corrosion.

In large commercial boilers, these ailments are averted with daily checks typically performed by maintenance staffs

Soot buildup can cause a 1%–2% decrease in efficiency. Utilizing a soot spray or soot stick can minimize the layers that build up over time.

trained to use sophisticated test kits to determine the boiler water's total alkalinity, water hardness, total dissolved solids and other common water chemistry conditions. Conversely, the average residential-boiler service technician does not have this training or available jobsite time to execute such tests. Fortunately, a water treatment with diagnostic color characteristics is more efficient, simple to use and cost-effective.

Therefore, a boiler-water treatment that reacts to operating conditions for proper water diagnostics is critical. Some treatments do not chemically react to changing conditions, but only add a color to indicate that some treatment has been added to the water. This is similar to automotive antifreeze. A greenish water color in an automotive radiator proves antifreeze is present, but it is difficult to determine if there is enough.

Water treatments that minimize corrosion are more important today because boiler walls are manufactured thinner for increased heat transfer, and the recent influx of overseas metal alloys are not always reliable. Corrosion and scale can also create hot spots, percolating noise and active pitting sites that could affect the system's future integrity.

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Another diagnostic sign is water discoloration, which in hot-water boilers probably signifies layers of corrosion are building up. Corrosion affects heat transfer and efficiency and will eventually lead to premature failure.

One of the most frequently occurring steam-boiler problems is surging or water hammering, which generates noise and vibrations, the latter of which can eventually damage pipes.

Fire-chamber treatments

Soot buildup in a boiler's oil-fired or gas-fired chamber, typically caused by inefficient combustion, is a major service checklist item. Soot acts as an insulator, thus cutting heat-transfer efficiency. Just a 1/32-in. layer of soot, for example, can cause a 1%–2% decrease in efficiency. As layers of soot thicken, the boiler efficiency exponentially decreases.

A soot spray can be applied during annual checkups, as it reaches remote areas easier than vacuum attachments. A soot stick can be burned in the chamber for a longer-term treatment.

Minimizing fuel-oil tank problems

The most common problem fuel-oil-fired boilers and furnaces experience is moisture in the oil tank and fuel line. Typically, moisture can cause an ice blockage, flame failure, sputtering

›› Seasonal treatments can be utilized every fall to help prevent sludge and remove moisture.

flame and corrosion-caused leaks from oxidation. Other problems that occur in fuel-oil-tank storage include sludge, varnish, waxing, gelling and general oil degradation.

Therefore, the most effective way to prevent these issues is a year-round preventive treatment with an antifreeze and other additives that minimize these ailments by dissolving sludge and removing moisture. A year-round treatment can be applied every fall as part of an annual heating-system checkup. Also, since summer effects can cause condensation within the tank, a mid-year treatment can be sold to the customer to apply themselves in the spring.

> **Once too much moisture or sludge accumulates, the customer is looking at system downtime, several hours of repair and the expense of curative chemicals.**

Year-round treatments are not curative, but they can prevent problems from manifesting over the course of several years. Once too much moisture or sludge accumulates, the customer is looking at system downtime, several hours of repair and the expense of curative chemicals. In severe cases, the service technician may need to revert to dumping, cleaning and refilling the tank, which will cost the customer hundreds of dollars, especially considering the cost of a fuel-oil refill. A year-round fuel-oil treatment, along with periodic filter replacements, can also minimize blockages in the fuel line to the burner.

‹‹ An annual test to detect if excessive moisture is present in the fuel-oil tank can help alert technicians to issues that can occur over time, such as microbial growth that can lead to sludge and blockages.

Not unlike the gasoline-additive market for engines, all year-round fuel-oil treatments are not based on the same sci-

‹‹ Annual preventive maintenance can help avoid costly repairs and premature system failure.

ence, but some manufacturers make the same claims. For example, some treatments are merely kerosene, which will not dissolve sludge or remove moisture. Additives with aromatic hydrocarbons, such as naphtha solvents, have a high enough kauri-butanol value to dissolve sludge. Likewise, additives such as glycol ethers serve the dual purpose of de-icing and removing moisture. A manufacturer's material safety data sheets will help determine which products use the most effective chemicals.

Another part of the annual fuel-oil system checklist should be a test detecting excessive water accumulation. Typically, service technicians use a paste that detects and locates water in fuel-oil tanks. The reddish-brown paste is applied to a dipstick that reacts in the presence of excessive moisture by turning fluorescent yellow-green.

There are many moisture-detection products on the market, but some methods are better than others. For example, some products depend on a pH reading to detect moisture. However, this method can produce false readings or no readings at all in the presence of alcohol, which concentrates in water.

Obviously an oil tank with no water is the goal in a perfect world; however, managing water to lower levels with chemical additives might offer the customer the most service-call value vs. time-consuming heating outages and fills. If the fuel-oil line pick-up is 4 in. above the tank's bottom, a good rule of thumb would be to maintain moisture below 1.5 in., which can be determined with the aforementioned dipstick method. A water absorber can also help reduce excessive water to those manageable levels.

Excessive water can also develop microbial growth, which can lead to sludge and blockages. Microbes cannot exist in oil, but they can exist in water and use oil for nourishment.

Most of the aforementioned prevention methods are not a matter of life and death, but heating systems left untreated over time prematurely fail or create catastrophic repairs that could be easily avoided with annual treatments and checkups. It is up to the service technician to suggest and use preventive products. Homeowners will likely pay for the extra service and appreciate the conscientiousness with loyalty every fall.

Harvey Grodjesk is Vice President of Operations for the Stewart-Hall product line of RectorSeal Corp. Grodjesk is a 37-year veteran of the chemical heating-product industry. RectorSeal offers a variety of products for fuel tanks and fuel lines, such as year-round treatments, water-detection pastes, water and sludge dispersant, and several products for boilers. For more information, visit www.rectorseal.com.

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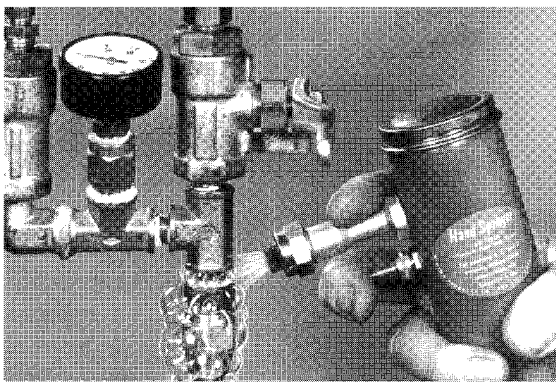

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