

CASE STUDY: CLOSED LOOP HEATING SYSTEM IN ICELAND

PIONEERING A NEW ERA OF SAFETY, EFFICIENCY, AND COST BENEFITS IN WATER TREATMENTS.

About Iceland:

Iceland, due to its volcanic locale, utilizes geothermal energy extensively for heating, with 87% of buildings benefiting from this natural heat source. However, geothermal water, while abundant, often contains high concentrations of dissolved sulphides and iron. These elements can lead to significant challenges such as corrosion, scaling, and growth of iron-related bacteria (IRB), leading to further fouling. The added presence of anaerobic sulfur bacteria results in unpleasant odors. Although there are products on the market aimed at treating these issues, they often use hazardous chemicals and do not effectively combat the distinct bacterial challenges posed by the volcanic region.

The Challenge:

The primary obstacle was **bacterial infestation in the heating waters**, which caused corrosion, fouling, and slime in the heating systems of an apartment building. This not only necessitated frequent maintenance, leading to increased costs but also required the water to be chemically treated. Existing market solutions were laced with toxic chemicals and were largely ineffective in treating the unique bacterial problems inherent in volcanic regions.

The Experiment:

LubeCorp Manufacturing Inc. introduced its product, Heating/Cooling System Water Treatment (HC/S). For the study, HC/S was applied to the problematic heating system in an Icelandic apartment building for a period of two years.



Figure 1: Heated Sidewalk



Figure 2. Heating system battery in an apartment building in Iceland



Figure 3. Closer look at the brown, slimy deposits caused by bacteria

The Outcome with Heating/Cooling System Water Treatment (HC/S):

Post-treatment with HC/S, scaling and fouling were entirely eradicated. Tests showed that the utilization of hot water improved, leading to a subsequent reduction in energy costs. This efficiency arises from the fact that HC/S lowers surface tension, thereby enhancing the heat transfer between water and pipes, and also lubricates the circulating pump with its water-soluble lubricants. Additionally, the built-in inhibitors in HC/S completely stopped corrosion. Furthermore, the product proved versatile, being compatible with all antifreezes and suitable for various heating/cooling devices in both commercial and industrial setups.

The Results:

The two-year trial demonstrated HC/S's effectiveness in not only addressing the immediate challenges of corrosion and bacterial growth but also in **optimizing the heating efficiency and reducing energy costs**. Following the success of the trial, Hrein Orka, LubeCorp's distributor in Iceland, is advancing with larger-scale tests in various Icelandic buildings.

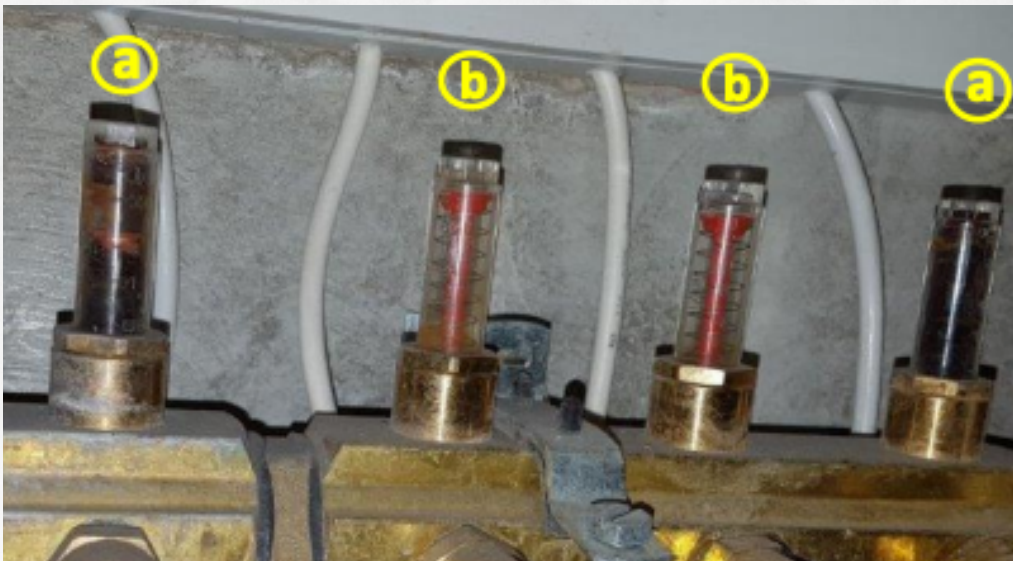


Figure 4. Heating system battery in a house in Iceland;

a) Untreated
b) 15 months after treatment with LubeCorp's HC/S Water Treatment

THE RESULTS

- Elimination of Bacterial Growth
- Reduction of Maintenance Costs
- Environmental Safety
- Improved Heating Efficiency
- Elimination of Scaling and Fouling
- Corrosion Prevention
- Versatility
- Expansion of Trial