

SAFE Heating/Cooling System Water Treatment

Case Study: Closed Loop Heating System

The Problem:

Water used for heating purposes in an apartment building in Iceland is infested with bacteria causing corrosion, fouling and slime. This results in frequent maintenance and increased costs. Furthermore, the water needs to be treated with chemicals to reduce these problems. All products on the market contain toxic chemicals, many are ineffective.

Iceland is a pioneer in the use of geothermal energy for heating purposes. Due to its location in a volcanic region, geothermal waters are used for heating everything from pavements, parking lots, shopping malls, houses, apartments to commercial buildings. In fact, geothermal heating in Iceland is mandated and 87% of all buildings are heated with geothermal water.



Figure 1. Heated Sidewalk

Heating water can contain high levels of dissolved sulphides causing corrosion and scaling. High concentration of iron is a breeding ground for iron related bacteria (IRB), which result in brown, slimy deposits further corroding and fouling the heating systems. IRBs are commonly found in any circulating water heating/cooling systems that contain oxygen, although they are known to grow in waters with as low as 0.01 ppm oxygen and can create problems in stagnant to low flow rate conditions. Another problem is anaerobic sulphur bacteria resulting in foul-smelling gases. Finding a solution to this problem has always been a problem.



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

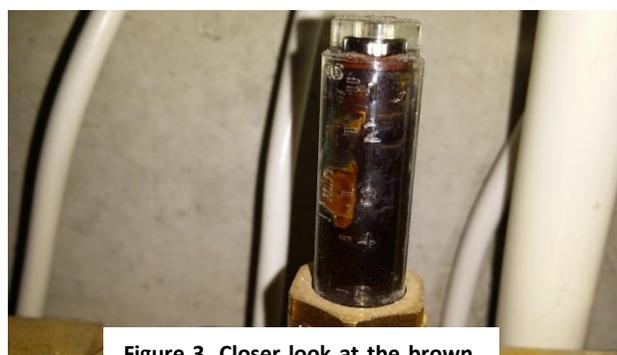


Figure 3. Closer look at the brown, slimy deposits caused by bacteria resulting in corrosion and fouling

There are products on the market to treat the water, but many use harsh, toxic chemicals and are quite ineffective in treating the stubborn bacteria found in the volcanic regions. Moreover, the toxicity of the chemicals is problematic in spills, leaks and water disposal.

Solution:



LubeCorp Manufacturing Inc. has developed a product called [Heating/Cooling System Water Treatment \(HC/S\)](#), which contains no toxic chemicals and completely eliminates microbial activity, eliminates scaling and fouling, prevents corrosion, is biodegradable and is environmentally safe to flush into municipal sewage systems. HC/S was tested in Iceland for a period of two (2) years with excellent results. The product is blended in at 25:1 ratio and extends water life up to 10 years with proper maintenance – this measure comes from the company’s experience, where the technology has been in use for over 15 years in LubeCorp’s hydraulic and waste treatment fluids. Microbiological activity is eliminated by biodegradation of bacterial food supply i.e. calcium, magnesium, phosphates, sulphates and iron oxides, hence requiring no biocides.

Figure 4. shows performance of LubeCorp’s Heating/Cooling System Water Treatment almost 15 months after the initial treatment. The house had problems with fouling caused by bacteria for 3 years prior to the use of HC/S. In this picture, 2 glass viewers kept from the time prior to the HC/S treatment are compared to the glass viewers used from the time when when HC/S treatment was performed.

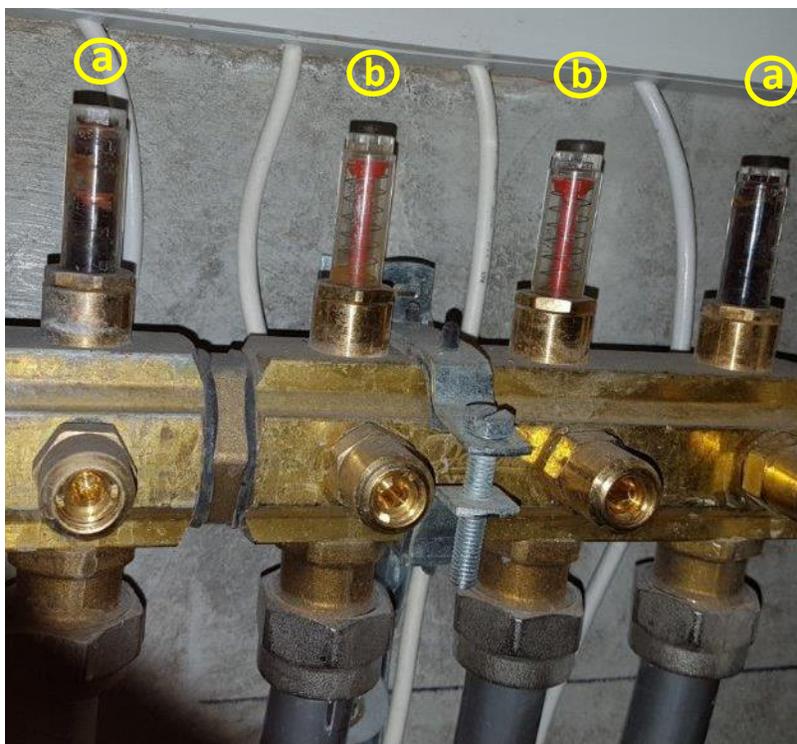
Figure 4. Heating system battery in a house in Iceland; a) untreated; b) 15 months after treatment with LubeCorp’s HC/S Water Treatment



a) untreated



b) 15 months after treatment with LubeCorp’s HC/S Water Treatment



Increased Water Utilization and Heating Efficiency

Scaling and fouling is eliminated with LubeCorp's H/CS, confirmed by tests from a large apartment building in Iceland, which show improved utilization of hot water reduced energy costs. This is because heating/cooling transfer contact between water and the piping is optimized through reduced surface tension; i.e. H/CS eliminates fouling, increases heat transfer and lubricates the circulation pump with H/CS built-in water-soluble lubricants. Corrosion is eliminated with H/CS built-in inhibitors. The product is universal, compatible with all antifreezes and can be used in a wide variety of heating/cooling equipment – both in commercial and industrial applications.

With a 2-year test completed, LubeCorp's distributor in Iceland, Hrein Orka, continues with larger scale trials in Icelandic apartment and commercial buildings.



Figure 5. Commercial Cooling Tower



Figure 6. Residential In-floor Heating



Figure 7. Cooling Tower Battery

About LubeCorp Manufacturing Inc.

LubeCorp Manufacturing Inc. develops and manufactures high performance and SAFE metalworking fluids, hydraulic fluids and waste water treatment products, while also producing high performance lubricants and fuel conditioners.

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