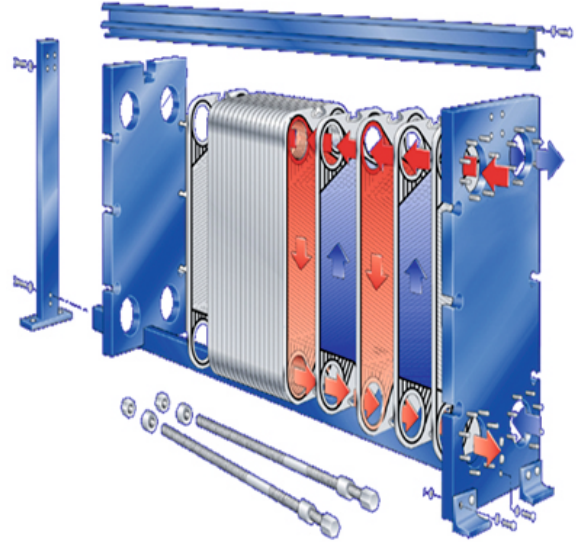


## CASE STUDY

### Improved Heat Transfer in a Plate Heat Exchanger



### Overview

Plate heat exchangers are often used in heating and hot water systems. In this case it is being used in a hot water system of a hotel on the secondary return.

### Key Problems

The efficiency of the Plate Heat Exchanger has been dramatically reduced by limescale. The build-up acts as an insulation barrier and reduces heat transfer. This leads to significantly increased energy consumption, less efficient operation, increased maintenance and could lead to premature failure.

### Our Solution

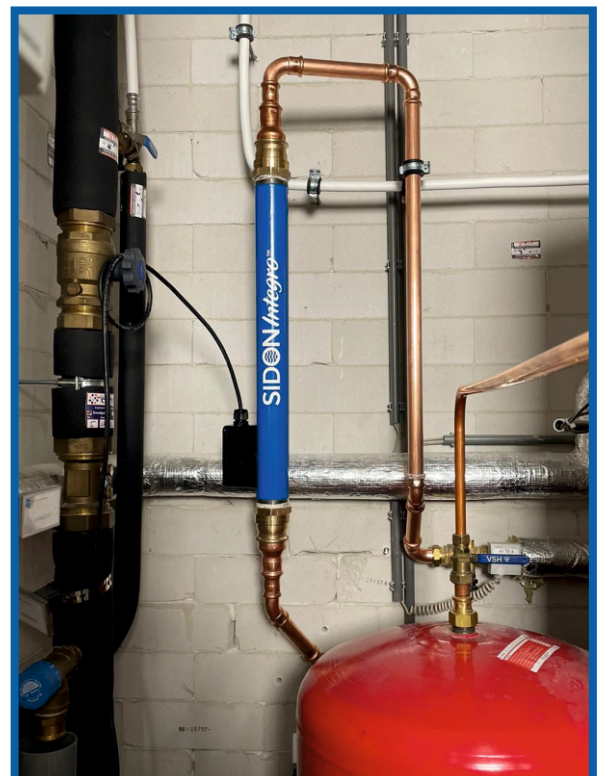
Our technology, the Integro™, was installed in the hot water loop (on the secondary return) in order to remove all of the existing scale build-up in the plate heat exchanger and keep it free from limescale on an ongoing basis.

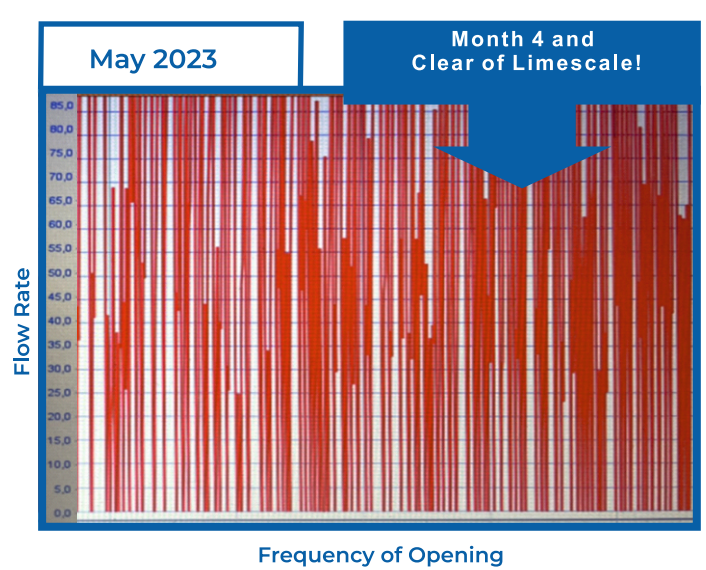
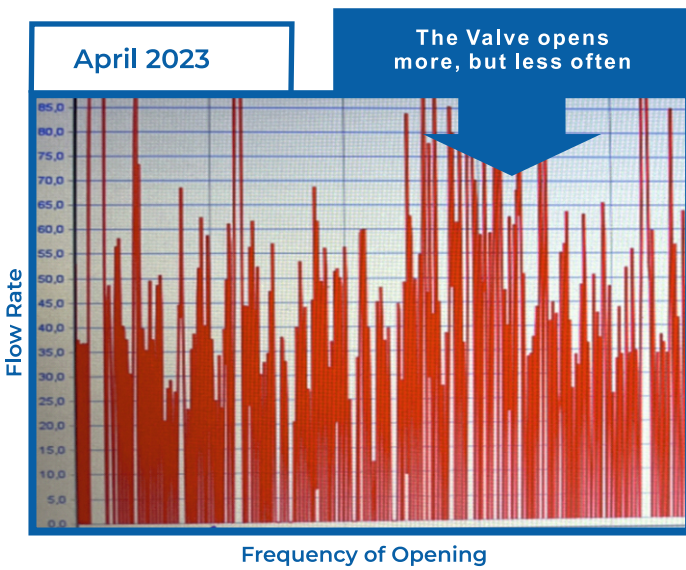
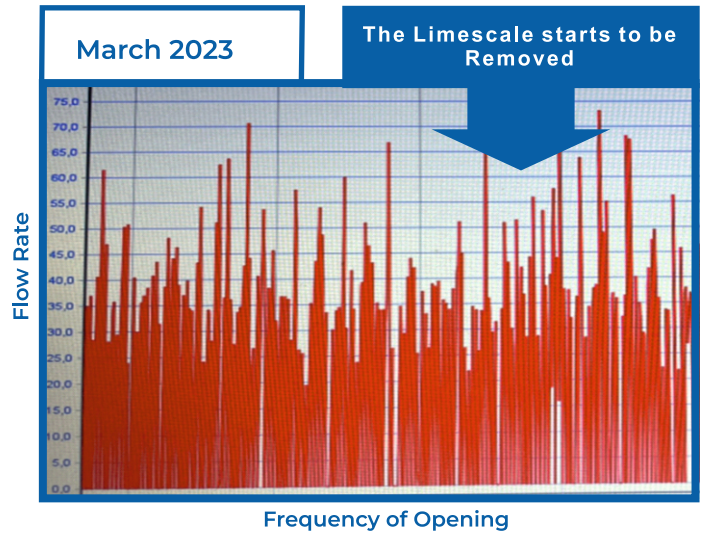
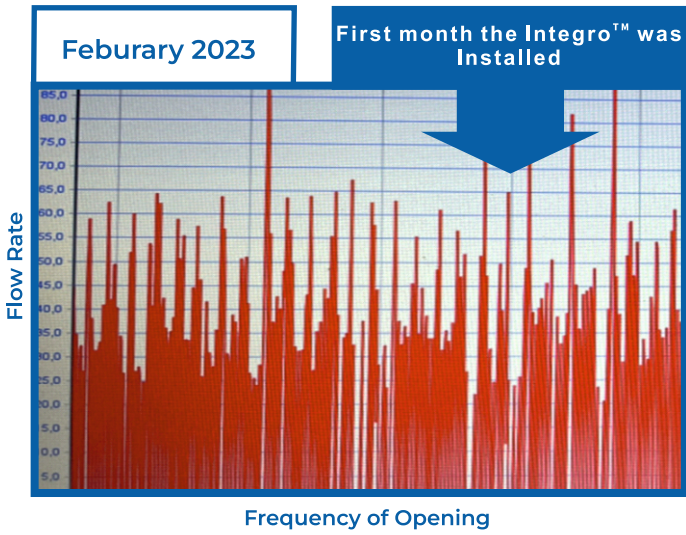
### The Results

The graphs (over page) are from the valve that regulates the water inlet to a plate heat exchanger. The purpose of the valve is to regulate the flow in order to give the heat exchanger enough time to heat the water to the target temperature as it passes through.

The data is over four months and starts when the Integro™ was installed. You will see that in the first month the valve is opening up less (Flow Rate), and more often (Frequency of Opening). This is to slow the flow of water as the heat exchanger is not getting effective heat transfer because of the historical limescale build-up.

Over the next three months you will see the valve begins to open more (taller red lines on the graph), and less often (less red lines). **This is because the scale is being removed, creating better heat transfer.** This allows more water to pass through over a shorter period of time and still reach the desired temperature.





## Summary

The operational efficiency of this heat exchanger has been greatly improved, and it is **now clear of limescale**. As a result, as well as significant energy savings, breakdowns and maintenance will be dramatically reduced.



The Carbon Trust in the UK estimates that just 1mm of limescale in heating equipment increases energy consumption by up to 7%, with 6mm Increasing consumption by as much as 40%. We estimate in this case approximately 20% improved efficiency and reduction in energy consumption.



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