

Aqua Unique
Overholmvej 8 B
DK-8722 Hedensted

30. June 1995

Solution to scale problems on plate heat exchangers

Test start: 6. February 1995
Situation report: June 1995

Place of installation: Vestjyske Slaughterhouse
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Boilerman: Orla Laursen

Water treatment: Magnetic water treatment

Manufacturer: Aqua Unique
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Presenting the Problem: Limescale build-up in plate heat exchangers for 60° C and 82° C water production. Steam cooling and hot water production is reduced to such an extent that acid-cleaning is necessary every 14 days.

Technical Data: To avoid undesirable production shut down, both systems (60° C and 82° C) have been constructed each using two plate heat exchangers which are installed in parallel and can be used alternatively during acid-cleaning.

60° C

The exchanger pulls 8-10° C water, which is heated to approx. 60° C, then removed to a storage tank.

82° C

The exchanger pulls water at approx. 55° C from the storage tank, which is then re-heated to approx. 82-90° C.

Solution to the problem: **Phase 1 - (partial solution)**

On Feb. 6, a magnetic water treatment unit was installed to the cold water supply of both the 60° C and 82° C systems:

1 unit WA227 EFL 2 1/2" - Capacity: 9-33 m3/h

The installation of this water treatment unit produced only a partial solution to the limescale problem as its efficiency is reduced by both the circulation pumps (60° C and 82° C). Turbulence (cavitation) in the pumps, distort the achieved crystal structure of the limescale. Therefore a magnetic water treatment unit must be installed on the pressure side of these pumps. NB: Dimensioning should correspond to the pump's capacity.

Phase 2 (the complete solution)

The installation of further two magnetic units, 1 unit installed on the pressure side of each of the circulation pumps (60° C / 82° C).

Result:

Extended cleaning intervals have been achieved, despite the fact that the water treatment system was not constructed as prescribed by the manufacturers:

Before treatment: Cleaning interval 14 days

After treatment:

06.02.95 - 21.03.95: Cleaning interval 45 days

21.03.95 - 08.05.95 - 45 days

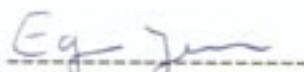
08.05.95 - 07.06.95 - 30 days*

* The shorted cleaning interval results from the plate heat exchanger being readjusted to produce water at 70° C (previously 60 ° C water was produced), this increasing lime precipitation in the heat exchanger.

Conclusion

The system has proved to be a most satisfactory solution to our limescale problems. Our cleaning intervals have increased from 14 to approx. 45 days. In addition the lime has become softer and more porous, and easier to remove.

Best regards,


Egon Jessen
Chief Engineer


Kristen Pedersen
Boilerman