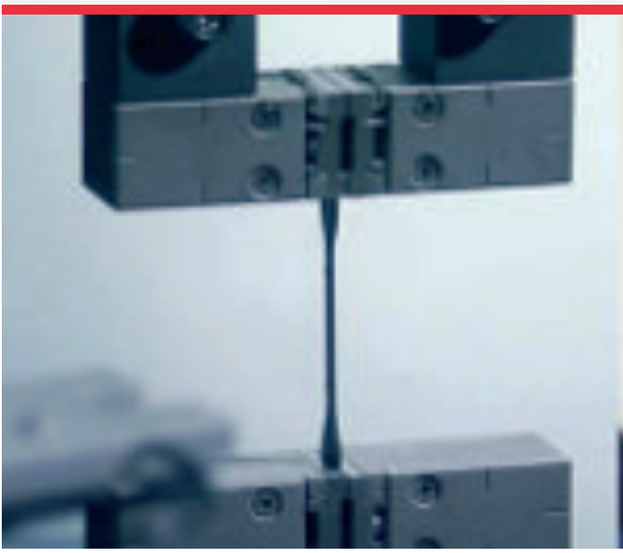
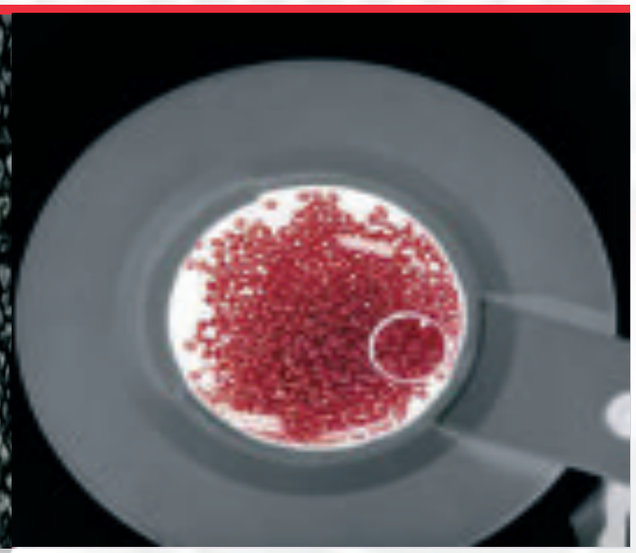
Aquabion



Functional Test

Galvanic element for the treatment of water

Dipl.- Eng. Maik Schulte

Lanxess Deutschland GmbH

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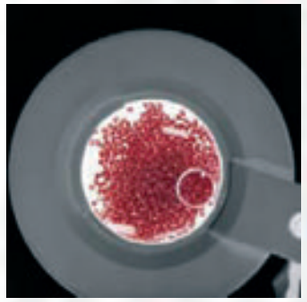
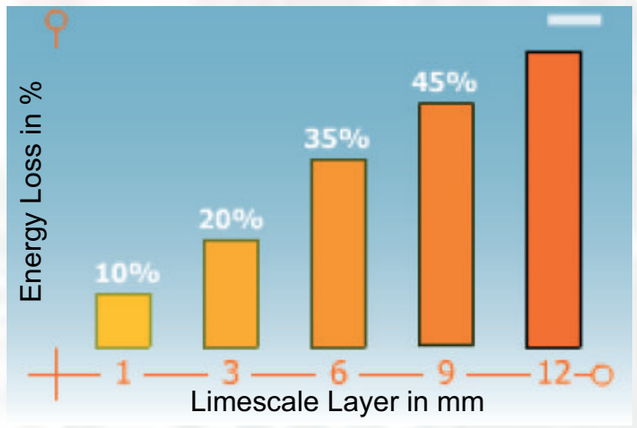
Energizing Chemistry

Current State



Problem:

- corrosion/calcification of the machines/periphery
  - process water → calcification and corrosion
  - demineralised water → corrosion
- Cost of energy and operating resources
  - water consumption
  - energy loss



Solution Approach:

Water treatment using galvanic element (Aquabion)

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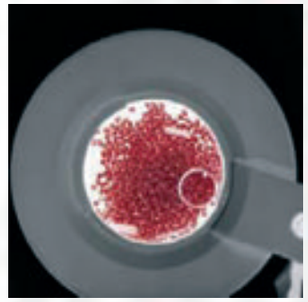
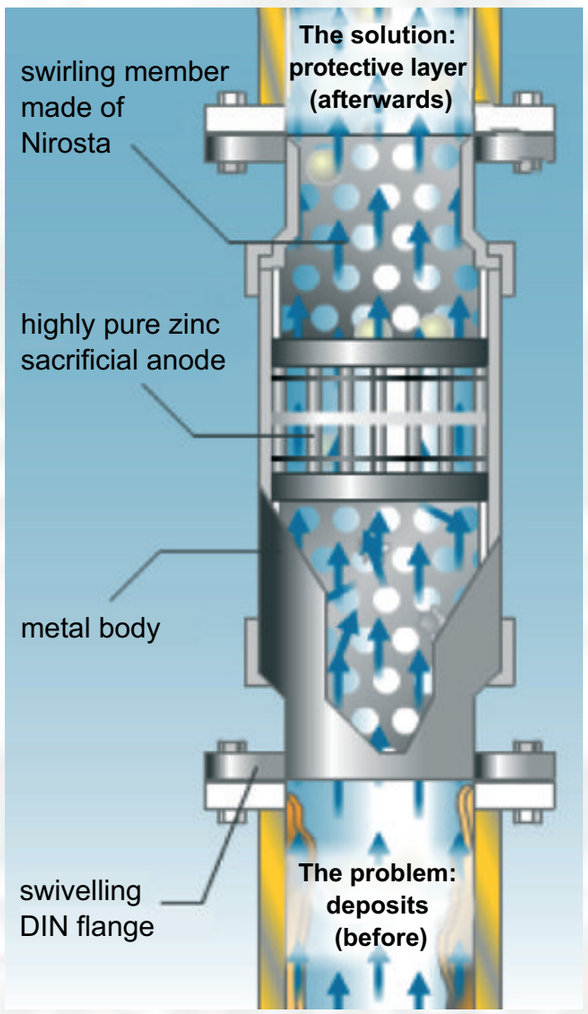
Description and Functional Principle



The Aquabion:

Zinc sacrificial anode functions as galvanic element, in order to turn the aggressive limescale into neutral, non-adhering lime.

Corrosion protection → zinc anode is oxidised before the other metals



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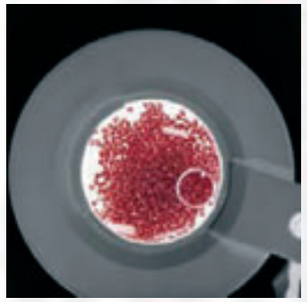
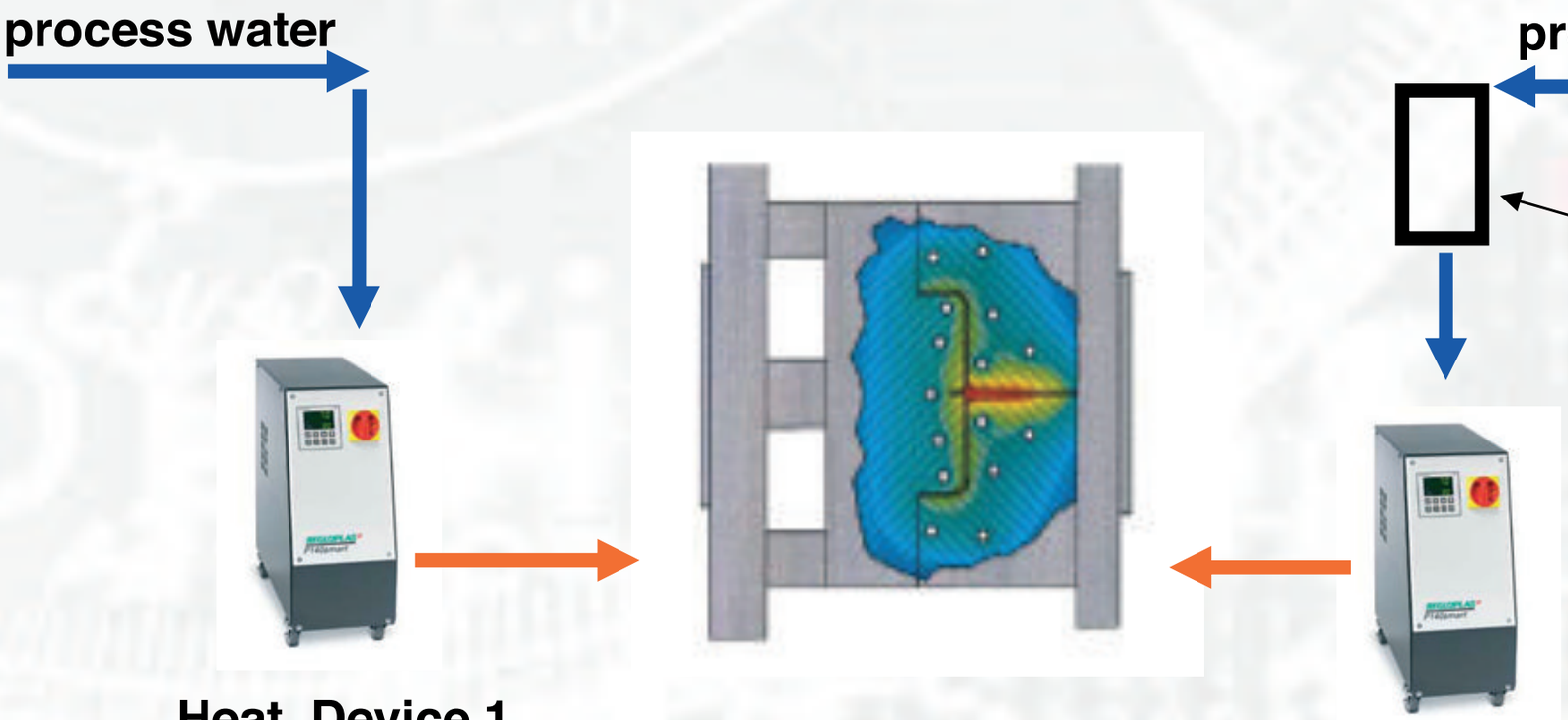
Test Setup and Method





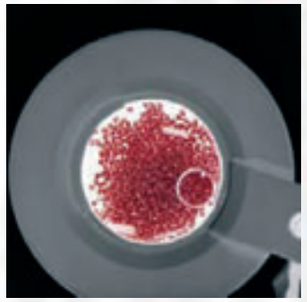
Heat. Device 1

Heat. Device 2

Both heating devices (new condition) are used to heat the injection moulding tools at the Arburg machine. Device 1 heats the ejection side, device 2 the nozzle side. The first heating device is supplied directly with process water. The galvanic element is installed between the process water supply and the second heating device.

Production is carried out with this setup for approx. half a year and then the heating devices are checked for limescale and corrosion.

Analysis
Heating Rods



Deposits are present on the heating rods in both heating devices. In the unprotected device, however, which is connected directly to the process water mains, substantially more deposits have formed, and the layers of these are also thicker.

Without Aquabion

With Aquabion

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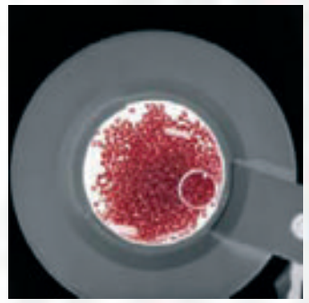
Analysis
Heating Rods

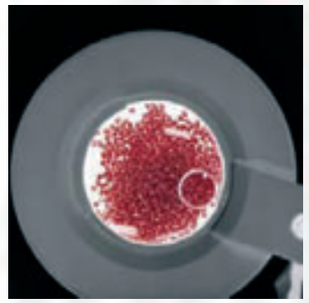


The pictures below show the quantity of deposit that has fallen from 2 heating rods during cleaning.

Without Aquabion

With Aquabion

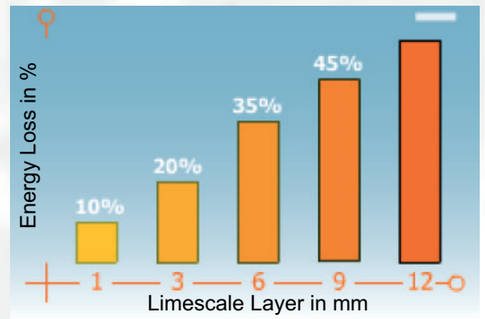
Conclusion



• The use of Aquabion reduces the area of deposit and above all the thickness of the layers of deposit. The deposits are, however, not entirely prevented.

An improvement over pure process water was proven and so extension to the entire technical centre is to be recommended. (systems heated with process water)

In addition to the savings to be expected on energy costs, other reductions in costs are also likely, as a result of decreased component failures (valves).



• It is questionable as to whether process water can be used in combination with Aquabion for present-day devices heated with demineralised water.

→ Suggestion: after the heating devices are cleaned, use the same test setup and method with demineralised water and process water + Aquabion.

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