

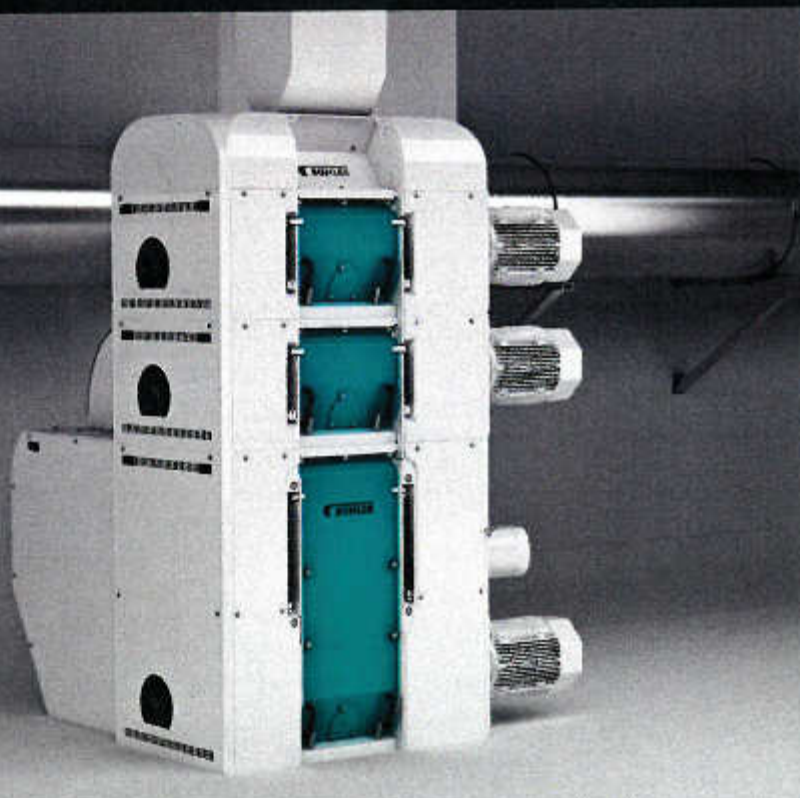
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BETTING ON THE RIGHT HORSE

Cold sterilization with anolyte

Bad Innauer Mineralquellen GmbH is a producer of mineral water that has always been open to technological innovations. In 2008, for instance, this company was faced with investment decisions in its bottling area. The challenge was to replace the disinfectants, as well as the hot-water cycle, that were then part of the CIP process of the bottle washer.

Eventually, the management settled on an Aquadron water treatment system as a solution. This system relies on anolyte as a cold sterilization agent. The Aquadron system selected by Bad Innauer Mineralquellen is made by Innowatech GmbH. This system is capable of producing Innowatech Anolyte, a highly effective disinfectant, right at the application site.

Bad Innauer Mineralquellen is located in Haigerloch-Bad Innau, a town in the German state of Baden-Württemberg, sandwiched between Germany's Black Forest and the Swabian Alb regions.

The company can look back on a long history, which began around 1700, when small mineral wells bubbling out of the ground were discovered in the Eyach valley. In 1733, a large well was discovered, which was soon

named the "prince well" after the local Prince Joseph Friedrich von Hohenzollern-Sigmaringen.

Subsequently, the company evolved under different owners and names. In 2010, the name Innauer Fürstenquelle GmbH changed to Innauer Mineralquellen GmbH. Since then, it has been under the management of Jochen und Wolfgang Ketterer. Today, the plant employs a staff of 65 and produces about 75 million fillings per year.

As early as 1733, the water from the Innauer well had achieved such a good reputation that its precious liquid was pumped by hand into jars and hauled by horse-drawn drays to many local customers. As more and more people discovered the great taste of the Innauer water, the company widened its distribution network and even shipped its water to as far away as Augsburg, Zurich and Stuttgart.

Wolfgang Mehnert

Studied brewing at VLB Berlin. Since 1996, in technical field support functions in the food and beverage industries. Since 2013, responsible for the international food and beverage market at Innowatech GmbH.



Innowatech Aquadron SGX allows for the generation of anolyte right at the application site.

Since then, market conditions have changed dramatically. Today, the company has a water portfolio in glass bottles ranging in size from 0.25 to 0.75 liters, as well as a special "gastro-bottle" of 0.75 liters. A PET-line was added in 2003 for containers from 0.5 to 1.5 liters.

In 2008, it became clear that the CIP process for the bottle washer needed to be upgraded, primarily to replace the disinfectant then in use as well as the hot-water cycle. Imnauer Mineralquellen GmbH purchased the anolyte cold-sterilization process of Aquadron Innowatech GmbH for the following reasons:

- Anolyte is a highly effective disinfecting agent capable of destroying all germs. This is why the technology is being used in many applications in the beverage industry.
- In addition, this process meets all the legal requirements for use in the treatment of drinking water.
- Anolytes are effective in a wide range of temperatures, from 1 °C to 75 °C.
- It is quick and easy to verify the effectiveness of anolyte treatments in simple lab tests.
- Anolyte is pH-neutral. Therefore, it is compatible with many materials. Specifically, it is non-corrosive and protects elastomers.

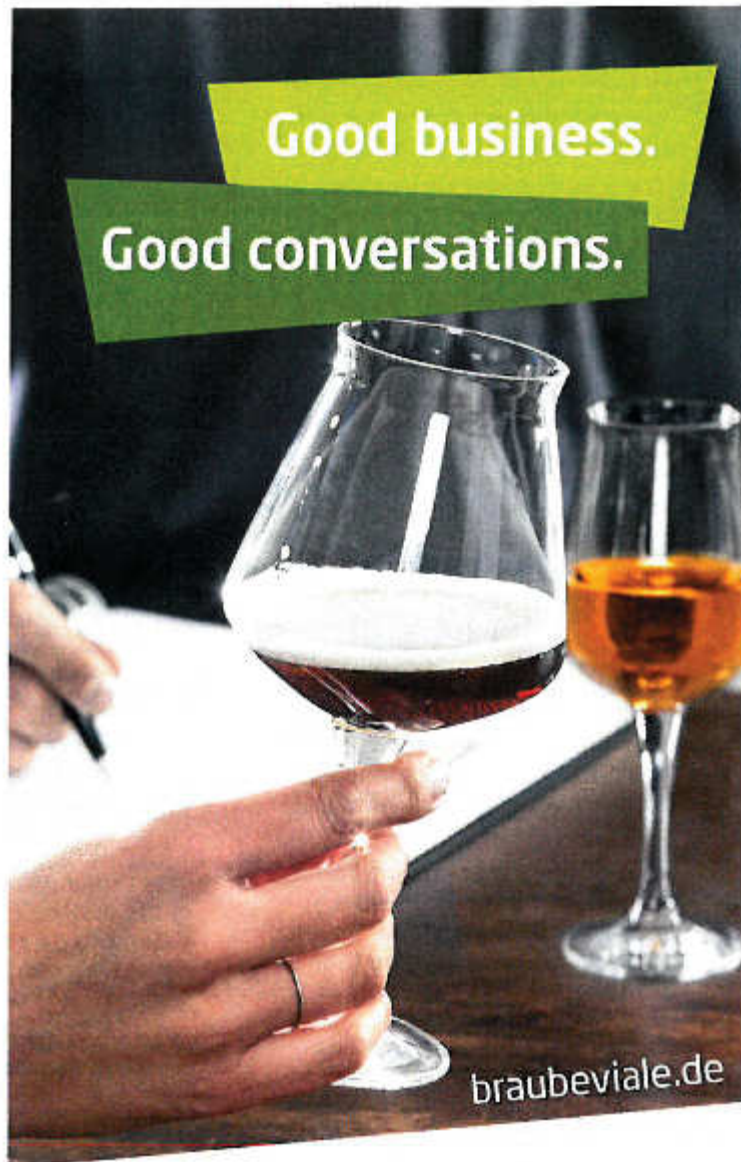
Step one: The changeover from one disinfection medium to another

After the installation of the anolyte producing system in 2008, the first step was to replace the peracetic acid as the disinfectant in the warm water zones of bottle washer with anolyte. In addition, all water in the cold-water zone was treated with anolyte in accordance within the regulations of the (German) Drinking Water Ordinance. The hot-water zone, too, was charged with anolyte, in order to achieve proper disinfection.

Step two: CIP disinfection of filler and mixer equipment

The results of the use of anolyte in both the hot-water and cold-water zone of the bottle washer were convincing. Verification of the absence of germs was by the Orange Serum Agar (OS Agar) and Standard I agar (ST I agar) tests. This led to the consideration of additional uses of the anolyte process in other parts of the production process, resulting in the decision to convert the CIP disinfection of the filler and mixer to anolyte treatments.

The hot-water cycle with water at a temperature of more than 85 °C – supplied from a CIP tank of about 12 m³ – was replaced with a disinfection cycle at room temperature. In this new process, anolyte is added at a concentration of 4 ppm as a disinfectant



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to fresh water. As expected, in a microbiological test for germs, no germs were detected.

The new process eliminated atmospheric humidity in areas where steamy conditions are undesirable. It also reduced the risk of staff being scalded. Finally, it eliminated the substantial primary energy costs associated with heating of 12 m³ of water. Anolyte can be stacked as a disinfectant and, because of its conductivity, is easy to meter for the correct dosage.

Changing requirements

The demands on bottling lines have increased dramatically in recent years. When the glass line was put into operation in 1994, there were only a few drink types to fill – mineral water, lemonade and orange soda.

Nowadays, the same line has to handle many more drinks. At Imnauer Mineralquellen, it must now accommodate more than 30 varieties of waters, spritzers, lemonades, and other drinks. Obviously, back then, the filler equipment could not have been planned for today's requirements.

This especially brings the mixer into focus. Few mixers are designed with cleaning, sterilizing, or disinfecting in mind. The conventional cluster of different vessels, piping and connectors makes it next to impossible to ensure proper cleaning, disinfecting

or sterilizing. Because of the age of the equipment, the construction of the filler and mixer, and the weak points in the system, the entire installation is subjected to a hot-water cleaning regimen once every three weeks.

In spite of all these measures, however, the capacity of the Imnauer plant was nearing its limits – but not the concepts and ideas of the staff that ran it. Anolyte as a means of disinfecting was deemed to enable still further capacity expansion. This expansion actually happened in the spring of 2014, and led to the next steps in the implementation of anolyte disinfection:

Step 3: Integration of the CIP system with the syrup sector.

Step 4: Anolyte use in the PET line CIP system.

Step 5: Filler disinfection in the glass and in the PET bottling line.

Years of practical applications of the anolyte system and the disinfectant Innowatech Anolyte have demonstrated the effectiveness of the procedure.

In addition, there are several other benefits:

- Reliable elimination of all drinks-infecting microbes.
- Fast response times.
- No recontamination from water residues in containers.
- No sensory, physical and chemical alterations of the product.

- No damage to stainless steel and elastomers.
- No need to use and storage hazardous materials.
- Because of pH-neutrality, no waste water issues. Instead, an improvement in COD and AOX values.
- Low maintenance costs.
- A reduction of water consumption from reduced flushing during cleaning & disinfecting.
- Safety in use and handling.
- No warehousing and logistics costs.
- Easy integration with existing and legacy systems (short installation time).
- The product complies with all national and international drinking water regulations as well as biocidal products regulations.

Conclusion

The use of Anolyte is advantageous for several reasons. The most important benefits of the changeover to disinfecting with anolyte for Bad Imnauer Bad Mineralquellen are the ability to cold-sterilize the filler and mixer. Also, the savings achieved through implementation of the technology resulted in a very short amortization period of the investment in anolyte equipment. □



CIP disinfecting of the mixer (left) and filler (right) constituted the second step in the changeover to the Innowatech Anolyte disinfectant.