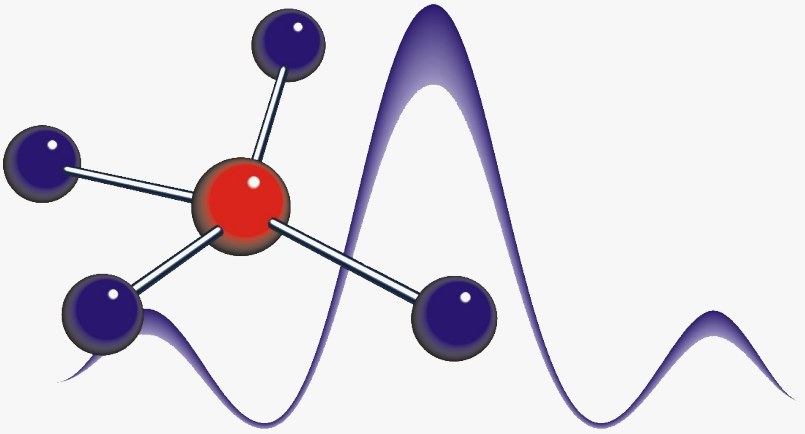
# Optimized water softening systems thanks to quality-controlled regeneration

*The new measurement process ensures the full utilization of the capacities of the softening plants, so that resources are saved.*

RONNEBURG, THURINGIA, GERMANY, July 8, 2019 /EINPresswire.com/ -- Novel water hardness monitoring
For the production of soft water, more and more ion exchangers with sodium chloride regeneration have been used for more than 50 years. The course and dynamics of the softening process depend on the ion exchange resins used, the proper regeneration processes, the removal quantities and their dynamics.

water softening analysis devices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These processes do not run constantly in practice, which is why resin capacities are not exhausted in all water softening systems for reasons of variability and the lack of process monitoring. For this reason, the softening plants are traditionally regenerated in quantity or time. Investigations on this revealed capacity reserves of 20% to 50% of the resin capacity used.

It would be desirable to constantly monitor the softening process. The aim is to detect the desired degree of exhaustion and to effect the regeneration control of the water softening system depending on the hardness. However, this is not possible with today's largely traditional and known photometric measurement techniques.

Limits of conventional processes
In recent decades, the cyclic photometric measurement method has emerged as the technical standard for soft water monitoring. The residual hardness is determined randomly by means of color change, the residual water hardness value determined is compared with the specified soft water threshold value and the alarm is triggered when the threshold value is exceeded.

With a larger number of measurements, the indicator consumption and the mechanical wear of the measuring device increase, resulting in readjustment, cleaning and functional control with increased service costs. To avoid this, long measurement breaks with low indicator consumption and low measurement frequency are sought.
Regardless of this, however, aging processes occur, which lead to creeping problems that would not occur with increased measurement frequency. In addition, manual control activities must be performed to verify the process-safe condition to compensate for lack of self-control.

Thus, a compromise between measurement frequency and susceptibility has to be found in order to limit operating and maintenance costs. However, a high level of process reliability and continuity is increasingly being sought.

Process-safe continuous soft water monitoring
By means of a novel soft water monitoring process, which was developed with the product line "Softcontrol" of the OFS GmbH, a measuring and control device with potentiometric measuring procedure for the permanent monitoring of the soft water is presented. This not only monitors the residual hardness and the measurement functionality very sensitively in cyclic circumstances, but also has intelligent self-monitoring.

Previous problems and obstacles of conventional measuring techniques are solved and a high reliability and economically continuous measuring functionality is ensured over long periods of time.

The process principle is based on a calcium-magnesium-selective electrode, which constantly determines the difference in water hardness between hard and soft water and evaluates to a predetermined threshold value.

The applied differential method offers the possibility to exclude sensor drift and to monitor the sensor quality. Thus, the soft water hardness is monitored, so that a high process and control security is given. In accordance with these possibilities, not only threshold monitoring in soft water, but also optimal conditions for a quality-controlled regeneration of water softening systems have been proven. Thus, a premature regeneration release is prevented by hardness and the soft water capacity is optimally utilized.

Effective capacity utilization
For the first time, this principle, with sensor life independent of the measuring cycles and lacking indicator means, enables continuous monitoring of water softening systems under economically effective conditions.

Thus, according to different practical conditions, 20% to 50% fewer regeneration cycles could be achieved when switching from batch to quality-controlled operation of the water softener. This reduced the costs of regeneration, kept the amount of soft water constant and the quality of the water high.

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