



Actina™



Advanced pellet softening
to reduce potable water hardness

WATER TECHNOLOGIES



ACTINA™

Pellet softening for drinking water treatment

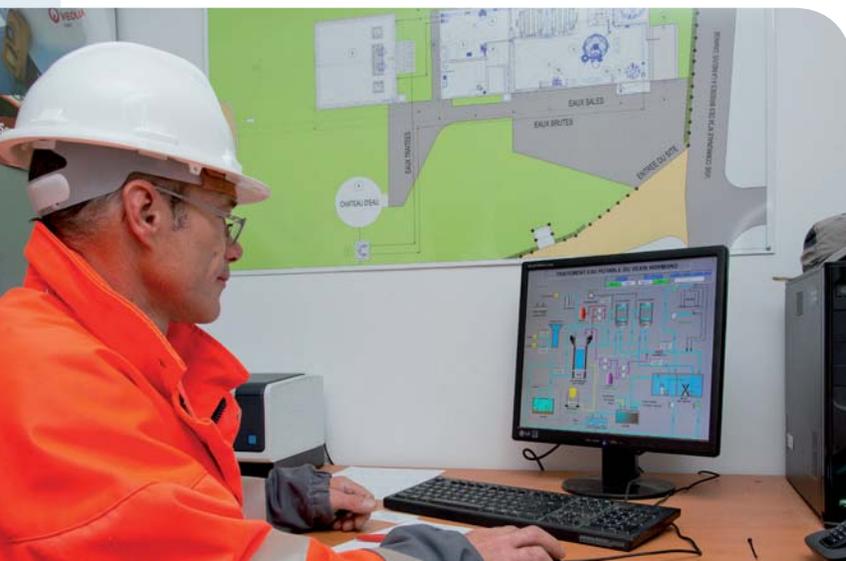
The daily use of hard water (or scale-forming water), loaded with calcium ions, results in whitish limestone deposits most noticeable on glassware and shower systems.

These deposits progressively clog hot water pipes and affect proper operation of household appliances and water heaters. Chemical additives such as detergents, sequestering agents and regenerating agents can be used, but overtime, the efficiency of the devices decreases, resulting in higher energy consumption.

For hard water above >150 mg/L Total Hardness it is recommended to treat the problem as far upstream as possible.

To soften hard water, Veolia Water Technologies has developed **Actina™**, a pellet reactor process tailored to municipal drinking water softening. By reducing calcium hardness, Actina™ allows municipalities and industries to enhance the asset management of their distribution network while preventing negative impacts on the end users. This solution also allows a significant reduction of impacts on downstream on-site or centralized wastewater treatment.

Reducing the number of individual, point-of-use softening devices will reduce the chloride loading on wastewater treatment systems.



ADVANTAGES

- ▶ Veolia's more than **35 years of expertise** in pellet softening;
- ▶ **Compactness, simplicity and reliability** of operation;
- ▶ **Robustness and additional barriers** against iron, manganese and metals;
- ▶ **No limit on calcium hardness removal**
→ media regeneration not required;
- ▶ **Energy savings**
→ unlike an electric carbonate removal system;
- ▶ **No associated sludge treatment needed**
- ▶ **No brine to dispose of**



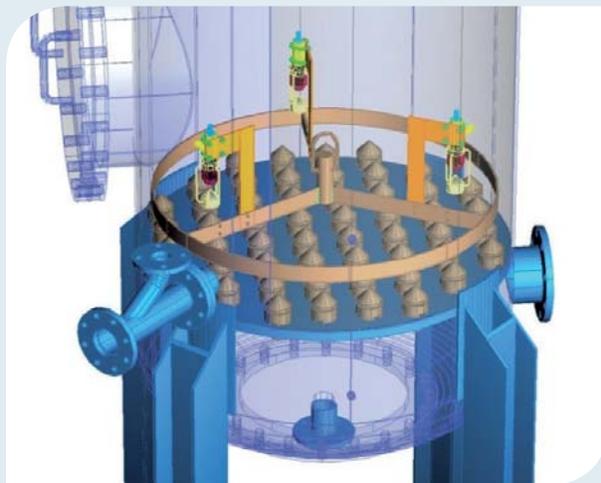
ACTINA™: Operating principle

The Actina™ process is based on the pellet softening principle, which consists in modifying the calcium-carbon equilibrium in the water to be treated. Soda or lime injection is used, causing limestone crystallization on the sand.

Actina™ is composed of a vertical reactor in which a bed of sand is maintained in fluidization, thanks to the pumping of water to be softened. This very fine sand is used as a crystallization seed for the pellet softening reaction, that is to say, the calcium carbonate's precipitation on the surface of grains of sand. The highly basic pH that enables crystallization is obtained by alkaline (soda or lime) addition to the reactor base.

The calcium carbonate thereby removed presents as beads, a few millimeters in diameter that are easily storable, transportable and recoverable.

The use of a fluidized bed allows Actina™ **to run with high rising rates**, around 32 to 90 gpm/sf and results in a **smaller footprint**.



▶ Veolia strength: pretreated alkaline injection system

The injection system is paramount, as it must mix basic reagent at the heart of the reactor while avoiding local calcium carbonate deposits on the injection orifice.

The injection device, by Veolia, ensures **the reagent's online dilution with softened water and the protection of injection nozzles**. It is a **removable system, easily accessible to the operator**.



▶ Calcium carbonate beads: a reusable final product

Beads are automatically extracted at the reactor base when their size reaches a few millimeters.

Once extracted, the calcium carbonate beads are stored in filtering bins for small capacities, or in draining silos. Following drainage, their **water content is lower than 5%**.

The beads are **easily transportable**, and **can be recycled** as road embankment material, pipeline trench sublayers, cement raw material, soil amendments or as an animal feed supplement.

