References

# Water treatment plant



**Uponor involvement**

- 2.4 m diameter Weholite tank

## Aeration tank to improve the water quality

Water company Ylä-Savon Vesi Oy needed a solution to improve the water quality in water supply process. The solution was an aeration tank made of Weholite.
Many of Ylä-Savon Vesi Oy's treatment plants have been in operation for a long time, but the actual water production has only been the company's responsibility for five years. - The company's Kuusimäki plant in Iisalmi has been missing a part of the process that improves water quality. The need for aeration has been recognized, and the aeration tower was included in the procurement program in 2010, says Tero Heiskanen, who worked as a civil engineer at Ylä-Savon Vesi Oy during the design phase of the project. - We knew that there is no space for a tower inside the plant building in Kuusimäki. The technical solution therefore had to be designed so that the tower would be made outside the plant.

**Project Facts:**

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| Location<br>Iisalmi, Finland | Completion<br>2010 |
| Building Type<br>Municipal | Product systems<br>Potable water, Tailor made constructions |
| Project Type<br>New building | |

The people of the company began to explore alternatives. In many systems, the tower is made of steel. According to Heiskanen, the use of plastic material has often been hampered by the small size of a traditional plastic pipe. Some plants

have used towers built of two to three plastic pipes in parallel.

- We then became acquainted with the use of Weholite pipe in barrel and tank applications, among other things. Today, it is also easy to get a large-diameter Weholite pipe, so we started to find out the suitability of the solution for the Kuusimäki plant, Heiskanen says. Mika Ohvo and Sami Seppälä from Uponor Infra, who were involved in the design of the tower, were pleased that they had been contacted from Ylä-Savon Vedas at an early stage.

- We also had the idea that aeration towers would complement the products of the water supply system well. The contact of Ylä-Savo water thus came in a good seam. Our technical advice had time to think of a solution in peace. The cooperation went very well from start to finish. The aeration tower was built at the Vaasa plant from a 2.4-meter Weholite pipe.

The process becomes more efficient

Ylä-Savon Vesi Oy has a periodically updated plan, the aim of which is to provide customers with the best possible water. - With the renovations of the Kuusimäki plant, we also wanted to produce even better water for the region's food industry, which needs a lot of water in its production, says Helena Valta, CEO of Ylä-Savon Vesi Oy. The company's water plant process development plan was completed as early as 2007. The study covered all nine water treatment plants owned by Ylä-Savon Vesi. The suitability of the processes and possible remedial measures were assessed on the basis of raw water quality. Streamlining of processes was planned as needed.

The client and the designer drew up the order of priority and implementation of the efficiency measures and selected the facilities most in need of reform. From the beginning, pipeline and plant designer Pekka Iivari from the design company FCG Finnish Consulting Group was involved in the design.

- The carbon dioxide content of the raw water of the Kuusimäki plant was high. Therefore, the alkalinity and calcium content of the water produced by the treatment method used, i.e. limestone alkalization, were high. This could be seen by consumers as precipitates in hot water appliances.

Under certain conditions, water exposed the copper pipes to corrosion. - The water produced was already good quality domestic water. With the reforms, we sought to fine-tune the process to make good water even better.

New technical solution

In aeration that improves water quality, water is led to the tower from above. The water flows through the infill mattress in the tower, removing the carbon dioxide in the raw water. Aeration can be adjusted by blowing clean air under the tower through the mattress upstream.

In this way, water treatment becomes more efficient in the further process, when, among other things, its carbon dioxide content can be changed. - When water is consumed from many plants, the quality of the network is as uniform as possible, Tero Heiskanen says.

The amount of air does not require the tower to withstand greater pressure than normal in normal use, but the Weholite tank can also withstand the full water pressure of the tank, for example in the event of washing or disturbances.

- As the tank could not be installed indoors, hygiene had to be taken into account in its design: no free openings could be left. The service hatches must be tight, as outdoor air pollutants must not get into the domestic water, Pekka Iivari reminds.

The tower as a ready-made structure on the site

Tero Heiskanen thanks the design process, in which the journalist was actively involved. The design team considered how the bushings and joints would work best. After the principle solutions, practical work was done at the factory.

- In such a situation, the pipe manufacturer is, of course, an absolute expert. We received suggestions for different construction options. Everyone had a common interest in developing a new kind of technical solution, Heiskanen praises. At the suggestion of the manufacturer, among other things, the planned substructure was changed. This made the bottom more solid and provided good insulation.

- The thermal insulation of the tower was done at the factory, and there was no need to work with the villas on the construction site, Heiskanen says. The aeration tower was completed at the Vaasa plant. Savo-Karjalan Vesihuolto Oy installed the aeration tower in the summer of 2010.

- The concrete slab under the tower had already been made in advance. On top of the base slab, we installed feet just over a meter high, on which we lifted a round concrete slab. The tower was attached to it, says work manager Kalevi Savolainen.

Valves and piping were installed in the space under the tower. The insulation of the lower part was also supplemented. The finished tower was raised with a truck crane. - The work went as planned. Already during the installation work, guests visited the site. The insulated aeration tank is interesting because there is little space for such massive structures in a few places, Savolainen says. The contractor completed the tower by installing exterior cladding.

## Weholite aeration tank



