

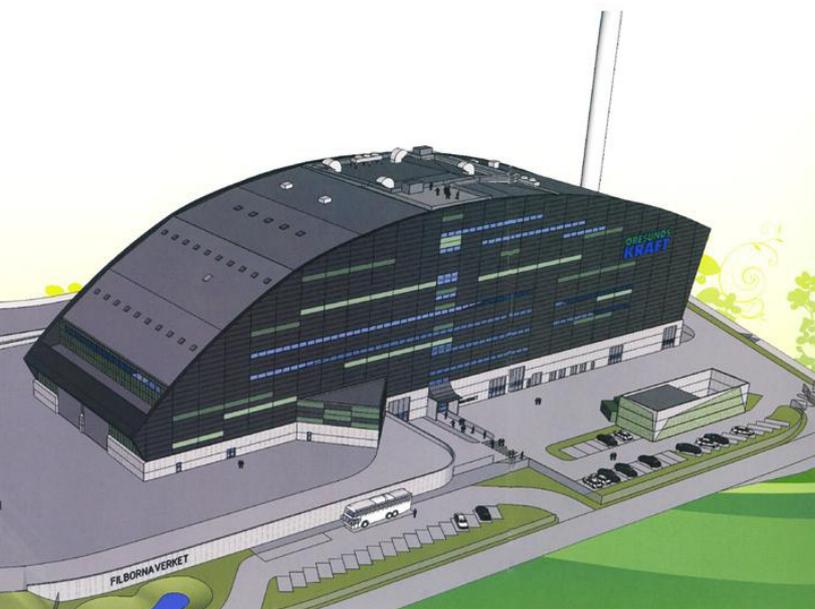
Multifunctional ADIOX[®] scrubber with condensation/heat pump after a semi-dry system

Öresundskraft Filborna WTE plant, Helsingborg, Sweden

The new 70 MW Waste-to-Energy plant, Filborna in Helsingborg, Sweden, was taken into operation in October 2012.

Götaverken Miljö was contracted to supply a multistage scrubber system to be positioned after a semi-dry gas treatment system. The unit includes stacked scrubber sections for removal of ammonia and remaining acidic components as well as recovery of energy by flue gas condensation. An absorption heat pump system provides for optimal efficiency.

The scrubber, of tower packing type, includes packing material and droplet separators of ADIOX[®]-material for maximum dioxin removal and dioxin «memory effect» prevention.



Flue gas cleaning

The multi-stage scrubber installed in series with the semi-dry system will guarantee extremely low pollutants' emission levels. Wet gas treatment processes are the most efficient and due to the high buffer capacity in this system it will provide an additional safety function in case of upstream process disturbances. Residual ammonia from the SNCR- system is removed. The effluent water is treated in a state-of-the-art water treatment system which includes ultra-filtration and reverse osmosis.

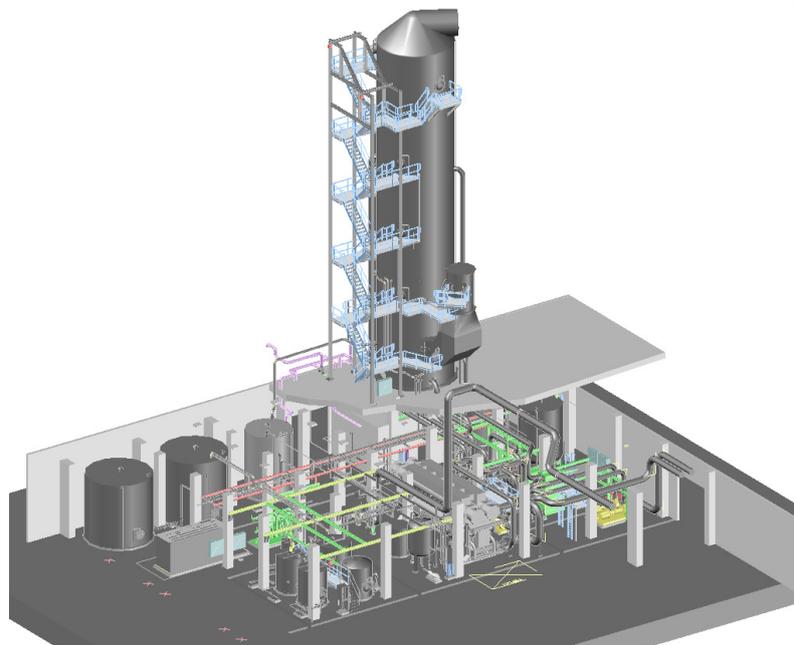
The scrubber is equipped with ADIOX® tower packing and droplet separators in order to provide a guarantee that the dioxin emission levels are kept during all periods of operation.

Energy recovery

The energy recovery process is designed in order to maximize the energy output with minimum investment in a heat pump system. This is achieved in a two stage condensing system where in the first stage the flue gas is cooled by the return district heating water and in the second stage by an absorption heat pump.

Mechanical design

The scrubber process water circulation piping as well as downstream flue gas ducts are all fabricated in fibre reinforced plastics for maximum corrosion resistance.

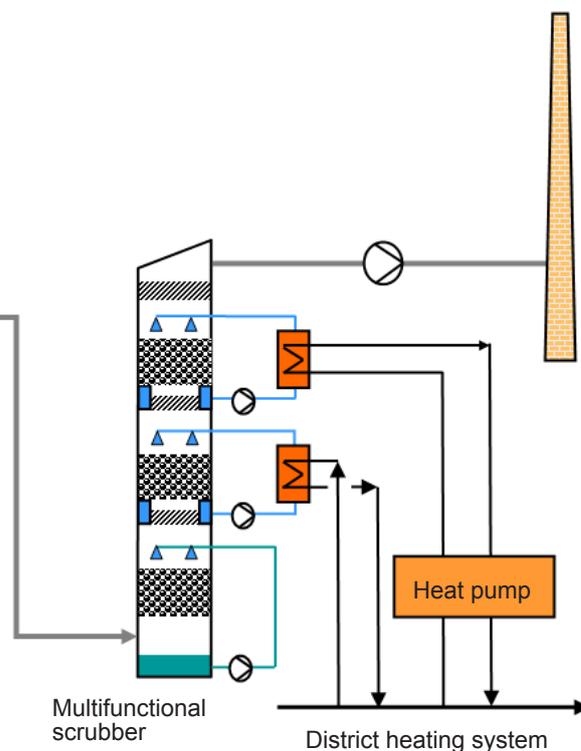
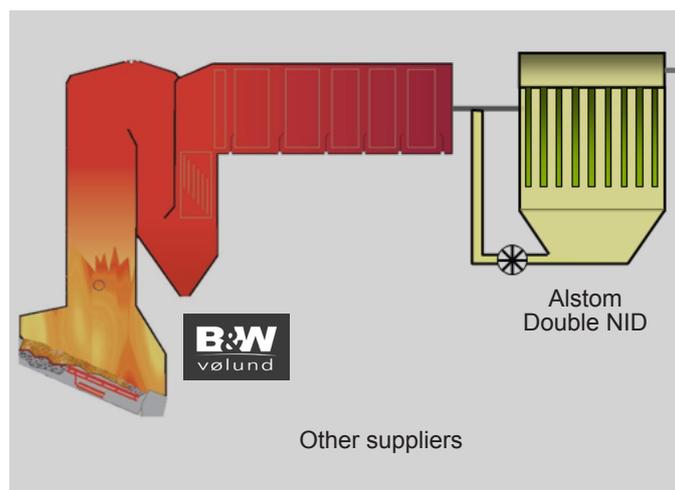


Götaverken Miljö's delivery to Filborna, Helsingborg.

The multistage scrubber structure is based on a patented design where the process water circulation tanks are integrated inside the scrubber structure, requiring no external water circulation tanks. The result of this design is not only a minimum footprint, i.e. minimum space required, but a consequence is also minimum energy consumption in the process water circulation pumps.

Process specifics:

- Flue gas flow (after boiler): 130 000 Nm³/h, w. g.
- Boiler rating: 70 MW
- Flue gas condensation: 15 MW
- Removal of: HCl, SO₂ and NH₃



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