Edition 35/2022

HydroGroup

Water News

WATER STORAGE WITH HydroSystemTanks®

Europe's largest stainless-steel drinking water storage tanks

Innovative, sustainable and long-lasting: HydroGroup®/Hydro-Elektrik GmbH is currently building a new drinking water storage system on the Kuhberg Hill in Ulm.

The drinking water storage system with three water chambers will contain 12,000 m³ of drinking water. Instead of conventional water chambers made of concrete, the system comprises three stainless-steel tanks with a useful volume of 4,000 m³. Once finished, the system will replace the two old concrete tanks. The smaller tank is still covering water supplies at the moment but the larger one was dismantled completely during a laborious process. Housed in a modern structure with a flat roof and a heart-shaped plot, the three stainless steel tanks measuring 25 m in diameter and almost 10 m high will form the core of Ulm's water supply network in the future. The steel hall lined with durable weathering steel and the 130 kW photovoltaic system installed on the roof underscore the public utility's resolve not to merely talk about sustainability but also actively implement sustainable solutions with state-of-the-art technology.

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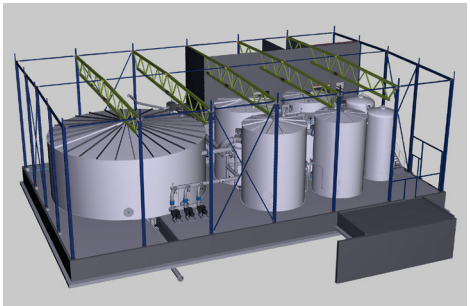
WATER TREATMENT IN NORWAY

New Tisjøen waterworks under construction

A waterworks with a planned capacity of 550 m³/h is being built upstream from the village of Minnesund for the Norwegian municipality of Eidsvoll and its more than 26,000 inhabitants.

Raw water is taken from the surface water in Lake Tisjøen. A completely new waterworks is being built using state-of-the-art HydroGroup® technology to reduce colour and the total organic carbon (TOC) and increase hygiene safety.



Consisting of two treatment lines with a maximum treatment capacity of up to 550 m³/h, the existing system contains an ozone generation system in three lines, three mixing and contact systems, two upright ozone reaction tanks, CO_2 dosing, two alkaline-effect upstream filters for hardening, two downstream filters for bio-filtration and a 1,000 m³ pure water tank for intermediate storage. What makes this new waterworks so special is that both the four large filter vessels and the stainless-steel pure water tank are being manufactured directly on site using a new production process.

The new waterworks is being installed next to an old waterworks still in operation. Once the new waterworks is complete and undergoes trial operation successfully, there will be a changeover to the new system and the old filter system will be taken out of service. Another special feature is that the energy from the inflowing water at a pressure of about 12 bar will be used to generate electricity in an upstream turbine house. The electricity generated will be more than that the waterworks itself requires, meaning a highly environmentally friendly system is being built. The municipality has consciously decided on a sustainable solution by using extremely durable stainless steel for all key process components.

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The water tower reinvented

Water towers are generally considered to be expensive and complicated to operate. This is not the case with the HydroSystemTower®.

The HydroSystemTower® is the innovative further development of the HydroSystemTank® with the end result being a state-of-the-art water tower. Assembled in the factory complete with thermal insulation, it is then transported to its installation location and mounted on the base provided by the client before being connected and put into operation. The lower section of the tank contains the installation room for the systems engineering with pipelines, valves, a room air dehumidifier and switchgear. Access to the installation room is via a thermally insulated door. Integrated water chamber lighting and external platforms with ladders and safety cages ensure safe, effective inspection visits.

A flexible all-rounder, the HydroSystemTower® can be used as a water storage tank wherever intermediate storage and an improvement or increase in supply pressure are required. It is also suitable in situations where an existing water tower needs to be replaced. As a basic rule, the tower is 4 m in diameter and has two water chambers with a total volume of up to about 150 m³.

One HydroSystemTower® with a volume of 2 x 30 m³, an integrated pressure booster system, extensive installation and a control system was manufactured, moved to its installation site and commissioned to supply water to a military training area in eastern Germany.

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EXHAUST VAPOUR CONDENSATE TREATMENT

Exhaust vapour condensate treatment plant under construction in Hanover

enercity Contracting GmbH is in the process of building a sewage sludge mono-incineration plant in the Hanover district of Lahe.

Once work is complete, municipal sewage sludge will be incinerated in the plant and used to generate heat. The supplied sewage sludge will first be homogenised in a mixing bunker and then conveyed to the drying system. Two disc dryers will reduce the water content in the sewage sludge to such an extent that it can then be used to generate heat. The water vapour produced during the drying process will be discharged into the public wastewater sewer as exhaust vapour condensate.

Problem:
condensate cannot be discharged into the wastewater sewer without prior treatment due to high concentrations of dust (particle load), ammonia or ammonium, and dissolved organic substances with a high vapour pressure.
This is why RWT GmbH was commissioned to plan and construct an exhaust vapour condensate treatment system.

All particulate matter is separated in an ultrafiltration (UF) system during the first process step. Filtration takes place via ceramic multi-channel tubular membranes with a pore size of 50 nanometres, which retain even very small particles and colloids. Since much of the particle load consists of organic substances, the COD content is also significantly reduced during UF. The ceramic membranes have a high mechanical, thermal and chemical resistance. A high overflow and occasional chemical cleaning are thus possible without causing any problems.
In the next step, the filtrate from the ultrafiltration is fed into a three-stage reverse-osmosis (RO) system. The dense polymer spiral-wound modules retain most of the dissolved organic substances and the ammonium. The water itself diffuses through the membrane. This permeate then only contains very low pollutant concentrations. Small amounts of antiscalant and, if required, biocides will be used to prevent crystallisation and biological fouling on the membranes.
The inlet volume flow into the plant will normally be 8.2 m³/h.
Advantages of the already supplied treatment technology are its high operational reliability due to thorough pre-treatment, the option of discontinuous operation, the low outlay for operating materials and the reliable retention of pollutants. This modern exhaust vapour condensate treatment plant is equipped with a PLC control system and is operated fully automatically except for chemical cleaning at regular intervals.
Most of the system components in the new building constructed especially for the plant have already been assembled, piped and wired. Commissioning is scheduled to start at the end of the year.

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MANUFACTURE OPTIMISATION

New MasterCut plasma cutting machine

With a **table 2.5 m wide and 15 m long** (extendible up to 25 m), the modern MasterCut plasma cutting machine provides economical large sheet metal cuts in a single piece at cutting or positioning speeds of up to **40 m/min**.

Operated at a relatively high air extraction rate of up to 9,600 m³/h, the sequential extraction system in the cutting table prevents air pollution on shop floors, thus ensuring a high work safety standard. The rapid air extraction rate requires a suitably large intake air volume. The heat from the extract air is therefore used directly in the extraction system to preheat the intake air, thus optimising energy usage. **This extraction system has a thermal efficiency of almost 100%.**

CONTAINER SYSTEMS

Small container with a big impact

Mobile drinking water treatment system on loan to spa town in Harz Highlands

A mobile ozone bio-filtration system installed neatly in a shipping container supplies almost 1,000 inhabitants in the spa town of Steina with immaculate drinking water. The raw water for treatment comes from a reservoir in the Steina Valley. The plant eliminates contamination by micro-organisms and humic substances from this water with two parallel lines consisting of pre-filtration, ozoning, a hardening filter, a multi-layer biological filter and final hygienisation by UV radiation. With a treatment capacity of 7000 l/h, the plant supplies the spa town with around 140 m³ of drinking water per day.

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