Edition 18/2012

HydroGroup

Water News

INFOS FROM THE HYDROGROUP

Facts

Micropollutants in drinking water

There has been increasingly frequent discussion in the media recently about the residues of chemical substances in drinking water, and their possible effects on the consumer. This gives the impression that the quality of our bodies of water, and of drinking water in particular, has worsened in recent years.

The fact is that nowadays, a very wide range of substances are being detected in many drinking waters. But it is also a fact that drinking water is also one of the most closely monitored foodstuffs - at least in Germany.

Firstly, the reduction of limit values has also lowered the threshold for permitted amounts being exceeded, and secondly, current analyses can detect substances in the nanogramme range (billionths of a gramme). This is lower by a factor of 1000 or more than was possible as recently as about 10 years ago.

In other words: Drinking water didn't used to be better than it is today. It was simply that not as many substances could be detected. Water is by far the best solvent. After all, this property also forms the basis for all life because the substances dissolved in water can feed both plants and animals. However, water cannot selectively distinguish between which substances are good and which ones are harmful.

Pesticides and their metabolites mostly enter the groundwater via natural seepage or via surface water discharge in rivers and lakes. This means that in most cases, pesticides can only be suitably removed as part of the drinking water treatment process. Possible processes are filtration via activated carbon or oxidative processes involving ozone (AOP process = Advanced Oxidation Process). Hormones and medicine residues enter the natural cycle via waste water. Many of the substances pass through sewage plants and enter the receiving water almost unaltered. We must also not ignore the veterinary medicinal products discharged via agricultural farmyard manure that enter the water cycle either into the groundwater or via the drainage of meadows and fields.

Although further waste water treatment with ozone can reduce pollution in the receiving waters, the diffuse sources from agriculture mean that drinking water treatment is in most cases essential in order to safeguard water quality.

Manfred Brugger

Drinking water treatment

New waterworks for Bamble

Hydro-Elektrik GmbH has won a large order from the Norwegian municipality of Bamble. The core of the order, which is being handled via Hydro-Elektrik AS, is the provision of all process technology for drinking water treatment based on the ozone biofiltration process. The plant can treat up to 680 m³/h.

New filtration techniques are being used for the first time in the plant. The process, which is based on a proposal by Hydro-Elektrik, provides for stainless steel filter vessels manufactured on location using the HST winding method. In all, two alkaline upflow filters with a diameter of 5.50 m and 7 m in height, plus two biofilters with a diameter of 6.70 m and 7 m in height, are being made. Stainless steel nozzle plates fitted with air cushion nozzles are being welded into the filters. Carbon dioxide is dosed upstream of the alkaline filter. This reacts with the filter material, dissolves it and thereby increases the water's calcium content. The water flows out of the alkaline filter and into the biofilter. The biofilter consists of a layer with broken bloating clay and a sand filter layer. The filtered water is temporarily stored in a 800 m³ stainless steel tank 13 m in diameter and 6.20 m high. The entire plant is controlled fully automatically via a modern process control system and PLC technology. Besides the required stainless steel pipes and fittings up to DN 600, the scope of delivery also includes the pumps and fan for the filter rinsing, as well as the ozone system technology including oxygen production. The municipality of Bamble in south-west Norway is home to about 14,000 inhabitants. The administrative centre is in Langesund, and the new waterworks will be built on Lake Flåte next to the existing pumping station (see photo above).

New technical information sheets

Climate management in water plants

In water engineering plants such as high-level water tanks, water works, wells and pumping stations etc., condensation sometimes forms on the cold surfaces of water-carrying plant components and structures if there is a lack of climate management. Moisture can also occur in walls due to diffusing atmospheric moisture, resulting in major structural damage. The main principles of climate control and dehumidification are explained in the new technical information „Climate Management in Water Plants", and tips are provided on how to select the right dehumidification equipment.

Cleaning stainless steel

Stainless steels are alloy steels with a chromium content of at least 10.5 % and a carbon content of less than 1.2 %. A dense and chemically resistant layer of chromium oxide (passive layer) forms on the stainless steel surface in conjunction with oxygen. This can resist many aggressive media and requires no further surface protection. Stainless-steel surfaces are hard, smooth and free of pores. No cavities for dirt and microorganisms can therefore come into being. Nevertheless, even stainless steel components must be cleaned regularly and disinfected when necessary. Stuck-on dust and production residues must be removed carefully during the initial cleaning or basic cleaning. The main principles of stainless steel cleaning and care are explained in the new technical information „Cleaning Stainless Steel", and tips are provided on how to select the right products.

Both information sheets are available on the Internet to download at www.hydro-group.de.

IMPORTANT DATES

10th - 11th April 2013

2nd South and East Bavaria Water Conference -Sparkassen-Arena Landshut

23rd - 26th April 2013

WASSER BERLIN INTERNATIONAL trade fair - Messegelände Berlin, Hall 2.2

24th - 25th September 2013

7. North Bavaria Water Conference 2013 - Scherenberghalle in Gemünden am Main

Production and use of oxygen in water treatment

Oxygen is one of the most important gases used in water treatment. Highly concentrated oxygen is used either directly as an oxidation medium for oxygen enrichment in the case of reduced waters and for the oxidation of iron and manganese, or indirectly as a process gas for ozone production. Industrial oxygen up to a purity of 95% can be produced from air using oxygen generators of the type „Hydroxymat".

Normal ambient air contains approximately 21% oxygen, 78% nitrogen and 1% other gases. During water treatment, the gas oxygen must be brought intensively into contact with the liquid water so as to achieve oxygen enrichment. Due to the high and disruptive proportion of nitrogen, the use of normal ambient air requires relatively large contact tanks and oxidator tanks. Due to the nitrogen in the air, disruptive nitrogen oxides that form corrosive nitric acid when they make contact with water are produced during ozone production from air - particularly at higher outputs. For these reasons, industrial oxygen has been increasingly used in recent years in both direct gassing and ozone production. In large plants or where a lot of oxygen is required, using liquid oxygen (LOX) is often the most economical variant. In plants in the low capacity range, producing oxygen on site is normally more economical.

PSA (Pressure Swing Adsorption) systems are used for on-site production. PSA systems work fully automatically on the basis of a simple physical principle. The compressed air produced in the compressor system is dried in the first stage, undergoes ultra-fine filtration and is temporarily stored in the compressed air tank. The compressed air is then fed to what is known as the oxygen generator. Oxygen generators produce industrial oxygen via concentration.

The generators work with two pressurized tanks filled with what re known as molecular sieves. Molecular sieves are special ceramic materials that can absorb gases under pressure. The sieves used in the oxygen generators absorb a certain limited amount of nitrogen and thereby increase the oxygen content in the process air to more than 95 %. When the pressure is relieved, first the oxygen is drained off into the oxygen tank, followed by the nitrogen into the atmosphere.

Our plants made entirely of high-quality components are optimally harmonised with each other and guarantee highly efficient and reliable oxygen production.

An oxygen generator line working fully automatically consists of the following individual elements:

- Compressor system for producing compressed air
- Refrigeration dryer
- Compressed air tank with oil/water separator
- Air filter combination made of fine filter and activated carbon filter
- Oxygen concentrator with oxygen tank
- Electronic control unit
- Distributor and controller unit for dosing

Hydroxymat oxygen generators can be retrofitted in existing systems. They guarantee reliable oxygen production in the working range up to around 30 Nm³/h. Connecting several lines in parallel enables both high redundancy and a high capacity to be achieved.

Hydroxymat 20 oxygen generator system in a line for 2.3 Nm³/h oxygen production

LEGAL INFORMATION

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