



Preparing process water from surface water rather than groundwater? An affordable and sustainable alternative is a water plant, built and operated in accordance with the DBFO concept!



Precursor of sustainable thinking and actions

## Sustainable water plant and oxygen-free water for Akzo Salt



AkzoNobel Salt in Delfzijl produces salt that is extracted from underground salt layers near Veendam and Winschoten. By pumping process water into the salt layer, the salt dissolves. The brine that is formed is then pumped to the salt factory in Delfzijl. Until the middle of the 1990s, the water that was required for the production was extracted from groundwater and then processed. Environmental awareness in combination with an anticipated increase in water demand encouraged AkzoNobel to look for alternative options.

They approached North Water - the result is not just an alternative to water extraction and processing water into oxygen-free water, but the construction of a water plant that was fully in accordance with the DBFO concept. This means that management and maintenance are also carried out by North Water. This makes the water factory for AkzoNobel probably the first industrial water plant in the Netherlands that was built in accordance with the DBFO concept.

### Process description

During the purification process, the surface water, which is taken from a side-branch of the A.G. Wildervanck canal in Veendam, is upgraded to oxygen-free and nitrate-low process water. The surface water enters the purification plant via an inlet system with grids that remove large pieces of dirt and a sieve system. Two low-pressure pumps pump the water via a micro sieve to the fluid-bed reactor. In the influent pipeline, methanol is dosed as a carbon source for biological denitrification (oxitron process). The oxygen-free, low-nitrate water is



then stored in a buffer, from where the process water is supplied to the two AkzoNobel sites. Minor temporary variations in AkzoNobel's demand are absorbed by the buffer. During the biological denitrification process, the biomass is formed on the sand grains in the fluid-bed reactor. The sand is withdrawn periodically from the reactor, after which the sand is separated from the biomass in a sand washer. The sand is reused in the reactor and the biomass is discharged directly into the wastewater purification plant in Veendam.



## Process-water quality

Parameter	Unit	Value
Nitrate (NO <sub>3</sub> -N)	mg/l	< 1
Nitrite (NO <sub>2</sub> -N)	mg / l	< 0,1
Oxygen (O <sub>2</sub> )	mg/l	< 0,1
Suspended solids (SS)	mg/l	< 25
Methanol (CH <sub>3</sub> OH)	mg/ l	< 0,1

## Technical details

Production capacity	10m <sup>3</sup> /year	Transport pumps	3 (2 + 1)
Hourly capacity	1,350m <sup>3</sup> /hour	Heiligerlee	650 m <sup>3</sup> /h
Fluid-bed reactors	2	Ommelandervijk	700 m <sup>3</sup> /h
diameter reactors	8 m	Transport pipes	
Bed height	2,2 m	Heiligerlee	13 km (ø 500 mm)
Process-water buffers	2	Ommelandervijk	3 km (ø 500 mm)
volume per buffer	350 m <sup>3</sup>		

