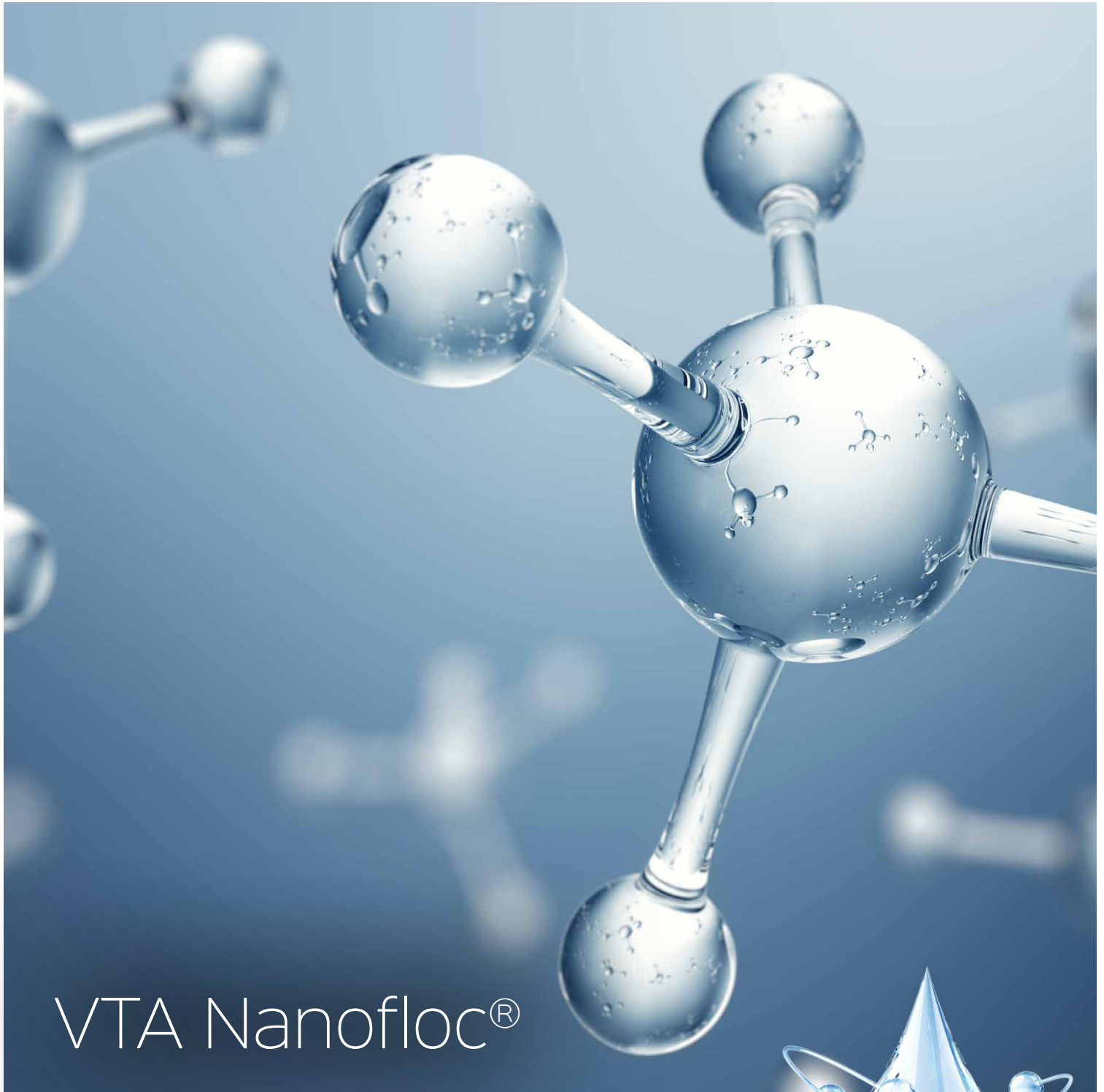



Tailored
system products


Innovative
water technology

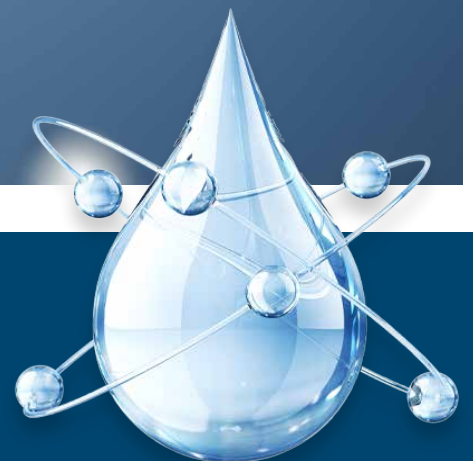

State-of-the-art
dosing technology


we clean water



VTA Nanofloc®

We clean water based on
state-of-the-art nanotechnology.





VTA Nanofloc®

Quick-acting effect and unrivalled penetrating power. VTA Nanofloc®, a high-tech product based on state-of-the-art nanotechnology. A knight in shining armour at peak times!

This multifunctional system product from VTA's in-house laboratories has been enhanced with properties that cause the formation of compact floc, leading to highly effective sedimentation of the suspended solid particles.



With its immediate effect and unrivalled penetrating power, VTA Nanofloc® is streets ahead of all other precipitants currently on the market.



Integrated metal oxide nanoparticles are bound to special organic charge carriers and trigger powerful chemical reactions in the treatment plant as required.



Even at extremely low dosages, it provides unique settling properties, high sedimentation rates and a low sludge volume index. This means pressure on the secondary clarifier is relieved significantly, even at high loads.

VTA Nanofloc® not only acts extremely quickly, but also in extremely low doses, making it particularly cost efficient.

ADVANTAGES

INCREASED SETTLEABILITY

- Huge increase in sedimentation rate (up to five times faster)
- Formation of extremely compact shear-stable sludge floc in record time
- Reliable binding of fine floc and suspended solids

LOWER COSTS

- Improved oxygen transfer
- Reduced aeration energy
- Accelerated breakdown of pollutants

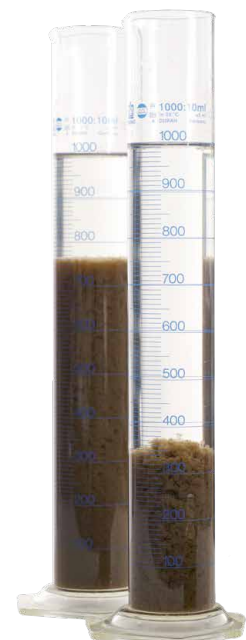
ADVANTAGES FOR SLUDGE TREATMENT

- Immediately visible and sustained improvement of sludge properties
- Increased dry substance content
- Minimisation of polymer consumption

VTA Nanofloc® sets standards

With its outstanding properties, VTA Nanofloc® makes the grade, especially for use in wastewater treatment plants:

- *Problematic operating conditions* with permanent hydraulic or seasonal overload.
- *Emergency situations* after incidents, unforeseen load surges and much more.



The fast-acting and reliable effect of VTA Nanofloc® is apparent in a range of practical tests.

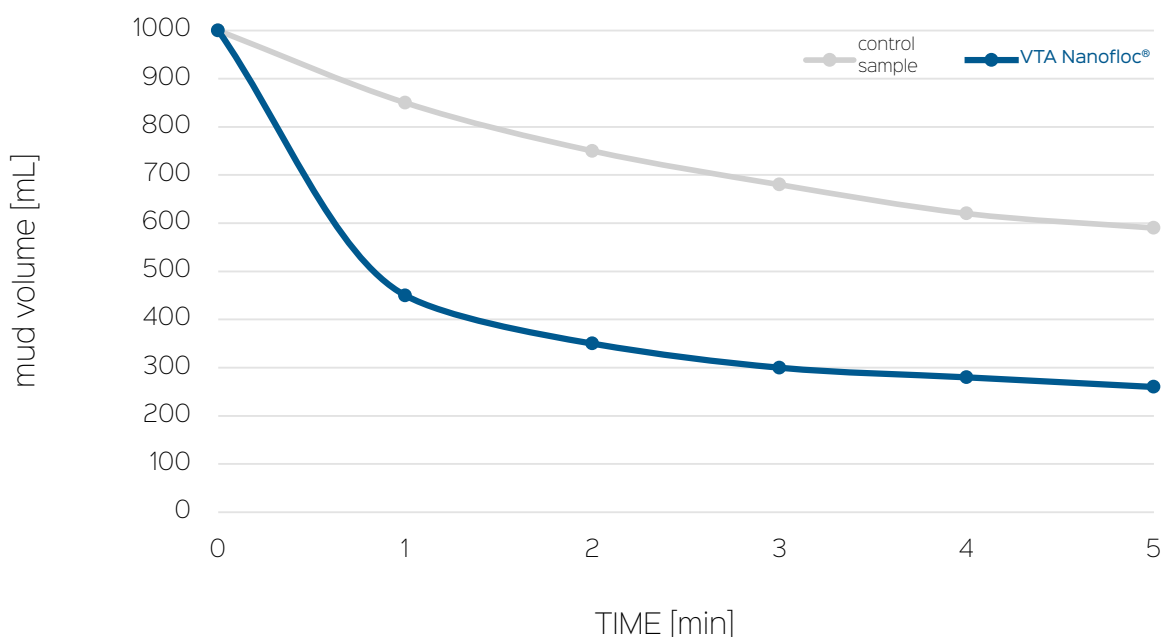
VTA Nanofloc® is much more than just a 'fire brigade' in times of crisis: As many practical applications prove, the product is also outstanding when it comes to optimising plant operation – particularly in treatment plants that have to cope with persistently difficult conditions, such as seasonal or permanent hydraulic overload.

APPLICATIONS

- Relief of the preclarification
- Exclusion of fine floc overflow in the secondary clarifier
- Treatment of excess sludge before thickening and dewatering
- Improved sludge volume index
- Sulphur binding
- Biomass retention in the digester
- Prevents foaming in the digester
- Degradation of lipophilic substances

SETTLABILITY

Effective and economical! Numerous series of tests confirm it: VTA Nanofloc® maximises the sedimentation rate of solid particles in record time – and at extremely low dosing quantities.



VTA NANOFLOC® IN PRACTICE

The treatment plant has a design capacity of 20,000 PE and a current load of approx. 15,000 PE.

Because of the current Covid-19 situation, there were serious changes at the treatment plant and the increasing volume of toxic substances in the wastewater caused damage to the ecosystem.



- Measurement period: 27 April - 7 May 2020
- Daily inlet volume: ~ 1000m³ (2/3 beverage industry, 1/3 municipal wastewater)
- Analysis: Sampling from the individual tanks followed by detailed microbiological analysis at the VTA laboratory
- Problem: High surfactant load, leading to disruption of the biocoenosis, increased growth of scum-producing filamentous bacteria, as well as impairment of the floc bacteria resulting in floc decomposition
- Dosage: VTA Nanofloc® in the ecosystem

GOAL

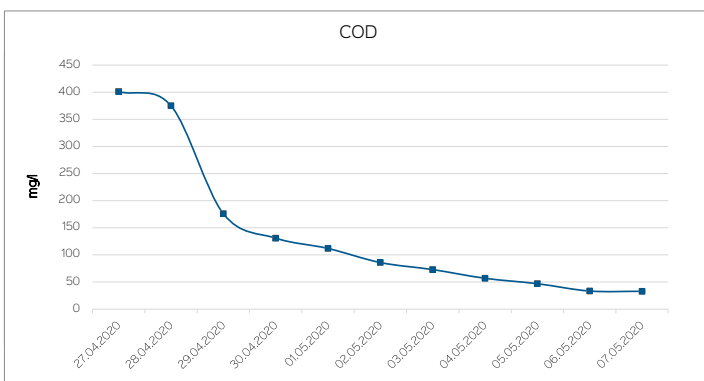
- Reduction of toxic substances in the ecosystem and in the discharge
- Optimisation of chemical parameters such as COD, total phosphorus (P-tot) and ammonium (NH₄-N)
- Improvement of physical parameters such as depth of visibility in the secondary clarifier
- Reduction of the sludge volume index
- Savings in aeration energy

RESULTS

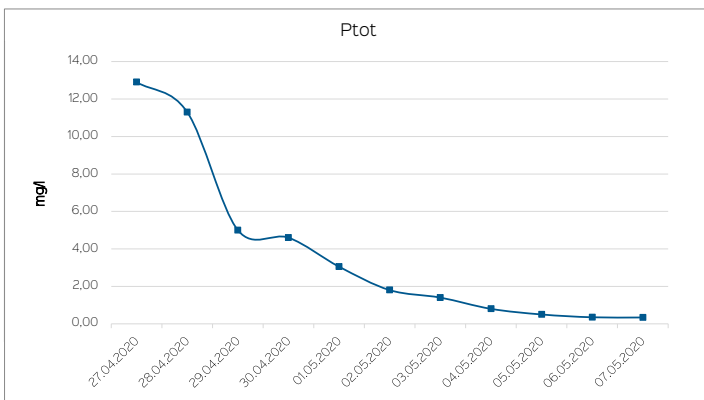
Chemical and physical parameters

COD, TOTAL PHOSPHORUS, AMMONIUM

The use of the system product VTA Nanofloc® led to a significant improvement in the chemical parameters for the discharge from the treatment plant.

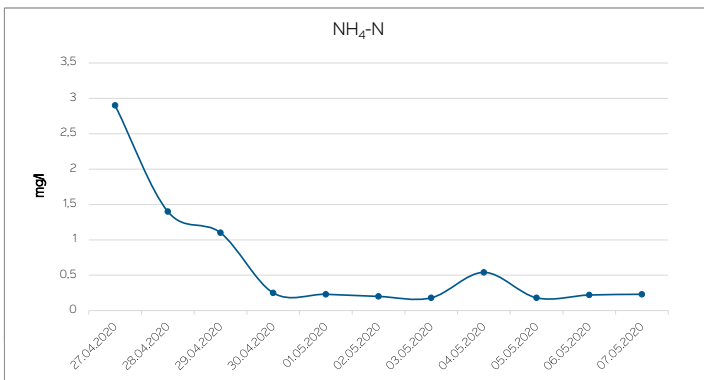


Reduction of the COD value by 92% from 401 to 33 mg/l.



Reduction of total phosphorus from 12.9 to 0.34 mg/l (97%).

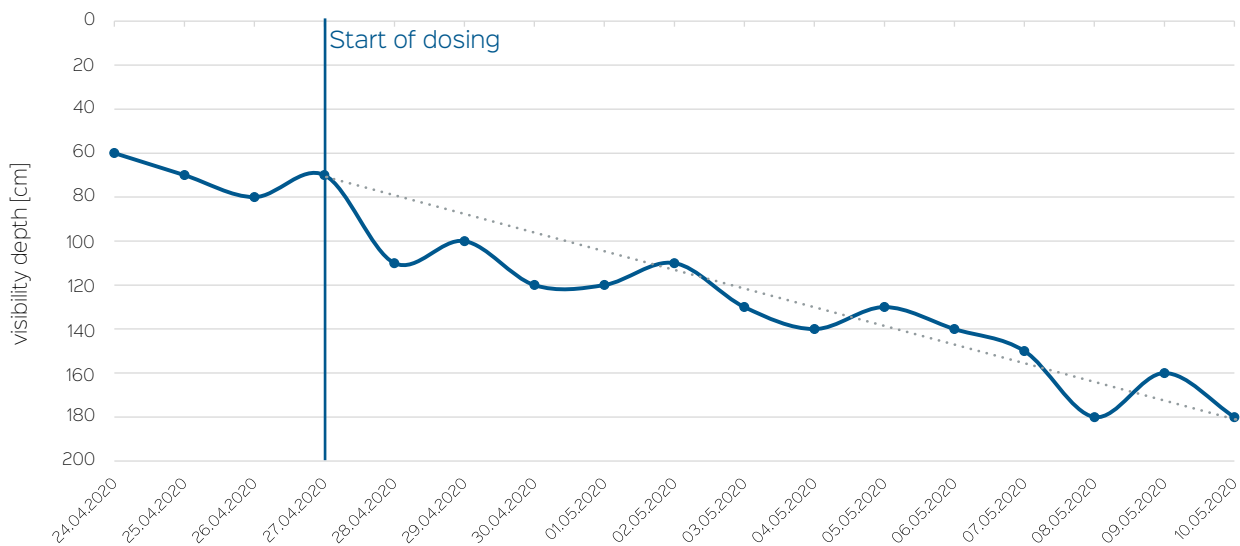
Guaranteed adherence to the prescribed limit values during normal operation.



Minimisation of the ammonium content by 92% from 2.9 to 0.23 mg/l.

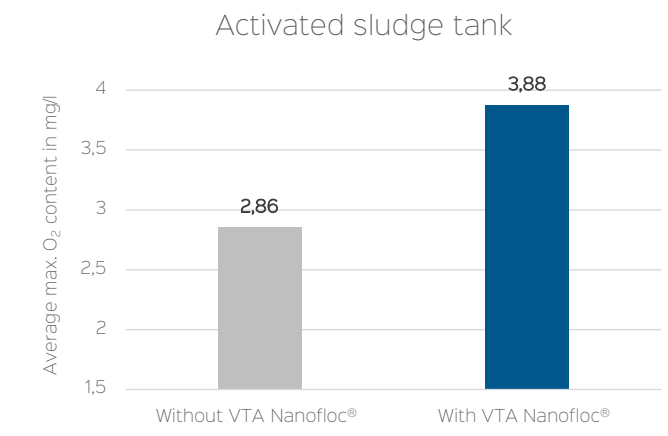
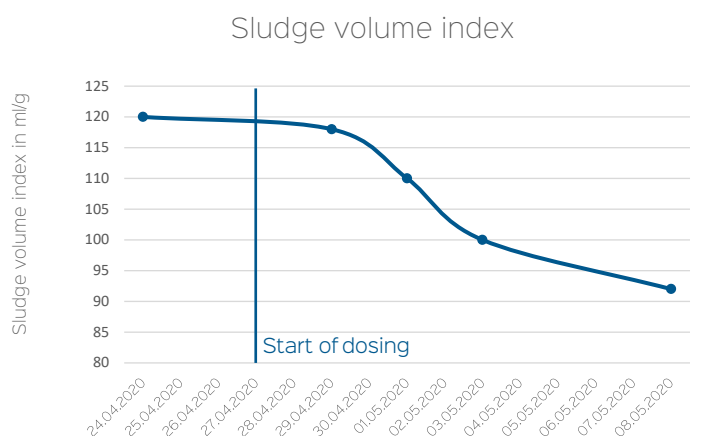
VISIBILITY DEPTH

After dosing with the system product VTA Nanofloc®, the depth of visibility in the secondary clarifier improved continuously from 70 cm to 180 cm.



SLUDGE VOLUME INDEX

During the measurement period, the sludge volume index was reduced from an initial 118 ml/g to 92 ml/g. The average maximum oxygen content in the activated sludge tank was increased from 2.86 to 3.88. This shows a potential for savings in aeration energy.



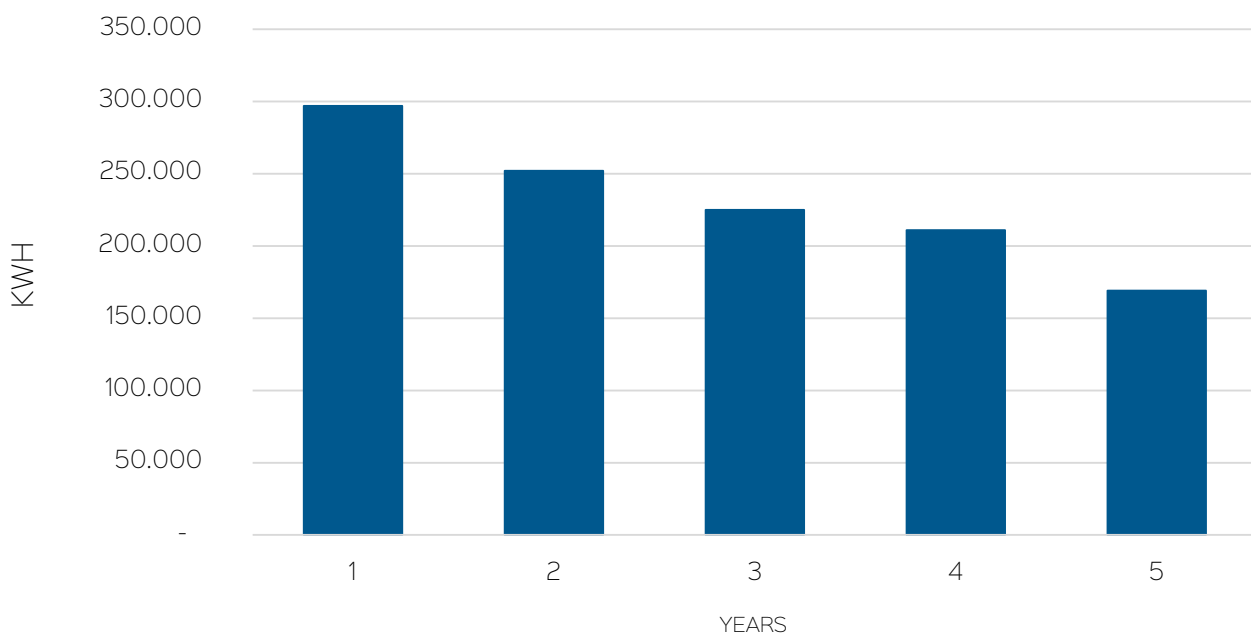
ENERGY CONSUMPTION

Used over the long term, VTA Nanofloc® ensures stable plant operation that is at the same time particularly cost-effective. An example from Germany shows that energy consumption, and thus also operating costs, are significantly reduced.

- Design capacity of the treatment plant: 8,000 PE
- Wastewater treatment: Curtains and decorative fabrics
- Test period: 5 years
- Dosage: VTA Nanofloc®

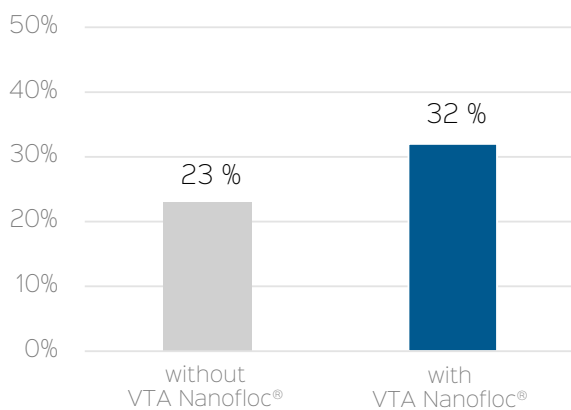
ELECTRICITY CONSUMPTION AT THE TREATMENT PLANT

VTA Nanofloc® in long-term use helps save costs. Energy consumption at the 8,000 PE treatment plant fell by 43% – from 297,000 kWh in the first year to 169,000 kWh in the fifth year of use.



POLYMER CONSUMPTION AND DRY RESIDUE

The effectiveness of the dewatering of sewage sludge is an important factor in the overall economic result. VTA Nanofloc® sets new standards in this area too. A large-scale test at a treatment plant in Baden-Württemberg has confirmed this with impressive results.



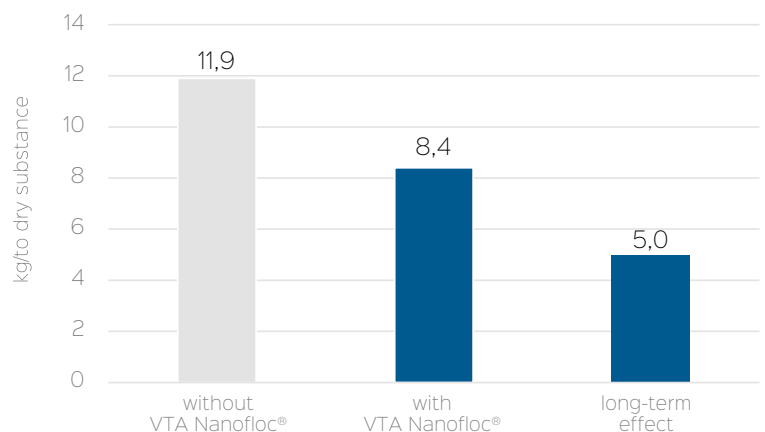
DRY RESIDUE

During the test at the treatment plant in question, VTA Nanofloc® far exceeded the lab values. The rate of dewatering actually achieved was 23% on average without pre-flocculation and rose to an average of 32% after the addition of VTA Nanofloc®. As in the lab test, Nanofloc also increased the shear stability of the floc.

POLYMER CONSUMPTION

An essential factor here is the difference in polymer consumption, which thanks to the use of VTA Nanofloc® fell by almost 30% – from 11.9 to 8.4 kg/t of dry substance.

In further tests, it even proved possible to reduce polymer consumption to 5 kg/t of dry substance, and with no appreciable loss in the rate of dewatering.





FLOCCULATION AND FILAMENTOUS BACTERIA

Wastewater treatment in the paper industry

This 115,000 PE plant is designed as a two-stage plant: the two SBR plants are preceded by three UASB reactors, where most of the organic degradation takes place under anaerobic conditions.

As is the case at most industrial wastewater treatment plants, the ecosystem has to cope with difficult conditions such as operational impact loads and unbalanced nutrient ratios.

PROBLEMS

- Poor degradation capacity in the anaerobic reactors.
- COD degradation, settleability of the activated sludge and the sludge volume index were all at their limits.
- Microscopic analysis shows floc decomposition due to impaired floc biocoenosis and strong impact loads.

DOSAGE

- VTA Nanofloc® in the ecosystem at the treatment plants

RESULT

VTA Nanofloc® leads to a more compact floc structure and to an increase in cleaning capacity and oxygen transfer. Within two weeks, ideal cleaning capacity and absolute operational reliability were restored.

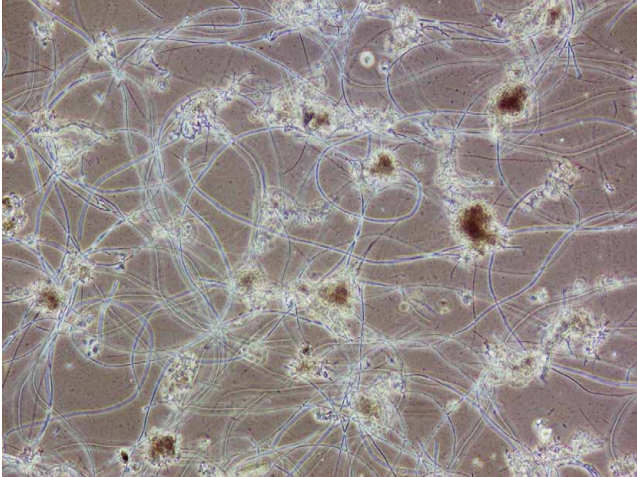


FIGURE 1:

An initial microbiological examination under the microscope showed advanced floc decomposition with extreme stringiness. The major portion of the activated sludge consisted of thick, long filaments of the filamentous bacteria type 021N and various industrial filaments. Because of the increased stringiness and much enlarged floc volume, sedimentation of the floc was no longer possible.

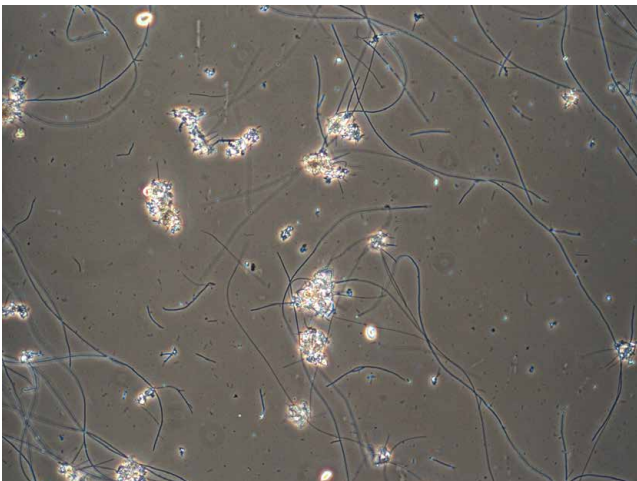


FIGURE 2:

Just a few days after the start of dosing with VTA Nanofloc®, there was a significant reduction in stringiness.

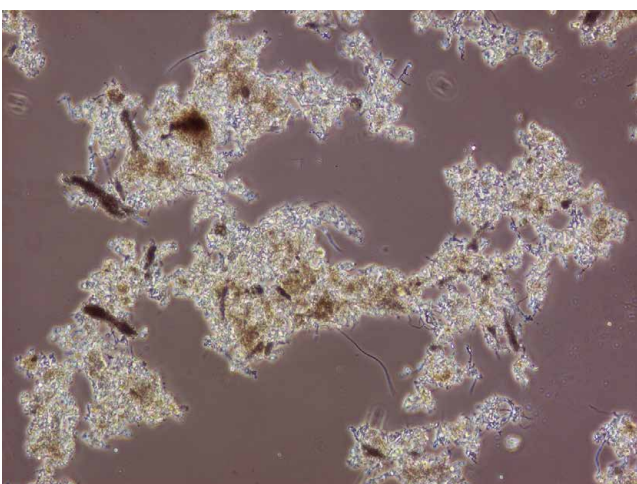


FIGURE 3:

As shown in the figure, floc size and floc structure have now stabilised. The floc bacteria have recovered and fully regenerated.

We set standards!

Highly effective, efficient and sustainable.
Following the example of nature and its cycles.



we clean water

” Clean water,
clean environment –
for our future
generations.

– Ing. Dr. h.c. Ulrich Kubinger
CEO VTA Group



We clean water.

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