



we clean water

VTA Trioxsan[®]

Oxygen-Enhanced
Activated Sludge Process

Green Deal by VTA

- ▶ **VTA Trioxsan[®]** can reduce aeration energy consumption by up to 40% through targeted oxygen-enhanced phosphorus removal and increased biological activity. This approach not only cuts disposal costs and reduces CO₂ emissions but also boosts the overall efficiency of the plant.
- ▶ In comparison, conventional iron chloride-based coagulants produce up to 65% more sludge.



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With **VTA Trioxsan®**, we are introducing a groundbreaking liquid engineering process – the first of its kind globally. This innovative solution integrates advanced technologies for **pollutant removal, phosphate precipitation, and bioactivation** into a unique 3D approach. It is versatile enough to be applied in both soft water regions and the most challenging wastewater treatment plants.



Precipitated Sludge Generation

Key Advantages of VTA Trioxsan®:

► Oxygen-Enhanced Phosphorus Removal:

Optimizes **phosphate precipitation** in an efficient and sustainable manner. Not only does your wastewater plant eliminate harmful pollutants, but it also benefits from the added bound oxygen, boosting biological degradation while reducing energy costs.

► Neutralization of Acidic Compounds:

By incorporating select alkaline earth ions, **VTA Trioxsan®** enhances the **buffer capacity** of activated sludge, ensuring system stability even when dealing with heavily contaminated wastewater.

► Odor Elimination and Biocenosis Stabilization:

VTA Trioxsan® effectively neutralizes unpleasant odors and supports the stabilization of your treatment plant's biological ecosystem, providing a long-term, sustainable solution that is ideal for sludge management.

► Prevention of Phosphate Re-dissolution:

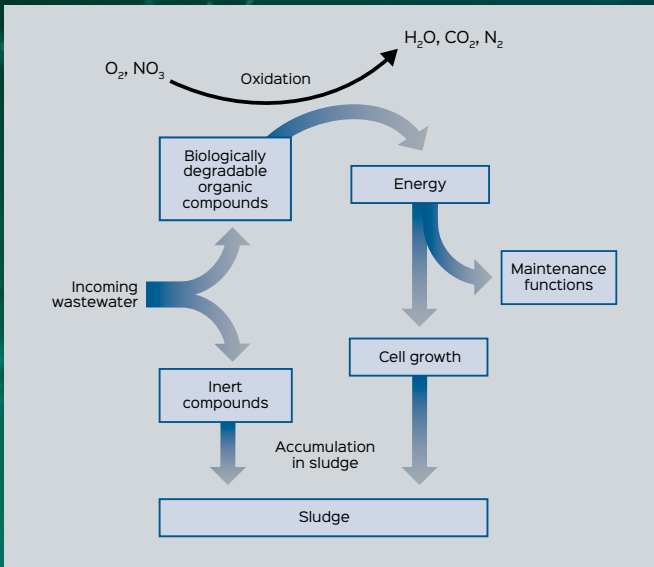
VTA Trioxsan® prevents the re-dissolution of phosphates, enhances nitrification efficiency, ensures stable phosphate levels, and reduces internal recirculation loads.

► MAP Crystal Control:

VTA Trioxsan® effectively inhibits the formation of troublesome **magnesium ammonium phosphate (MAP) crystals**, which are a common challenge in wastewater treatment facilities.

► Versatile Application:

Whether in **soft water regions** or high-load wastewater plants, **VTA Trioxsan®** offers a **universal solution** suitable for a wide range of wastewater types.

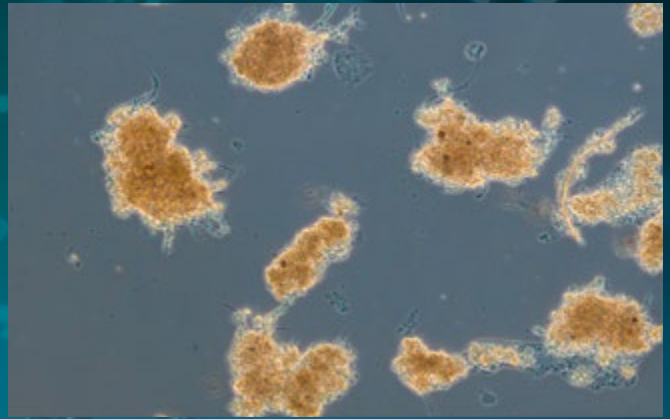


Schematic illustration of biological breakdown processes in a wastewater treatment plant.

Biological Approach

In the biological phase of a wastewater treatment plant, complex, energy-rich organic pollutants are broken down through various biological metabolic processes. This is carried out by specifically adapted, predominantly heterotrophic microorganisms or bacteria such as *Azoarcus sp.*, *Thauera sp.*, *Bacillus halodenitrificans*, *Haloarcula denitrificans*, and *Paracoccus denitrificans* in an aerobic or anoxic environment.

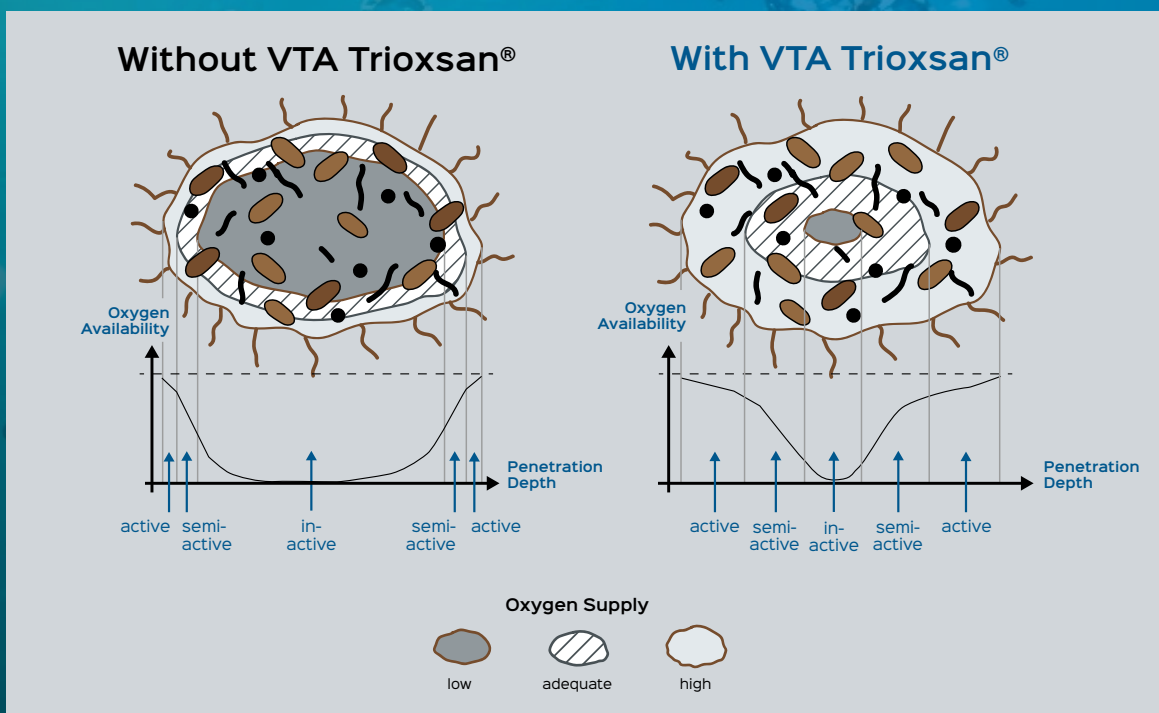
These bacteria use the breakdown process to generate energy, a mechanism known as cellular respiration, which consumes oxygen in both dissolved and bound forms. The introduction of a highly effective



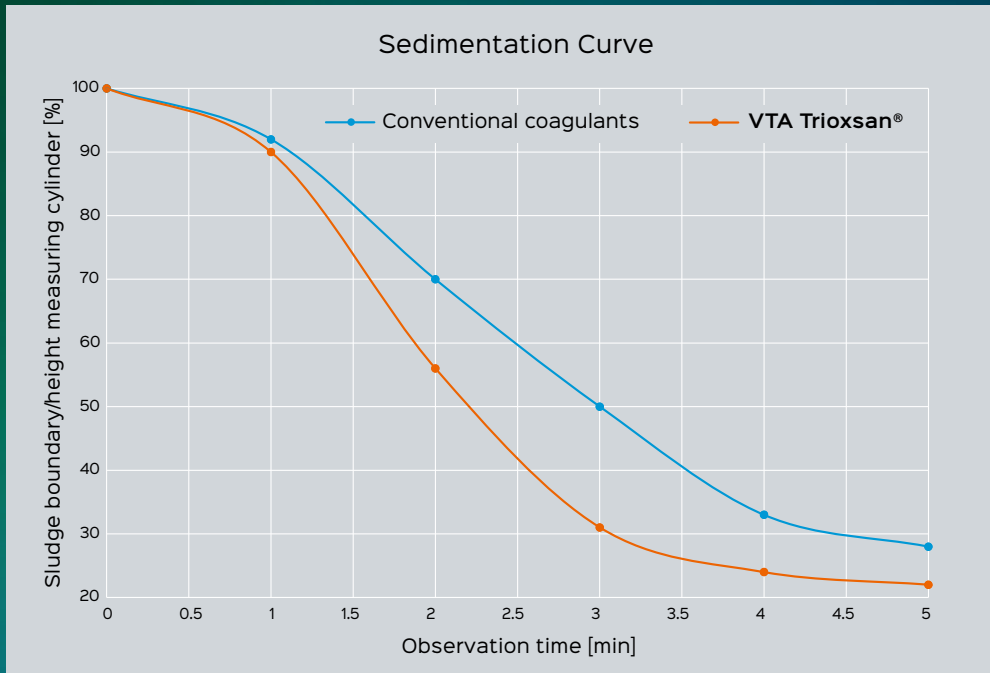
VTA Trioxsan® creates an ideal floc formation and enhances biological activity.

ve oxygen source through the newly developed **VTA Trioxsan®** process for wastewater treatment enhances oxygen availability and boosts biological activity, especially within the sludge floc. This allows for significant reductions in the additional energy required for aeration in activated sludge tanks. Along with improving overall treatment efficiency, it dramatically increases energy efficiency, reduces the CO₂ footprint of wastewater treatment plants, and optimizes energy and material balances. Additionally, the oxygen source, which binds to alkaline earth ions, improves both the structure and stability of the floc while decreasing overall sludge volume.

By using the **VTA Trioxsan®** process for oxygen-assisted phosphorus removal, municipalities and businesses can not only cut costs but also greatly reduce environmental impact. This makes it a promising, future-oriented „Green Deal“ solution.



A schematic representation of oxygen distribution in an activated sludge floc.



To achieve the highest possible efficiency of VTA Trioxsan®, we recommend dosing it directly into the biological treatment stage.

Why Choose VTA Trioxsan®?

VTA Trioxsan® redefines the benchmark in wastewater treatment technology. By integrating **sulfur binding** and **oxidation**, it delivers exceptional efficiency, proactively preventing the buildup of residues and deposits in your systems. Furthermore, it optimizes the **calcium-to-sodium ratio**, enhances overall water quality, neutralizes harmful and inhibiting substances, and stimulates biological activity. The reduction in the growth of undesirable filamentous bacteria leads to improved sludge characteristics, ensuring superior operational safety.

VTA Trioxsan® utilizes a carefully balanced of **alkaline earth ions** and bound oxygen to deliver an advanced liquid engineering solution, designed to effectively eliminate pollutants and odors, even under the most demanding conditions in the activated sludge process.

As an innovative solution for sustainable wastewater treatment, VTA Trioxsan® significantly **reduces sludge by up to 40%** when compared to iron chloride-based alternatives. By integrating this powerful bioactivator, you can streamline your operations and enjoy a multitude of performance benefits.

The remarkable efficiency of VTA Trioxsan® is showcased in a short film, accessible via QR code, which highlights its impact even at low application levels.



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VTA Trioxsan® Animation

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