

einBLICK²⁴

CUSTOMER INFORMATION REGARDING ENVIRONMENTAL PROTECTION, PRODUCTS & EXPERIENCE



PATENTED PHOSPHATE PRECIPITATION



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WELCOME NOTE



Matthias Löbbers
Vice President
Sales & Marketing

Heike Horn
President Finance
& Administration, HR

Dr. Andreas Kinnen
President Marketing
& Sales, retired

Dr. Ing. Kai Schaefer
President Technical Services,
Operations & Research

DEAR READERS

"The Chinese use two brush strokes to write the word 'crisis.' One brush stroke stands for danger; the other for opportunity. In a crisis, be aware of the danger – but recognize the opportunity." (John F. Kennedy)

At SCHAEFER KALK, we have always been good at recognising opportunities and developing solutions for our customers.

In recent years, we have revolutionised wastewater treatment true to our motto „Rethinking phosphate precipitation“ and we are very honoured that our innovative product SCHAEFER PRECAphos® received the Rhineland-Palatinate Innovation Award in 2022.

The success of SCHAEFER PRECAphos® doesn't give us a reason to stop and relax, on the contrary – it drives us to continue and become even better.

We have now achieved this with the development of SCHAEFER PRECAL® 75. SCHAEFER PRECAL® 75 differs from its predecessor, SCHAEFER PRECAL® 74, in that it contains a significantly higher level of active ingredients, which has many advantages.

The feedback regarding our innovations has been so positive that we are also expanding our workforce in this division – a clear commitment to our region and an expression of our high level of service for our customers.

There have also been changes in our management team. For example, we bid farewell to Dr Andreas Kinnen at the end of 2023 as he takes his well-deserved retirement. Matthias Löbbers is now responsible for Sales & Marketing.

New products, additional staff and a new manager with a new approach to SCHAEFER KALK – these are the key elements that will enable us to meet the challenges of our time and fulfil the requirements of our customers.

We look forward to talking to you!

Your SCHAEFER KALK Management Board

Patented technology from SCHAEFER KALK

Six years ago, we started using SCHAEFER PRECAphos® on a commercial scale. A lot has happened since then:

- > The very good phosphate precipitation determined in the laboratory was even better in practice in wastewater treatment plants.
- > In 2018, we filed a patent application for SCHAEFER PRECAphos® and received full patent protection in 2023.
- > Phossi – the happy activated sludge floc is thrilled about SCHAEFER PRECAphos®.
- > In 2022, we were awarded the Rhineland-Palatinate Innovation Prize for SCHAEFER PRECAphos®.

PRACTICAL POWDER FORM

Precise dosing – up to 30% more efficient than liquid precipitants
> **Resource & environmental protection**

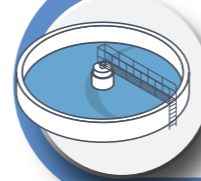


EASY TRANSPORT

Whether bagged goods or returnable silos, the categorisation as a hazardous substance facilitates transport also to smaller wastewater treatment plants
> **No hazardous good**

NEUTRALISES ACIDS

Improves living conditions and the stability of activated sludge flocs
> **Active acid binding**



OPTIMISES WASTEWATER TREATMENT

Has a positive effect on the entire wastewater treatment process. In particular, it improves the nitrogen decomposition and prevents sludge discharge.
> **Clean water**

BINDS HYDROGEN SULPHIDE

Acts in the digestion tower and binds harmful hydrogen sulphide
> **Optimum digestion and sludge dewatering**



SCHAEFER PRECAphos®



In addition to phosphate precipitation, SCHAEFER PRECAphos® optimises biological wastewater treatment and enables the complete substitution of aggressive acids and alkalis as precipitants.

Phosphate precipitation without liquid precipitants – SCHAEFER PRECAphos® is the answer!

Our long-standing customer, the Taunusstein wastewater treatment plant, started using SCHAEFER PRECAphos® as a precipitant in 2018. In the first two years, the liquid precipitant ferric chloride was also added. The wastewater treatment plant has been using SCHAEFER PRECAphos® exclusively for 4 years now.

SCHAEFER PRECAphos® is dosed fully automatically via a SCHAEFER KALK silo system. Even average values of less than 0.2 mg/L ortho-phosphate are maintained safely and reliably.

In most cases, a basic dosage with SCHAEFER PRECAphos® is sufficient. The product develops a depot effect. It is only very rarely and briefly that the dosing quantity is adjusted fully automatically due to phosphate surges in the feed.

Key issues of the innovative phosphate precipitation with SCHAEFER PRECAphos®

- | | |
|---|--|
|  Active neutralisation of acids |  Nitrification is promoted; > 50 % natural raw materials |
|  Activated sludge flocs are strengthened |  Optimises biological wastewater treatment |
|  Calcium for the optimisation of acid capacity, pH value and biological wastewater treatment |  Phossi – the happy activated sludge floc is thrilled about the patented SCHAEFER PRECAphos® |
|  Denitrification is improved |  Quality from SCHAEFER KALK |
|  Iron for phosphate precipitation and safe sulphide binding in the digestion process |  Cleaning of waste water is supported |
|  Promotes the biological wastewater purification performance of bacteria |  Bagged goods for small wastewater treatment plants |
|  Hazardous good – no thanks! |  Select a turbulent point for dosing |
|  Highly effective – 1 tonne of SCHAEFER PRECAphos® replaces approx. 1.6 tonnes of liquid ferric chloride or aluminium chloride |  Rethinking phosphate precipitation – powder instead of liquid hazardous good as precipitants |
|  Innovation Award Winner 2022 in Rhineland-Palatinate (Germany) |  Many advantages for wastewater treatment – for clean water |
|  Yes to active environmental protection |  Economical phosphate precipitation |
|  No dosing of liquid, concentrated acid required for phosphate precipitation |  Used successfully in multiple applications |
|  Rental silo systems for easy dosing |  YOLO – when, if not now? |
|  Made in Rhineland-Palatinate |  Pioneering phosphate precipitation |



Advantages of SCHAEFER PRECAphos®:

- > Completely replaces liquid, aggressive precipitants
- > Safe to use and store – SCHAEFER PRECAphos® is **NOT** a hazardous good
- > Up to 30 % less precipitant used compared to liquid precipitants
- > Significant increase in acid capacity
- > Nitrification and denitrification are ideal – very low discharge values in total nitrogen
- > Sulphide is safely bound in the digester gas

SCHAEFER PRECAphos®



WE HOLD AN AWARD

In June 2022, we received the Innovation Award in the category of 'Special Industry Prize' for our product SCHAEFER PRECAphos®.



Minister Daniela Schmitt, Volker Ermel and Dr. Benjamin Hellmann, both SCHAEFER KALK

SCHAEFER KLAROLIT®

Our product for your wastewater treatment for over 10 years!

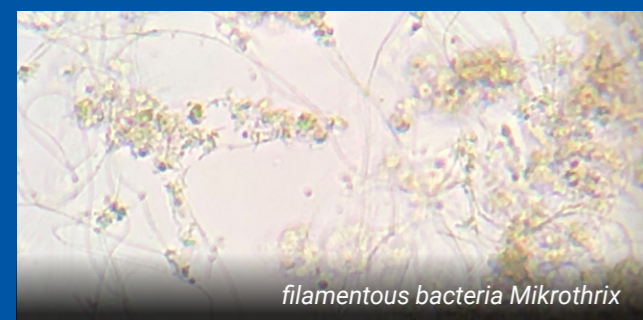
SCHAEFER KLAROLIT® stands for the optimisation of biological wastewater treatment and for the targeted increase of the acid capacity in the activated sludge flocs. It permanently improves the living conditions of floc-forming bacteria. Acids from nitrification and liquid precipitants and soft rainwater – factors that would otherwise severely affect the bacteria – are eliminated.

Due to its purity and composition, our product can easily anchor itself in the activated sludge flocs and transport the vital acid capacity specifically to the floc-forming bacteria.



SCHAEFER KLAROLIT® also effectively tackles filamentous bacteria!

We have successfully managed to control filamentous bacteria such as *Microthrix Parvicella* in many wastewater treatment plants with SCHAEFER KLAROLIT® through regular dosing. We recommend a daily dosage of approx. 40 – 50 kg of SCHAEFER KLAROLIT® per 1,000



filamentous bacteria *Mikrothrix*



Activation with floating sludge



Activation without floating sludge

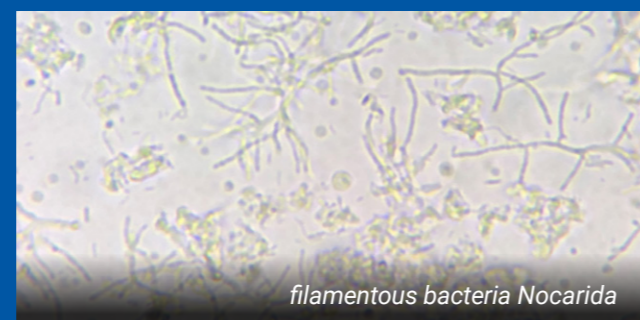
Strengthened activated sludge flocs ensure that the activated sludge settles very well in the secondary clarifier. This effectively prevents sludge carryover during rain events and melt water input.

The very high purity and quality of SCHAEFER KLAROLIT® guarantee safe use and successful optimisation of biological wastewater treatment. Its use is extremely simple, safe and non-hazardous.

SCHAEFER KLAROLIT® is delivered either as bagged goods (25 kg bags), big bags with 1,000 kg, in our SCHAEFER KALK rental silo system or on site in the customer's own silo system with loose goods from the silo truck.

m³ of dry weather inflow. The activated sludge flocs are strengthened and successfully suppress the filamentous bacteria.

In the case of filamentous bacteria such as „*Nocardia*“ (Nocardioform acinomycetes), wastewater treatment plants with a special dosage have been successful: by shock dosing 600 – 800 kg of SCHAEFER KLAROLIT® per 1,000 m³ of dry weather inflow every 3 – 4 weeks, our customers have succeeded in displacing the problematic floating sludge and reliably complying with the discharge values.



filamentous bacteria *Nocardia*

Our rental silo systems – a real success story!



Display with integrated control system

We have been offering our customers rental silo systems for dosing SCHAEFER KLAROLIT® and SCHAEFER PRECAphos® for more than 10 years. With the help of feedback from our customers, we have been able to continuously develop and improve our rental silo systems in recent years. We are proud to now be able to offer you a very compact and trouble-free system for the automated dosing of our products for wastewater treatment.



Rental silo & transport



Delivery by truck

The silo systems are delivered by truck and the dosing of our products can begin immediately after installation on site. The system is topped up on site as required; there is no need for time-consuming handling of bagged goods or big bags.

We have now optimised the control system so that the signal from the digital phosphate measurement (e.g. in the 4 – 20 mA range) can be received directly and the required amount of product can be added fully automatically.

Our rental silos make the use of our products even more comfortable and – in addition to all the other positive features we report on in this issue of einBlick – are very good arguments in favour of using SCHAEFER PRECAphos® or SCHAEFER KLAROLIT®.

See for yourself!



The installation area for our silo is compact with approx. 3 x 3 metres. The dosing screw supplied makes it possible to overcome a tank wall of approx. 1.20 m in height. The control cabinet contains a clear display with an integrated control unit, which can be used to select the desired dosing times and check the fill level of the silo at any time.

MILK OF LIME – THINKING BEYOND

**Our new milk of lime, SCHAEFER PRECAL® 75,
with 45 % active substance is now available! —————**

What makes our new product, SCHAEFER PRECAL® 75, so special?

Our new milk of lime quality is characterised by a genuine 45 % active substance. Our SCHAEFER PRECAL® 75 is more concentrated than the previous 40 % milk of lime SCHAEFER PRECAL® 74 and requires less transport volume, thus contributing to a better environmental balance. Our customers benefit economically because SCHAEFER PRECAL® 75 can be dosed sparingly and precisely.



For which applications is SCHAEFER PRECAL® 75 suitable?

SCHAEFER PRECAL® 75 is particularly suitable for industrial and technical applications and can replace the economically unattractive caustic soda in many areas.

The focus here is on rapidly increasing the pH value with our highly concentrated milk of lime. SCHAEFER PRECAL® 75 is not suitable for drinking water treatment processes due to the dispersing agent it contains, which keeps the viscosity of the milk of lime low.

Are there SCHAEFER KALK products for drinking water treatment?

Yes, with our lime milks SCHAEFER PRECAL® 71 and SCHAEFER PRECAL® 72 we offer an 11 % and a 20 % highly reactive lime milk for applications in drinking water treatment. These two qualities are produced without additives using our own patented process – using only water and high-quality, highly reactive quicklime. Many drinking water plants have relied on the high quality of SCHAEFER KALK for decades.

The active ingredient makes the difference!

The percentage stated in the data sheet of many products does not refer to the active substance, but to the solids content in the milk of lime. Inert substances such as sand or silicates are included here. These secondary constituents contained in the solids content are not available for the neutralisation process and often cause abrasion and wear of the pump technology. These secondary constituents are often also responsible for deposits in the storage tank.

At SCHAEFER KALK, we indicate the content of the active ingredient Ca(OH)_2 in our lime milk. This enables our customers to adjust the dosage of the product precisely to their processes.

The basis for this high-quality milk of lime is one of the purest lime deposits in Europe. This purity enables us to guarantee consistently high product quality.



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