



Solutions for the Biogas and Anaerobic Digestion Industry

Product Guide

www.omexenvironmental.com

B I O G A S



OMEX Environmental Ltd is based in the UK and operates both nationally and internationally. It provides a range of liquid and solid treatment solutions for the energy, water, construction and transport sectors.

Anaerobic Digestion is becoming increasingly popular as one of the main processes which produces energy from waste. Anaerobic digestors treat wastewater and organic solid wastes such as municipal, food, animal waste, sewage sludge and a variety of forage crops, converting the organic portion to biogas.

OMEX offer a range of products to optimise microbial performance in anaerobic digesters, wastewater treatment and biogas plants.

Micronutrient and Biological Additives

These include trace element additives to optimise biogas production, iron solutions to minimise hydrogen sulphide levels and enzyme solutions to improve fibre breakdown, all of which help to optimise plant performance and increase return on investment.



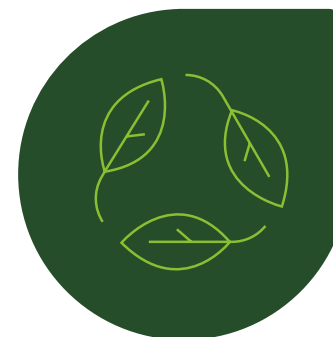
Nutromex® TEA

Trace Element Additives

In order for anaerobic plants to operate effectively they require a variety of nutrients for the micro-organisms to grow and function properly, including trace elements such as Iron (Fe), Nickel (Ni), Cobalt (Co), Manganese (Mn), Zinc (Zn), Copper (Cu), Molybdenum (Mo) and Selenium (Se).

These nutrients are critical for the successful operation in anaerobic conditions and for correct bacterial growth as deficiencies often occur and can affect plant performance and biogas production. This can lead to poor COD and/or organic solids removal, elevated VFA levels, bacterial slime production, poor microbial growth and poor granulation in UASB type reactors.

Nutromex® TEA is a range of bioavailable micronutrients created for the AD Market to ensure effective operation with optimised process performance.



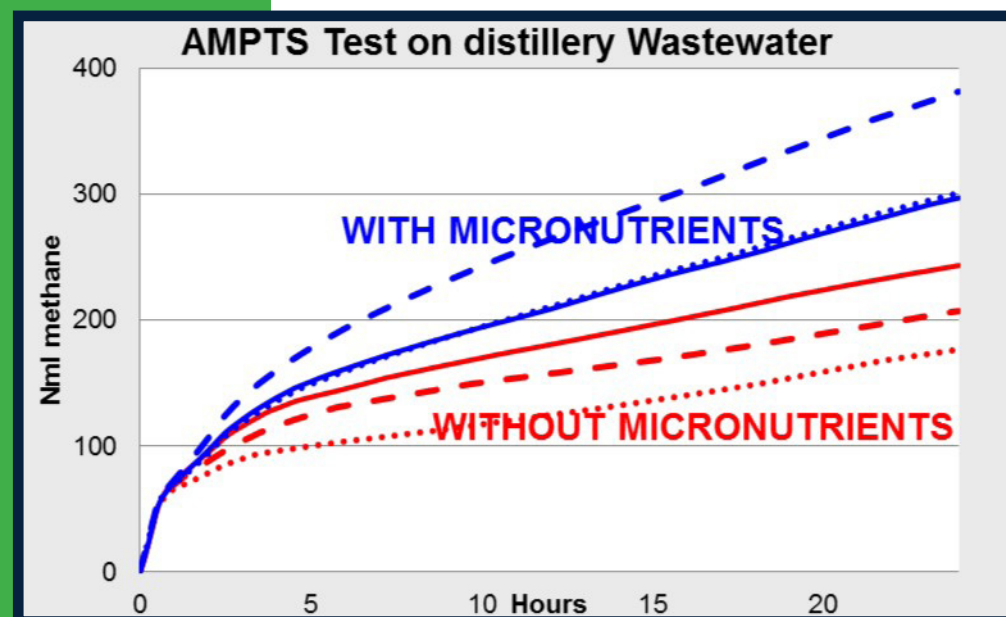
OMEX assesses the requirements of a plant by the analysis of its influent and effluent. It will then produce a TEA solution tailor-made to treat the plant's individual requirements, in a form which remains fully bioavailable in anaerobic conditions.

Benefits of Nutromex® TEA

- Increased biogas production
- Increased methane content of biogas
- Decreased digester VFA (Volatile Fatty Acids) content
- Increased profitability
- Enhanced bioavailability

Back Up Service

- Macro and micro-nutrient profiling
- VFA specification
- Advice on process optimisation





Active Fe

Active Iron Powder



OMEX Environmental supply a non-hazardous iron powder product to the anaerobic industry for the minimisation of hydrogen sulphide levels in a plant's fermenter.

Biogas can often contain hydrogen sulphide which needs to be removed to avoid odour and corrosion issues occurring. The dissolved H₂S in high concentrations can be toxic to the bacteria in the slurry which can inhibit the production of biogas and cause its composition to alter.

The presence of hydrogen sulphide in biogas also makes it corrosive to metal parts. Iron is subject to surface attack, although not major corrosion. However the effect on non-ferrous metals in components, such as pressure regulators, gas meters, valves and mountings, is much more serious as they are very quickly corroded.

Active Fe is designed to minimise hydrogen sulphide levels in the fermenter by binding it immediately during formation. This allows the AD process to occur uninhibited resulting in optimal biogas yields and methane content, along with reduced levels of corrosion.

How does Active Fe help?



Easy to apply

straight into the fermenter



Prevents

against acidification



Fast results



Optimises

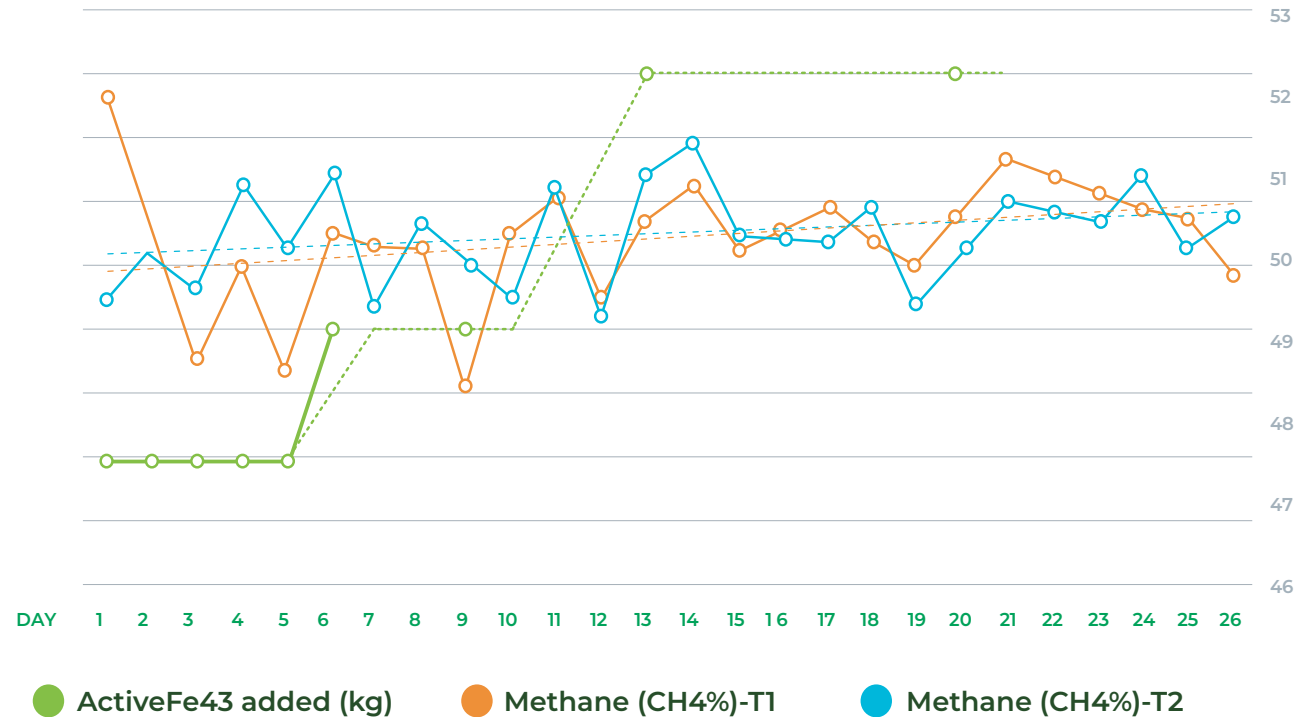
methane content



Non-hazardous

compared to other iron products in the market

Methane behaviour with Active Fe 43 addition



The Active Fe range consists of three products, each one with unique abilities for their intended application. The Active Fe33, which is a fast-reacting product originally intended for digesters with low retention times. The Active Fe43, which is a more moderate-reacting product but with a set of unique properties that show monitorable effects in a short space of time and the Active FeOpti, which is a slower-reacting product, very high in iron concentrations. All three products aim to achieve the same dual-purpose result; reduction of hydrogen sulphide and augmentation of the available nutrient-iron levels in the digester.



Enzymes

Biogas Additives

OMEX supply enzymes for anaerobic digestion which effectively consume substrates with a high dry matter content to improve biogas production, reduce viscosity and minimise mixability issues in digesters.

These include enzymes applicable to cereal based fibre substrates and waste water treatment plants to improve substrate conversion (more biogas, less sludge).

The change in economic framework conditions and the necessity for improved use of renewable energy sources are motives for many operators to optimise the process in municipal wastewater treatment plants with the help of modern methods. The addition of hydrolytic enzyme supplements therefore presents itself as a technically and economically sensible option.

A recent study was carried out looking at the optimisation of agricultural anaerobic digestion with the addition of enzymes and micronutrients. The study showed that with the daily addition of the enzyme preparation to the feed, the biogas yield increased significantly by 9.5 %, through the reduction of total solids in the tank and the conversion of volatile fatty acids to biogas due to the application of micronutrients. The application of the combination of micronutrients and enzymes therefore proved to be advantageous for the agricultural anaerobic digestion site in both technical and economic terms.



Process optimisation

- Higher biogas/methane output
- Increased process stability
- Optimised feedstock usage
- Improved mixing

Process efficiency

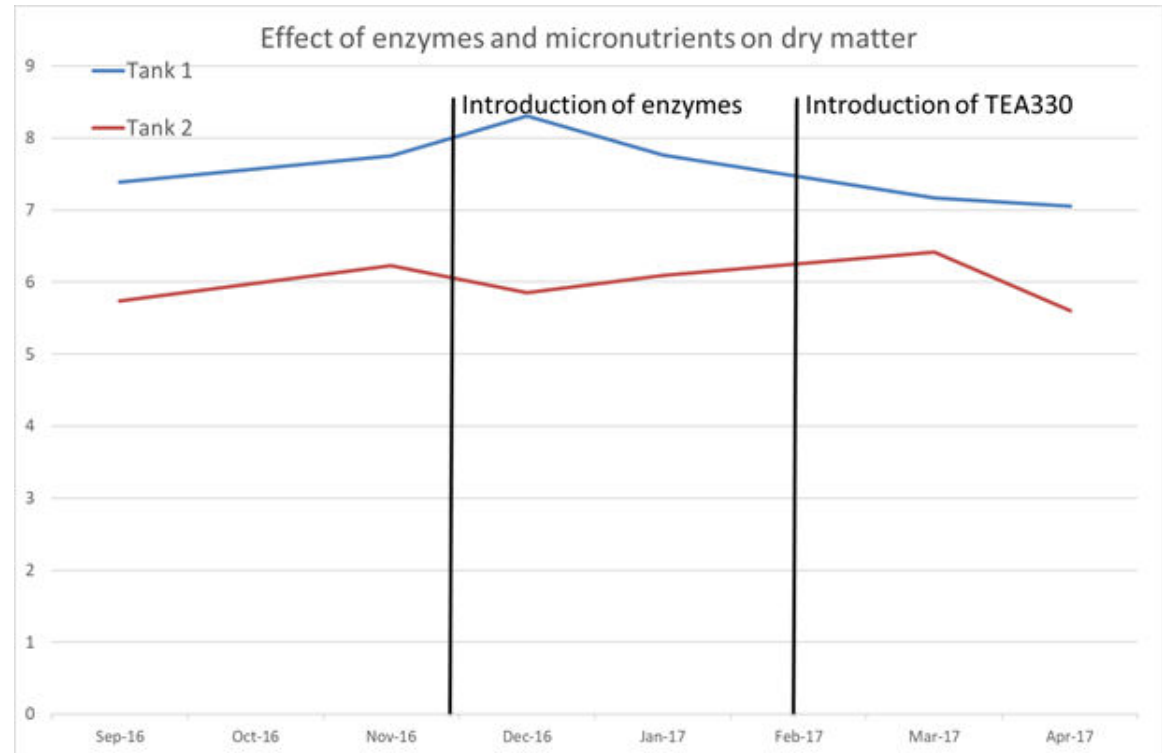
- Lower electricity consumption
- Higher efficiency

Economic advantages

- Lower operation costs
- Lower maintenance costs

Socio-environmental advantages

- Enhanced renewable electricity or heat supply



A decorative graphic on the left side of the page. It features a large, light green circle with a thick, rounded border. Inside this circle, the text "Magmex® Magnesium Hydroxide Suspensions" is centered. To the left of the circle, there is a solid green circle and a larger, dark green circle with a rounded square shape attached to its right side.

Magmex®

Magnesium Hydroxide Suspensions

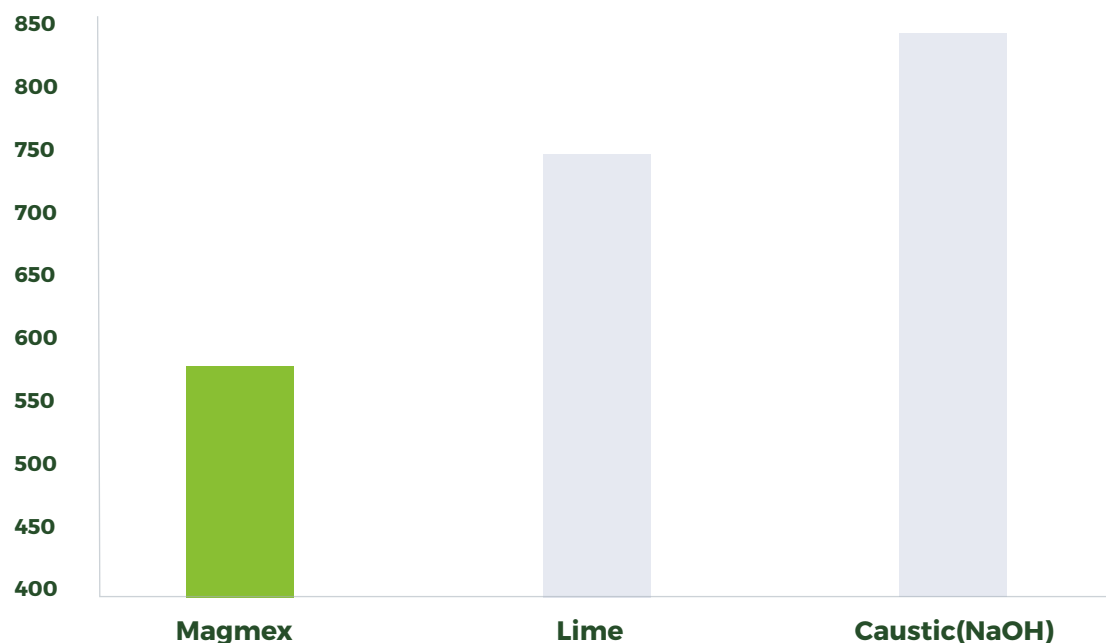
A range of magnesium hydroxide suspensions for treating acidic wastewaters and controlling pH levels within both anaerobic and aerobic systems.

Traditionally, sodium hydroxide (caustic soda) and calcium hydroxide (lime) have been used to neutralise acidic solutions. However, these compounds are reactive and can cause high pH levels if not controlled correctly.

The Magmex® range is the environmentally friendly answer to the neutralisation of acidic wastewater. It is safe, ready-to-use and overcomes the majority of problems associated with the traditional acid neutralisers such as caustic soda or lime.

Magmex® helps improve the process by reducing sludge volumes, improving flocculation and naturally buffering at around pH 9 - 9.5 meaning biological plants are safe from overdose.

Alkali used (kg) to neutralise 1 tonne sulphuric acid (98%)



Magmex® 1060

A unique formulation specifically designed for use in situations where higher pH levels are needed to enhance precipitation



Magmex® 740

The standard formulation for use where a safe, efficient alkali is required for pH correction and where minimal sludge volumes are needed.



Magmex® 706

A stable formulation for use in smaller scale applications where longer term storage is required without the need for agitation.



Magmex® OP Series

OMEX's exclusive range of magnesium oxide and hydroxide powder products, which are available for a wide range of applications.



OMEX Environmental Ltd

T: 01553 770092 | E: environmental@omex.com

www.omexenvironmental.com