

## Individual mixtures

iCAP 6500: Leading edge laboratory methodology measures the crucial macro- and trace elements

## Substrate preservation

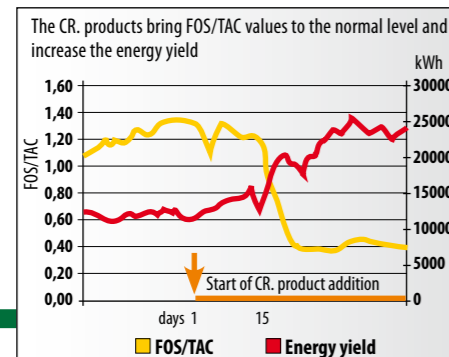
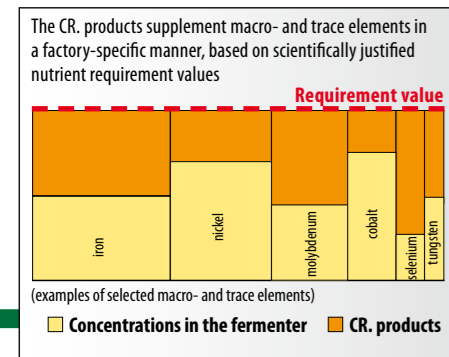
## Organic waste materials

## Process optimisation in the fermenter

### CR.CON and CR.COMPACT

The micronutrient mixtures CR.CON und CR.COMPACT synchronise the different stages of biogas production and stabilise the process as a whole:

- Stabilisation of breakdown processes
- Activation of methanogenic organisms in the fermenter
- Synchronisation of the different stages of biogas production
- Sustained increase in fermenter efficiency
- Maximum methane yields
- Increased company profit



### Preservative for pourable and moist organic substrates

CR.ACID are acid mixtures for preserving pourable and moist organic substrates for biogas production. They prevent the development of moulds and bacteria during storage and protect against process-inhibiting yeast accumulation.

CR.ACID mixtures have a pronounced antimicrobial action. They actively disrupt

the carbohydrate metabolism of the microorganisms and specifically inhibit the ability of the microbes to multiply during the storage phase. By lowering the pH of the substrate, CR.ACID creates unfavourable conditions for existing harmful microorganisms to survive.

### The result

- Protection and retention of substrate energy during transport and storage
- Prevention or reduction of odour problems during pre-storage of the substrate
- Stabilisation of substrate batches in order to maintain a consistent substrate mix throughout the year and secure the stability of the plant
- Avoidance of process disruption through mycotoxins and/or harmful microorganisms
- Maintenance of the C : N ratio in the substrates

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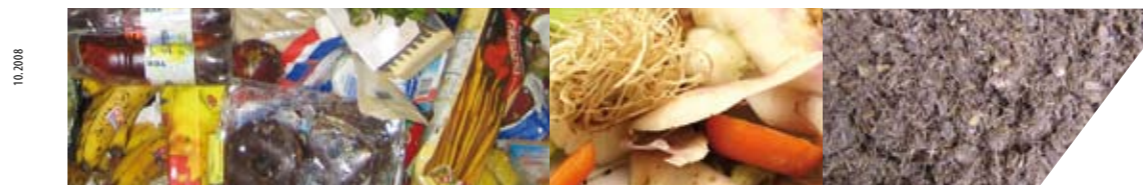
**CR.ACID**

**CR.CON**

**CR.COMPACT**

### The CR. concept for process optimisation

Factory-specific micronutrient mixtures for industrial biogas production from secondary organic materials and organic waste materials

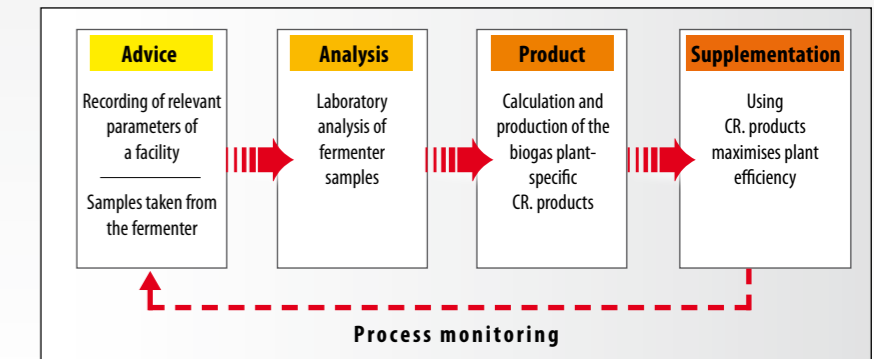


**SCHAUMANN** Expertise in biogas  
BioENERGY

### The concept for efficient biogas production

Process optimisation, process stability and production efficiency are paramount in the production of biogas from secondary organic materials and organic waste materials.

This is where the concept devised by Schaumann BioEnergy comes in: The use of fermenter-specific micronutrient mixtures based on accurate analysis of the substrate and comprehensive advice.



### CR. products for substrate utilisation

Schaumann BioEnergy produces the tailor-made CR. products as trace element concentrates or speciality mixtures, which are supplemented with specific combinations of active substances as required.

The CR. products are individually tailored to the biological situation in the

fermenter and maximise the efficiency of methane production. They compensate for deficiency, unfavourable conditions and low availability of micronutrients.

The CR. products can be used in plants of any output capacity.



### The CR.CON product line

The situation in a fermenter differs widely between biogas plants, depending on the substrates used, operational management and a multitude of other factors. In addition to using the tailor-made CR.CON micronutrient mixtures, this often requires supplementation of specific active substances.

The CR.CON product line enables the in-

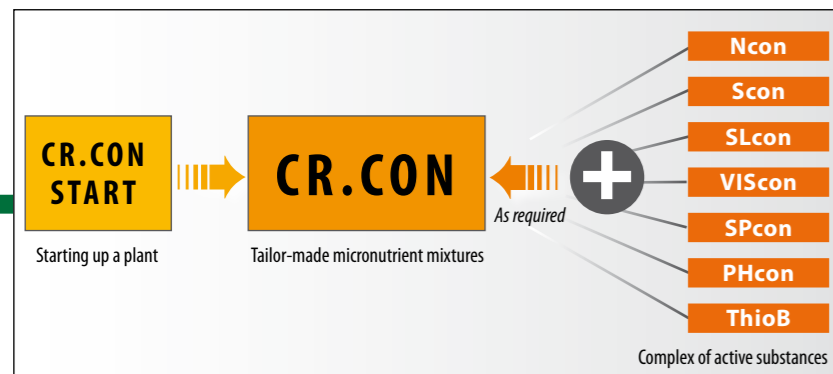
tegration of any complex of active substances for any biogas plant.

The CR.CON micronutrient mixtures are formulated in a factory-specific manner, based on accurate iCAP spectrometric analyses and in accordance with scientific requirement values, and are manufactured using an original production process.

### Use of the CR.CON product line

- Analysis-based, individual mixtures
- Suitable for any organic capacity
- Unlimited compatibility with active substances
- Optional fermentable bag
- Use rate: 3; 4; 5 kg/100 kW

### Tailor-made CR.CON products



### CR.CON and specific combinations of active substances

#### CR.CON START

Developed for the start-up phase. The mixture of micronutrients, iron compounds and buffer substances creates an optimal environment for the process biology and effectively reduces the concentration of hydrogen sulphide in the biogas.

#### Ncon – binds nitrogen

Ncon reduces the inhibitory action in nitrogen-rich facilities and stabilises the fermenter biology, especially in plants using large amounts of protein-rich substrates (e. g. food waste, dried chicken manure).

#### Scon – binds hydrogen sulphide

Scon binds the hydrogen sulphide in the substrate, thereby improving the fermenter biology and enhancing the biogas quality.

#### SLcon – reduces floating biomass layers

SLcon promotes the disintegration of settled biomass at the bottom and floating biomass at the top and prevents biomass layers from reforming.

#### VIScon – homogenises the substrate

VIScon homogenises the fermentation substrate, stabilises gas production and reduces wear and tear of pumps and stirrers.

#### SPcon – controls foam formation

SPcon reduces and prevents foam formation by altering specific physical characteristics of the substrate.

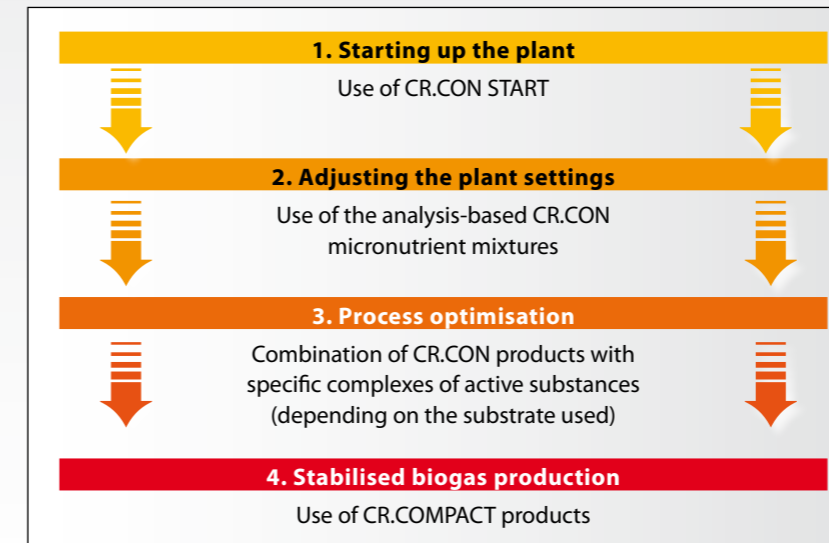
#### PHcon – increases buffering capacity

PHcon supplements buffer substances, thereby increasing buffering capacity and preventing fluctuations in the process operation.

#### ThioB – desulphurises the biogas

Nutrient complex ThioB optimise the biological desulphurisation of biogas in external solid bed systems.

### Stable process for high fermenter efficiency



### The production of CR. micronutrient mixtures is tailor-made for ...

#### ... a wide variety of systems:

- Municipal waste fermentation plants
- Sewage treatment plants with co-fermentation
- Anaerobic industrial sewage treatment plants
- Dry fermentation plants
- Percolate plant systems
- External biological desulphurisation projects

#### ... different types of co-substrate:

- Waste materials and waste water from food production
- Waste materials and waste water from drink production
- Waste materials from carcass utilisation plants and poultry production
- Slurry from ethanol production
- Waste materials from starch production and fat separators

### The CR.COMPACT product line

The CR.COMPACT line is characterised by low dosage and an excellent price-output ratio.

The more highly concentrated CR. COMPACT products are used after the plant has been set for a stable, optimal output level. Compatibility with active substances is limited.

In view of their composition and higher concentration, the CR.COMPACT products are classified as hazardous material. They are therefore supplied only in fermentable bags which can be put into the fermenter unopened.

### Use of the CR.COMPACT product line

- Analysis-based, individual mixtures
- Suitable for any organic capacity size
- Limited compatibility with active substances
- Supplied in fermentable bags
- Dosing of sealed bags
- Use rate: approx. 2 kg/100 kW and day

