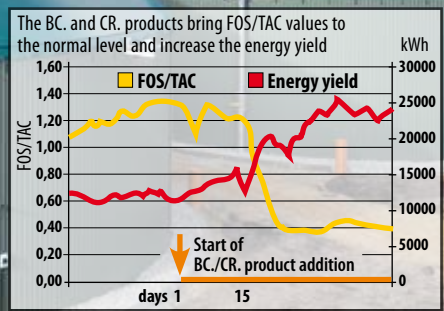
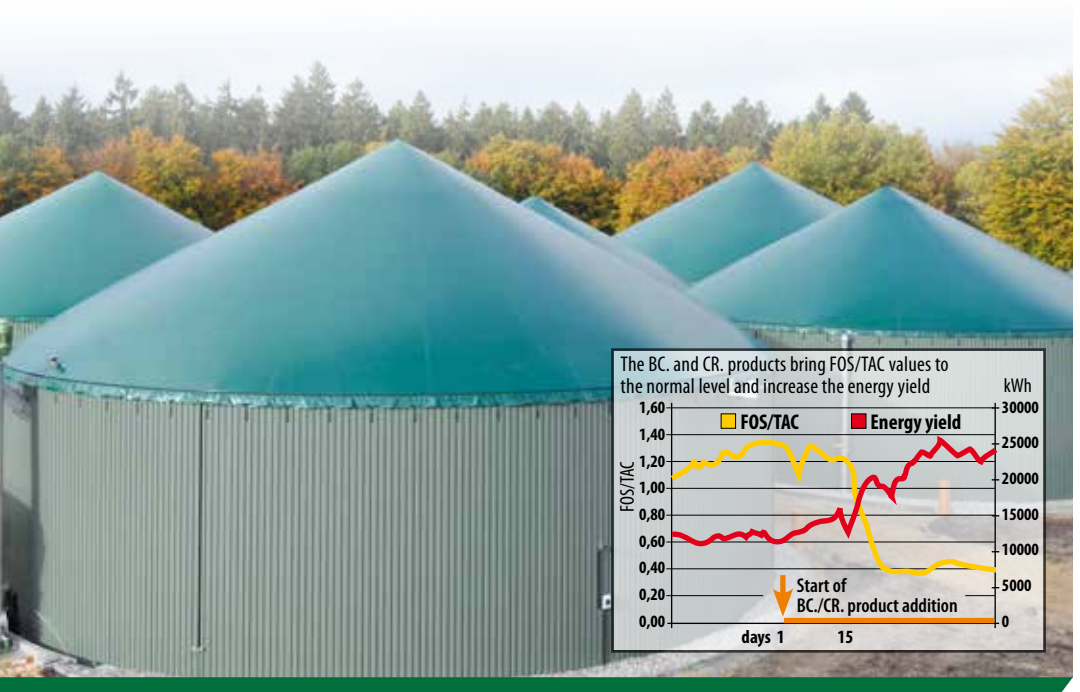


We research for you:

From batch trials up to the 776 kW biogas plant

From model silo up to commercial silo facility (16,000 t)



Optimising the fermentation processes

In recent years ISF SCHAUMANN RESEARCH has intensified their research work into the fermentation processes of biogas factories.

This started with studies in a test facility with 48 batch fermenters on a 60-litre scale and 28 fermenters on a 30-litre scale. Fermentation of 300–500 g material allows representative samples of heterogeneous substrates to be drawn without prior processing. The trials were conducted in conformance with VDI Guideline 4630 in four batches. In addition 80 batch systems with automa-

Study objectives:

- Effect of aerobic losses in the substrate store on the biogas yield
- Rate of degradation and residual methane potential
- Degradation kinetics and metabolic pathways during anaerobic breakdown using the in sacco method and feed batch trials

tic pressure sensor and pressure release (1 litre ORGA test) were established for the simultaneous detection of gas formation.

776 kW biogas facility at the Gut Hülseberg

In order to investigate the transferability of the results from model trials to practical biogas production the ISF SCHAUMANN RESEARCH division decided to build a 776 kW field test biogas facility at GUT Hülseberg.

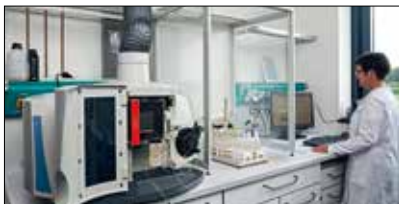
In two identical full scale fermentation lines, it is possible to compare at

commercial-scale a research test with a control.

Comprehensive research and analytical facilities in modern in-house research laboratories create the basis for optimising fermentation processes and increasing substrate degradation rates.



Biogas facility at Gut Hülseberg



ICP-OES analysis for determination of macro- and trace-elements

Key data of the biogas facility:

- 526 kW electrical power directly at the biogas plant and 250 kW electrical power via a satellite CHP
- 4,800 m³ total fermenter volume
2 x 1,300 m³ main fermenters
2 x 1,100 m³ secondary fermenters
- 2 identical but separate process lines, each with a main and secondary fermenter and gas-tight terminal store with separate balancing
- Separate gas volume and quality measurement in all tanks

We research for you

With the recently reconstruction and expansion of the laboratory facilities and the technical centre in Gut Hülseberg, ISF SCHAUMANN RESEARCH has significantly expanded its potential to deal with a broad spectrum of questions on biogas production.



HPLC systems for analysis of organic acids



Continuous biogas fermenters



Laboratory and technical centre facilities of ISF SCHAUMANN RESEARCH

From basic research in batch fermenters and trials in continuous fermenters through to field studies in parallel working commercial fermenters, the Hülseberg research centre has created outstanding facilities for resolving complex issues relating to biogas production:

- Optimisation of fermentation processes in biogas plants
- Continuous updating of trace element requirement data
- Testing new combinations of active ingredients and product formulations for tailor-made micronutrient mixtures which provide a long-term increase in fermenter efficiency while reducing environmental impact.
- Laboratory and pilot-scale investigations for customised and tailored enzyme mixtures depending on the requirements of the fermentation process.

Ensiling and substrate preparation

A key aspect of profitable biogas production is optimal substrate preparation and professional ensiling of the energy plants. This is something we have been working on with a high degree of success for more than 18 years.

ISF SCHAUMANN RESEARCH selects special lactic acid bacteria which are combined in accurately balanced ratios in speciality products which ensure op-

timal fermentation of the ensiled material, preserve the energy content of the plants and increase the efficiency of biogas production. This applies both to pure biogas substrates and to substrates for universal application (livestock feeding and biogas production).

Outstanding results in practice testify to our successful research and development work.



Our expertise in biogas

- Qualified advice
- Extensive, detailed analysis
- State of the art laboratory and technical centre facilities
- SILASIL ENERGY® – specialises ensiling additives
- BC.ACID – successful preservation products
- BC. concept and CR. concept – fermenter-specific, individual micronutrient mixtures
- BC.ZYM – the specific enzyme blends for process enhancement in biogas plants
- BC.TEplex – highly concentrated, liquid trace elements mixtures with high bio-availability

The result: more profit for you

- Optimal ensiling and substrate preservation
- Long-term increase in fermenter efficiency
- More full-capacity hours per year
- Higher company profit



SCHAUMANN
BioENERGY