



# *BC.ZYM*

- accelerated fibre breakdown
- improved viscosity
- reduced energy consumption

# BC.ZYM

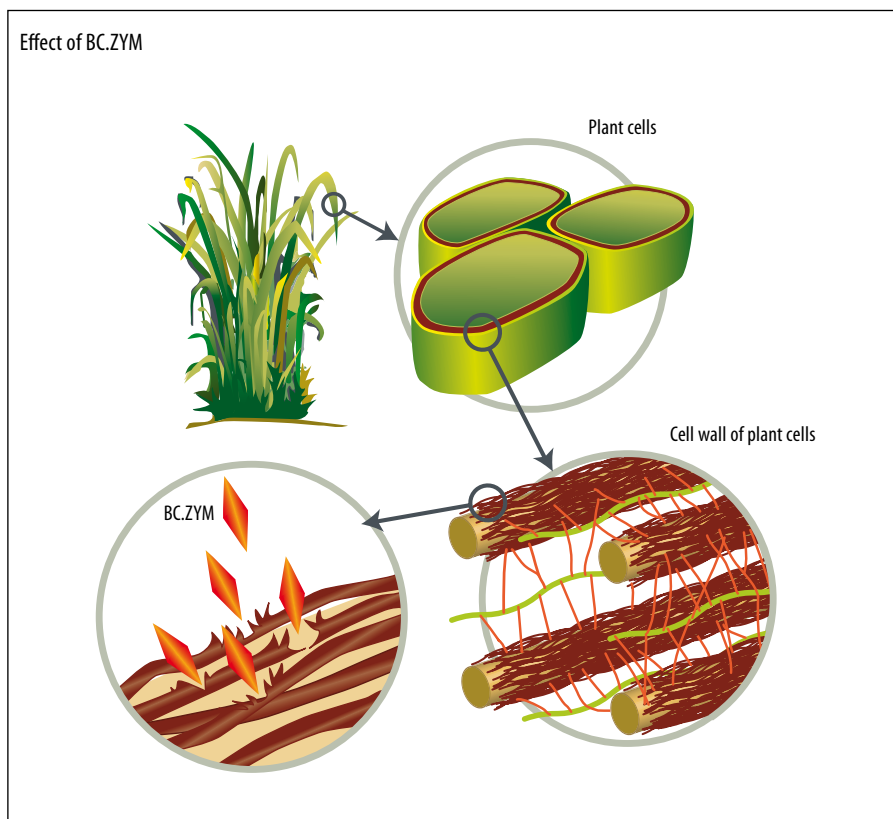
## How they work

BC.ZYM products are specific biocatalysts which accelerate biochemical reactions or enable them in the first place.

In the initial stage of biogas production – hydrolysis – the enzymes break down the substrate constituents (cellulose, hemicellulose, pectins, starch, proteins, lipids) into substances that can penetrate cell membranes (sugar, amino acids, fatty

acids). Only then can the bacteria involved in the biogas process carry out the next stages of biogas production.

BC.ZYM provides the necessary enzymes, specifically optimised for these processes. This latest innovation in the development of enzyme mixtures solves a number of specific difficulties encountered in biogas plants.



## The Enzyme Product Range

The BC.ZYM enzyme product line accelerates conversion processes in your fermenter at optimally adjusted trace element status. The breakdown of fibrous substrates and reduction of viscosity due to the hydrolytic conversion of complex macromolecules

improves the structural viscosity characteristics of the fermenter contents.

The ideal product variant for your plant is determined in our biogas lab based on the biological and technical parameters.

**BC.ZYM<sup>M</sup>**

➤ for maize silage and whole-crop cereal silage

**BC.ZYM<sup>G</sup>**

➤ for grass and clover grass silage

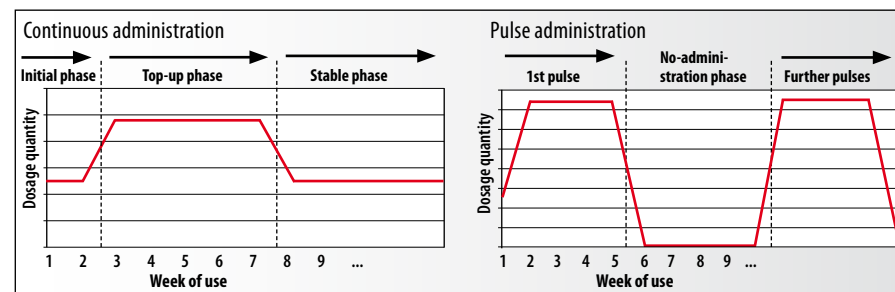
**BC.ZYM<sup>M+</sup>**

➤ for the targeted improvement of structural viscosity characteristics

## Dosage method and quantity

The specifically calculated dosage quantity and fermentable bags make application straightforward. Dosage method and

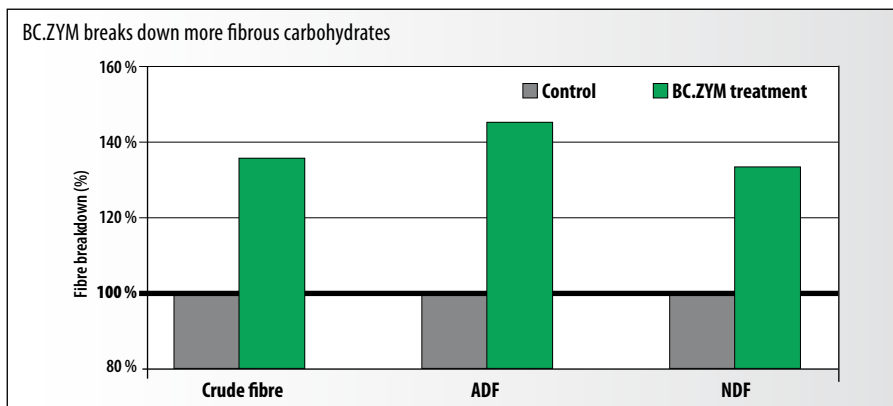
quantity are decided on the basis of laboratory tests and calculations by our special Schaumann BioEnergy consultants.



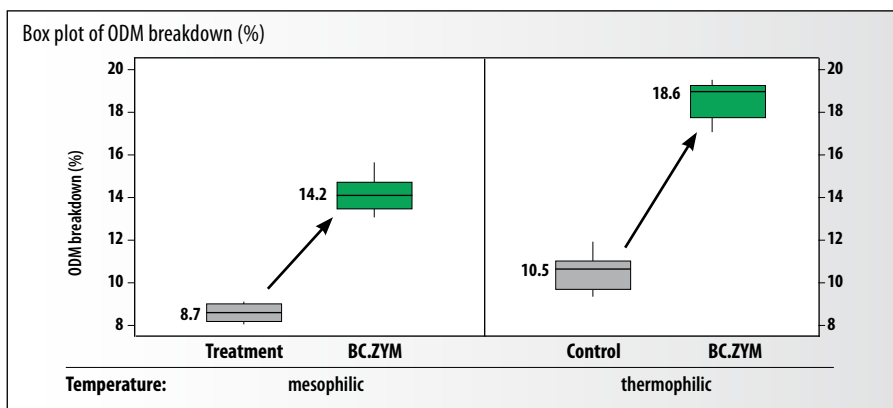


## More methane with BC.ZYM

**BC.ZYM breaks down significantly more crude fibre and increases methane yield.**



**Results of tests by the ISF:** Compared with the untreated variant in the batch test, approximately 35 % more crude fibre (see graph) is broken down with the use of BC.ZYM after 7 days.

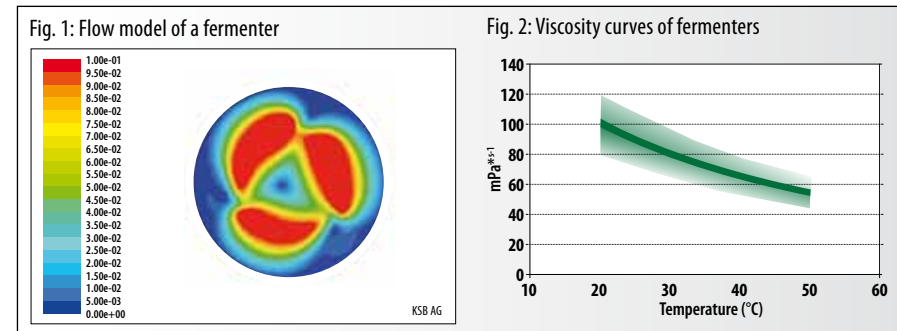


**The results of tests by HAWK Göttingen** show a significantly increased breakdown of organic dry matter in the fermentation residue of an energy crop biogas plant, amounting to 63 or 75 % respectively in the first 5 days.

## Viscosity improvement

Viscosity refers to the thickness of a fluid or mixture. The higher the viscosity, the poorer the flowing and pumping properties of the material. Flow speed in the fermenter is substantially influenced by the viscosity. The structural viscosity properties

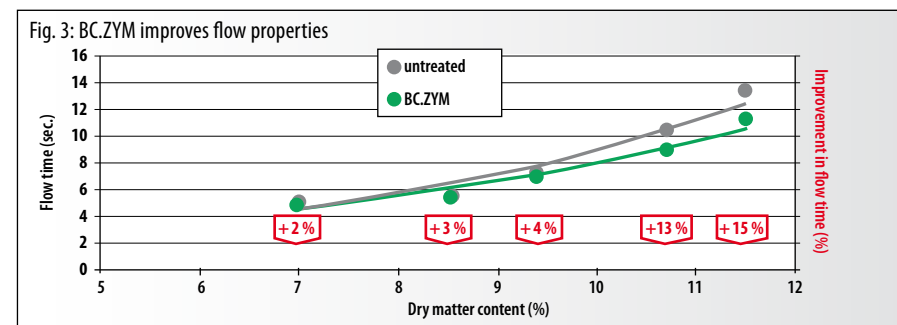
of non-Newtonian fluids such as fermenter sludge can be characterised using the V-funnel flow time. A rising flow time corresponds to increasing viscosity and strongly affects the pumping and stirring capacity.



The blue regions in Fig. 1 indicate areas with lower flow speeds and hence potential “dead zones”.

Fig. 2 shows the fluidity (flow properties) of various fermenter sludges depending on temperature. Besides temperature, flowability depends on the feed substrates and can vary widely.

The enzymatic/hydrolytic activity of BC.ZYM breaks up the macromolecular compounds, improving flowability and speeding up the V-funnel flow time (see Fig. 3).





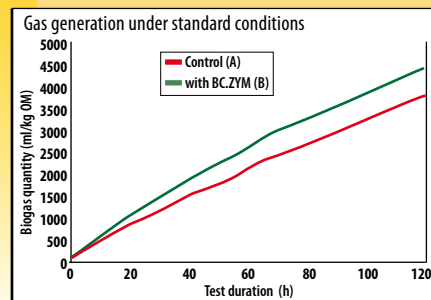
Stages of evaluation leading to the recommendations for use

1. Plant technology      2. RosA-test      3. Saccharification test      4. Flowability

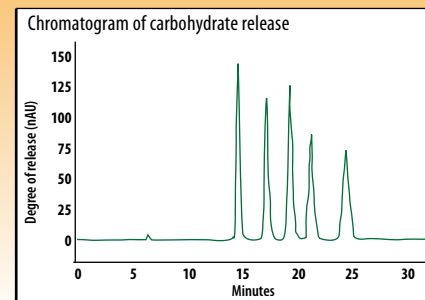


- Hydraulic retention time
- Organic loading rate
- Stirring technology
- Floating layer
- Fermenter analytics

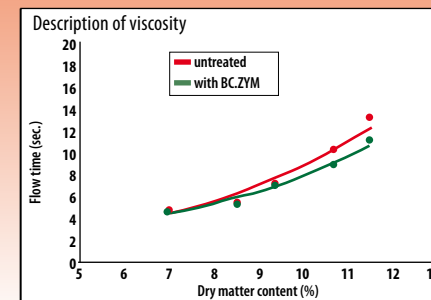
Detailed evaluation of the relevant influencing factors guarantees maximum efficacy of BC.ZYM products. The existing plant technology and fermenter biology are characterised and compared with our extensive biogas database.



The fermenter biology's response to the addition of enzymes is determined by the Rostock activity test (or 'ORGA test'). Biological activity is measured in terms of volume of gas per unit of time.



The saccharification test is used to ascertain the degree of enzymatic release of various sugars from the relevant substrate mix used in the biogas plant.



The V-funnel flow time determined under standardised conditions describes the flowability of the fermenter contents.

Viscosity improvement with BC.ZYM



## Improved biogas production through the use of enzymes

BC.ZYM is intended for use at optimally adjusted trace element status in plants with:

- difficulties in mixing fermenter contents
- difficulties in pumping fermenter contents
- suboptimal substrate utilisation
- a high volume of fibrous materials
- floating or settled layers
- a short hydraulic retention time

# BC.ZYM

The individual recommended use rate is worked out on the basis of the evaluation criteria and is between 1 and 10 kg/100 kW.

## The result → More profit for you

- Improved structural viscosity characteristics
- Increased mixing efficiency
- fast correction of process malfunctions
- more methane with less substrate
- reduced energy consumption and maintenance costs
- higher company profit

[www.schaumann-bioenergy.eu](http://www.schaumann-bioenergy.eu)

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