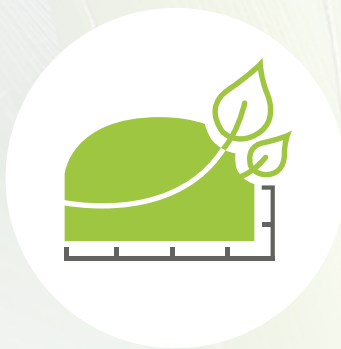
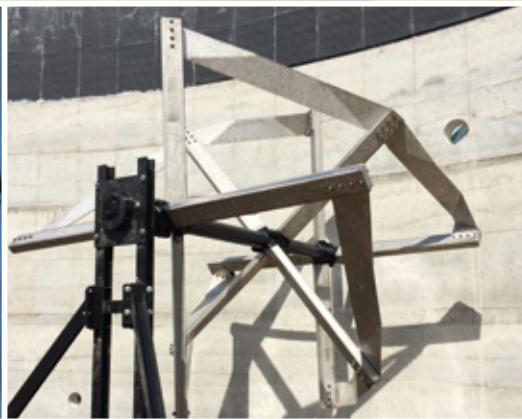


STEVERDING  
RÜHRWERKSTECHNIK



EFFICIENCY EXCELLENCE



BUILT-IN FUTURE



5 GOOD REASONS

# OUR HIT SERIES – for more efficiency

Powered by Steverding Rührwerkstechnik

# No matter how you stir the material,...agitators made by Steverding

## TIMES ARE CHANGING

In the NaWaRo scene, maize cultivation has been the predominating biomass for biogas plants for many years. In the past years the use of alternatives for experimenting became more and more common. New substrates more and more frequently place new demands on technology. This is a good thing if your plant is prepared for the changes of tomorrow.

The pioneering days of biogas plants are long gone. Today, high-tech is requested on all levels of energy generation. Steverding Rührwerkstechnik has more than 20 years of experience in the production of agitators. Due to the continuous optimization of the designs and production, but especially due to technical innovations, plants containing our components achieve optimum values.

Today we are partners and system suppliers of leading manufacturers from Germany, France, Great Britain, Lithuania, Chile, Turkey, Spain, the Benelux countries and further countries. Steverding Rührwerkstechnik combines know-how from the fields of machine and plant construction and designers from the fields of fluid mechanics and bioenergy, who are strong on innovation, under one roof.

### Our core areas are:

- Analysis and system certificates
- Design and optimization
- Research and development
- Manufacturing and installation
- Maintenance and repair
- Repowering



Exterior view of a drive unit



## Comparison of our products

Features / description	Spiralo®	Schwanko	Hydromixer	Vertical agitator	Plug-flow agitator
Agitation efficiency	+++	++	++	++	+++
High-viscosity media	++	+++	++	+++	+++
Low-viscosity media	+++	+++	++	++	+
Fluctuating filling level	+++	+++	+	+++	++
Displacement volume	+++	++	++	+	○
Torque	++ (+)*2	++ (+)*2	++ (+)*2	++ (+)*3	+++
Ideal for dry matter content*1	Up to 11%	Up to 15%	Up to 13%	Up to 15%	Up to 25%
Availability	Stock article	Stock article	Stock article	Per order at short notice	Per order at short notice
Suitable for:	▼	▼	▼	▼	▼
Fermenter	+++	+++	+++	+++	+++
Secondary digester	+++	+++	++	+	○
Fermentation residue storage	+++	+++	○	○	○

\*1 Depending on the substrate composition and cutting length

\*2 On request 22 KW motor

\*3 1 – 45 KW



The table provides a concise comparison of our five basic types, allowing to give a first, quick orientation on the agitator that is perfectly suited for the corresponding application. Technical details can be modified for individual orders so that possibly a different model from our range may be more suitable. Our technicians will be pleased to work out the ideal solution together with you.



## OUR HIGHLY INNOVATIVE PRODUCT

As is generally known, the field of biogas production provides different possibilities of keeping substrates in motion. The energy yield and therefore the efficiency of a plant substantially depends on how this is done. Spiralo is a completely newly developed agitator into which the experience of several decades of collaborating with technical colleges and institutes has been incorporated. The numerous innovations are registered for patent approval, since our agitator is unique in its category. There are many good reasons for this:



### Advantages

- Slow-moving horizontal paddle agitator for constant and fluctuating filling levels throughout the whole agitation diameter
- Axial suction effect from the container centre and radial ejection at the container wall for highly efficient mixing
- High effectiveness also with high-viscosity media
- Allows for agitation of the whole container in a short time
- Careful treatment of the bacteria population in order to attain an optimum gas yield
- Container bearing consisting of special, extremely wear-resistant and maintenance-free bearing plastics
- All relevant components can be replaced without having to drain the container or replacing the agitator shaft
- The functional principle is ideal for breaking floating layers
- Agitator principle supports the agitation of setting layers
- Makes degassing of the substrate easier
- Very low maintenance

### Fields of application

- Breaking of floating layers
- Agitation of setting layers
- High-viscosity & low-viscosity media (dry matter content up to 11 %)
- Suitable for fermenters, secondary digesters, and fermentation residue storages in steel or concrete design

## THE VARIABLE ALL-ROUNDER

The requirements with regard to the optimum production process may vary considerably. If you prepare for specific features with a fixed dimensioning and commit themselves to a narrow spectrum due to their technology selection. However, if you still need a high degree of flexibility, you will want to focus on variably adjustable components when designing your plant. Schwanko offers maximum flexibility without real compromise. The special features of our all-rounder at a glance:



### Advantages

- For containers with high-viscosity input materials and a constant or fluctuating filling level throughout the whole agitating diameter
- Special paddle design provides for smooth immersion, full thrust, and efficient mixing substrate
- Gentle treatment of the bacteria population in order to attain an optimum gas yield
- A seal monitoring system enables a reduction of the filling level below the shaft, also in the gas-tight area during agitation
- Inner bearing for dry pump operation
- Container bearing consisting of special, extremely wear-resistant and maintenance-free bearing plastics
- All relevant components can be replaced without having to drain the container or replace the agitator shaft

- The functional principle is ideal for breaking floating layers
- The agitator principle supports the agitation of setting layers
- The process makes degassing of the substrate easier
- Very low-maintenance

### Fields of application

- Breaking of floating layers
- Agitation of setting layers
- High-viscosity & low-viscosity media (dry matter content up to 15 %)
- Suitable for fermenters, secondary digesters, and fermentation residue storages in steel or concrete design

## THE CHAMPION

Renowned biogas plant manufacturers focus on proven standards when they construct new plants. Therefore, then as now, the hydromixer is installed in the most various biogas plants. Alone in the past years more than 3,000 agitators of this type have been manufactured. This makes our hydromixer one of the sector's renowned and proven classic products among the agitators. It is still the best choice for numerous applications, so that new biogas plants are also built using our agitator. The most important features at a glance:



### Advantages

- Slow-running horizontal shaft agitator
- High effectiveness also with high-viscosity media
- Gentle treatment of the bacteria population in order to attain an optimum gas yield
- Container bearing consisting of special, extremely wear-resistant and maintenance-free bearing plastics
- All relevant components can be replaced without having to drain the container or replacing the agitator shaft
- The functional principle is ideal for breaking floating layers
- The functional principle supports the agitation of setting layers
- Degassing of the substrate is made easier
- This agitator type is suitable for slightly fluctuating filling levels
- The plant and components require very low maintenance

### Fields of application

- Breaking of floating layers
- Agitation of setting layers
- High-viscosity & low-viscosity media (dry matter content up to 13 %)
- Suitable for fermenters and secondary fermenters in steel or concrete design

## THE POWERFUL COMPACT CLASS

Vertically agitating biogas fermenters constitute a niche segment, however, their use is strongly increasing. Steverding Rührwerkstechnik offers efficient agitator technology for the a broad variety of substrates – whether you need fermenters with a central agitator or several eccentric agitators, or even receiving tanks for food industry waste products. The robust agitators made by Steverding Rührwerkstechnik may be the right choice for these cases.

Exclusively for Agraferm Technologies AG



### Advantages

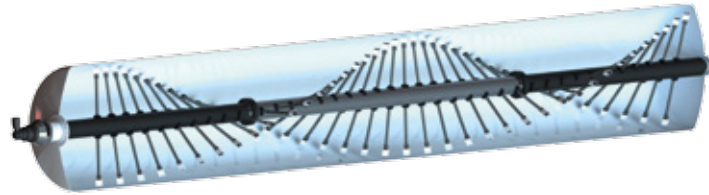
- Centric and eccentric installation in the container for an ideal flow in the medium
- Horizontal and vertical intermixing for high-viscosity input materials by arrangement of the paddles alternately on each side (preventing setting/floating layers)
- The special arrangement and design allows for the attainment of an optimum gas yield with low-power motors
- A special seal prevents gas from escaping from the top cover
- For maintenance purposes, the agitator can be removed from the container during operation

### Fields of application

- Breaking of floating layers
- Agitation of setting layers
- High-viscosity media (dry matter content up to 15 %)
- Suitable for fermenters with a concrete top cover, steel containers, and GRP containers

## FOR EXTREME SOLIDS CONTENTS

In the past 20 years, biogas technology has developed further in many respects. Also with regard to the fermentation of new substrates. With an increasing solids content, more and more plants by definition reach the degree of dry fermentation. Our plug-flow agitators are able to agitate dry matter contents of more than 25% without any problems. In this sector, demands with regard to technology are highly specific, and they are perfectly met by our plug-flow agitators. These are the special features:



## Advantages

- Very slowly running agitator for plants with a very high content of dry substrate
- Accelerated maceration of the biomass provides for an increased gas yield
- Variable use, e.g. for hydrolysis or as fermenter
- Use for operation in mesophilic and thermophilic areas
- No pre-treatment of the input materials necessary
- Very high torque
- Low current consumption
- Variable filling levels, dwell times, and speeds can be implemented without any technical modifications

## Options:

- The patented floating shaft by STC engineering makes an additional bearing in the container dispensable
- GRP tank can be supplied along with the delivery

## Fields of application

- Avoidance of setting/floating layers
- Very highly viscous media
- Suitable for pre-fermenters for hydrolysis and for fermenters

## CUSTOM-MADE PRODUCTS:

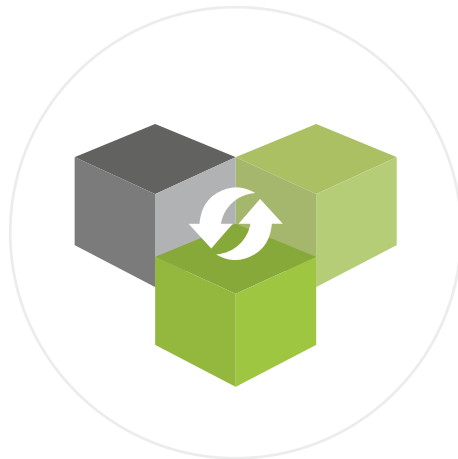






## EFFICIENCY EXCELLENCE

Consume less, save more – this is our incentive. Together with colleges and universities we have achieved some well-respected innovations in the past years. Numerous patents and awards are great feedback. What's even more important, however, is the noticeable effect on practice. The evaluations of successfully converted plants speak a clear language and prove by figures what can be saved in the long term today when a state-of-the-art agitator by Steverding is used.



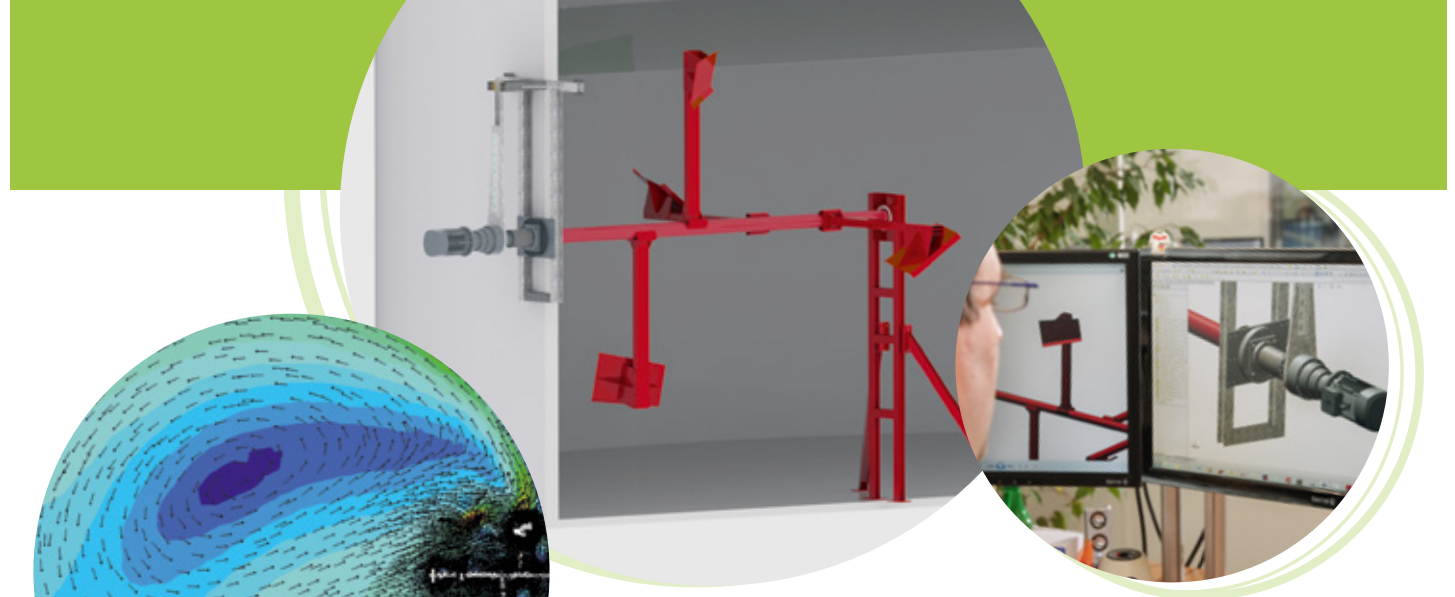
## BUILT-IN FUTURE

Consistent production in modular design allows for perfect extensibility of our agitators. The design is logically adapted to the current need. Over time, the parameters may change. New dry substance contents or the conversion to completely new substrates require different kinds of agitation. Here our modular concept provides for the perfect extensibility.



## 5 GOOD REASONS

- A partner nearby – fast service
- High quality made in Germany
- Expert advice by engineers and technicians
- More than 20 years of know-how in the fields of development and production
- Unbeatable price/performance ratio



Design and construction of paddle agitators

## In our competence centre

Product developments can be reliably tested in the laboratory before being produced in series. CFD data ideally back up the test series.

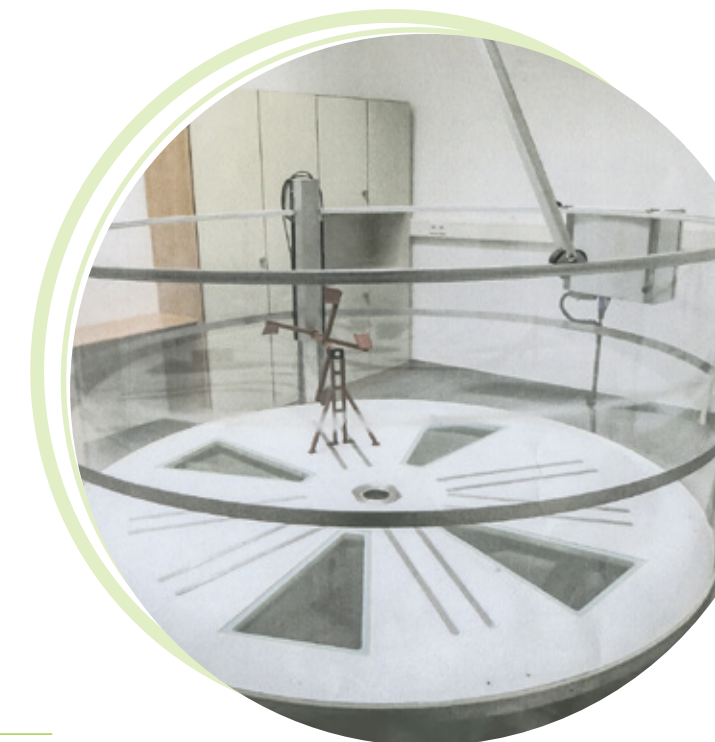
## EFFICIENCY IS CALCULABLE

Computer simulations make it possible to carry out virtual field tests with reliable results. The advantages are obvious. The expensive prototype construction is dispensed with, and comparative values based on detail changes allow for a targeted optimization of the product innovations.

Computational Fluid Dynamics – abbreviated CFD – enable the process visualization on a digital basis. Like in a film, the fluidic conditions can be represented in a container that is true to the original. Therefore there are no scale-up effects. Meaningful CFDs require the use of high-tech and engineers in front of the computers, who handle these processes in an experienced fashion. The testing part is supplied to us by institutions of colleges and universities as well as partner offices.

## From the idea to series-production readiness!

Starting with an idea, new projects can be developed with state-of-the-art programs. Using CFD data calculations, flow characteristics can be optimally determined. Test facilities that are true to scale provide for tangible results that are true to the original, so that field tests under real conditions only have to be carried out optionally. The CFD data allow for short-term development phases, since the construction of a prototype is dispensed with and series production can be carried out directly.



# Contact us!

**Optimize your operating result by the right agitator technology!**

## ANALYSIS

- Evaluation of the agitator technology installed
- Energy consumption values of the agitator technology
- Efficiency of the agitator technology
- Determination of the susceptibility
- Characterization of the fermenter suspension by means of a tube viscometer.

**Tube viscometer**  
The dynamic viscosity is determined, which is decisive for the agitator dimensioning.



## PROBLEM

- Bad fermentation
- High agitation energy input
- Extreme formation of setting/ floating layers
- Obstruction of the level drains
- Frequent faults in the agitation technology

## SOLUTION

- Remove old agitation technology
- New agitation technology installed within 1 day
- More profit without additional effort
- All problems solved

## We are there **for you!**

Being a manufacturer we have access to all components. After commissioning of the plant, we are your contact for wear parts and spare parts. Our in-house installation teams can carry out the repair or replacement 24 hours a day and 365 days in the year.

**Please do not hesitate to contact us, we are looking forward to your tasks!**



**STEVERDING  
RÜHRWERKSTECHNIK**

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