

Nº S.M

TECHNOLOGY FOR AGRICULTURE AND BIOGAS PLANTS

YOU CAN RELY ON THEM: QUALITY DOWN TO THE LAST DETAIL



Market leader for elastomer-coated rotary lobe pumps and experts in separation technology. We are represented in more than 65 countries and remain on course for growth. Not only are we a global player but also an independent, family-owned and second generation managed company.

"Constantly making things better" has been our guiding principle right from the start. This is evident by the quality, durability and ease of maintenance of our products. Not only has it shaped our company history since 1975 with continuous new developments and innovations, it also is expressed in the honest and reliable partnership with customers, suppliers and staff.

Our products for agriculture and biogas are customized to the specific demand. Whether pumping and macerating liquid manure, separating solid from liquid parts in digestates and liquid manure, feeding of biomass into a biogas plant or storing liquid manure – our experienced experts know the requirements, recommend suitable products or develop individual solutions for you. Highest quality "Made in Germany".

BÖRGER EXCELLENCE - MADE TO LAST

Börger products are designed for trouble free, continuous operation, as we want you to be able to work as effectively as possible. This is the reason why we only offer powerful and durable plants with unbeatable ease of maintenance features.



PRODUCT OVERVIEW AGRICULTURE AND BIOGAS

You can rely on Börger products: We know the requirements of an agricultural company and a biogas plant. Our products have been successfully used in these sectors for more than 40 years.



ROTARY LOBE PUMPS

Börger is a specialist in rotary lobe pumps. We offer solids-resistant rotary lobe pumps with flow rates of 1 – 24,000 l/min and a large selection of equipment and additional parts. The pumps can be used as mobile, stationary or submerged versions.



MACERATING TECHNOLOGY

Börger provides suitable solutions for particle size reduction of solids contained in liquids. Offering the Multicrusher, Multichopper and Rotorrake, we have three different macerators in order to be able to provide an ideal unit for every solid material to be macerated.



SEPARATION TECHNOLOGY

The Börger Bioselect stands for efficient separation technology. Using a purely mechanical process, liquid parts are separated from solid parts in the medium (such as digestate or liquid manure).



LIQUID FEEDING TECHNOLOGY

The Powerfeed is used for feeding solids into biogas plants. The liquid feeding technology is available in four different versions. Containers of any number and of different heights can be fed by means of the Powerfeed.



STAINLESS STEEL TANKS

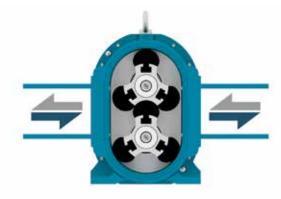
Börger stainless steel tanks in segmental design with capacities of 30 to 5,000 m³ are very well suited for storing different liquids.



AGITATOR TECHNOLOGY

In order to homogenize liquids and prevent the formation and deposit of solid layers, the Börger submersible B-MX mixer agitates the storage medium.

BÖRGER ROTARY LOBE PUMPS ROBUST, RELIABLE AND CUSTOMIZED



Börger rotary lobe pumps have made our company wellknown worldwide. The solids handling pumps are powerful, reliable and efficient. Börger pumps convey dirty, sludgy and abrasive media without problems.

OPERATING PRINCIPLE

Börger rotary lobe pumps are self-priming, valveless, positive displacement pumps. The synchronized rotation of the rotor pair creates a vacuum on the priming side of the pump. This vacuum draws the liquid into the pump chamber. The medium is pumped into the pressure area due to the rotation of the rotors. If the direction of rotation is changed, the flow is reversed.



1 The quick-release cover

Access to all wetted parts by simply loosening four ring nuts – maintenance without removal of pipe or drive systems (MIP[®]).

2 The rotors

Large selection of high-quality rotors for almost pulsation-free pumping of the medium.

3 The casing protection

Depending on its size, the BLUEline pump is available with and completely without protection plates and liners. When pumping abrasive media containing solids, the protection plates and liners protect the pump casing from wear and can be replaced in a matter of minutes.

4 The intermediate chamber and shaft seal

The large-volume quench chamber is oil-filled and ensures the highest degree of safety. The ideal mechanical seal is selected depending on the medium.

5 The carrier and timing gear

The high-quality and maintenancefree carrier and timing gear guarantees a smooth and even operation of the rotors. The result is a long service life of the pump.



ROTARY LOBE PUMPS AT A GLANCE

+ 25 pump sizes with flow rates of 1 – 24,000 l/min
+ With and without casing protection plates

and liners

+ Pumping in slurp operation

- + Resistant to solids and self-priming
- + Ease of maintenance thanks to MIP®
 - + Different drive options
 - + Short-term dry-run capability

CASE STUDY: MOBILE VAT FILLING STATION

A large agricultural contractor uses a mobile vat filling station from Börger for filling their spreading vats. The pump sucks the liquid manure through a Börger Rotorrake which macerates the solids. The on-board hydraulics of the vat filling station is driven by the PTO of a tractor. There are three hydraulic circuits from the on-board hydraulics which drive the pump, the Rotorrake and the extendable docking arm. The Piadin can be fed from the 200 l tank into the liquid flow by means of a dosing pump. In addition, ammonium sulphate solution or UAN can be fed into the liquid flow from an external tank.



HIGH FLEXIBILITY STATIONARY, MOBILE OR SUBMERGED

STATIONARY OR SUBMERGED

For pump system installations, the structural conditions plant site and required accessories need to be considered. Börger offers complete solutions. In addition to the rotary lobe pump itself, we also manufacture the pump skid components.

The mounting position of the pump / drive combination are selected according to plant requirements. Our rotary lobe pumps can be either driven by an electric motor, a combustion motor, a hydraulic motor, or a PTO shaft of a tractor. The rotary lobe pumps can be used as stationary, mobile or submerged versions due to the flexibility and compact design of the pumps.

MOBILE PUMPS AND VAT FILLING STATIONS

Börger builds each mobile pump in line with customer's requirements. The pumps can be installed on a three-point hitch frame, on a trailer, on a hand cart or on a tanker truck. Börger supplies special pump systems or mobile unit "turn-key". The design, metal construction and electrical engineering departments meet any challenge.

Börger vat filling stations are used in many different versions. They are mostly driven by the PTO shaft of a tractor. If media containing solids are pumped, a macerator is recommended.

CONTROL PANEL TECHNOLOGY

Whether rotary lobe pump, macerating unit, separation or feeding technology, optional control panels are adapted to the customer's individual requirements by Börger's electrical engineering department. You can easily control and monitor our agricultural machines via the control cabinet. The control unit coordinates the operation of the devices perfectly in case of more complex installations. For example, the feed pump speed (and the flow rate) is adjusted to the utilization of the Bioselect by the control panel technology. This way, the separator is always operated at optimal capacity. Our electrical engineering department can directly access your control panel technology by means of an optional remote maintenance module and can directly take measures if you need assistance or have a question.

MOBILE PUMPS AND VAT FILLING STATIONS

STATIONARY OR SUBMERGED

CONTROL PANEL TECHNOLOGY

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MAINTENANCE IN PLACE (MIP®) SIMPLE. EASE OF MAINTENANCE.



Börger products are designed for trouble-free, continuous operation and incorporate unbeatable ease of maintenance features. All components are extremely resilient and durable. Instead of expensive maintenance contracts, Börger offers MIP[®] (Maintenance in Place). Control maintenance and repair procedures yourself. Product wetted parts can be replaced at the installation site without the need to remove piping and the drive system. Easily and quickly.



BLUEline Legend

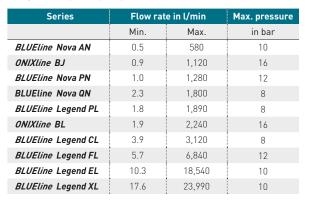
ROTOR AND CASING PROTECTION

Just the removable lobe tips of the patented rotor "Unique" have to be replaced in case of wear. Our Premium profile rotor has been especially designed for the biogas sector and offers long service life in case of pumped media containing fibers. The casing liners and casing protection plates protect the pump casing and can be replaced through the quick-release cover in case of wear just as the single-acting mechanical seal. This way, the pump is like in a new condition within a few minutes.

SEVERAL PUMP SIZES

With the wide spectrum of ten series with 25 pump sizes (flow rates of 1 – 24,000 l/min), a large selection of equipment and additional parts, Börger is able to build rotary lobe pumps which are perfectly suited to every single application.

Börger rotary lobe pump overview





FOR SIMPLE TRANSFER OPERATIONS EASY SOLUTION

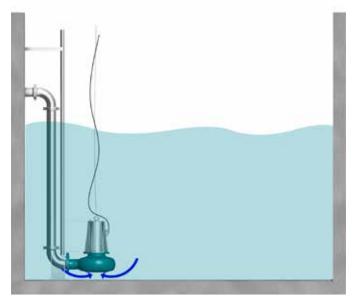
Submersible centrifugal pumps can be used for simple transfer operations with short distances and minor height differences.

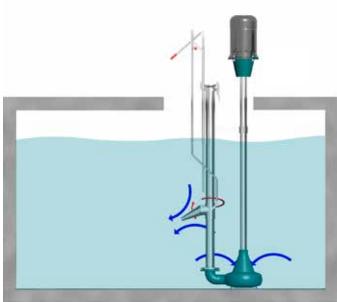
SUBMERSIBLE CENTRIFUGAL PUMPS

Submersible centrifugal pumps can be used for conveying aqueous media with low solids content. The submersible pump is lowered into the liquid to be pumped and uses the feed from below. The pump is driven by a submersible motor.

SUBMERSIBLE CHOPPER MIX PUMPS

The pump wheel of the submersible cutting pump is equipped with cutting edges. This way, fibers are macerated during the pumping process. By simply moving a valve, the submersible chopper mix pump can be used for transfer operations or for circulation by means of an agitating nozzle.





MACERATING TECHNOLOGY COMPACT AND POWERFUL

By offering three different macerators, we are able to provide the ideal unit for every macerating task. You can select from a perforated disk macerator, a dual-shaft grinder or a one-shaft macerator.

THREE MACERATING TECHNIQUES

The Börger Multichopper is a macerator with a central, perforated disk and high-performance blades for size reduction of solids contained in liquids.

The Multicrusher is a universal and powerful dual-shaft grinder which is based on the basic design of the proven Börger rotary lobe pump. The two shafts are equipped with blades and spacers instead of rotors.

The Rotorrake is a robust, single-shaft coarse macerator which tackles macerating tasks where others have failed – for macerating very coarse solids and rags. Each of our macerators is available in different sizes.

Börger macerator overview

Macerator	Max. capacity in l/min	Max. pressure in bar
Multicrusher	4,300	12
Multichopper	6,600	5
Rotorrake	9,000	5





MACERATOR AT A GLANCE

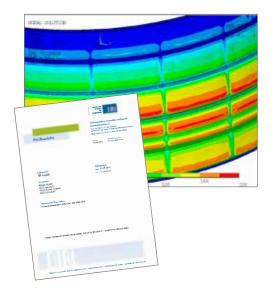
+ Excellent cutting result + With or without foreign body separator + Low life-cycle costs + Can be supplied in stainless steel + Energy efficient

CASE STUDY: SECONDARY CRUSHING IN A BIOGAS PLANT

A Börger Multichopper is used for secondary crushing of fermentation substrate in a biogas plant in Lower Saxony in Germany. The operator of the plant uses a screw shaft to feed the biomass into the fermenter. In order to achieve higher gas yield and remove impurities from the fermenter, the fermentation substrate is conveyed through the Multichopper by means of a Börger rotary lobe pump. All impurities are separated in the foreign body separator of the perforated disk macerator. The agitating effort in the tanks has been reduced and the gas yield increased by using the macerator.



STAINLESS STEEL TANKS DURABLE AND LASTING VALUE



Börger stainless steel tanks available in different material grades are suitable for storing any liquid.

Capacities between 30 to 5,000 m³, various accessories and roof constructions allow a customized, customer centered solution. The tanks can be installed quickly and the storage size can be increased without problems due to the segmented tank design. The segments are easy to transport (compact) and can be installed in existing premises, if necessary. The Börger standard tank is static-tested and certified.

BÖRGER TANKS OVERVIEW

Туре			1	2	3	4	5	6	7	8
	Cyl. height		1.50 m	3.00 m	4.50 m	6.00 m	7.50 m	9.00 m	10.50 m	12.00 m
	* Ø (m)	Area (m²)								
04	3.71	11		32 m³	49 m³	65 m³	81 m³	97 m³	114 m³	130 m³
05	4.63	17		51 m³	76 m³	101 m³	126 m³	152 m³	177 m³	202 m³
06	5.56	24	36 m³	73 m³	109 m³	146 m³	182 m³	219 m³	255 m³	291 m³
07	6.48	33	49 m³	99 m³	148 m³	198 m³	247 m³	297 m³	346 m³	396 m³
08	7.41	43	65 m³	129 m³	194 m³	259 m³	323 m³	388 m³	453 m³	517 m³
09	8.34	55	82 m³	164 m³	246 m³	328 m³	410 m³	492 m³	574 m³	656 m³
10	9.26	67	101 m³	202 m³	303 m³	404 m³	505 m³	606 m³	707 m³	808 m³
11	10.19	82	122 m³	245 m³	367 m³	489 m³	612 m³	734 m³	856 m³	979 m³
12	11.12	97	146 m³	291 m³	437 m³	583 m³	728 m³	874 m³	1,020 m³	1,165 m³
13	12.04	114	171 m³	342 m³	512 m³	683 m³	854 m³	1,025 m³	1,195 m³	
14	12.97	132	198 m³	396 m³	595 m³	793 m³	991 m³	1,189 m³	1,387 m³	
15	13.89	152	227 m³	455 m³	682 m³	909 m³	1,136 m³	1,364 m³		
16	14.82	173	259 m³	517 m³	776 m³	1,035 m³	1,294 m³	1,552 m³		
17	15.75	195	292 m³	584 m³	877 m³	1,169 m³	1,461 m³	1,753 m³		
18	16.67	218	327 m³	655 m³	982 m³	1,310 m³	1,637 m³	1,964 m³		
19	17.60	243	365 m³	730 m³	1,095 m³	1,460 m³	1,825 m³	2,190 m³		
20	18.53	270	405 m³	809 m³	1,214 m³	1,618 m³	2,023 m³	2,427 m³		
21	19.45	297	446 m³	891 m³	1,337 m³	1,783 m³	2,228 m³			
22	20.38	326	489 m³	979 m³	1,468 m³	1,957 m³	2,447 m³			
23	21.30	356	534 m³	1,069 m³	1,603 m³	2,138 m³	2,672 m³			
24	22.23	388	582 m³	1,164 m³	1,747 m³	2,329 m³	2,911 m³			
25	23.16	421	632 m³	1,264 m³	1,896 m³	2,528 m³	3,160 m³			
26	24.08	456	683 m³	1,366 m³	2,049 m³	2,732 m³	3,416 m³			
27	25.01	491	737 m³	1,474 m³	2,211 m³	2,948 m³	3,684 m³			
28	25.94	528	793 m³	1,585 m³	2,378 m³	3,171 m³	3,964 m³		1	
29	26.86	567	850 m³	1,700 m³	2,550 m³	3,400 m³	4,250 m³			
30	27.79	606	910 m³	1,820 m³	2,729 m³	3,639 m³	4,549 m³			
31	28.71	648	971 m³	1,942 m³	2,913 m³	3,884 m³	4,855 m³			
32	29.64	690	1,035 m³	2,070 m³	3,105 m³	4,140 m³	5,175 m³			
33	30.57	734	1,101 m³	2,202 m³	3,303 m³	4,404 m³		•		
34	31.48	779	1,167 m³	2,335 m³	3,502 m³	4,670 m³				

*Special and intermediate sizes possible

APPLICATION OPTIONS

Börger stainless steel tanks are versatile, e.g.:

- Liquid manure
- Fodder components
- Liquid fertilizer
- Turnips storage
- Fermenter
- Waste water and sludge

STAINLESS STEEL TANK AT A GLANCE

+ Capacity of 30 to 5,000 m³ + Maintenance-free and lasting value + Can be increased and demounted + Different roof constructions possible + Versatile



B-MX SUBMERSIBLE MIXER MORE EFFECTIVE AGITATION



The B-MX submersible mixer ensures that liquid media with solids are effectively agitated.

OPERATING PRINCIPLE

The design without edges of the device allows liquid to flow to the displacement blades without creating turbulence. This guarantees high efficiency. The high-precision casing and all wetted parts are made of full stainless steel.



CONSTRUCTION AND FUNCTION

1 *B-MX*

The submersible mixer is connected to the guide pipe by means of the guide carriage.

2 Guide carriage and guide pipe

The guide pipe guides the mixer.

3 Container wall

Attaching the mixer to the container wall is not necessary.



4 Working platform

The adjustment unit can be accessed via the working platform. In addition, it can be used to look into the tank.

5 Adjustment unit

The adjustment unit can be used to change the height of the mixer and the lateral alignment. In addition, the adjustment unit is used for fixing the guide pipe.

B-MX AT A GLANCE

+ Different sizes + Completely made of stainless steel + Good flow to the propellers

+ Cable inlet at the protected rear of the mixer

+ High efficiency

Börger B-MX overview

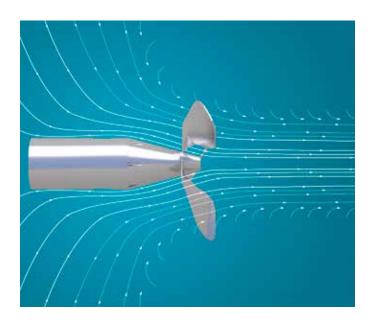
B-MX	Output in kW	Output in m°/h	Rotational speed in rpm	Weight in kg
B-MX 9	9	3,780	342	120
B-MX 13	13	5,020	342	165
B-MX 18	18	6,860	342	185
B-MX 22	22	8,640	342	250

GOOD FLOW PROPERTIES

The slim design of the B-MX and the geometry of the agitator blades have been optimized by means of the latest flow simulation programs and ensure highest efficiency.

CIRCULATION MIXER

The B-MX submersible mixer is also suitable for circulation channels (slalom liquid manure channels).





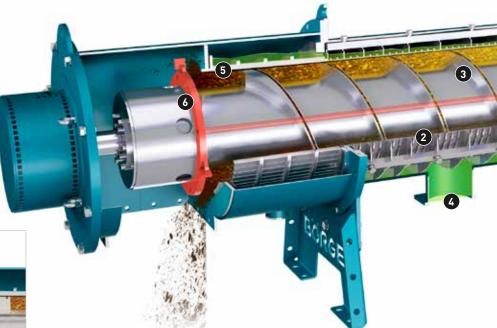
PERFECT SEPARATION RESULT BÖRGER BIOSELECT

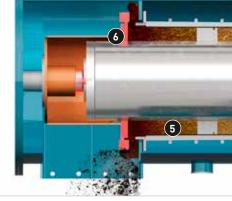
The Börger Bioselect stands for efficient separation technology. Using a purely mechanical process, liquid parts are separated from solid parts in the medium (such as digestate or liquid manure).

OPERATING PRINCIPLE

The media to be separated find their way through the inlet opening **(1)** into the vessel-like Bioselect. The outer cylinder is separated from the auger **(3)** by a roundly sealed wedge wire screen **(2)**. The auger has a frictional connection to the drive. The imported liquid flows into the screen area next to the drive. The liquid flows through the wedge wire screen **(2)** into the outer vessel area. The liquid drains through the liquid outlet **(4)**.

The solid contents remain on the screen surface. They are removed and conveyed into the press channel **(5)** by the rotating auger **(3)**. Powerful subsequent dewatering takes place in the press channel **(5)**. The rotating auger has a Multi Disc **(6)** (sealing disk), which can be shifted in axial direction, at the non-drive end. The adjusting unit **(7)** presses the Multi Disc against the auger and the compressed thick matter plug. When the thrust force of the plug is greater than the spring force of the Easy Shift unit, a slot for discharging is created by axial movement. A scraper edge is used to loosen and expel the solids.





MULTI DISC

Liquid penetration is impossible due to the Multi Disc technology **(6)**. Whether the desired DS content is at 15 or 38%. The Multi Disc **(6)** seals the press channel **(5)** as long as the required drying stage of the thick matter plug is achieved. This is when the slot for discharging opens and the solid phase is loosened and expelled – **penetration-proof technology.**

WHY SEPARATION?

+ Saving of the storage capacities during the waiting period

+ Separated solid is energy supplier and fertilizer containing humus

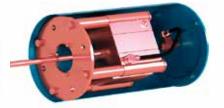
+ Solid phase as bedding for cattle

+ Liquid phase is a fast-acting fertilizer and runs down at the leaves and grasses

+ No etching damage to the plants as the liquid phase directly enters the soil

EASY SHIFT TECHNOLOGY

The DS content can be varied continuously by means of the Easy Shift **(7)** unit. Alternatively, the DS content can be adapted fully automatically (pneumatically) by means of a control unit.



pneumatic

AUGER WITH PROFILE GROOVE

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Fibers are caught in the profile groove of the auger **(3)**. The fibers function as a sealing brush. Metallic rubbing between the auger and the wedge wire screen **(2)** is avoided by the brush. This unique technology increases the service life of the wedge wire screen **(2)** and auger many times over. In addition, the brushing surface cleans the wedge wire screen very thoroughly. Additional cleaning by the operator is not necessary.

SOPHISTICATED TECHNOLOGY NO RISK OF PENETRATION

The Bioselect is available in four sizes with maximum capacities of between 25 and 150 m³/h. The separator achieves infinitely variable dry solids contents (DS content) between 15 and 38 percent so that the solid phase can be used as thickened solid, stackable mass or bedding for livestock farms.

READY-TO-CONNECT UNIT "FROM A SINGLE SOURCE"

Börger mostly supplies the Bioselect as a complete unit ready for operation. The separator is fed by means of a Börger rotary lobe pump. The separator can be operated very easily by means of the Börger control unit. The control unit coordinates the operation of the feed pump and Bioselect perfectly. This way, the separator is always operated at optimal capacity and achieves the best possible results.

INSTALLATION OPTIONS

Whether attached to a simple wall bracket, installed on a movable frame with an upstream macerator or as a mobile version with a conveyor belt – the application options of the Bioselect are versatile.



BIOSELECT AT A GLANCE

+ Double side auger bearing assembly resulting in increased longevity and higher throughput with equal energy consumption

- + Solid phase infinitely variable up to a solid content of 15 to 38 %
- + No risk of penetration the Multi Disc is always leakproof even with low DS contents
 - + Four sizes with capacities of up to 150 m³/h for each unit
 - + Perfect adaptation due to wedge wire screen with different slot opening widths

CASE STUDY: BIOSELECT FOR SAVING STORAGE CAPACITY

In order to save storage capacity for liquid manure in the waiting period, a cattle farm uses a Börger Bioselect. The farmer opted for a Bioselect because he can determine the DS content in the separated thick matter flexibly with this kind of technology. The farmer uses a part of the separated solid phase as bedding for his cattle. For this purpose, he sets the DS content to 32 %. In addition, he cooperates with a neighboring biogas plant which takes the solid phase free of charge. For this purpose, the farmer sets the DS content to 20 %.



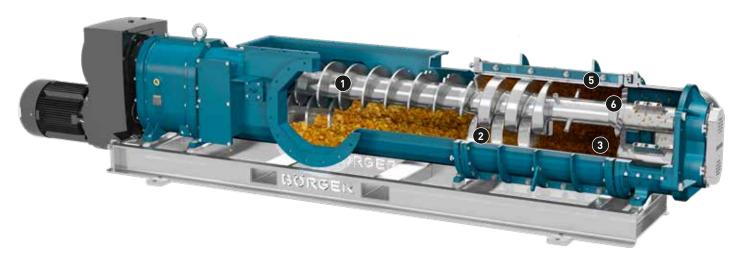
POWERFEED PERFECT LIQUID FEEDING TECHNOLOGY

The Powerfeed is used for feeding solids into biogas plants. The Powerfeed technology is installed at an appropriate position in the pressure pipesystem. The Börger dosing technology conveys the biomass into the flow pipeline in the fully enclosed system.

The Powerfeed is available in three sizes and four different versions. This way, the ideal technology can be offered for each plant. The Powerfeed is fed through the feed hopper in the basic version. The Powerfeed connect is fed from the side. The Powerfeed duo is a combination of a stainless steel storage container (capacity of 5 to 15 m³).

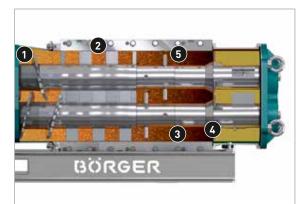
NEW POWERFEED TWIN

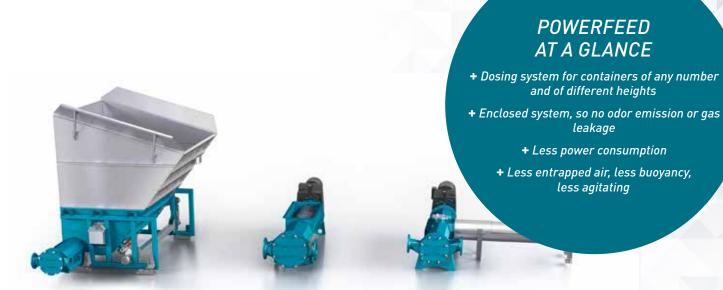
The new Powerfeed twin with its two powerful auger shafts has been developed for special applications – feeding of large quantities of widely varying biomass.



CONSTRUCTION AND FUNCTION

The biomass introduced is collected, broken up and partly macerated by means of the tearing tools of the augers **(1)**. The biomass is fed to the compactor unit **(2)** by means of auger rotation. The double screw spindle unit **(2)** which seals in every position conveys the biomass into the press channel **(3)** by means of pressure. In the process, the mass is partly ground. An adjustable narrowing **(5)** is attached to the outlet side of the press channel. Combined with the screw spindle unit, strong compression is achieved in the press channel **(3)**. The structure of the biomass is changed by the friction generated by the pressing procedure. Material disintegration can be increased if the optional tools **(4)** are installed in the press channel. The maintenance opening **(6)** enables easy access to the compactor unit and press channel.





Powerfeed duo

Powerfeed

Powerfeed connect

CASE STUDY: POWERFEED IN A BIOGAS PLANT

An operator of a biogas plant has been using a solids dosing feeder for feeding the biomass into the fermenter for several years. The operator was looking for an alternative feeding technology due to the extension of the biogas plant and the very high agitating effort. He opted for a Börger Powerfeed twin. The liquid feeding technology can be used for feeding tanks of any number. In addition, they were able to use the existing technology to a large extent.



in twin installation





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