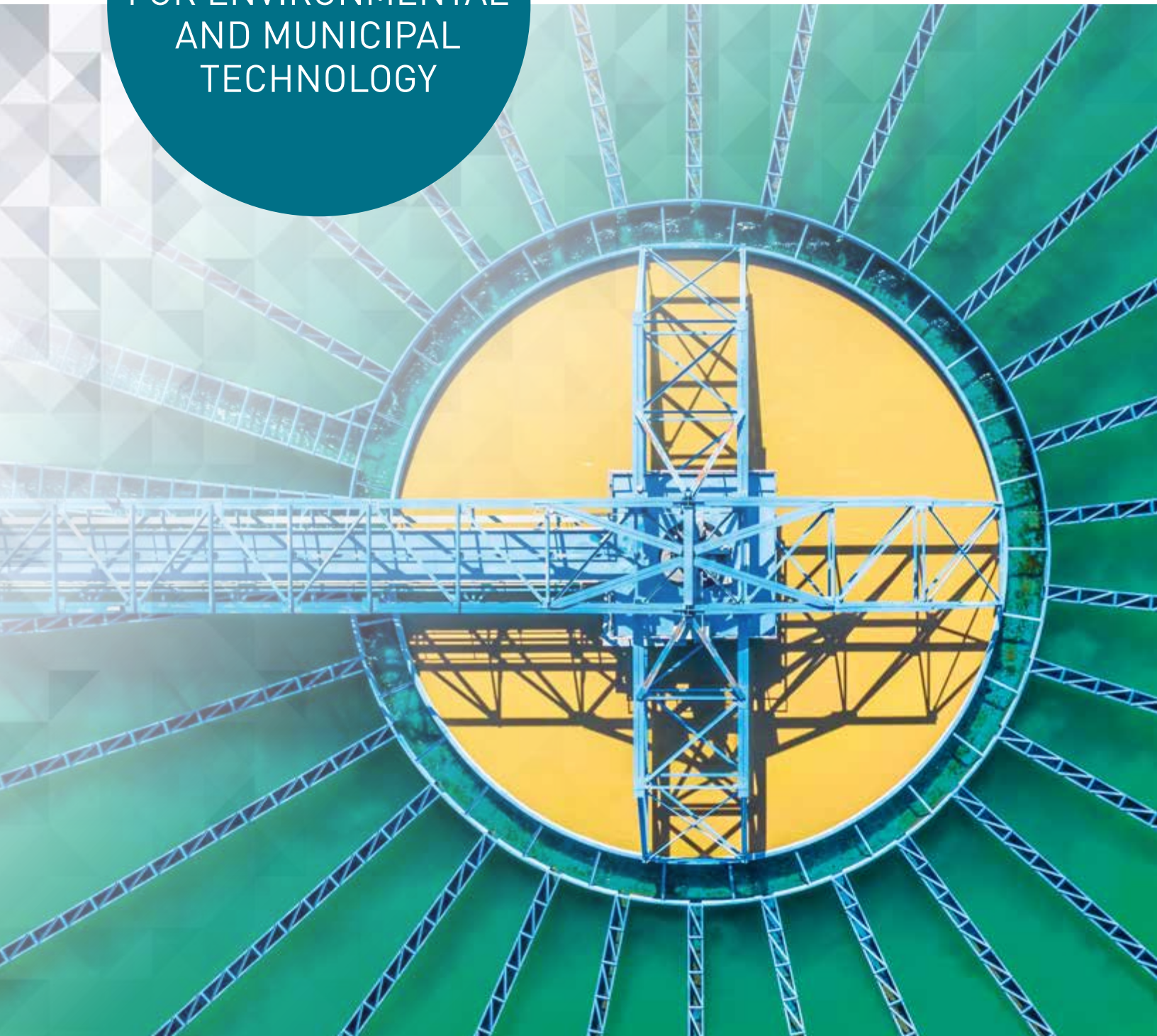


PUMP SOLUTIONS  
FOR ENVIRONMENTAL  
AND MUNICIPAL  
TECHNOLOGY



# YOU CAN RELY ON THEM: BÖRGER ROTARY LOBE PUMPS



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*Market leader for elastomer-coated rotary lobe pumps and experts in macerating 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 all our products. Not only has it shaped our company history since 1975 with continuous new developments and innovations, it is also expressed in the honest and reliable partnership with customers, suppliers and staff.*

*Our pump solutions for environmental and municipal technology are customized to the specific demand. Whether pumping municipal wastewater and biosolids, disposal of chemicals or for sewer rehabilitation – our experienced experts know the requirements, recommend suitable products or develop individual solutions for you. Highest quality “Made in Germany”.*

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# BÖRGER®

EXCELLENCE – MADE TO LAST

*Börger rotary lobe pumps and macerators 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 machines with unbeatable ease of maintenance features.*

# PERFECTLY MATCHED: BÖRGER PUMP AND MACERATING SYSTEMS



Börger provides innovative and customized pump solutions for environmental and municipal technology. Whether it's a wastewater plant, a recycling and composting service provider or a company that operates environmental technology, Börger has a solution for you.

Due to its wide range of rotor geometries, materials, and pump sizes, the Börger Pump can be used in a variety of applications with different fluid types, including those with high flow rates and those that need to operate in specific local conditions. The Börger Pump has become synonymous with flexibility in the pump industry.

## RELIABLE AND EFFICIENT PROCESS

Börger offers high-performance pumps and macerators with space-saving design and minimal energy consumption. Their reliability and durability guarantee a market leading system to give you peace of mind.



DIGESTATE

LEACHATE

**COMPOSTING**

RAW SEWAGE

FATS, OIL  
AND GREASE

MUNICIPAL  
WASTEWATER

**WASTEWATER  
TREATMENT**





GRAY WATER

PROCESS WATER

DEWATERED  
SLUDGE

WASTE ACTIVATED  
SLUDGE

FOOD WASTE

FLOTATION  
SLUDGE

SLURRIES

THICKENED SLUDGE

WASTE OIL / SOLVENTS

PRIMARY SLUDGE

RECYCLING

SEWER FLUSHING

TUNNEL INGRESS

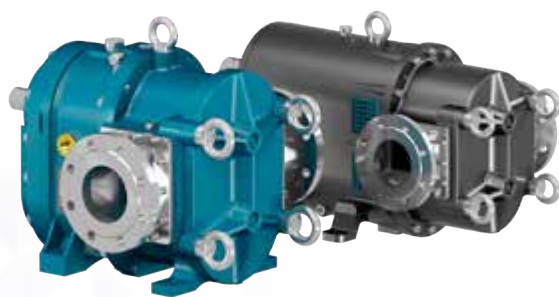
WELLPOINT DEWATERING

COLLECTION  
SYSTEM

# PRODUCT OVERVIEW

## ENVIRONMENTAL AND MUNICIPAL TECHNOLOGY

*You can rely on Börger products. For any fluid, from the most delicate to the most viscous, we offer a wide variety of rotary lobe pumps that can handle it. We also offer macerating units for various solids and stainless steel tanks, constructed to handle any liquid.*



### ROTARY LOBE PUMPS

Börger is a specialist for rotary lobe pumps. We offer 25 pump sizes with flow rates of 1 – 6,400 gpm (1 – 1,440 m³/h) and a large selection of equipment and additional parts. The large-scale geometry and short passage enable the medium to be pumped gently.



### MOBILE PUMPS

The compact Börger pumps are especially suitable as cart pumps, high-performance pumps mounted on a trailer, on a tanker truck or as portable units.



## CONTROL UNITS

Börger is ready to provide a control unit to match your needs. Each control unit is specifically designed and programmed for the product and application by Börger's in-house electrical engineering department.



## STAINLESS STEEL TANKS

Börger stainless steel tanks in segmental design with capacities of 8,000 – 1,320,000 gal (30 to 5,000 m<sup>3</sup>) are very well suited for storing different liquids.



## MACERATING TECHNOLOGY

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



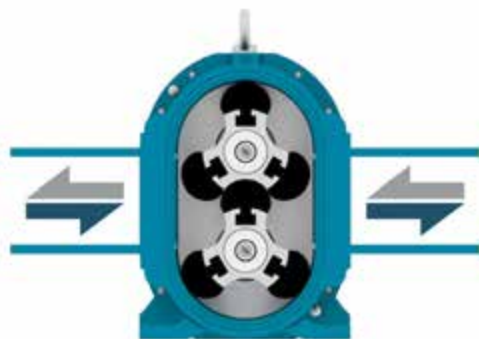
## AGITATOR TECHNOLOGY

In order to homogenize liquids and prevent the formation and deposit of solids, the Börger submersible B-MX mixer agitates various fluids.



# BÖRGER ROTARY LOBE PUMPS

## ROBUST, RELIABLE AND CUSTOMIZED



*Börger rotary lobe pumps have been used in the municipal and environmental technology sector for more than 35 years. The solids handling pumps are powerful, reliable and efficient. Börger pumps convey dirty, sludgy and abrasive media without problems.*

### CONSTRUCTION

#### 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 or 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 timing gear

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

### 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.



BLUEline Nova



## AT A GLANCE

- + 25 pump sizes with flow rates of 1 – 6,400 gpm (1 – 1,440 m<sup>3</sup>/h)
- + With and without casing protection plates and liners
- + Self-priming, pumping in slurr operation
  - + Resistant to solids
- + Ease of maintenance (MIP®)
- + Compact, space saving design
- + Cantilevered carrier design
  - + Reversible

## CASE STUDY: MEMBRANE FILTRATION

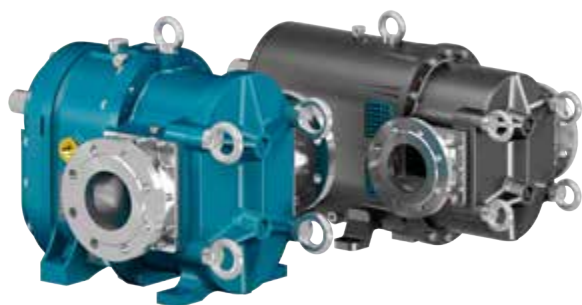
*A membrane filtration system uses 8 Börger rotary lobe pumps which draw water to be cleaned through the membranes. The membranes are cleaned by periodic back-flushing with filtered water. For this reason, it was important for the operator of the water treatment plant to use pumps which can be reversed. In addition, the pumps should have high suction capacity. As different quantities are pumped when operated in filtration mode compared to back-flushing mode, Börger rotary lobe pumps are operated by means of a frequency converter controlling the pump speed.*



# MAXIMAL MODULAR VARIETY

## NO BÖRGER PUMP IS LIKE ANY OTHER

*No matter which application – Börger builds a suitable rotary lobe pump for you. With suitable materials, exactly aligned construction and design, whether with overhead mounted drive, submerged or as a mobile pump. Even individual solutions are a specialty of Börger.*



### 25 PUMP SIZES WITH FLOW RATES OF UP TO 6,400 GPM (1,440 m³/h)

*The BLUEline and ONIXline series differ in flow rates and pressure ranges. The proven BLUEline pumps achieve flow rates of up to 6,400 gpm (1,440 m³/h). The ONIXline pumps achieve optimum efficiencies at pressures of up to 230 psi (16 bar).*



*Börger rotary lobe pumps overview*

Pump series	Speed in rpm		Flow rate in gpm (m³/h)		Max. pressure in psi (bar)
	Min.	Max.	Min.	Max.	
<b>BLUEline Nova AN</b>	1	800	0.1 [0.03]	155 [35]	145 [10]
<b>BLUEline Nova PN</b>	1	800	0.3 [0.06]	340 [75]	175 [12]
<b>BLUEline Nova QN</b>	1	600	0.6 [0.14]	475 [110]	115 [8]
<b>BLUEline Legend PL</b>	1	700	0.5 [0.11]	500 [115]	115 [8]
<b>BLUEline Legend CL</b>	1	600	1.0 [0.23]	825 [185]	115 [8]
<b>BLUEline Legend FL</b>	1	600	1.5 [0.34]	1,805 [410]	175 [12]
<b>BLUEline Legend EL</b>	1	600	2.7 [0.62]	4,900 [1,100]	145 [10]
<b>BLUEline Legend XL</b>	1	450	4.6 [1.10]	6,335 [1,440]	145 [10]

Pump series	Speed in rpm		Flow rate in gpm (m³/h)		Max. pressure in psi (bar)
	Min.	Max.	Min.	Max.	
<b>ONIXline BJ</b>	1	800	0.2 [0.05]	295 [65]	230 [16]
<b>ONIXline BL</b>	1	800	0.5 [0.11]	590 [135]	230 [16]





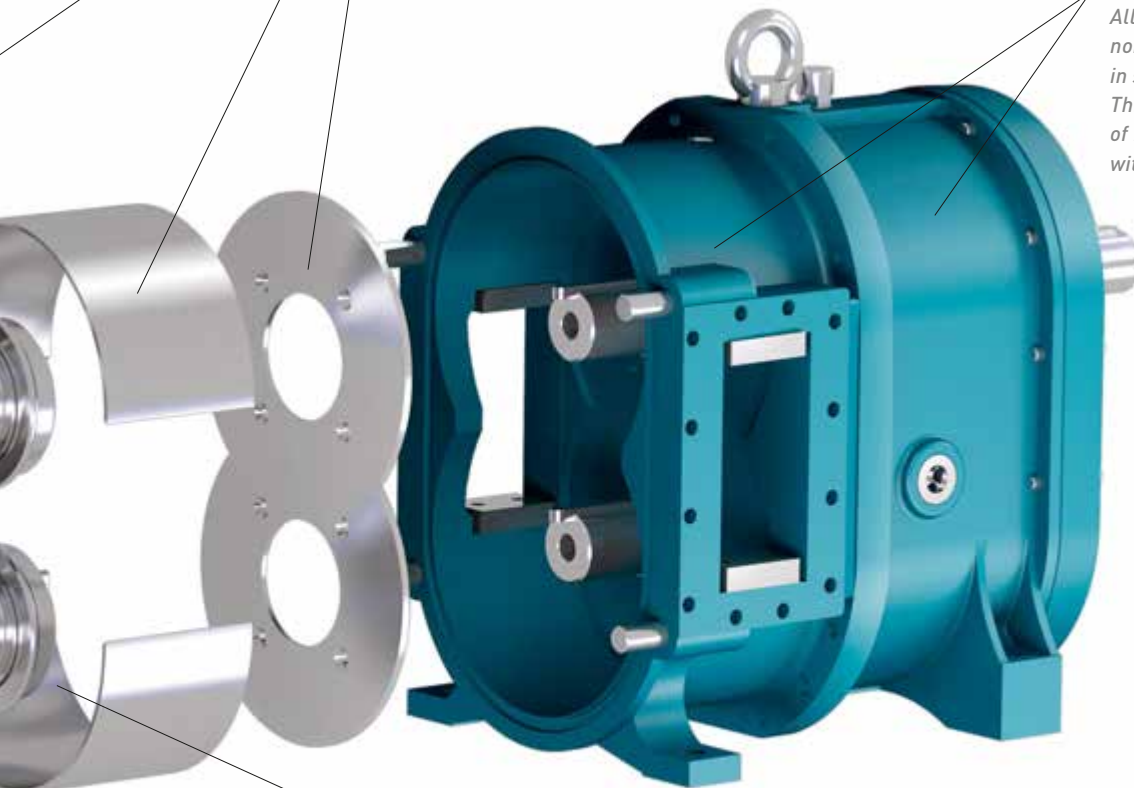
## UNIQUE CASING PROTECTION

*In order to prevent pump casing damage, e.g. due to abrasive or aggressive fluids, Börger pumps are equipped with casing protection. The unique casing liners and casing protection plates are available in different materials. For conveying pure, non-abrasive media, the Nova series AN, PN and QN are also available as a "clean" version without protection plates and liners.*



## UNIQUE BLOCK DESIGN

*All 25 pump models feature dedicated, non-segmented pump casings and rotors in single-piece (BLOCK) construction. This design reflects the high quality standard of Börger and guarantees long service life with ease of maintenance.*



BLUEline Legend



## VARIETY OF ROTORS

*Börger offers a comprehensive range of rotors differentiated by geometry and material. We offer a suitable rotor for your application.*



## HIGH-QUALITY SEALS

*Our solids-resistant, single-acting mechanical seals ensure the highest degree of safety. Individual shaft seal solutions for challenging applications are possible.*

## DETAILED AND LARGE VARIETY OF MATERIALS

*Börger offers a broad range of materials for all pump components. For example, the pump casing can be manufactured in cast iron, cast steel, aluminum, stainless steel, Duplex® or Hastelloy®.*

# AS VERSATILE AS YOUR TASKS

## SUBMERGED PUMPS

The compact design, the chemical resistance and the ability to pump highly viscous media are reasons why the Börger rotary lobe pump is perfectly suited for submerged or semi-submerged applications. This is also an ideal solution if the NPSHa of the process system prohibits a dry pump installation.

## DIFFERENT SKID DESIGNS

For pump installations, the plant's structural conditions and required accessories must be taken into account. Börger provides complete solutions to meet your needs, which include more than just pumps. We also manufacture the pump skid components for a turnkey installation.

Individually made base frames and customized flange connections, as well as stainless steel hoppers or feed augers, are part of Börger's product portfolio. The mounting position of the pump/drive combination is selected according to plant requirements.

Börger supplies special pump systems or mobile units from a single source. The design, metal construction and electrical engineering departments are up to the challenge.

## CONTROL PANEL TECHNOLOGY

Optional control panels make it easy to monitor and control your equipment. These panels are created by Börger's engineering department to suit your individual needs.

The control panel for your rotary lobe pump and macerator is a user-friendly device. It can also be used to control and monitor the macerator's rotation, which will help to prevent blockages.

Additionally, the necessary control functions for using your rotary lobe pump in potentially hazardous environments can be monitored.



**SUBMERGED PUMPS**



**SKID DESIGNS**





# MOBILE PUMPS FOR FLEXIBLE SERVICE

*Many sectors require flexible, mobile pump systems for deployment on short notice. As versatile as mobile pump solutions from Börger are, they have one thing in common: they are configured to the customers specification.*

The experience designing and building hundreds of mobile pump units is reflected in each Börger mobile pump. We offer complete solutions – the trailer, the pump technology and the, and the control panel.

Börger rotary lobe pumps can be equipped with an electric drive, a hydraulic motor or a combustion engine depending on the application. They can also be driven by the PTO shaft of a vehicle.

Whether as a flexible hand cart pump, portable pump, high performance pump on a trailer or compact tanker truck pump, Börger mobile units are ready on short notice. Simply connect the hoses and start the engine.

## MOBILE PUMPS





# MAINTENANCE IN PLACE (MIP®)

## SIMPLE. EASE OF MAINTENANCE.



*Repairs and downtimes are time-consuming and costly. To maximize your production time with minimized interruptions, your operating and maintenance personnel can inspect and if necessary replace all product wetted parts onsite.*

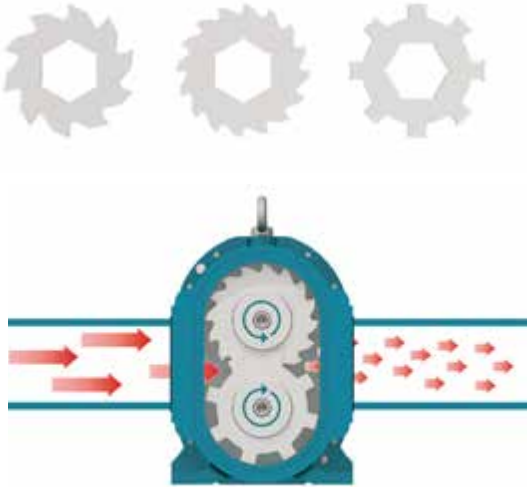
Börger pumps and macerators are designed for continuous operation and incorporate unbeatable ease of maintenance features. All components are extremely resilient and durable. Expensive maintenance contracts? Not with Börger products.

We offer MIP® (Maintenance In Place). Control maintenance and repair procedures yourself. Product wetted parts can be inspected or replaced at the installation site without the need to remove piping and the drive system. This all can be done by your own personnel, easily and quickly.



# MULTICRUSHER

## VERSATILE MACERATOR



*The dual-shaft grinder Multicrusher effectively and reliably processes solids contained in liquids and ensures that downstream pumps and equipment operate smoothly.*

### OPERATING PRINCIPLE

The basic design of the dual-shaft grinder is based on the proven Börger rotary lobe pump. The two shafts are equipped with blades and spacers instead of rotors. The solids-laden medium passes through the counter-rotating blade configuration and is therefore macerated.

*Börger Multicrusher overview*

Multicrusher series	Max. capacity in gpm (m³/h)	Max. pressure in psi (bar)
HAN	70 (15)	175 (12)
HPL	265 (60)	175 (12)
HCL	530 (120)	175 (12)
HFL	1,150 (260)	175 (12)



### CONSTRUCTION

- 1 The quick-release cover**  
 Access to all wetted parts through the quick-release cover – maintenance without removal of pipe or drive systems (MIP®).
- 2 The blades**  
 The degree of maceration of the Börger Multicrusher depends on the blade selection, selected blade tooth shapes, blade thickness, arrangement of the blades and operational speed of the Multicrusher.
- 3 The intermediate chamber**  
 The large-volume quench chamber is filled with oil and ensures the highest degree of safety.
- 4 The timing gear and gear reducer**  
 The different circumferential speeds of the carrier shafts and the sharp blades create an excellent cutting result.





## MULTICRUSHER AT A GLANCE

- + Variable degree of maceration due to flexible blade combinations
- + Compact, space saving design
- + Available in stainless steel
- + Low life-cycle costs
- + Long service life

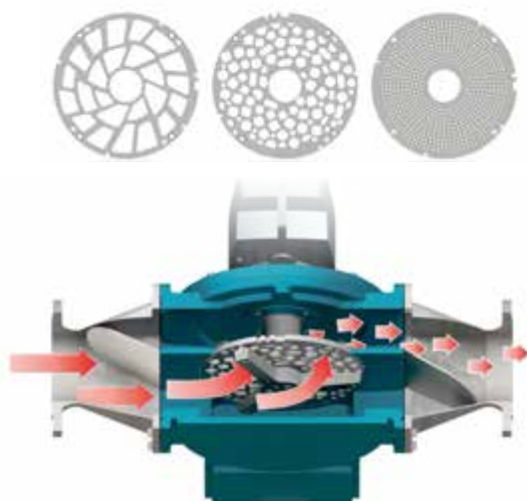
### CASE STUDY: PRIMARY SLUDGE MACERATION

*In order to macerate solids in primary sludge before the sludge is further processed, a Multicrusher is installed upstream of Börger primary sludge pumps. The treatment plant operator was particularly impressed by the degree of safety, maceration result and the low wear rate of the operation.*



# MULTICHOPPER

## FINE MACERATION OF SOLIDS



*The Børger Multichopper is a perforated disk macerator with a central, perforated plate and high-performance blades for size reduction of solids contained in liquids. The macerator is available in three sizes with capacities of up to 1,760 gpm (400 m³/h).*

### OPERATING PRINCIPLE

A pump transfers solids containing liquids through the Multichopper. Blades rotate on a perforated plate inside the macerator. The blades encounter the solids passing through the perforated plate resulting in particle size reduction. The reduced solids then continue to flow suspended in the liquid.

### CONSTRUCTION

#### 1 The quick-release cover

Access to all wetted parts through the quick-release cover – maintenance without removal of pipe or drive systems (MIP®).

#### 2 The blade unit

The three-blade knifehead rotates on the perforated disk. The blades have multiple cutting edges and can be turned around for longer service life.

#### 3 The perforated disk

Various perforated disks are available depending on the maceration result required. The rotational speed and fluid velocity also affect the maceration result. The perforated disks can be reversed and used from both sides.

#### 4 The debris collector

The Multichopper is available with or without debris collector (with drainage device at the side).

#### 5 The MCA unit (Mechanical Cut Adjustment)

The externally mounted MCA unit guarantees an ideal contact pressure of the blades against the perforated disk. The result: an optimal cutting effect.

*Børger Multichopper overview*

Multichopper plus	Max. capacity in gpm (m³/h)	Max. pressure in psi (bar)
P150	350 (80)	75 (5)
P300	970 (220)	75 (5)
P500	1,760 (400)	75 (5)
Multichopper pure	Max. capacity in m³/h	Max. pressure in psi (bar)
P150	360 (80)	75 (5)
P300	970 (220)	75 (5)



## MULTICHOPPER AT A GLANCE

- + Different perforated disks
- + Automatic MCA unit
- + Optional debris collector
- + Can be supplied in stainless steel
- + Low life-cycle costs
- + High degree of maceration

### CASE STUDY: MACERATING SOLIDS IN FATS, OIL AND GREASE

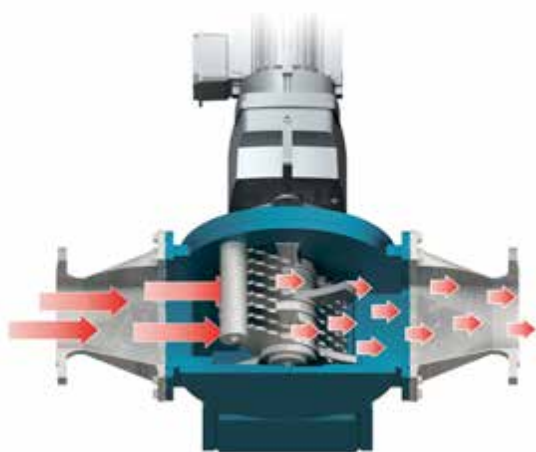
*Fats, oils and grease processed by separators from surrounding industrial and municipal wastewater treatment plants are delivered by means of liquid transporters. The Multichopper reliably macerates the solids contained in the grease before the fluids are conveyed to a storage container. Reliable continuous operation is guaranteed due to the long service life and low-maintenance design of the Multichopper.*





# ROTORRAKE

## ROBUST SINGLE-SHAFT COARSE MACERATOR



*The Rotorrake tackles macerating tasks where others have failed – for macerating very coarse solids and rags. Coarse objects which cannot be macerated are ejected into the debris collector.*

### OPERATING PRINCIPLE

The solids containing liquids flow through the stationary counter blades which are arranged at an angle. The solids are captured by the counter blades and shredded by the cutting action of the rotating blades. The reduced solids then continue to flow suspended in the liquid.

*Börger Rotorrake overview*

Rotorrake	Max. capacity in gpm (m³/h)	Max. pressure in psi (bar)
RR 6000	1,590 (360)	75 (5)
RR 9000	2,380 (540)	75 (5)



### CONSTRUCTION

- 1 The quick-release cover**  
 Access to all wetted parts through the quick-release cover – maintenance without removal of pipe or drive system (MIP®).
- 2 The blades and counter blades**  
 Blades and counter blades are assembled alternately on the shaft. The rotational blades are moved by the shaft. The stationary counter blades are locked into the casing.
- 3 The debris collector**  
 Solids that cannot be macerated are collected in the debris collector (with drainage device at the side).



## ROTORRAKE AT A GLANCE

- + Effective coarse macerator
- + High resistance to wear due to no-contact arrangement of blades and counter blades
- + Blades and counter blades can be turned round for longer service life
- + Available in stainless steel
- + Energy efficient

### CASE STUDY: ANAEROBIC DIGESTION RECIRCULATION

*A wastewater treatment plant was having problems with rag buildup in their biosolids. The macerators used were not able to handle the high rag accumulations, so they ended up clogging the digester recirculation pumps. The plant operator decided to install a Börger Rotorrake upstream of the pumps. There have been no pump blockages since that day. The operation of the Rotorrake has been trouble-free for more than two years.*





# B-MX SUBMERSIBLE MIXER FOR EFFECTIVE AGITATION



## SUBMERSIBLE MIXER AT A GLANCE

- + Various sizes
- + Completely made of stainless steel
- + Good flow pattern to the propellers
- + Cable routing at the protected back end of the mixer
- + High efficiency

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

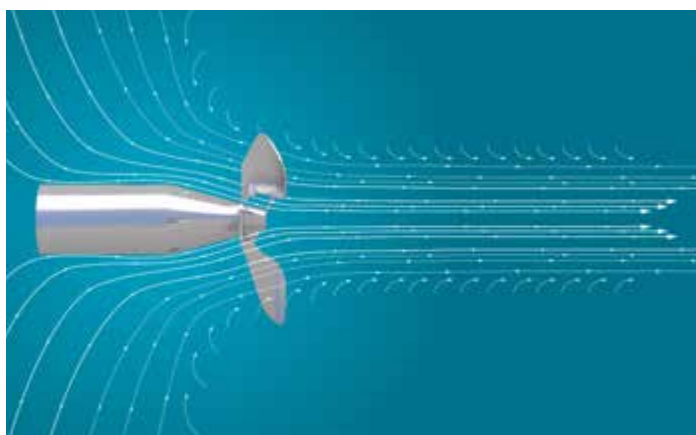
## OPERATING PRINCIPLE

The slim design and smooth surface 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 stainless steel.

*Börrger Submersible Mixer overview*

B-MX	Output in HP (kW)	Output in gpm (m <sup>3</sup> /h)	Speed in rpm	Weight in lbs (kg)
B-MX 9	12 (9)	16,640 (3,780)	325	265 (120)
B-MX 13	17 (13)	22,100 (5,020)	335	365 (165)
B-MX 18	24 (18)	30,200 (6,860)	335	410 (185)
B-MX 22	30 (22)	38,045 (8,640)	346	530 (240)

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



# STAINLESS STEEL TANKS FOR STORING LIQUIDS

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

Capacities between 7,900 - 1,320,000 gal (30 to 5,000 m<sup>3</sup>), various accessories and roof constructions allow a customized, customer centered solution. The storage size can be increased without problems due to the segmented tank design.

## STAINLESS STEEL TANK AT A GLANCE

- + Capacity of 8,000 - 1,320,000 gal (30 to 5,000 m<sup>3</sup>)
- + Maintenance-free and lasting value
- + Can be increased and disassembled
  - + Different roof constructions
  - + Versatile function







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