

stolz

desmet ballestra

## Grinding and Milling



# Grinding line with hopper and screw discharge



Grinding unit with hopper and screw discharge

## The most widely used for standard grinding

The RMP or RMA type hammermills are generally installed on a concrete or metal floor and fixed with anti-vibrating mountings.

The air enters via the ABMS feeder and goes through the mill screens and then through the automatic cleaning filter.

The air is forced out after passing through a muffler.

The motorized flap adjusts the air flow-rate at the centrifugal fan inlet.

The ground product is discharged by the screw conveyor equipped with a sealing flap or better still, with a rotating valve.

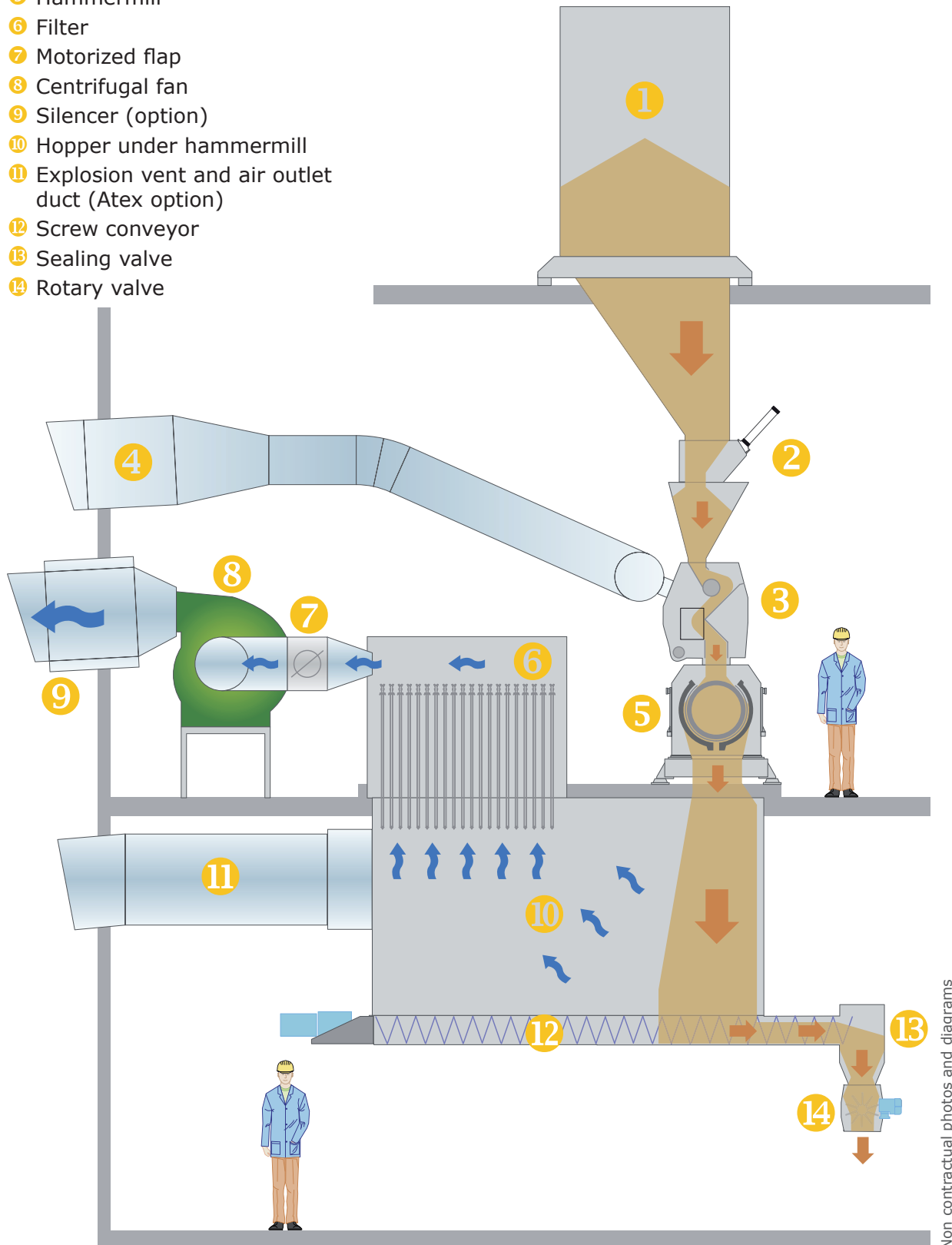


Hopper beneath hammermill



Explosion vent and outlet duct

- ① Hopper
- ② Helmet gate
- ③ ABMS feeder (destoner, ferrous cleaner)
- ④ Air intake (Atex option)
- ⑤ Hammermill
- ⑥ Filter
- ⑦ Motorized flap
- ⑧ Centrifugal fan
- ⑨ Silencer (option)
- ⑩ Hopper under hammermill
- ⑪ Explosion vent and air outlet duct (Atex option)
- ⑫ Screw conveyor
- ⑬ Sealing valve
- ⑭ Rotary valve



Non contractual photos and diagrams

# Grinding line with pneumatic conveying



**Hammermill with pneumatic conveying**  
**The most widely used for fine grinding lines (0.8 mm or 20 mesh screens)**

The air gets in through the ABMS feeder and an additional air inlet. It passes through the screens inside the hammermill. The ground product is conveyed by suction thanks to the fan.

An automatic cleaning filter separates the product from the air.

The air flap adjusts the air flow rate at the fan inlet. The air is forced out after going through a muffler.

Considering the fineness of the product, the cyclo-filter is flat bottomed, equipped with a motorized cleaning arm and a sealing valve.

A centrifugal sieve is designed to separate the products. The particles not meeting the required size are handled back towards the mill.

In ATEX area, an explosion vent and an air outlet duct ensures the safety of the installation.



**Cyclo-filter and fan**

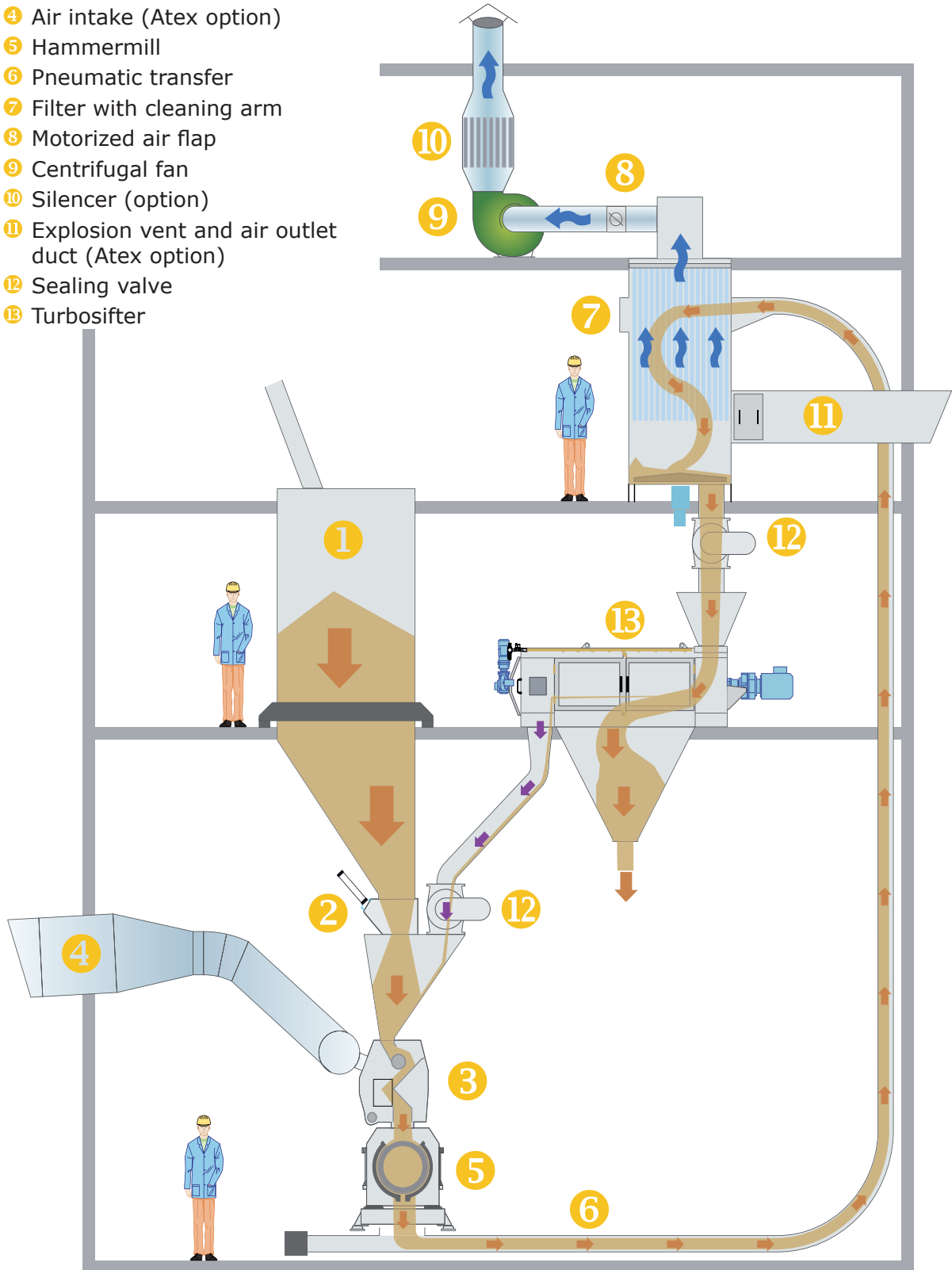


**Filter with cleaning arm**



**Pneumatic conveying**

- ① Hopper
- ② Helmet gate
- ③ ABMS feeder (destoner, ferrous cleaner)
- ④ Air intake (Atex option)
- ⑤ Hammermill
- ⑥ Pneumatic transfer
- ⑦ Filter with cleaning arm
- ⑧ Motorized air flap
- ⑨ Centrifugal fan
- ⑩ Silencer (option)
- ⑪ Explosion vent and air outlet duct (Atex option)
- ⑫ Sealing valve
- ⑬ Turbosifter

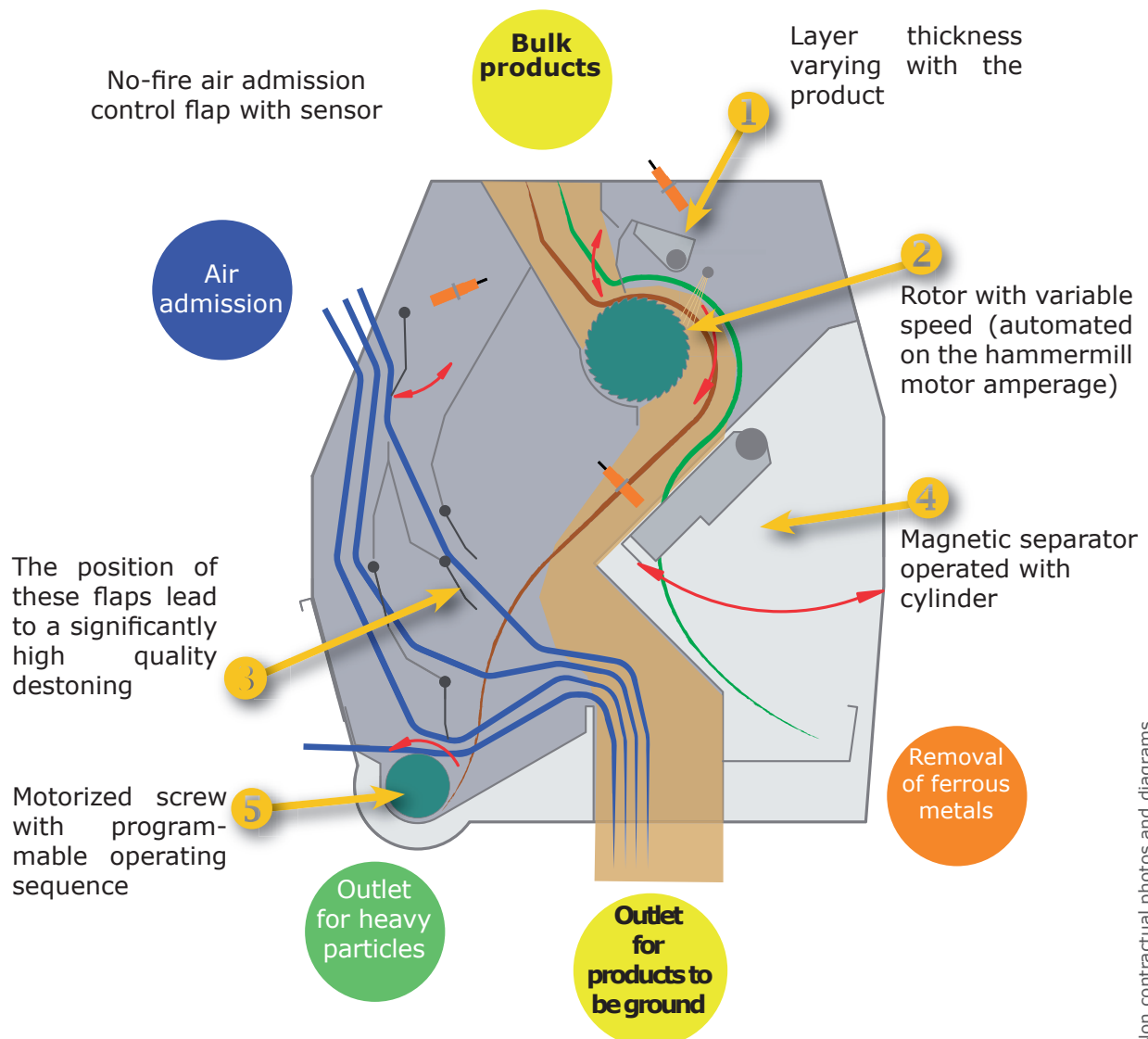




# Hammermill feeder - ABMS type

## Features

- Magnetic separator with pneumatic cylinder, automatically operated or remote controlled by an operator.
- Removal of heavy particles, especially stones and non-ferrous metals.
- Quality of hammermill feeding leading to the wearing of screens and hammers to be the same all over the rotor length.
- Increase of the screens and hammers lifetime thanks to a regular and homogeneous feeding.
- Assembly on the hammermill with silent-block.





ABMS 10 hammermill feeder



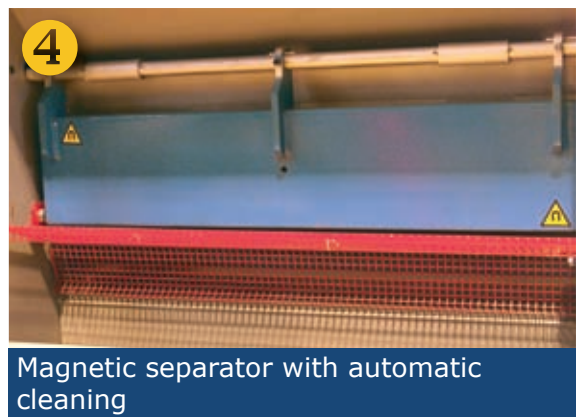
Motorized sector for the product layer adjustment



Cellular rotor for a regular feeding of the grinding chamber over its full length



Orientation flaps for air flow admission



Magnetic separator with automatic cleaning



Splitter box for a fast connection to the supervision system



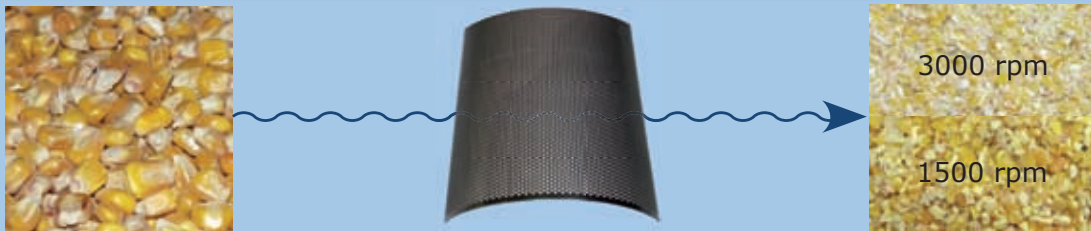
Screw for automatic removal of stones and non-ferrous metal

# Screens

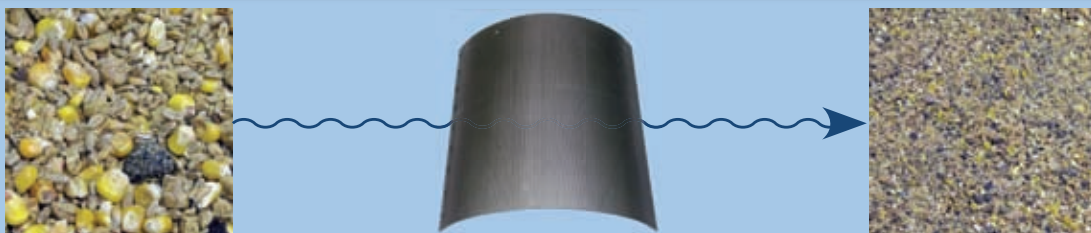
For over 30 years, our hammermill system has built-up a solid reputation in the following industries :

- **For animal feed industry** : 3 mm or 6/7 mesh screens
- **For aqua food meal and petfood industries** : 0.8 mm or 20 mesh screens
- **For biofuel industry** : 2 mm or 9 mesh screens

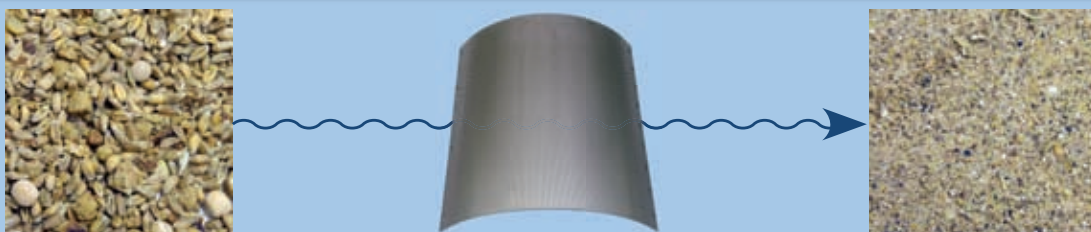
Corn -> Ground with Ø 5.0 mm screen at 1500 and 3000 rpm



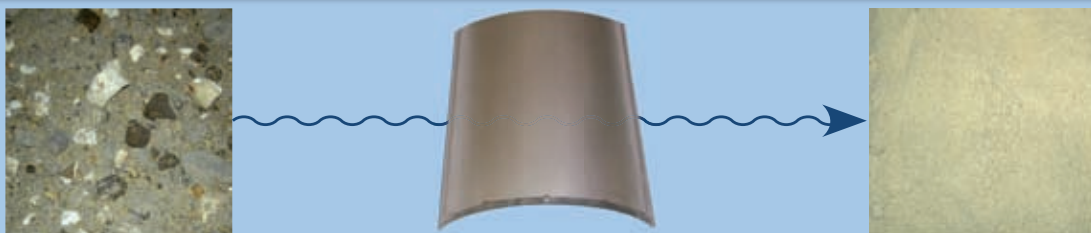
Poultry feed premix -> Ground with Ø 3.0 mm screen at 1500 rpm



Chicken feed premix -> Ground with Ø 2.5 mm screen at 3000 rpm



Fishfeed premix -> Ground with Ø 0.8 mm screen at 3000 rpm



Non contractual photos and diagrams



# Dynamic rotor balancing



Dynamic balancing

Dynamic balancing on bench as per G 2.5 tolerance, corresponding to a radical deviation of  $2.5 \mu\text{m}$ , i.e. a balancing mass of 23 g for a rotor weight of 1300 kg. Controls carried out without and subsequently with hammers in position.

## Monitoring of bearings

Optionally, STOLZ can provide its hammermill with a monitoring system of the bearings :

- Continuous monitoring of vibrations
- Reliable measurement by detection of impact noise
- Limited machine maintenance downtime with a smart maintenance
- Easy setting and commissioning
- Diagnosis display, commutation outputs for processing.

## Innovative technology

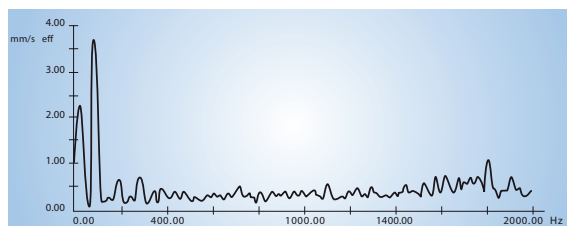
The bearing controller technology is based on a frequency analysis diagnosis. The bearing status can be displayed on the controller with a logical "green - yellow - red".

The monitoring and diagnosis are carried out in real time.

The bearing controller setting is easy : the bearing to be monitored has to be selected from a database, the rotation speed of motors with variable speed has to be specified



Balancing weights screwed on a hammermill rotor



Spectrum analysis of a rotor



Initialization of a bearing controller

Non contractual photos and diagrams

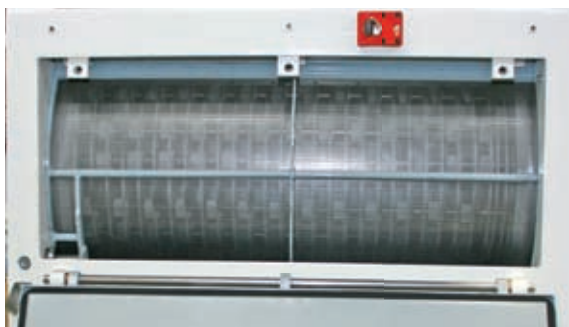
# Hammermills - RM and RMP types



RMP 18 hammermill and ABMS 8

## Features

- Two-way direction of rotation
- Speed of rotation up to 3600 rpm
- Effective screening area from 0.45 to 2.20 m<sup>2</sup>
- Quick change of hammers by tilting
- Change of screens while running
- Continuous control of bearings and grinding chamber temperatures
- Adjustable feeder flap
- Grinding chamber fitted with grooved armor plate and counter-hammers



Grinding chamber fully taken up by the screens



Screen and rotor

**RM type :** Manual removal of screens

**RMP type :** Manual removal of screens assisted by pneumatic cylinders (French patent n°93-051-88)

For fine grinding process, the grinding chamber has reinforced sealing.

**RMF type :** Identical to RM but for fine grinding

**RMPF type :** Identical to RMP but for fine grinding



Manual change of operating screens protected by guard



Grooved armor plate inside the grinding chamber



Fast tilting of hammers



Rotor equipped with 8 rows of hammers



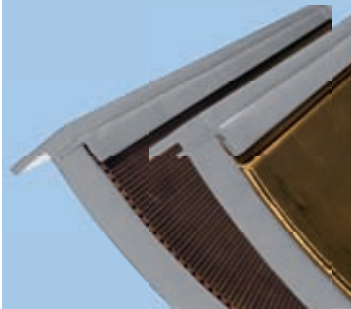
Counter-hammers

## Fine grinding

STOLZ has built-up a new grinding / sieving concept in order to offer solutions for an even finer grinding dedicated to the specific food formulas for extrusion meeting the users requirements.

Our sifters with two-way centrifugal rotation and automatic cleaning while running (see pages 22-23) are installed at hammermills outlet with 400 to 1600 mm chamber width, and with 37 to 355 kW.

That concept, combined with the RM hammer-mill reputation and our high quality ABMS pneumatic feeder-metal remover-destoner appeal to several dozens of customers each year.



Fast exchange of hammers axles with supplied specific tools



Rotative cylinder for feeding flap orientation



Clamping for screen tightness



Pneumatic extraction of screens



Mounting support - base - anti-vibration mountings



## Splitter boxes

STOLZ hammermills and feeders are provided as standard with sensors and probes with output on M12 connectors (see picture opposite).

These sensors, probes and solenoids are linked to M12 splitter boxes (see picture below).

When the machine is delivered, the wiring between sensors/probes and splitter boxes has already been done in factory with pre-assembled potted cable.

The information transfer between the hammer-mill and the automaton is quick (limited wiring on hammermill, no installation required of junction boxes or raceway on the machines...).



Splitter box for a quick connection to the supervision



Temperature gauge on grinding chamber



Automatic greasing of bearings



Interlocking system by key transfer

## Atex

In an ATEX zone the atmosphere can become explosive according to the local or operational conditions.

For an installation in ATEX zone, STOLZ build ATEX hammermill feeders and hammer-mills with components complying with the operating area.

We require the installation of the feeder air intake outside the building and an explosion panel to protect the hopper under hammer-mill. That explosion panel is calculated according to the product characteristics given by the customer.

All the accessories will comply with the legislation in force.

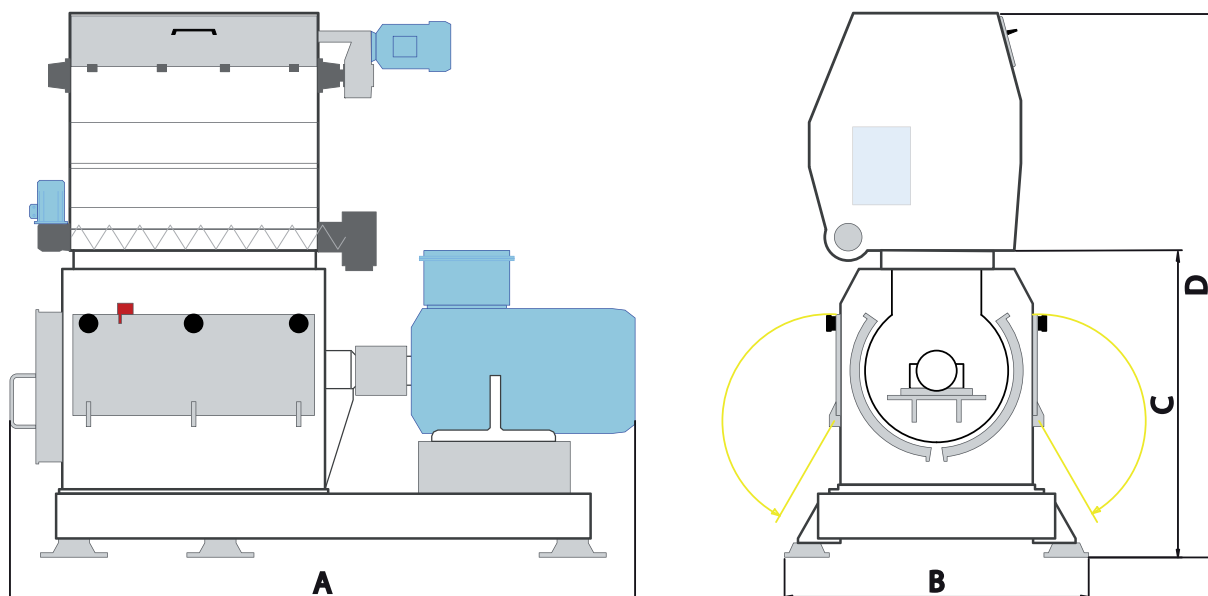


Temperature gauge on bearings





## Overall dimensions of RM14 to RMP116 hammermills



Type	Power	Mill mass with motor and ABMS	Quantity of hammers	Effective screening area (m <sup>2</sup> )	Dimensions (mm)			
	(kW)				A*	B	C	D
RM 14	45/75	3200	52	0,70	2150	1360	1360	2430
RM 16	75/110	3750	72	1,00	2435	1360	1360	2430
RM 18	90/132	4150	92	1,25	2615	1360	1360	2430
RMP 110	110/160	4550	112	1,50	2800	1360	1360	2430
RMP 114	180/250	5800	152	2,00	3595	1455	1415	2485
RMP 116	200/355	6900	168	2,20	3740	1455	1415	2485

\* 'A' dimension given for a standard motor

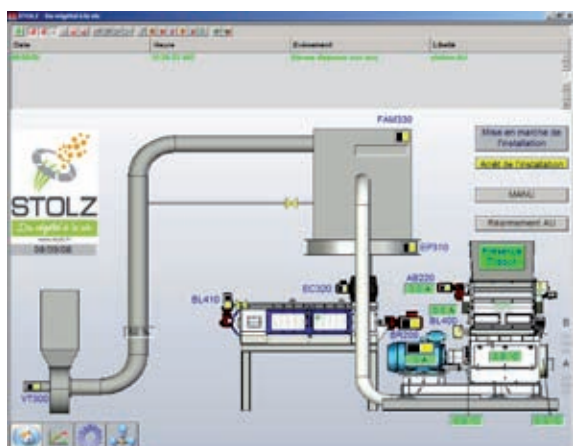
## Overall dimensions of ABMS feeders

The image contains two technical drawings of an ABMS feeder. The left drawing is a side view showing the feeder's profile with a horizontal dimension line labeled 'A' and a vertical dimension line labeled 'B'. The right drawing is a front view showing the feeder's hopper shape with a horizontal dimension line labeled '950' at the base and a vertical dimension line labeled '1065' on the right side.

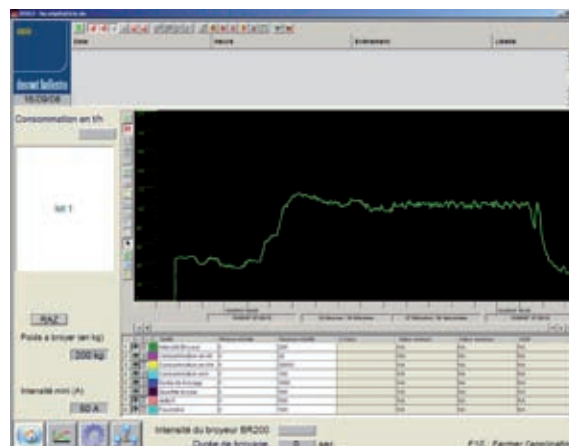
Type	Power (kW)	Mass (kg)	Dimensions (mm)	
			A	B
ABMS 4	1,5	530	574	530
ABMS 6	1,5	590	754	530
ABMS 8	1,5	650	934	530
ABMS 10	1,5	720	1114	530
ABMS 14	2,2	840	1484	610
ABMS 16	2,2	900	1629	610

Non contractual photos and diagrams

# Grinding line supervision



Supervision of a grinding line



Supervision of a grinding line

The automation and supervision of a STOLZ grinding line optimize the unit capacity and control all the machines and personnel safety devices.

The supervision of the grinding line ensures :

- Information management
- Alarms management
- Alarms historization
- Passwords management
- Maintenance help
- Process events historization
- Energy consumption calculation per ton of ground product

The power and driving of the line, or just the driving, can be managed by the whole unit.

The driving part is monitored by a network (As-i) designed to lower the quantity of wires and the time spent for wiring significantly.

The standard remote maintenance is designed to operate at a distance on the automaton. The purpose is to have a repair service and to improve the system easily.



Modem for remote maintenance (RTC or Ethernet link) :

- Changes in programs
- Repair service



Automaton for a grinding line monitoring

Non contractual photos and diagrams

# Self standing automatic screen selector



Self standing automatic screen selector

The automatic SAGA screen selector is designed to insert one of the 4 sets of screens in stand by through data exchange with the production automation without any manual operation.

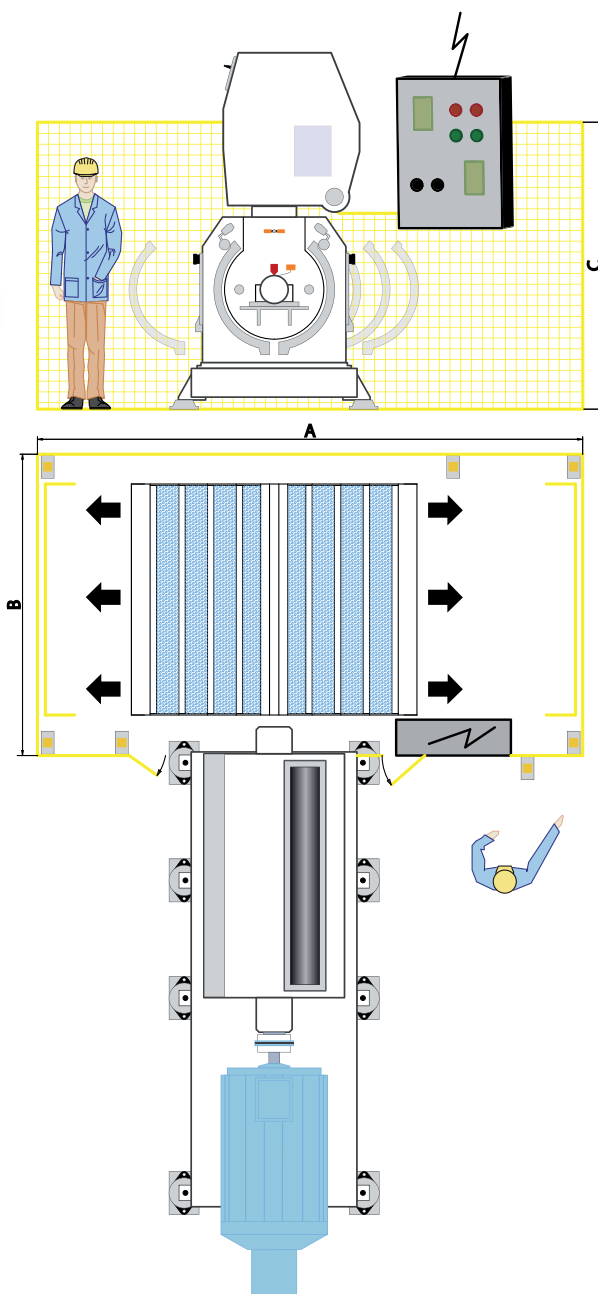
The SAGA can be adapted to STOLZ RMP type hammermills from 110 to 116 type.

## Features

- Traceability of screens
- Limited downtime
- 4 sets of screens available
- Improved working conditions

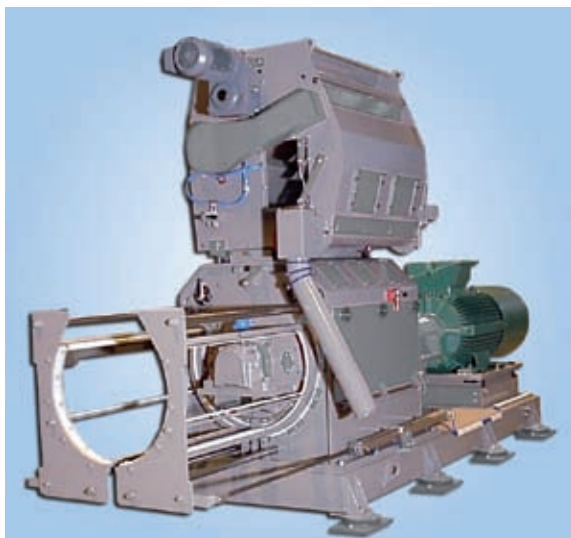


Self standing automatic screen selector



Type	Screens quantity	For hammermill type	Dimensions (mm)		
			A	B	C
10.4.1	2x4	RMP 110	3800	1800	2000
14.4.1	2x4	RMP 114	3800	2200	2000
16.4.1	2x4	RMP 116	3800	2300	2000

## Hammermills - RMA type



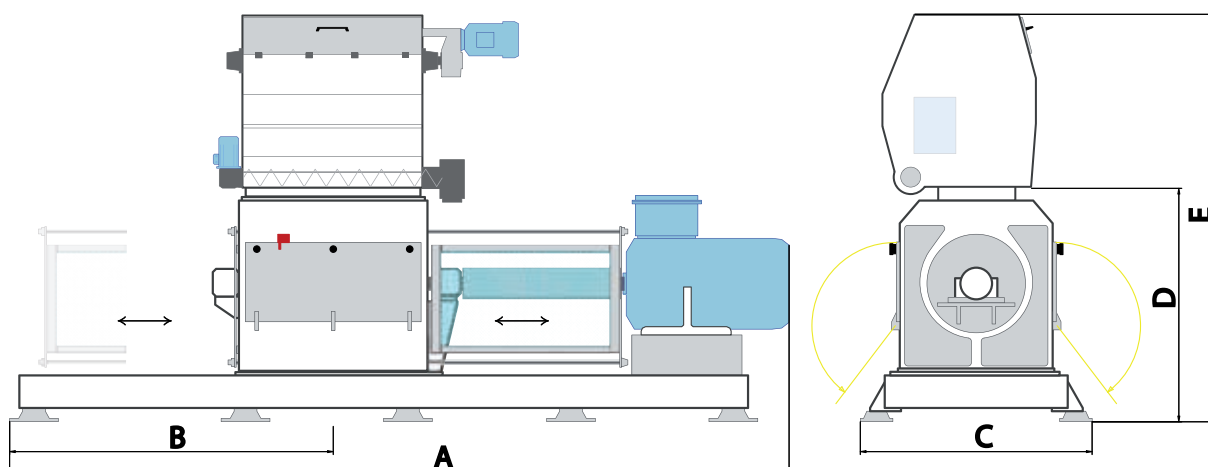
Hammermill with automatic change of screens while running

In the RMA configuration (automatic exchange of screens while running), the screens are fitted into 2 rigid half frames sliding inside the grinding chamber. The change of screens is automatic. It is performed by 2 pneumatic cylinders.

Also comes in RMAF version for fine grinding.

### Features

- Automated change of screens
- Traceability
- Change of screens without downtime
- Easy control of the overall condition of screens



Type	Power	Hammer-mill mass with motor and ABMS	Quantity of hammers	Effective screening area (m <sup>2</sup> )	Dimensions (mm)				
	(kW)				A*	B	C	D	E
RMA 16	75/110	3750	72	0,85	3840	1600	1425	1435	2505
RMA 18	90/132	4350	92	1,10	4410	1900	1425	1435	2505
RMA 110	110/160	5000	112	1,35	4795	1990	1425	1435	2505
RMA 114	180/200	8050	152	1,95	6270	2500	1540	1535	2605

\* 'A' dimension given for a standard motor

Non contractual photos and diagrams



## Hammermills - RME type

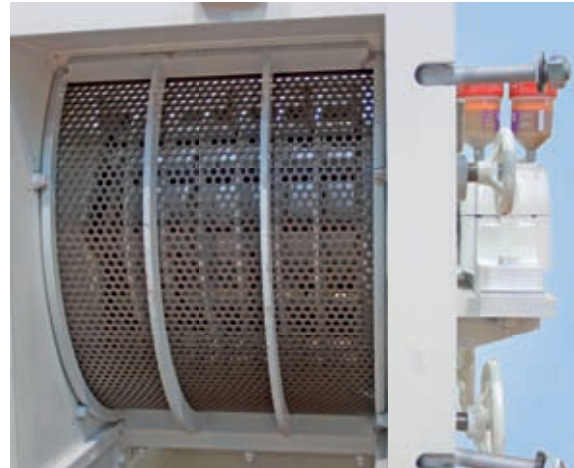


RME type hammermill mainly used for knackery industry

That hammermill is derived from the RM range. It has been adapted to meet reliability criteria required by industries with important surges requiring a very high mechanical and wearing strength (knackery, paper blocks, cakes, cassava roots, etc...)

### Features

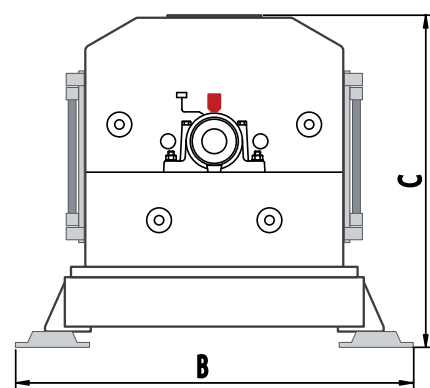
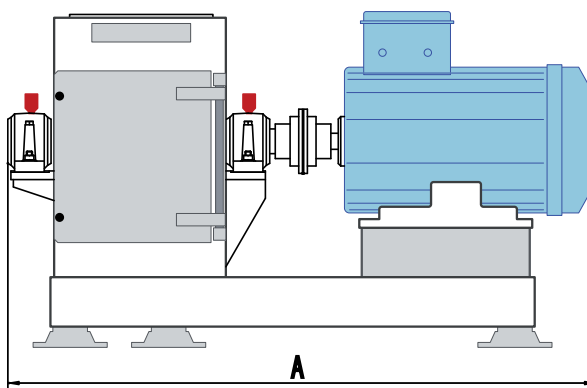
- Two-way rotation
- Screen exchange when machine stopped



Screens with sturdy frames

- Speed 3000 rpm
- Grinding chamber equipped with grooved armor plates
- Hammers with high thickness

That type of hammermill is usually fed by a belt conveyor with adjustable speed. The powder is conveyed by a hopper and a screw conveyor.



Type	Power	Hammer-mill mass without motor	Quantity of hammers	Effective screening area (m <sup>2</sup> )	Dimensions (mm)		
	(kW)				A*	B	C
RME 12	45	1940	28	0,4	2195	1610	1345
RME 14	55	3050	40	0,7	2370	1610	1345
RME 17	110	3650	56	1,1	2600	1610	1345

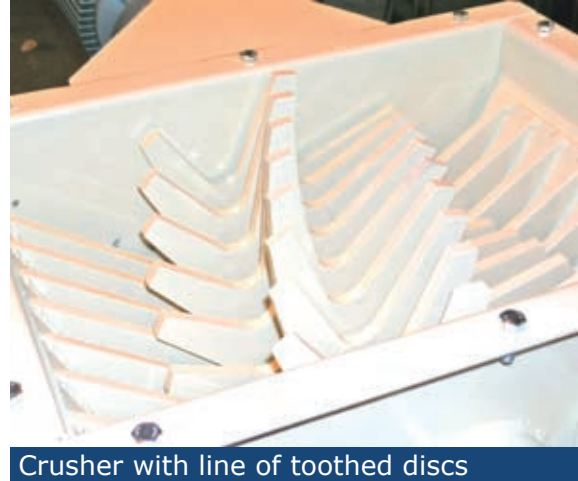
\* 'A' dimension given for a standard motor

Non contractual photos and diagrams

# Crusher



Crusher



Crusher with line of toothed discs

That machine can be installed in all product inlets (in bulk or in bags) when the particle size of a product that should be powdery is not guaranteed.

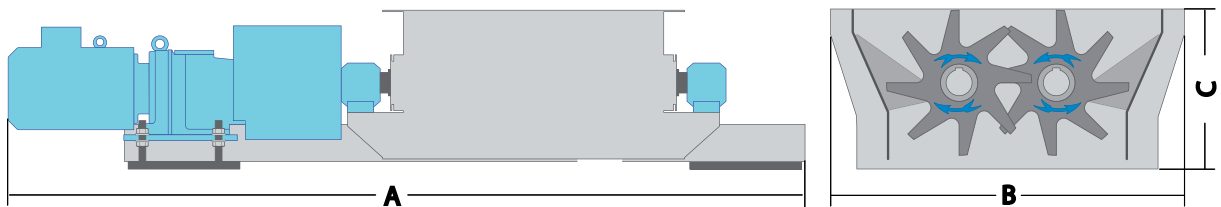
The crusher can be assembled in a circuit under a discharging hopper or a bag unloader but its purpose is not to turn a non friable raw material into powder.

## Features

The crusher includes one or two rotors depending on the required capacity. It has two versions, coarse or fine, according to the required particle size.

## Options :

- Rotation sensor
- Temperature probes on bearings



Type	Quantity of rotors	Power	Mass	Dimensions (mm)		
		(kW)	(kg)	A	B	C
BMG1	1	1x2,2	230	1210	660	400
BMF1	1	1x2,2	240	1210	660	400
BMG2	2	2x5,5	920	2150	960	430
BMF2	2	2x5,5	1035	2150	960	430

Drawing : crusher with double row of toothed discs

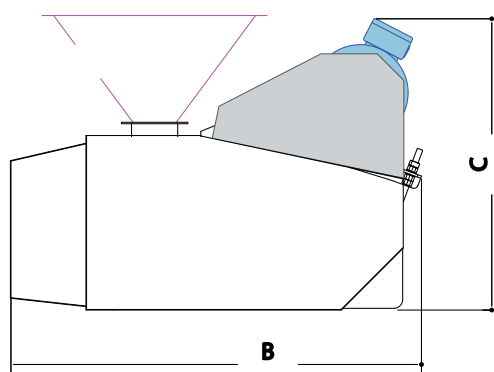
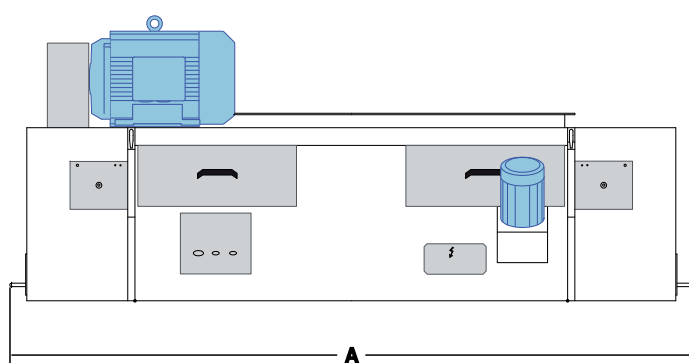
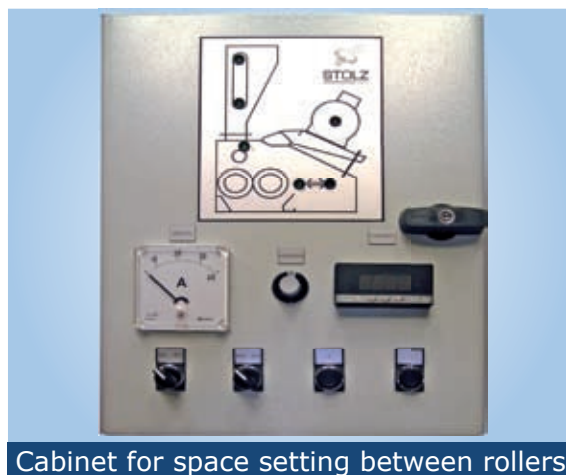
# Crumbler



Our range of crumblers is designed to make crumbles from 0.2 to 4 mm with granulated product passing between 2 rollers.

## Features

- Ø250 mm rollers
- Space adjustment between cylinders with remote control with analog position detection
- Integrated system for product sampling
- Automatic spacing of cylinders when foreign bodies going through
- Total spacing of rollers to allow a free passage of pellets



Type	Capacity	Power	Mass	Dimensions (mm)		
	t/h	(kW)	(kg)	A	B	C
PEDT 600	4 à 6	7,5	1100	1590	1460	1010
PEDT 1000	8 à 12	11	1400	1990	1460	1010
PEDT 1500	12 à 18	15	1850	2490	1460	1010
PEDT 1800	15 à 25	18,5	2200	2790	1460	1010

Non contractual photos and diagrams

# Filters with automatic cleaning



Built-in pad filter

## Pad filters

The pad filter is the most frequently used equipment in grinding operations with mechanical handling.

It is designed to recycle particles directly within the product mass.

## Features

- Limited size for filtering area up to 120 m<sup>2</sup>
- Cleaning by counter current compressed air (tank do not require to be proofed again)
- Filtering pads adapted to the different kinds of products

## Regulation

- Atex 94/9/CE compliance on demand
- Compliance to the regulations in force and to specific requests in regard of dust discharge
- Air tank compliance to the 97/23/CE pressure equipment directive, do not require to be proofed again

## Solutions for limited explosion risks

- Use of antistatic medias
- Installation of explosion vents (to be specified according to : implantation, capacity, product KST,...)
- Installation of a decoupling valve
- Reinforcement of the filter
- Clogging monitoring of the media by measuring the Delta-P
- Control of the medias state
- Wastes control
- Inert gas injection



Pad filter on a grinding unit



Stainless steel pads filter

Non contractual photos and diagrams





Sleeve filter unit (pneumatic transfer arrangement)

### Sleeve filters

The sleeve filter installed in a cylindrical case is generally used in case of grinding with pneumatic handling. It may be fitted, with a emptying cone in its lower part.

For fine grinding application, it is worthwhile replacing the cone with a flat bottom equipped with a motorized rotary sweeper.



Galvanized cyclofilter with sleeves



Cyclofilter with pneumatic conveying



Sleeves filters with decoupling valves, explosion vent, rotary valves, and silencers

## Monitoring of filtration processes



Our sequencer is designed to control and monitor the pads and sleeves filters cleaning.

The solenoid valves are inserted into the sequencer.

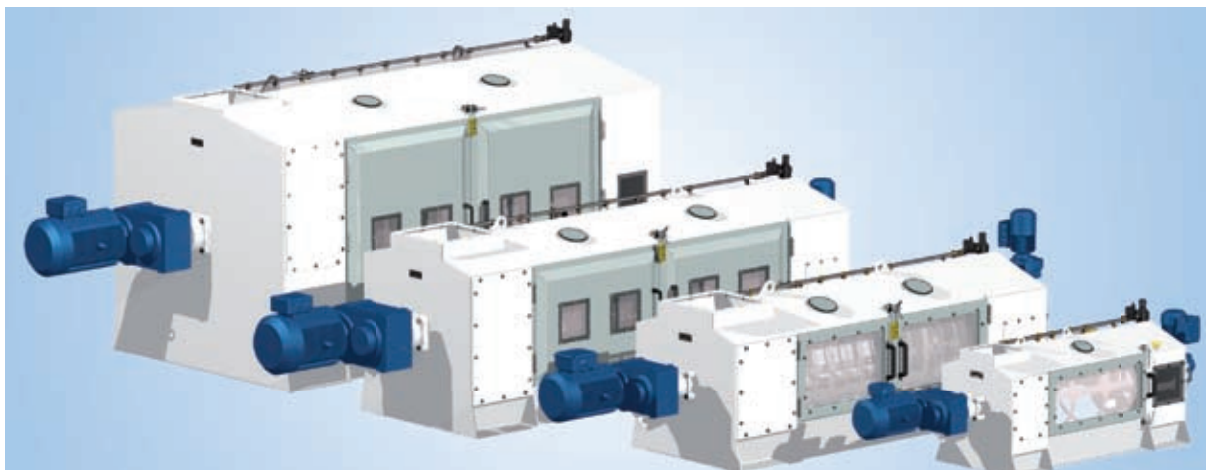
This device is set according to the required use.

The sequencers are fitted with a  $\Delta P$  module, controlling the start-up and stop of the cleaning operation. This device saves air and improves filtration.

It is equipped with :

- High and low  $\Delta P$  alarms (with relay output)
- A  $\Delta P$  threshold and an input for fast running
- A control of an electric fault
- An analog output for the remote monitoring of  $\Delta P$  measurement
- 2 relay outputs to report faults and control the cleaning.

# Turbosifter



Range of turbosifter of 1 to 12 m<sup>2</sup>

The need to separate a product batch into 2 different and regular particle sizes, especially in the field of bioethanol, starch, cement, petfood, and fishfeed lead STOLZ to design a range of high performance rotative sifters, called «turbosifter».

## Specifically designed for the separation of fine ground products

- Cleaning of screens by air blowing and rotation of screens supports (BCMT version)
- Limited risk of cross-contamination
- Quick change of screens through large sized side doors



BCMT 750 Turbosifter

- Limited maintenance
- BCMF version with fixed screens for standard products not requiring any specific cleaning
- Screens from 5 mm to 0.4 mm, or 4 to 40 mesh

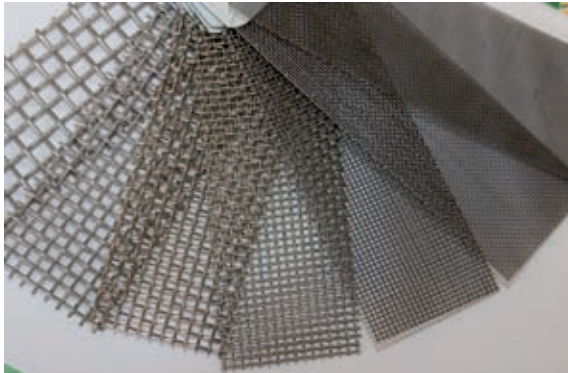
## Features

- Bi-rotor innovative technology for the clogging powders sifting
- Sturdy structure and ATEX compliance
- High performance separation of fatty and fine products
- Drive by motor and belts, or direct gear-motor

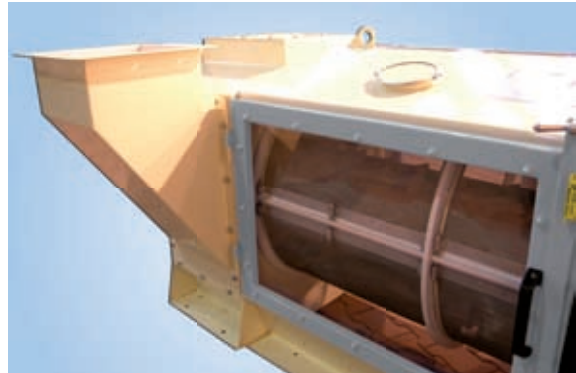


Rotor with pre-adjusted paddles

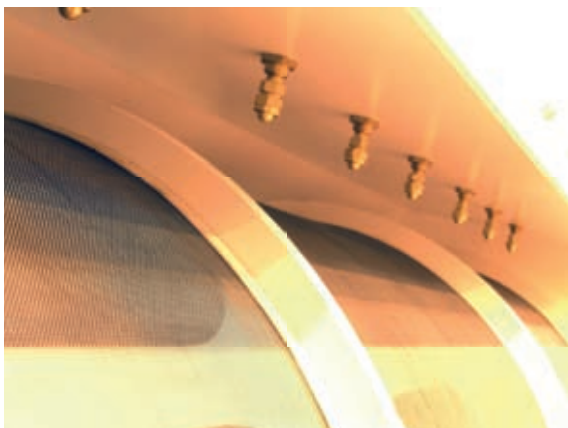
Non contractual photos and diagrams



Wide range of stainless steel screens



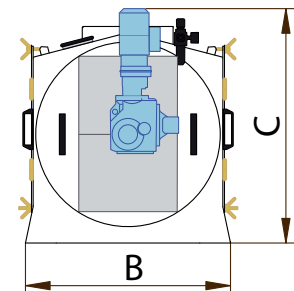
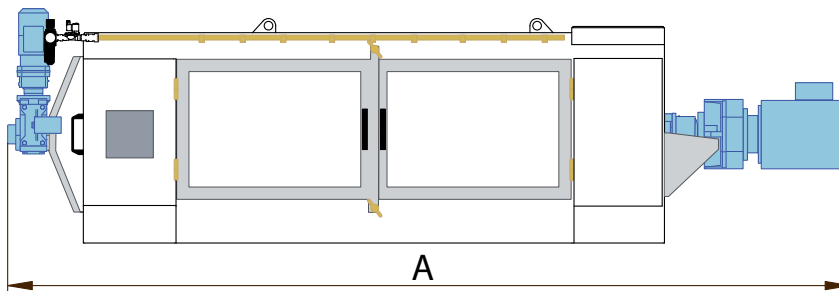
By-pass at machine inlet - right or left hand side (optional)



Nozzles for the screens pneumatic cleaning



Easy and tight sealing of screens



Type	Dimensions (mm)			Rotor/Screens power (kW)	Mass (kg)	Effective area (m <sup>2</sup> )
	A	B	C			
BCMT 400	2330	650	730	5,5/0,37	285	1,0
BCMT 600	3500	900	1050	9,2/0,37	800	2,5
BCMT 750	4100	1000	1150	15/0,37	1100	4,2
BCMT 1250	4100	1600	1400	18,5/0,37	1850	7,5
BCMT 1250+	4700	1600	2100	45/0,75	3100	12,0

Non contractual photos and diagrams

**stolz**

**desmet ballestra**

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*Grinding and milling*

*Thermal conditionning & Cooling*

*Pelletizing*

*Mixing & Coating*

*Sifting & Cleaning*

*Services*

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