



P R O B A T G R O U P

A high-contrast, black and white close-up photograph of a Bauermeister grinding mill tip. The tip is a polished, conical metal component with a small circular opening at its apex. It is positioned in the center of the frame, surrounded by the complex, curved internal structure of the mill. The lighting creates strong highlights and shadows, emphasizing the metallic texture and the precision engineering of the component.

BAUERMEISTER

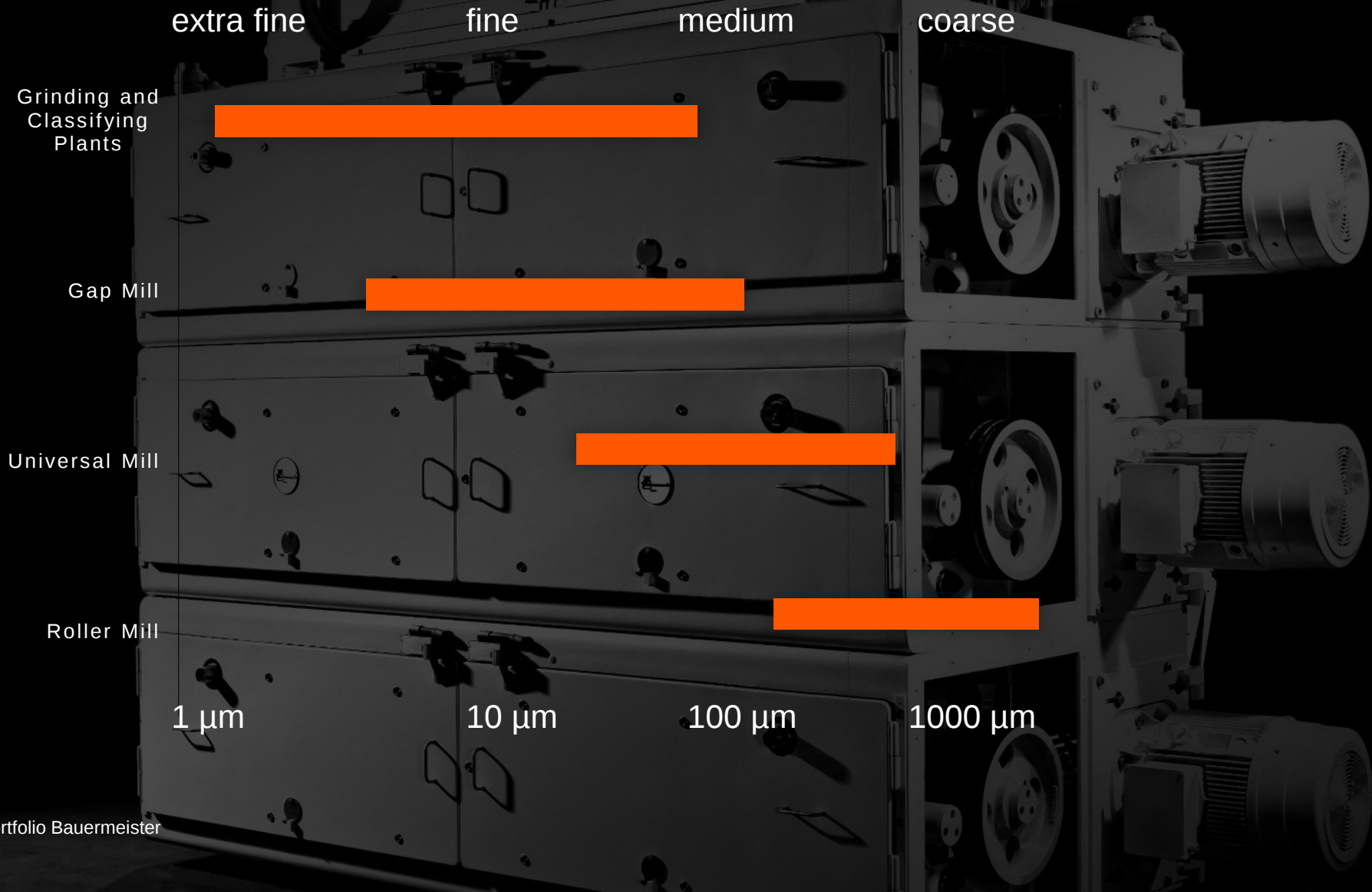
PRECISE PARTICLE
SIZE REDUCTION



BAUERMEISTER
ZERKLEINERUNGSTECHNIK

PROBAT GROUP

PRECISE PARTICLE SIZE REDUCTION APPLICATION FIELDS AND FINENESS RANGES



PRECISE PARTICLE SIZE REDUCTION CONTENT

01 FINE GRINDING

- Universal Mill (UM)
- Compact Grinding System (UCOM)
- Gap Mill Dry (GMT)

02 CRUSHING

- Crusher (VWR)

03 CLASSIFYING

- Dynamic Air Classifier (CL)

04 PASTE GRINDING

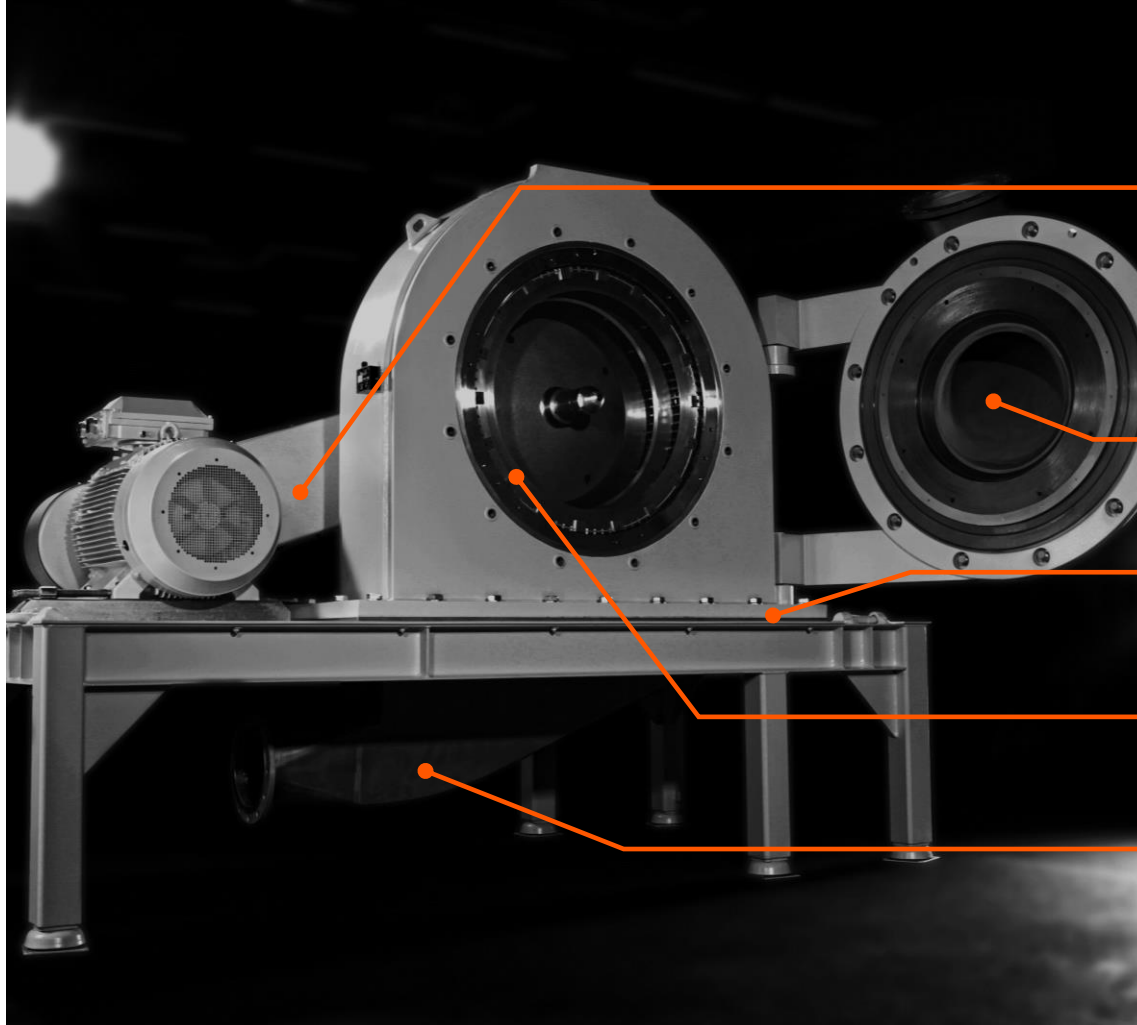
- Beater Blade Mill (SMM)

01 FINE GRINDING

- Universal Mill (UM)



FINE GRINDING (UNIVERSAL MILL UM) OVERVIEW / MAIN COMPONENTS



- Application fields: grinding of various dry products to medium and fine powder; processing of feed products up to 20 mm size (depending on mill version)
- Covered motor belt drive with customizable belt pulleys (transmission ratios) to maximize the throughput of your grinding system while ensuring machine safety in case of a blockage (slip)
- Mill door with product feed into the centre of the grinding chamber
- All parts are consistently earthed to ensure highest levels of machine safety
- Grinding chamber – smooth design, high finish surfaces – with rotating and static grinding tool
- 10 bar pressure shock resistant hopper below the mill to ensure an ATEX compliant pneumatic discharge of the product and air

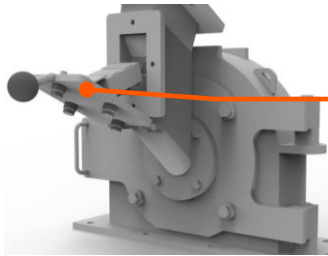
FINE GRINDING (UNIVERSAL MILL UM)

HIGHEST SAFETY STANDARDS FOR MAN AND MACHINERY



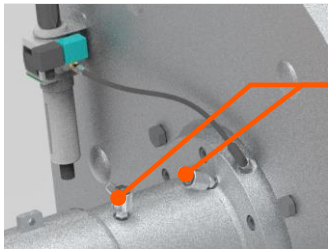
BAUERMEISTER UNIVERSAL MILL

Explosion pressure shock resistant up to 10 bars - ATEX certified



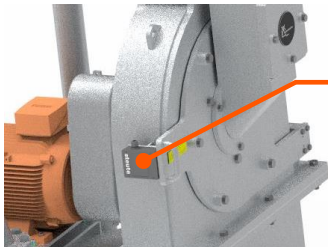
NEODYMIUM MAGNET

Installed in the mill inlet for capturing magnetic impurities to prevent sparking as “root” of explosion



TEMPERATURE PROBES

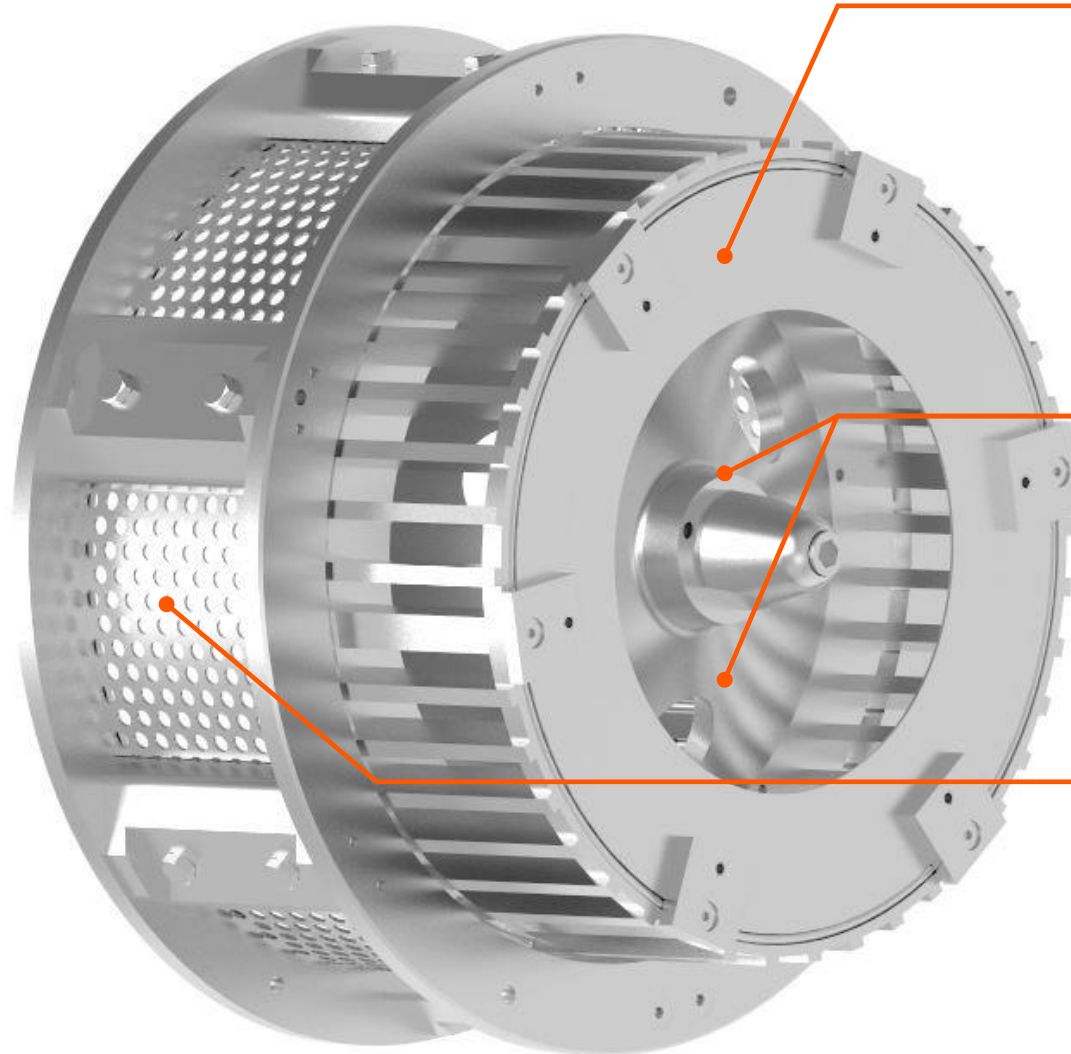
Continuously monitoring of bearing temperatures detecting too high temperatures at an early stage to minimize vice interventions



TWO-WAY DOOR SAFETY LOCK

Opening the mill is automatically locked during operation and starting the mill is inevitably avoided when door is not locked

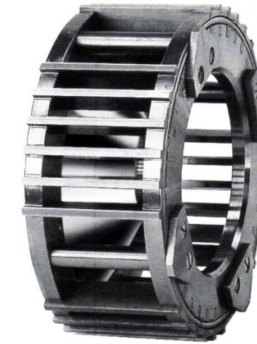
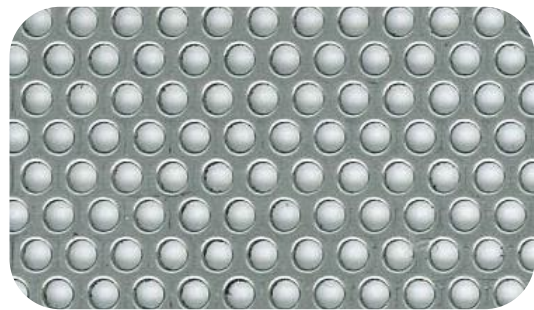
FINE GRINDING (UNIVERSAL MILL UM) GRINDING TOOL TURBO ROTOR



- Fast rotating grinding element with high kinetic energy at a circumferential speed of max. 120 m/s (up to 160 m/s in titan execution) hits the feed particles against the static grinding element
- Feeding of the product into the rotor by high air volume generated by a fan supported vacuum system
- Static grinding element in various customized designs to achieve the requested particle size distribution (optimized application usage)

FINE GRINDING (UNIVERSAL MILL UM) GRINDING TOOL VARIATIONS

- Turbo rotor as standard rotating grinding tool due to decades of experience with various products and applications
- Different sieve ring assemblies and plates for fulfilling customer requirements (particle size, throughput)
- Various sieve plates with cylindrical perforation or customized with special perforation for finer particle size distributions
- Cross beater tool with hardened toothed plates for minerals
- Pin disk tool available for special products



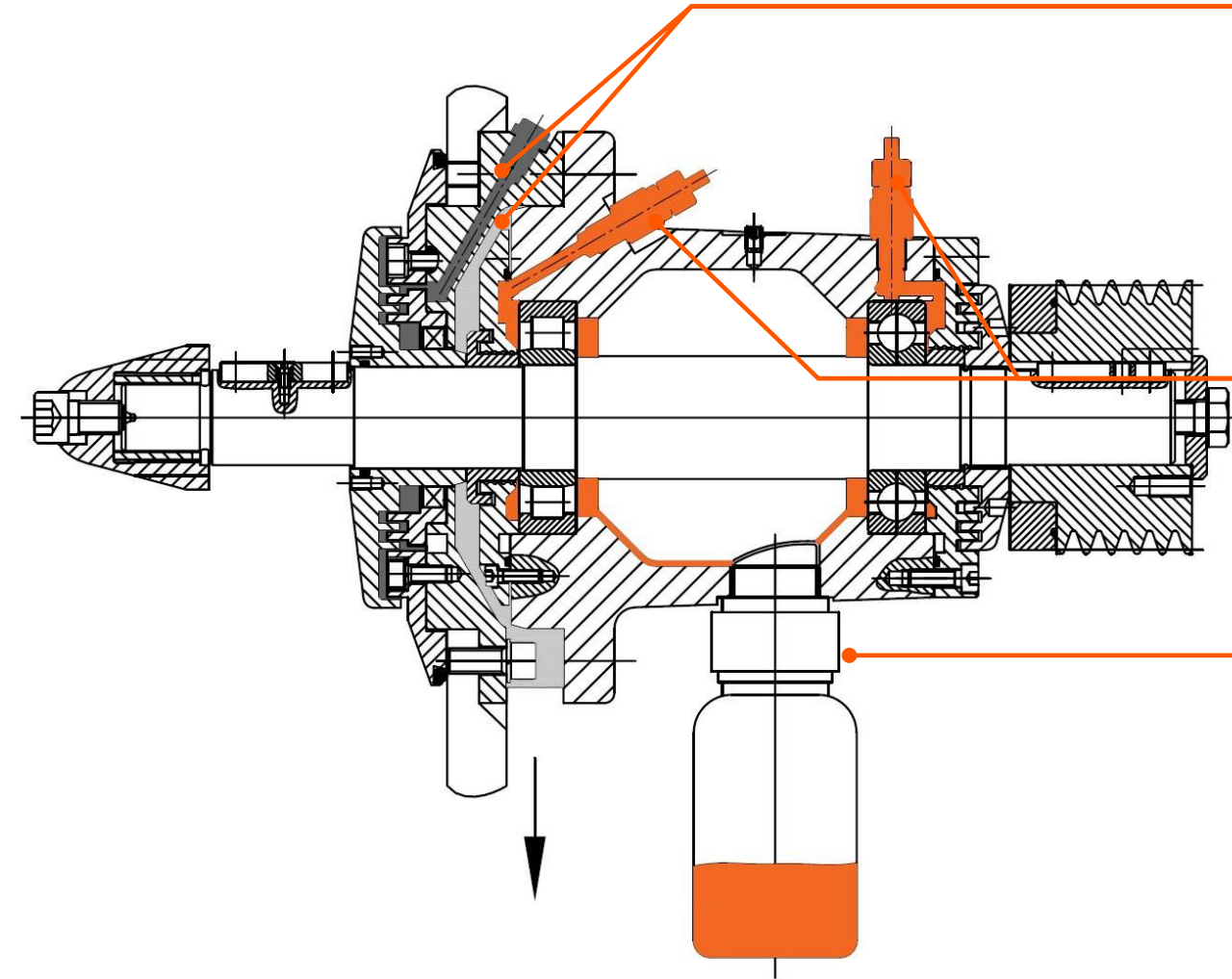
FINE GRINDING (UNIVERSAL MILL UM) DESIGN VERSIONS



- Perfectly suitable for a wide range of particle size distributions and throughputs
- Available in seven different sizes
- Stable final particle size distribution according to customer request – proven by trial runs

SIZE / TYPE	<u>UM 0 (N) Ex</u>	<u>UM 1 (N) Ex</u>	<u>UM 2 (N) Ex</u>	<u>UM 3 (N) Ex</u>	<u>UM 4 (N) Ex</u>	<u>UM 5 (N) Ex</u>	<u>UM 6 (N) Ex</u>
CAPACITY FACTOR	1	1,8	3,2	4,9	7,3	11	20,4
INNER DIAMETER (MM)	220	310	450	600	800	1000	1200
MAX. CONNECTED LOAD (KW)	11	18,5	37	55	90	132	200

FEATURES – (UNIQUE SELLING PROPOSITIONS)



The air purged labyrinth sealing in combination with the separation area between labyrinth sealing and bearing unit prevents effectively the penetration of fine product into the bearing unit. This leads to less wear & tear and therefore to an increased OEE (Overall Equipment Effectiveness).

Temperature probes in both bearings monitor the status of the bearings continuously for recognizing possible wear/tear at an early stage. This enables predictive, targeted and cost-minimized maintenance.

Collecting bin for dispensable or used bearing grease discharged from the bearing unit to ensure a clean ambience around the mill free of grease residue and for protecting the environment.

FINE GRINDING (UNIVERSAL MILL UM) SUMMARY

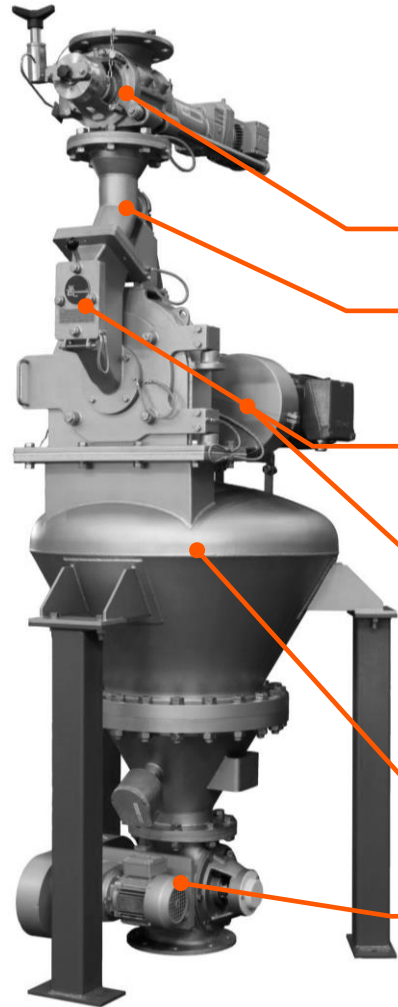
- Grinding experience since 1882
- High variability in terms of products to be processed
- Precise particle size distribution due to variable tooling and operating parameters
- Controllable temperature increase (tooling geometry, air cooling)
- High surface qualities of all components (food grade)
- Effective measures against wear and tear (tools, linings)
- Precisely dynamically balanced rotating tools ensure a long mechanical lifetime and reliable safety of operation
- Manufacturing and Servicing available in Germany and USA

01 FINE GRINDING

- Compact Grinding System (UCOM)



FINE GRINDING (COMPACT GRINDING SYSTEM UCOM) OVERVIEW / MAIN COMPONENTS



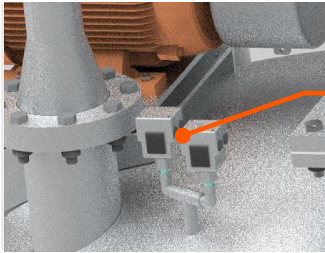
- Application: grinding of dry crystal sugar to fine powdered sugar (beet or cane); processing of feed sugar size up to 3 mm (moisture content < 0.1 %); guaranteed final particle size distribution (PSD) down to 90 % < 100 µm (standard commercial icing sugar fineness), or finer for special applications...
- Feed rotary valve for dosing crystal sugar secures an even load of the mill
- Integrated process air recirculation as close loop to minimize peripheral equipment
- Neodymium magnet in the mill inlet for capturing magnetic impurities to prevent sparking as “root” of explosion (ATEX compliance)
- Covered motor belt drive with customizable belt pulleys (transmission ratios) to maximize the throughput of your UCOM system while ensuring machine safety in case of a blockage (slip)
- 10 bar pressure shock resistant collection bin below the mill to ensure an integrated ATEX compliant gravimetric separation of product and air
- Discharge rotary valve for ground sugar secures a constant emptying of the intermediate bin

FINE GRINDING (COMPACT GRINDING SYSTEM UCOM) HIGHEST SAFETY STANDARDS FOR MAN AND MACHINERY



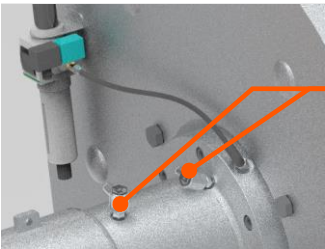
BAUERMEISTER UNIVERSAL MILL AND ACCESSORIES

Explosion pressure shock resistant up to 10 bars - ATEX certified



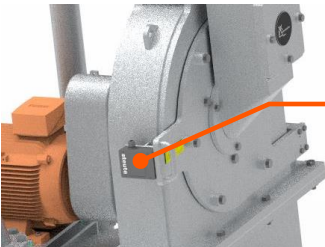
REDUNDANT PRESSURE SWITCH / ROTARY LEVEL SWITCH

To detect inappropriate pressure, increase and product accumulation in the bin – to cause emergency stop



TEMPERATURE PROBES

Continuously monitoring of bearing temperatures detecting too high temperatures at an early stage to minimize service interventions



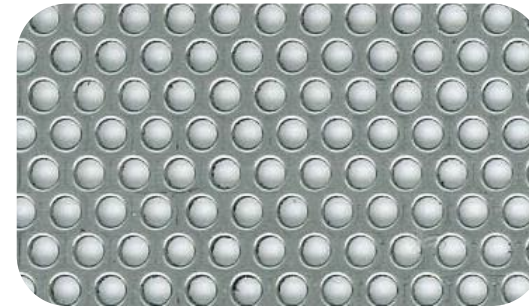
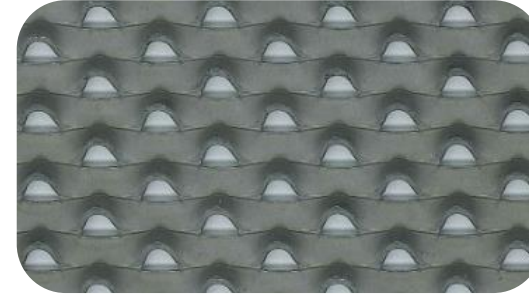
TWO WAY DOOR SAFETY LOCK

Opening the mill is automatically locked during operation and starting the mill is inevitably avoided when door is not locked



FINE GRINDING (COMPACT GRINDING SYSTEM UCOM) GRINDING TOOLS

- Precisely dynamically balanced rotating tools ensure a long mechanical lifetime and reliable safety of operation
- Turbo rotor as standard rotating grinding tool due to decades of experience with various products and applications
- Different sieve ring assemblies and plates for fulfilling customer requirements (particle size, throughput)
- Various sieve plates with cylindrical perforation or customized with special perforation for finer particle size distributions
- Pin disk tool available for special products



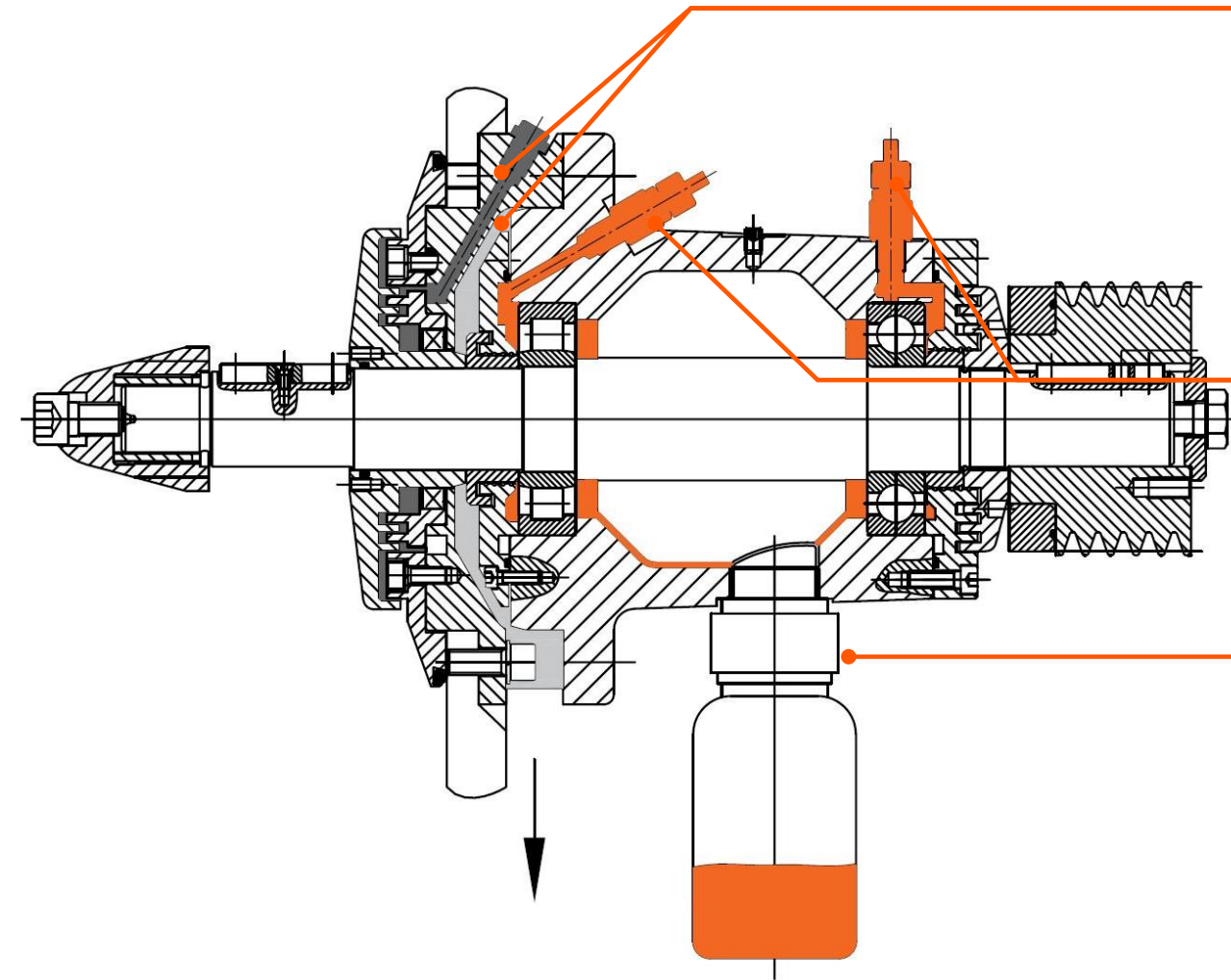
FINE GRINDING (COMPACT GRINDING SYSTEM UCOM) DESIGN VERSIONS



- Perfectly suitable for a wide range of particle size distributions and throughputs
- Available in five different sizes
- Stable final particle size distribution according to customer request – proven by trial runs

SIZE / TYPE	<u>UCOM 0 (N) Ex</u>	<u>UCOM 1 (N) Ex</u>	<u>UCOM 2 (N) Ex</u>	<u>UCOM 3 (N) Ex</u>	<u>UCOM 4 (N) Ex</u>
CAPACITY (KG/H) @ STANDARD ICING PSD	400-500	800-1000	1400-1600	2000-2200	2800-3000
MAX. CONNECTED LOAD (KW)	10	18	25	40	60

FINE GRINDING (COMPACT GRINDING SYSTEM UCOM) FEATURES (UNIQUE SELLING PROPOSITIONS)



The air purged labyrinth sealing in combination with the separation area between labyrinth sealing and bearing unit prevents effectively the penetration of fine product into the bearing unit. This leads to less wear & tear and therefore to an increased OEE (Overall Equipment Effectiveness).

Temperature probes in both bearings monitor the status of the bearings continuously for recognizing possible wear/tear at an early stage. This enables predictive, targeted and cost-minimized maintenance.

Collecting bin for dispensable or used bearing grease discharged from the bearing unit to ensure a clean ambience around the mill free of grease residue and for protecting the environment.

FINE GRINDING (COMPACT GRINDING SYSTEM UCOM) SUMMARY

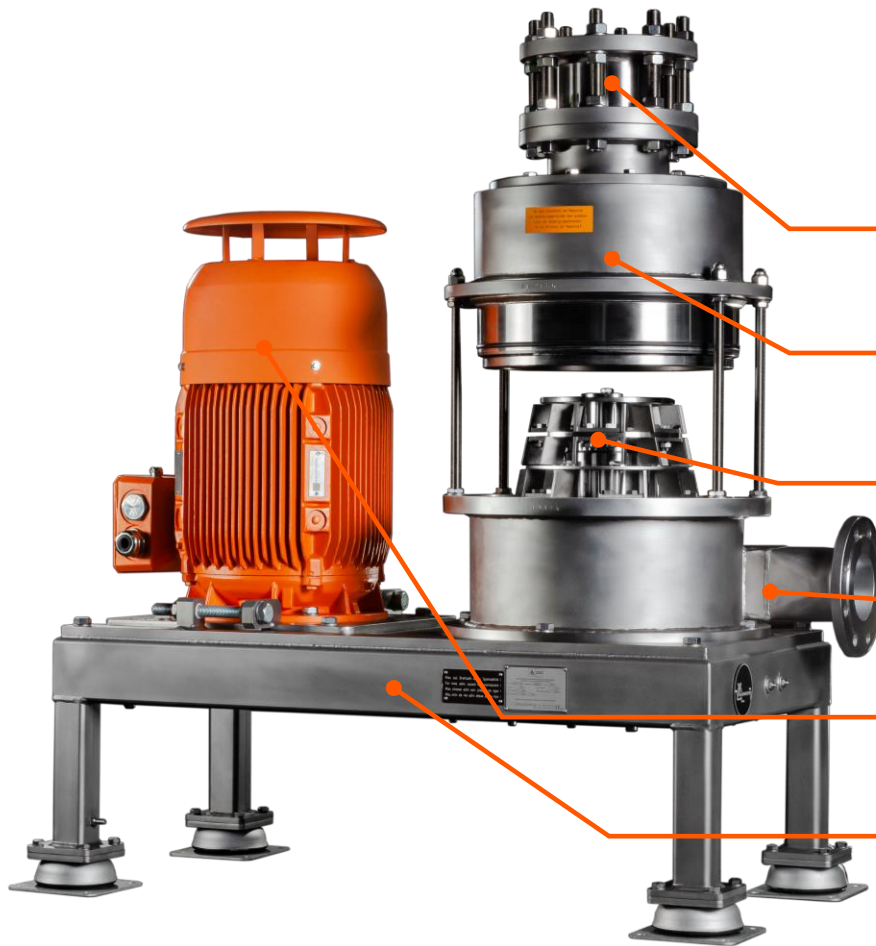
- Grinding experience since 1882 (Market leader in sugar grinding)
- Worldwide proven compact grinding solution for fine grinding of sugar
- Grinding system based on the well-recognized Universal Mill (UM)
- Minimum floor space requirements as stand alone system
- Hygienic stainless-steel design meets food grade requirements
- Latest ATEX standard by pressure shock resistant design
- No need for further peripheral equipment – less investment
- Various grinding tools to achieve the desired fineness
- High surface qualities of all components (food grade)
- The Bauermeister Pilot Plant is at your disposal to carry out trials with your sugar and to configure an UCOM according to your specific needs.
- Excellent energy utilisation and operational costs by effective measures against wear

01 FINE GRINDING

- Gap Mill (GM)



FINE GRINDING (GAP MILL GM) OVERVIEW / MAIN COMPONENTS

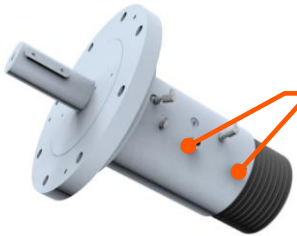


- Application fields: grinding of various dry products to fine and finest powder; particularly well equipped for processing of infeed products that contain fibrous components
- Central product and process air inlet onto the top of the rotor
- Adjustable upper housing with the conical static grinding wall
- Rotating grinding element with exchangeable grinding tools
- Tangential outlet of the fine ground powder dispersed in process air
- Main mill motor, designed for frequency-controlled drive
- Belt drive unit securely positioned underneath the stand



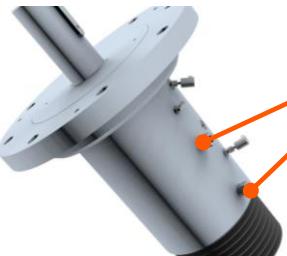
BAUERMEISTER GAP MILLS

Explosion pressure shock resistant up to 10 bars - ATEX certified



GREASING POINTS

Manual or automatic re-greasing of the bearing unit ensures minimum friction to prevent high bearing temperatures



TEMPERATURE PROBES

Continuously monitoring of bearing temperatures detecting too high temperatures at an early stage to minimize service interventions

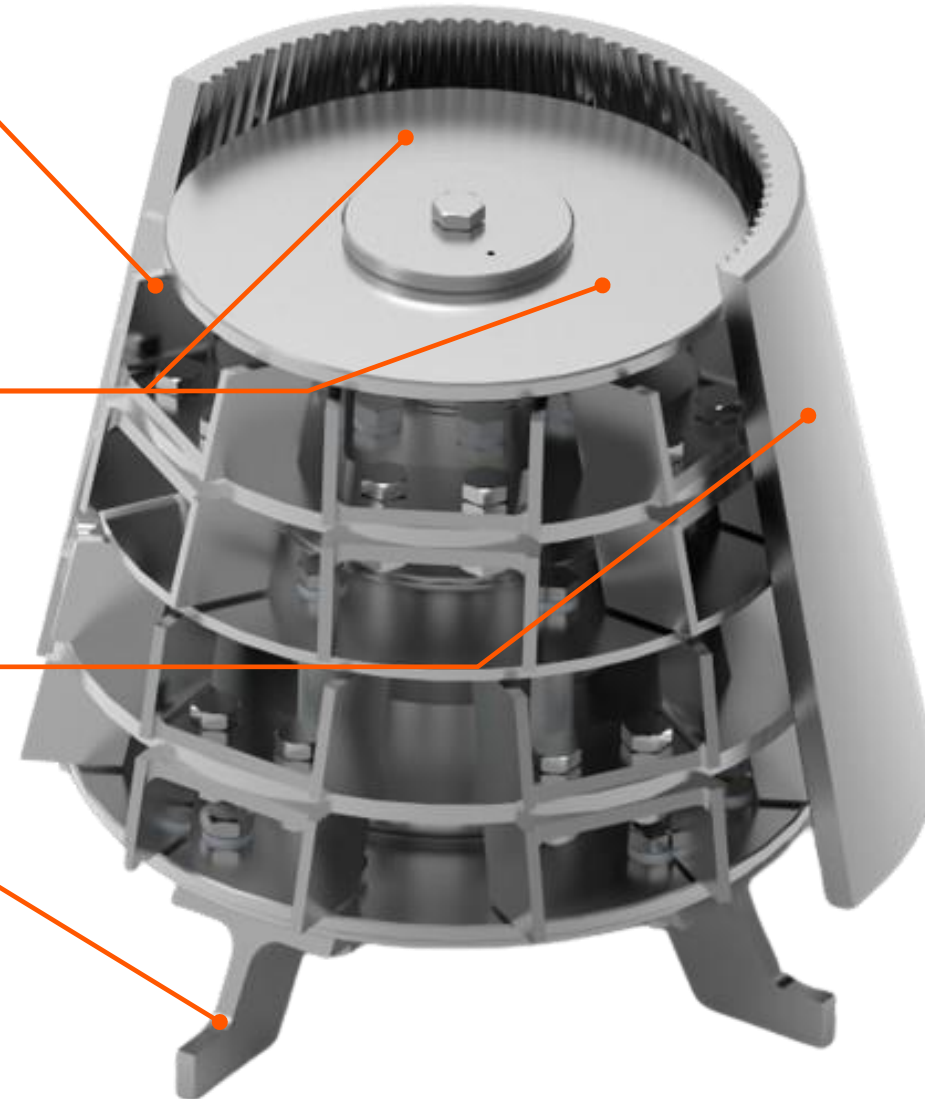


TWO WAY DOOR SAFETY LOCK

Opening the mill is automatically locked during operation and starting the mill is inevitably avoided when door is not locked

FINE GRINDING (GAP MILL GM) GRINDING TOOLS

- Fast rotating grinding element with high kinetic energy at a circumferential speed of max. 130 m/s spins the feed particles into the gap, optionally being equipped with high-wear resistance plates
- Feeding of the product onto the top plate of the rotor – different sizes available – by high air volume generated by a fan supported vacuum system
- Static grinding wall forming the adjustable grinding gap to achieve the requested particle size distribution
- Rotating scraper are designed individually for different products to improve the discharge of the ground product



FINE GRINDING (GAP MILL GM) DESIGN VERSIONS

- Perfectly suitable for a wide range of particle size distributions and throughputs
- Available in four different sizes
- Stable final particle size distribution according to customer request – proven by trial runs

SIZE / TYPE	<u>GM 20.1 (N) Ex</u>	<u>GM 40.1 (N) Ex</u>	<u>GM 80.1 (N) Ex</u>	<u>GM 120.1 (N) Ex</u>
CAPACITY FACTOR	0,6	1	1,8	2,8
ROTOR DIAMETER (MM)	200	400	800	1200
MAX. CONNECTED LOAD (KW)	15	45	90	200

SUMMARY

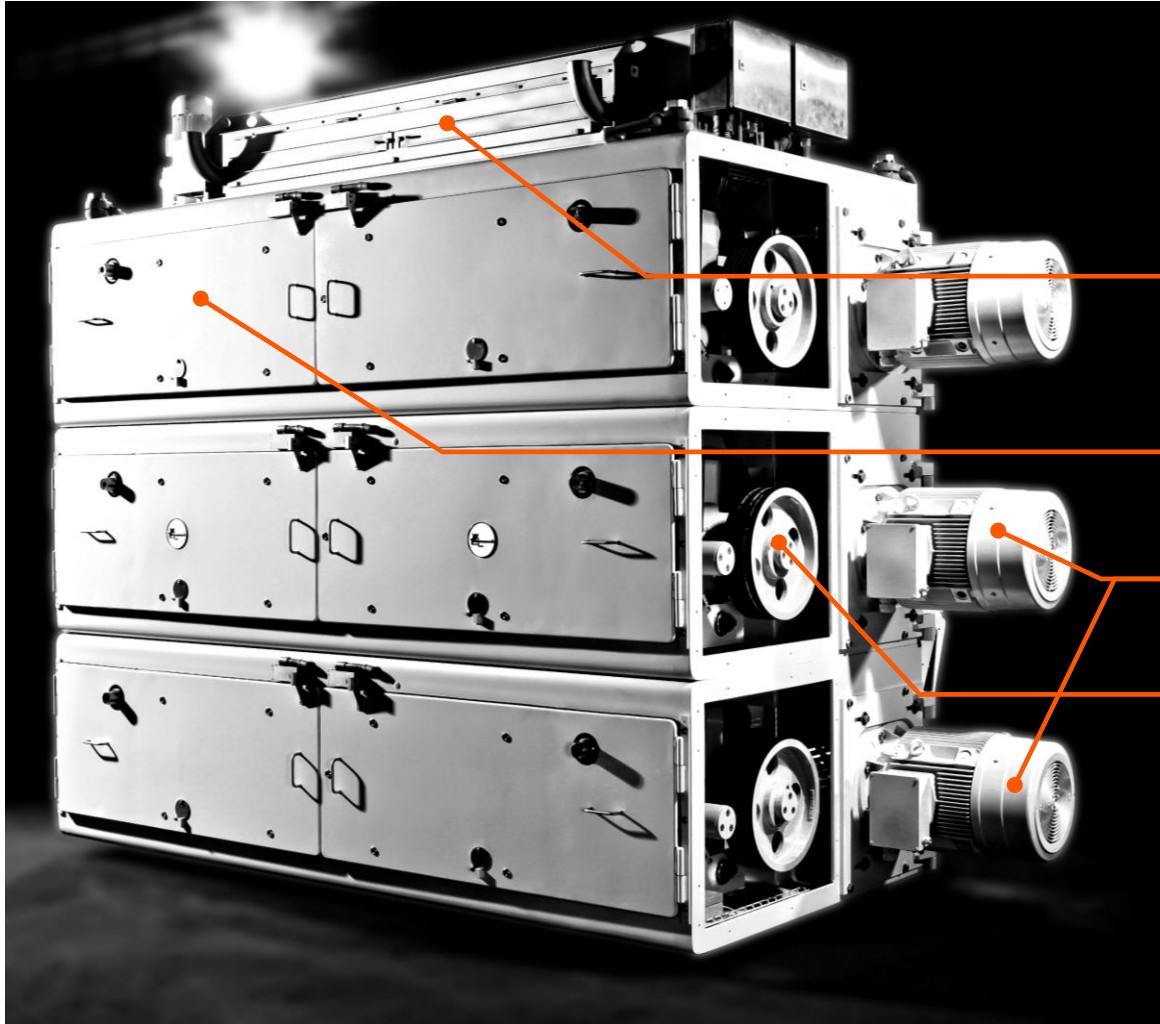
- Grinding experience since 1882 (Market leader in sugar grinding)
- Extended application range compared to UM and UCOM
- Suitable for size reduction of fibrous and fat containing products.
- Precise particle size distribution due to variable rotor speed and adjustable working gap
- Free discharge of ground product (no limiting sieve to prevent mill blocking by fibrous ingredients)
- Manufacturing and Servicing available in Germany & USA
- High surface quality of all components (food grade)
- High variability in terms of various products
- Hardened grinding tools available for abrasive products to minimize wear and tear
- Precisely dynamically balanced rotating tools ensure a long mechanical lifetime and reliable safety of operation



02 CRUSHING

- Crusher (VWR)

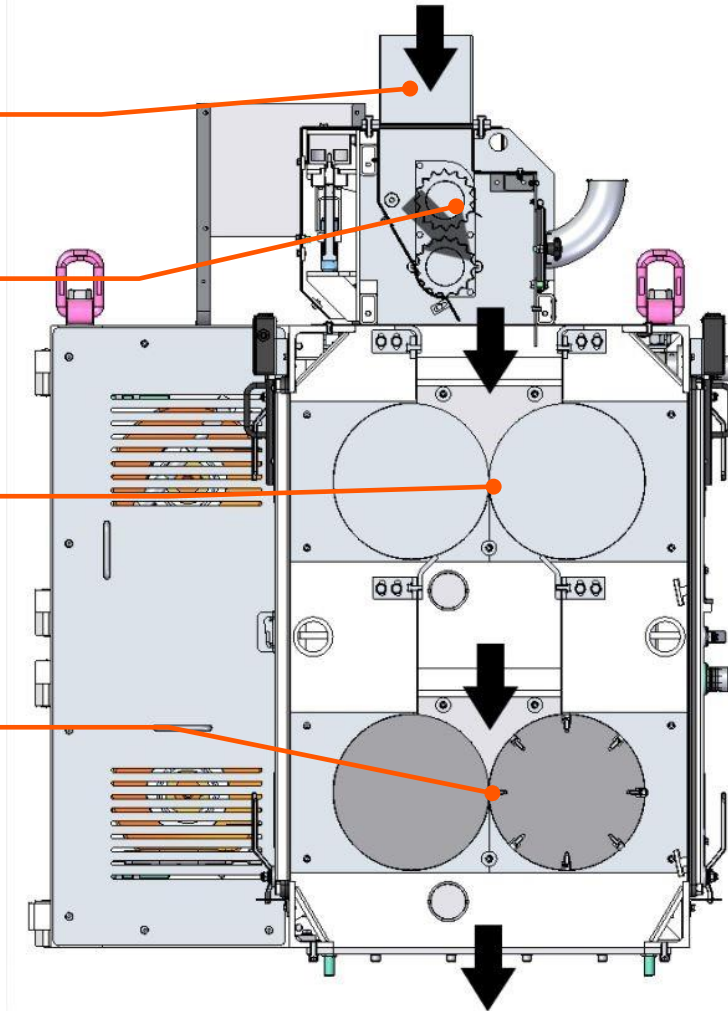
CRUSHING (VWR) OVERVIEW / MAIN COMPONENTS



- Application fields: crushing of dry crystal products to small particles however not powder; particularly experienced for the oversize particle crushing in the process of producing UREA based fertilizer and SAP for sanitary products.
- Double roll feeder for volumetric dosing and distributing the raw product into the crusher
- Dust tight inspection doors covering the grinding chamber
- Main motors each driving a pair of rolls
- Covered and vented v-belt drive assembly

CRUSHING (VWR) PRODUCT FLOW

- Raw product entry
- Double roll dosing unit distributing the product over the complete roll length
- Pre-crushing stage reducing the size of the raw product by approx. 1:4 - 1:8
- Fine crushing stage to achieve the requested final particle size distribution with low content on fines



CRUSHING (VWR) DESIGN VERSIONS

- Different series of crushers are available in terms of size and configuration
- Crusher are designed as one-, two- or three-stage machine - customized to the application

SIZE / TYPE	<u>VWR 250.1 x 1250</u>	<u>VWR 250.2 x 1300</u>	<u>VWR 350 x 1800</u>	<u>VWR 400 x 2100</u>
ROLL DIAMETER (MM)	250	250	350	400
ROLL LENGTH (MM)	1250	1300	1800	2100
CONNECTED LOAD (KW)	2 x 22	2 x 30	2 x 37	2 x 45
NUMBER OF STAGES AVAILABLE	2	1 / 2 / 3	1 / 2 / 3	1 / 2 / 3

CRUSHING (VWR) SUMMARY

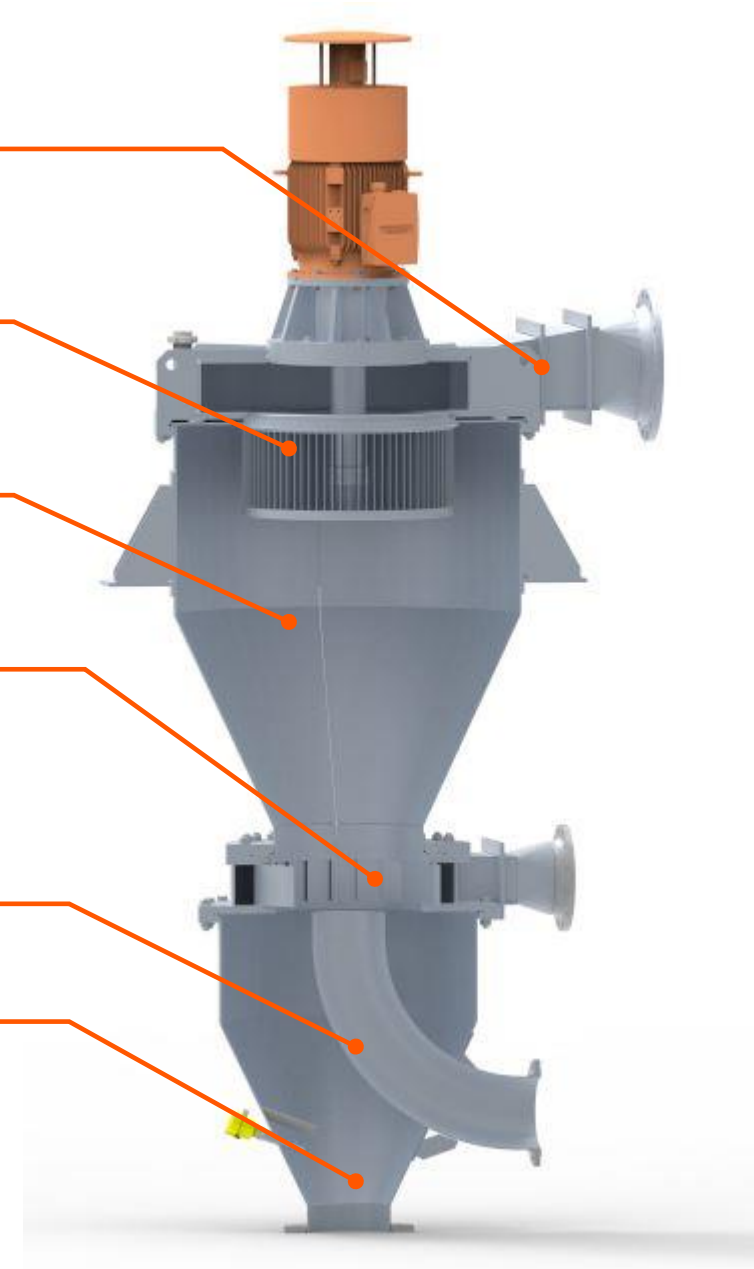
- Grinding experience since 1882 (Market leader in the UREA industry)
- Crushing of crystal goods into pieces with low amount of fines
- Smooth size reduction with steep particle size distribution
- Rolls in different material qualities in terms of hardness
- Rolls with various corrugations and designs
- High surface quality of all components available
- Manufacturing and Servicing available in Germany & USA

03 CLASSIFYING

- Dynamic Air Classifier (CL)

CLASSIFYING (DYNAMIC AIR CLASSIFIER CL) OVERVIEW / MAIN COMPONENTS

- Fine product outlet (wide chamber) – to be separated from the process air in the cyclone filter
- Classifier wheel rotating with variable speed to precisely adjust the cut point between coarse and fine product
- Classifying area – separation by specific weight difference of particles in high turbulent air flow ambience
- Secondary static shovel ring provides the secondary air to have an optimum turbulence in the classifying area for deagglomeration and highest precision in separation
- Product entry - dispersed in the process air of the mill
- Coarse product discharge – product to be recirculated to the mill or taken out of the process



CLASSIFYING (DYNAMIC AIR CLASSIFIER CL) HIGHEST SAFETY STANDARDS FOR MAN AND MACHINERY



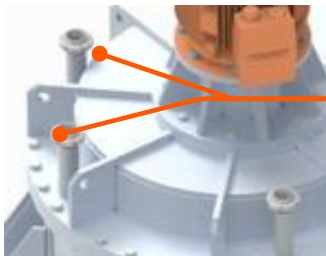
BAUERMEISTER DYNAMIC AIR CLASSIFIERS

Explosion pressure shock resistant up to 10 bars - ATEX certified



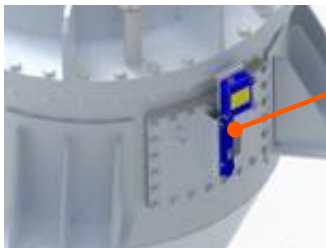
WING TYPE LEVEL SENSOR

Secures the coarse product discharge back to the process and detects clogging at an early stage



FLUSH AIR CONNECTION

Controlled amount of air is injected to keep the gap between classifier wheel and housing free to prevent by-passing of coarse product



TWO WAY SAFETY LOCK

Opening the inspection flap is automatically locked during operation and starting the classifier is inevitably avoided when flap is not locked.

DYNAMIC AIR CLASSIFIER (CL) DESIGN VERSIONS



- Perfect for a precise cut point – customized for your application
- Available in eleven different sizes

SIZE / TYPE	<u>CL L (N) Ex</u>	<u>CL 0 (N) Ex</u> <u>CL 20 (N) Ex</u>	<u>CL 1 (N) Ex</u>	<u>CL 2 (N) Ex</u>	<u>CL 40 (N) Ex</u>	<u>CL 3 (N) Ex</u>	<u>CL 4 (N) Ex</u>	<u>CL 80 (N) Ex</u>	<u>CL 5 (N) Ex</u>	<u>CL 120 (N) Ex</u>	<u>CL 6 (N) Ex</u>
CAPACITY FACTOR	0,2	1	1,5	2,5	3	3,5	4,5	6	7	10	12
NOMINAL AIR FLOW (M ³ /MIN)	3	20	30	50	60	70	90	120	140	200	240
CLASSIFIER WHEEL SPEED (1/MIN)	700-14000	500-5500	400-4500	350-3500	300-3200	280-3000	250-2700	220-2300	200-2100	170-1800	150-1600
CLASSIFIER WHEEL DIAMETER (MM)	100	260	315	400	450	475	540	630	690	780	99
CONNECTED LOAD (KW)	1	5	11	15	18,5	18,5	22	30	30	37	37

CLASSIFYING (DYNAMIC AIR CLASSIFIER CL) SUMMARY

- Optional installing in combination with a Bauermeister Universal or Gap Mill to achieve a highly precise cut point of the final product
- Adjustable range of cut point by the choice of three different classifier wheels for coarse, medium and fine final products
- Classifier sizes corresponding to the nominal air flow of the mill to achieve a precise cut point & a high separation efficiency
- Secondary classifying stage to intense the de-agglomeration of coarse particles
- Variable ratio between primary and secondary air flow according to process requirements
- High surface quality of all components (food grade)
- The precisely dynamically balanced classifier wheel ensures a long mechanical lifetime & reliable safety of operation.
- Manufacturing and servicing available in our sites in Germany and USA

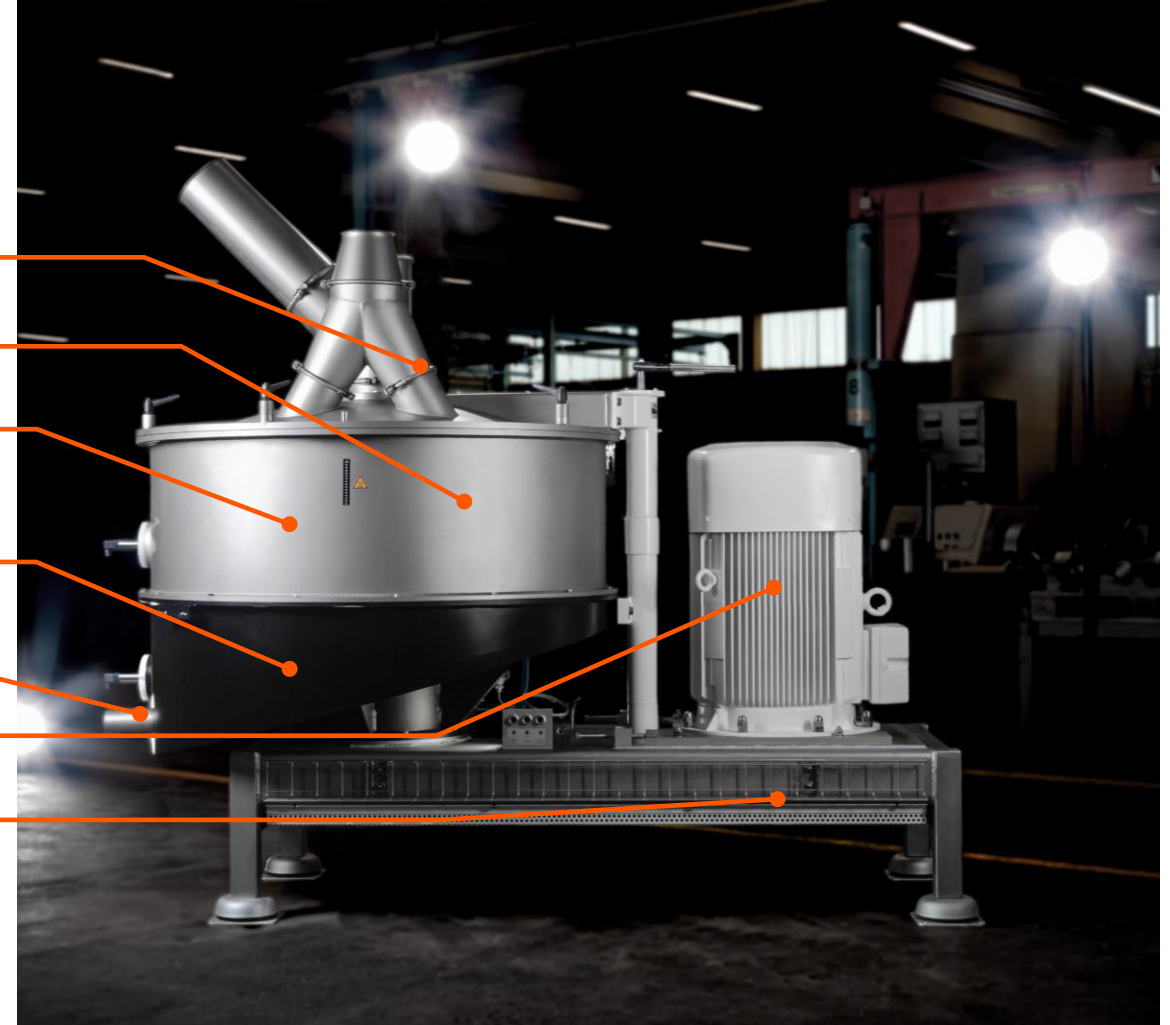
04 PASTE GRINDING

- Beater Blade Mill (SMM)

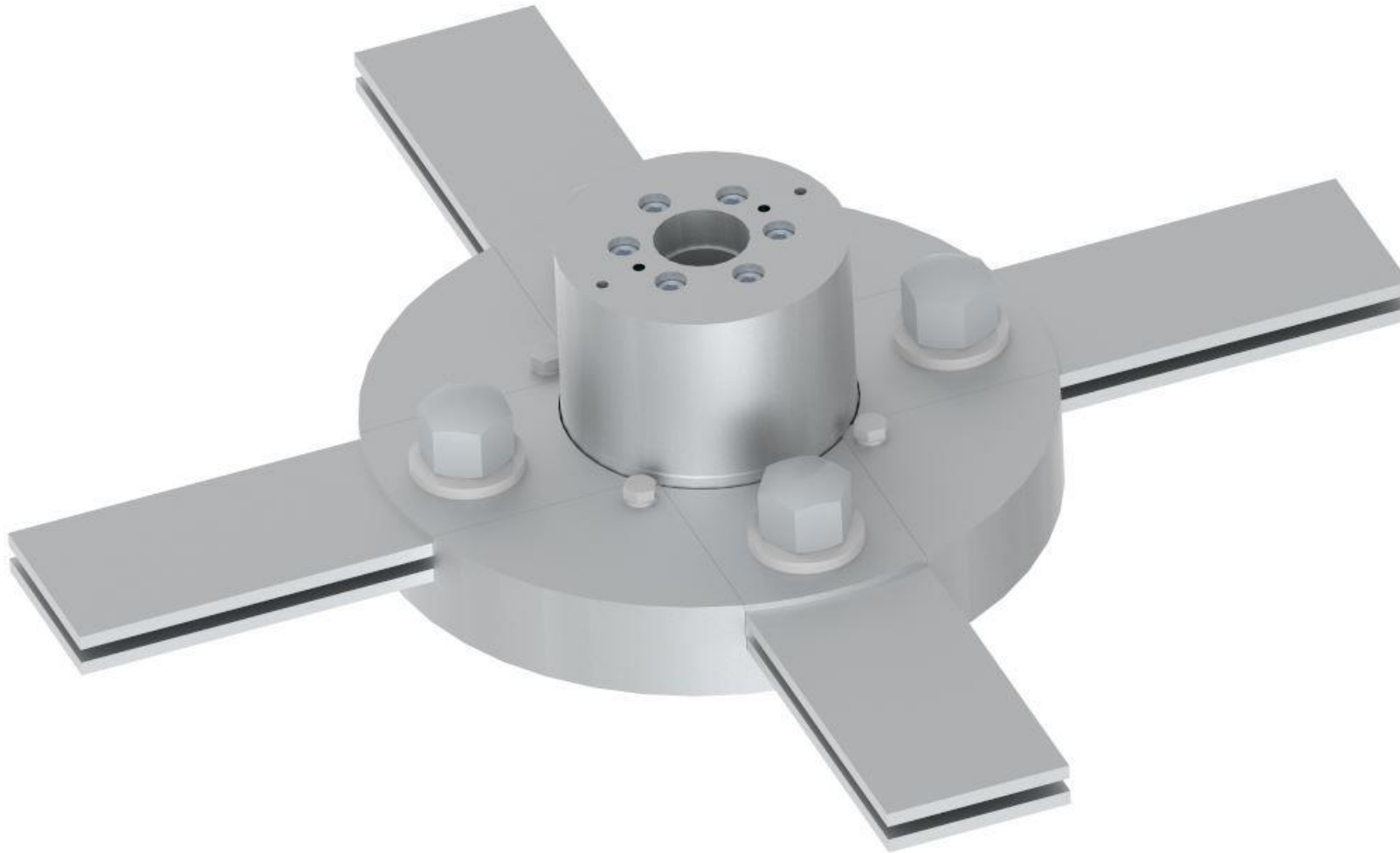


PASTE GRINDING (BEATER BLADE MILL SMM) OVERVIEW / MAIN COMPONENTS

- Application fields: grinding of cocoa nibs, nuts, seeds to fine paste up to approx. 95 % < 75 µm
- Central product feeding onto the top of the rotor
- Upper housing with integrated slotted sieve 0.15 – 0.30 mm
- Rotating grinding element inside with exchangeable hardened beater blades
- Lower housing double walled for cooling of the mass
- Outlet of the cocoa mass to an external mass pump
- Main mill motor, designed for fix speed drive
- Belt drive unit securely positioned underneath the stand

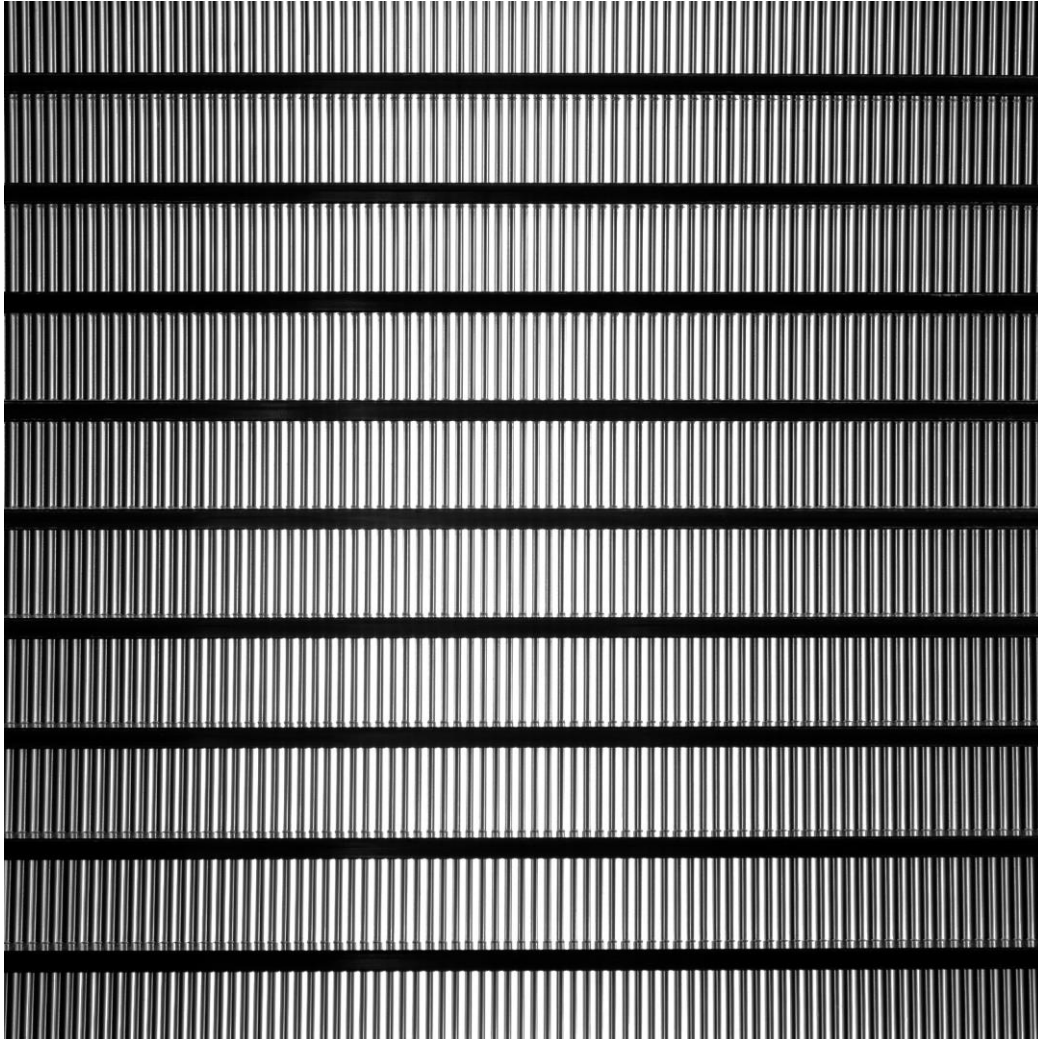


PASTE GRINDING (BEATER BLADE MILL SMM) GRINDING TOOLS



- The rotor is equipped with eight beater blades in two layers with a distancing shim between – sandwich design.
- This allows a turbulence between the two layers of knives to improve the shearing of product particles.
- The beater blades are hardened and can be used on both sides by changing direction of rotor.
- The exchange of the beater blades is comfortable and leads to short service times.

PASTE GRINDING (BEATER BLADE MILL SMM) GRINDING TOOLS



- The slotted sieve – available in gap widths 0.15, 0.20, 0.25 and 0.30 mm is highly precise in its design.
- The design allows a very big slotted surface area in ratio to the closed parts of the sieve.
- The material of the sieve is of special triangle design to prevent the product clogging in the slots.

PASTE GRINDING (BEATER BLADE MILL SMM)

DESIGN VERSIONS



- Available in different sizes, depending on your needs

SIZE / TYPE	<u>SMM 801</u>	<u>SMM 801.1</u>	<u>SMM 1100</u>	<u>SMM 1100.1</u>
ROTOR DIAMETER (MM)	802	802	1140	1140
CONNECTED LOAD (KW)	45	55	90	110
CAPACITY WITH 0.25 MM SIEVE	≤ 1000	≤ 1500	≤ 2000	≤ 2500
SIEVE HEIGHT (MM)	333	333	460	460

PASTE GRINDING (BEATER BLADE MILL SMM) SUMMARY

- Experience in grinding of cocoa nibs for several decades
- Adjustable final product fineness by choosing sieve slot size
- Rotor with hardened tools to be used both-way
- Water cooled bearing unit to minimize temperature increase
- Double walled bottom housing to cool the cocoa mass
- High surface quality of all components
- Manufacturing and servicing available in our sites in Germany and USA



THANKS A LOT FOR YOUR ATTENTION

WE APPRECIATE YOUR INTEREST
AND LOOK FORWARD TO HEARING
FROM YOU.

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