

# MaxxMill®

## Agitate media mill

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for dry and wet grinding  
iron-free  
adjustable grain size distribution

- Final product: up to  $d_{97}=5\ \mu\text{m}$
- Feed material: up to 2 mm
- Hardness: up to 9 Mohs



# The MaxxMill® – agitated media mill

## A multi-talent

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### Range of application

Continuous dry and wet grinding of coarse-grained materials to fine-ground and ultrafine-ground products

### Machine layout

- rotating grinding chamber
- eccentric, high-speed agitator running in counter
- or co-current direction to the rotating grinding chamber
- stationary flow deflector

### Mode of operation

The grinding chamber is filled to a capacity of 80 - 90 % with spherical grinding media. Unground material is fed down through the hollow flow deflector to a point near the bottom of the chamber, where it is drawn into the agitated media by rotation of the chamber. The material now moves continuously

from bottom to top of the agitated media bed and is effectively ground by the input of energy from the agitator and the resulting impact and friction forces.

### Ground product separation

#### Dry grinding:

Pneumatic extraction from the surface of the agitated media bed

#### Wet grinding:

Separation of suspension from the agitated media by ball retaining device

### Flexibility

Through careful selection of the size and quantity of grinding media used, the rotational speed of the agitator and the grinding chamber, and the rate of material throughput it is possible to adapt the grinding results over a wide range to suit specific requirements.

## With many advantages

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### in terms of costs

- low investment costs
- low operating costs
- low specific energy consumption
- high throughput rates yet small space requirements
- easy integration into existing systems

### reproducible product quality

- adjustable grain size distribution
- little product loss
- adaptable to changing quality requirements

### in terms of process control

- continuous operation with short dwell times
- high level of automation
- high operational reliability
- simple product changeover
- on-line monitoring and control of grain size

### in terms of service

- good access to wear parts and simple replacement
- easy cleaning when changing to a different product



# The MaxxMill® series

## MaxxMill® MM3 and MM5

These are the models currently available and now in use for the most diverse applications in our customers' production plants. The Eirich Test Center is equipped with a MaxxMill® MM3 for dry and wet grinding tests on a production scale.

## Design options

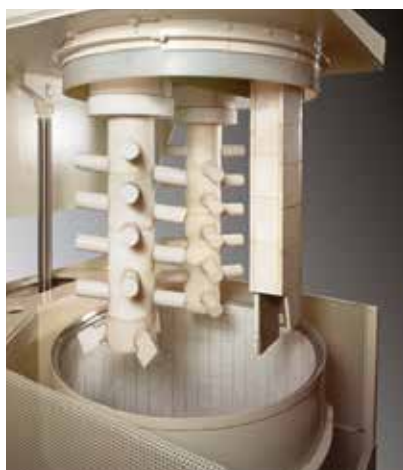
Various geometries and agitators are used to adapt to different applications.

## Wear elements

Tungsten carbide, ceramic and polyurethane are used for wear protection.

## Grinding media

High grinding performance and low wear are guaranteed by EIKORIT® oxide ceramic balls and EIDURIT® steel balls.



MM5 – Wear elements made of ceramic bar agitator



MM3 – Wear elements made of tungsten carbide bar agitator

Data	MaxxMill® MM3	MaxxMill® MM5
Capacity range (t/h) <sup>1</sup>	up to approx. 2.5	up to approx.10
Grinding chamber volume (l)	190	800
Number of agitators (-)	1	2
Drive rating up to (kW)	25 - 50	120 - 200
Grinding media/ball diameter	EIKORIT® oxide ceramic/EIDURIT® steel approx. 3 - 10 mm	
Max. grinding media charge weight (kg)	up to 500	up to 2100
Feed material range (mm)	< 2	< 2
Final fineness (d <sub>97</sub> ,µm)	down to 5	down to 5
Dimensions approx. h/w/d	2600 x 900 x 1700	3500 x 2000 x 3100
approx. Weight	3 - 3.5 t	11.5 t

1) dependent on feed material and required fineness of ground product



Grinding system MaxxMill® MM3  
in the EIRICH Test Center

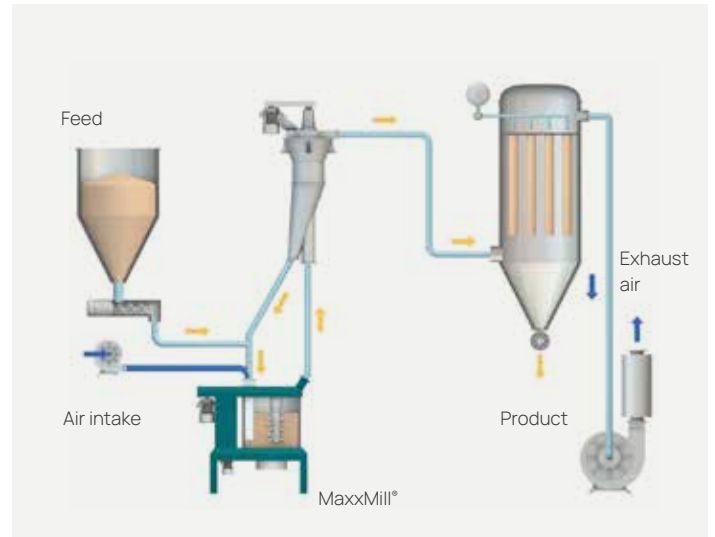
# Dry grinding ... up to $d_{97} = 5 \mu\text{m}$

## Dry grinding

with a closed grinding/classifying circuit  
Using the MaxxClass multiwheel air classifier it is also possible to achieve end fineness values up to  $d_{97} = 5 \mu\text{m}$ .

### Advantages

- high grinding effectiveness
- small space requirement
- low specific energy consumption
- free and exact setting of the required final fineness
- iron-free grinding possible

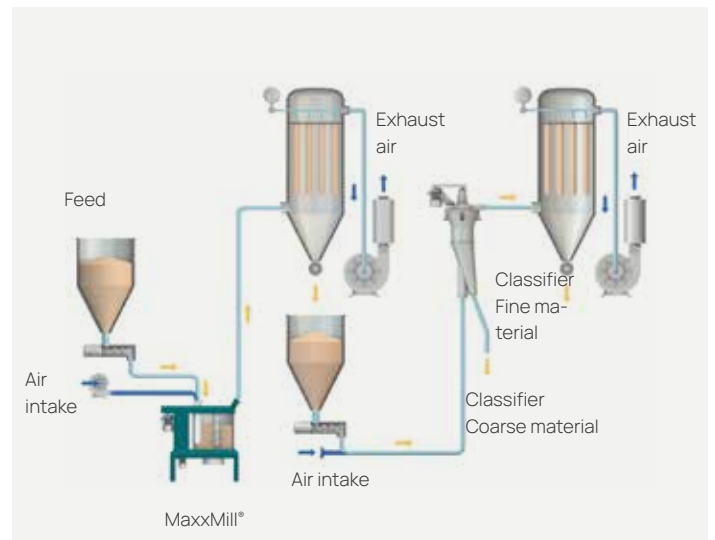


## Dry grinding

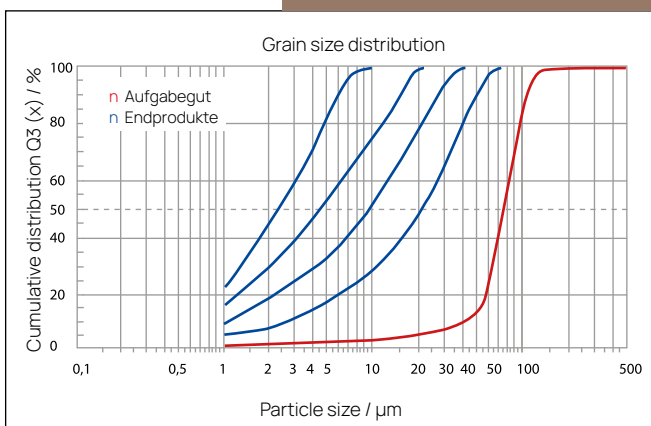
with a separate air classifying circuit  
e. g. for feed materials with low bulk densities

### Advantages

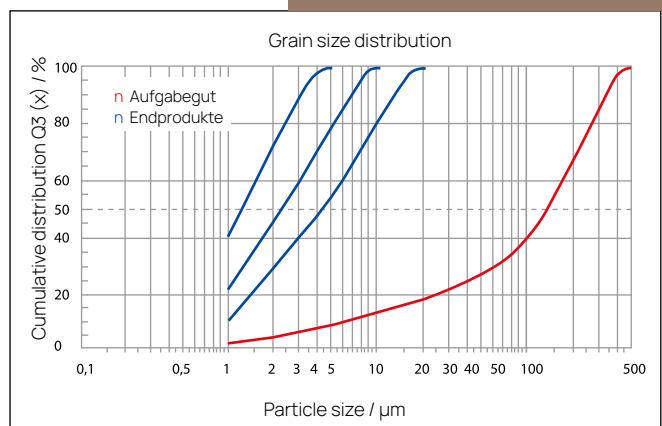
- ultrafine-ground products
- optimum adjustments for the MaxxMill® and the MaxxClass air classifier
- high throughput rates
- low specific energy consumption
- the classifier coarse fraction is the dedusted finished material or is recycled to the MaxxMill®



### Aluminum oxide



### Calcium carbonate



Fine grinding with closed grinding/classifying circuit and different classifier wheel speeds



MM3 for dry grinding of frits



### Application examples

	Throughput rate	Initial fineness	Final fineness	Spec. grinding energy consumption	Type
Frits	300 - 600 kg/h	90 % < 2 mm	99 % < 63 µm	50 - 70 kWh/t	MM3
Feldspar	600 kg/h	95 % < 2 mm	98 % < 45 µm	40 kWh/t	
Limestone	600 kg/h	97 % < 500 µm	99.5 % < 5 µm	120 kWh/t	MM5

- aluminum oxide
- bauxite
- bentonite
- calcium carbonate
- china clay
- clay
- diatomite
- feldspar
- frits
- pigments
- quartz
- special cement
- talcum
- zirconium silicate

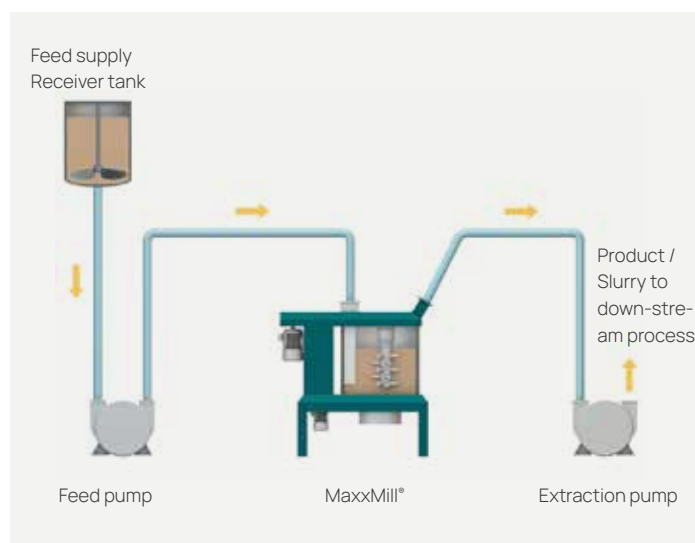
# Wet grinding

## ... up to P80 = 10 µm

### Fine grinding of suspensions

#### Advantages

- fully automatic, continuous operation
- smooth processing of high-viscosity suspensions
- no grinding media compression
- no glide ring seals
- agitator bearing without product contact
- small space requirement
- adaptation/control of product fineness and grain size distribution
- low specific energy consumption
- suitable for pendulum and circulation modes of operation
- coarse raw material admitted
- can be operated in combination with classifying equipment
- iron-free grinding possible



Wet grinding system for single-pass operating mode

#### Application

- fine grinding
- disagglomeration
- dispersion
- activation of grain surfaces

#### Application examples

- aluminum oxide
- calcium carbonate
- ceramic slip
- clay
- engobes
- ferrites
- glazes
- ores

	Throughput rate Dry matter	Initial fineness Wet screening	Final fineness Wet screening	Specific grinding energy consumption (approx.)	Type
Ceramic slip Porcellanato	8500 kg/h	~ 8 % > 63 µm	2.5 % > 63 µm	6 kWh/t	MM5
Ceramic slip Monocottura	10 000 kg/h	~ 13.5 % > 63 µm	4 % > 63 µm	4 kWh/t	
Glazes	400 - 600 kg/h	< 200 µm	1 % > 40 µm	20 - 25 kWh/t	MM3





MM5 for wet grinding  
of ceramic slip  
0.7 % > 45 µm

# Wet/dry finish-grinding for the optimization of existing grinding systems

## Finish-grinding of suspensions and dry solid matters

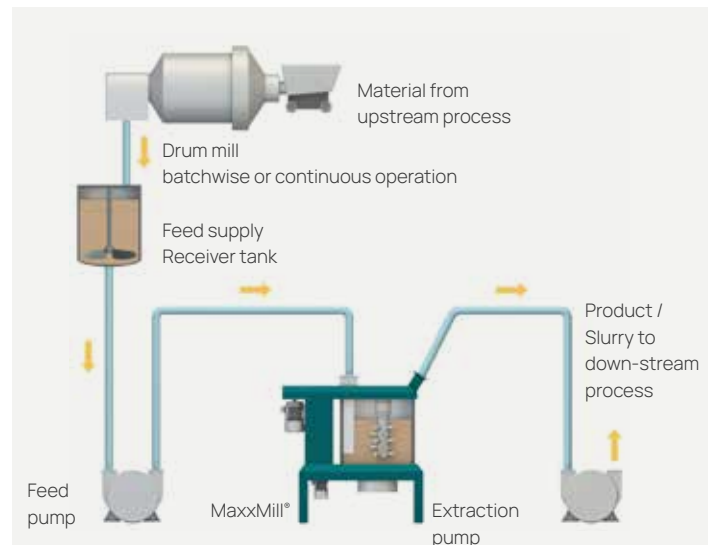
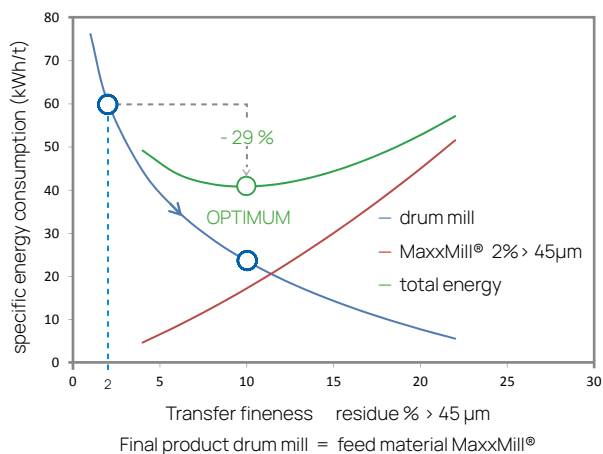
### Advantages

- combination with continuous and batch-type mills possible
- cost-effective increase of capacity with the same fineness of product
- cost-effective increase of product fineness with the same capacity
- far lower energy consumption overall
- small space requirement
- adaptation of product fineness and grain size distribution
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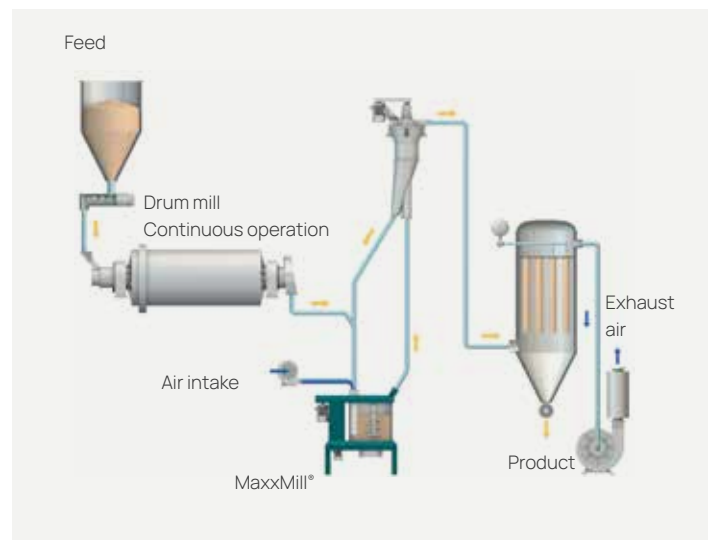
### Application examples

- ceramic slip
- glazes
- ores
- special cements
- ferrites
- fillers

Energy savings when using a conventional drum mill combined with a MaxxMill®



Drum mill (wet grinding) with downstream MaxxMill®



Drum mill (dry grinding) with downstream MaxxMill®

### Wet grinding:

Final product ceramic slip with fineness 2 % > 45 µm  
 Pregrinding: Drum mill fineness 10 % > 45 µm  
 Finish-grinding: MaxxMill® end fineness 2 % > 45 µm  
 Energy savings: 29 %



MM5 for dry grinding of hard materials for wall and floor tiles

MM5 for dry grinding of china clay



The Eirich Group, with the Gustav Eirich machine factory as a strategic center in Hardheim, is a supplier of machines, systems and services for mixing technology, granulating/pelleting, drying and fine grinding. Our core competencies are procedures and processes for the treatment of loose materials, sludge and mud. We are a family-run company with 16 locations worldwide.

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More information at:  
**[www.eirich.com](http://www.eirich.com)**