

MaxxMill® Agitated media mill

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



The MaxxMill[®] agitated media mill

A multi-talent ...

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

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

in terms of quality

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

in terms of process control

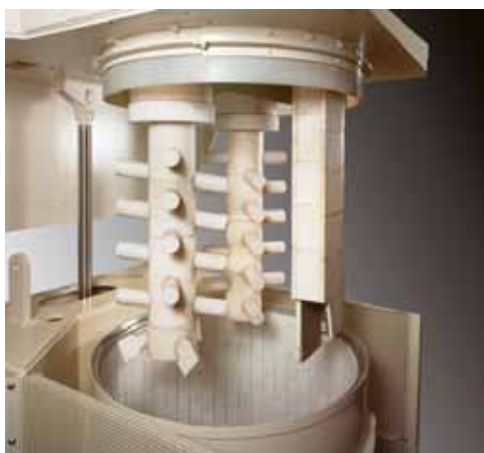
- continuous operation with short dwell times
- high level of automation
- high operational reliability
- simple product changeover
- on-line monitoring and control of grain size

in terms of service

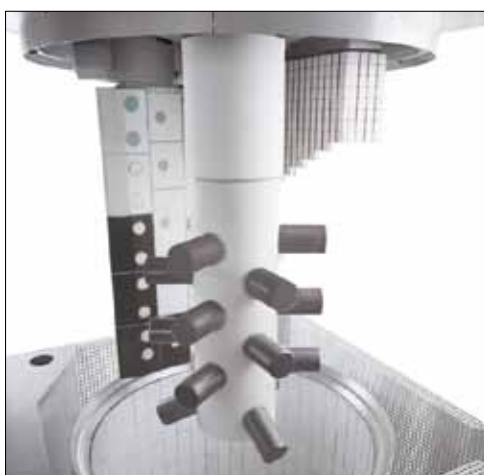
- good access to wear parts and simple replacement
- easy cleaning when changing to a different product



The MaxxMill® series



MM5
Wear elements
made of ceramic
bar agitator



MM3
Wear elements
made of tungsten carbide
bar agitator

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.

Data	MaxxMill® MM3	MaxxMill® MM5
Capacity range (t/h) ¹	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 ₉₇ 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

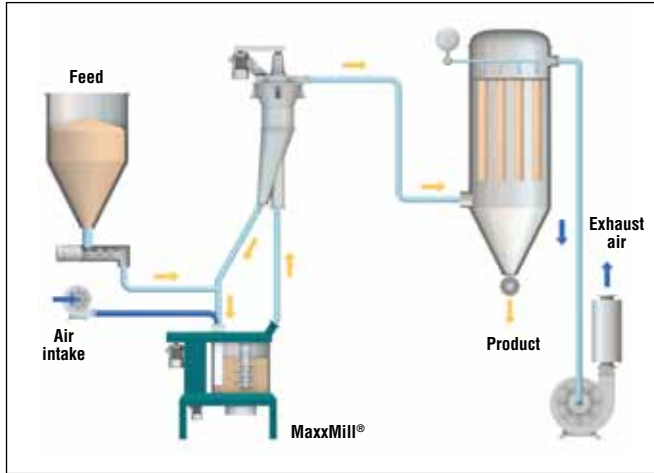
¹⁾ dependent on feed material and required fineness of ground product

*Grinding system MaxxMill® MM3
in the EIRICH Test Center*



Dry grinding

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



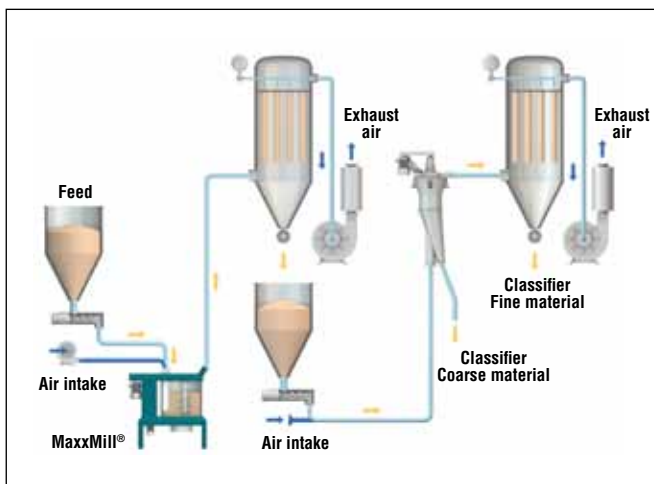
Dry grinding

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

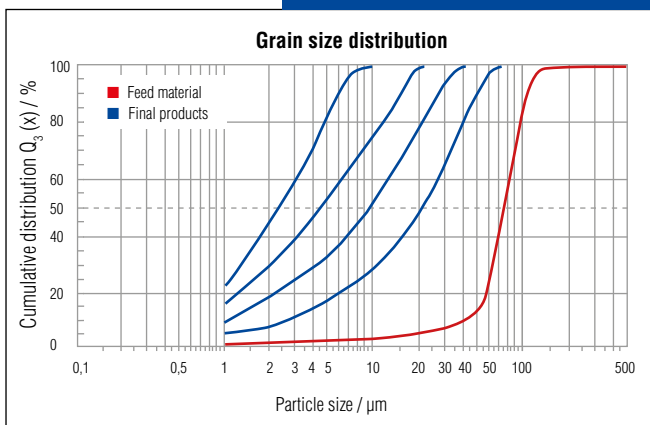
with a separate air classifying circuit

e. g. for feed materials with low bulk densities

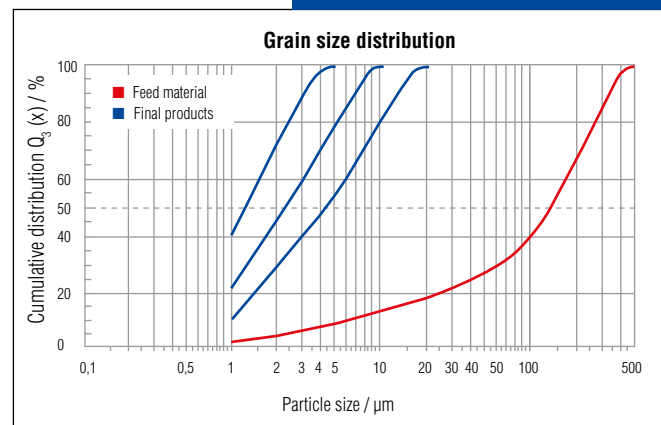
Advantages

- 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



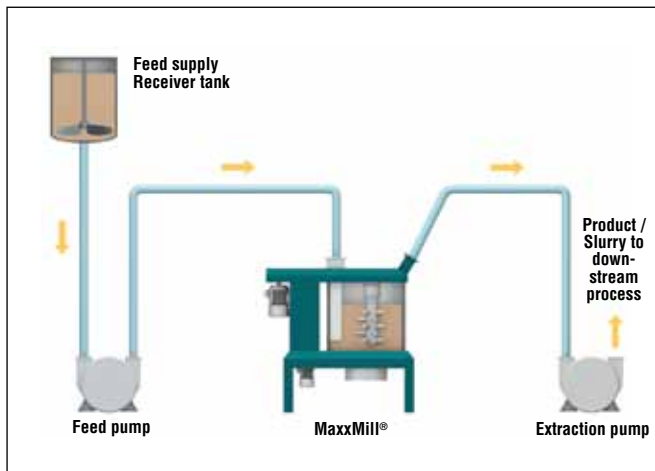
Application examples

	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 $P_{80} = 10 \mu\text{m}$



Wet grinding system for single-pass operating mode

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

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

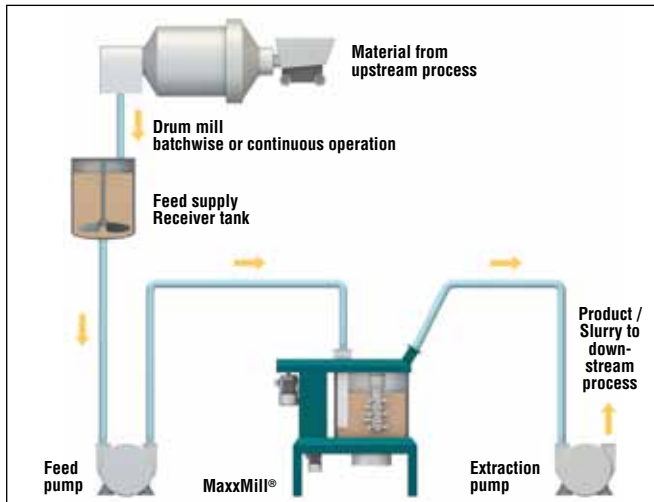


 **EIRICH**

*MM5
for wet grinding
of ceramic slip
0.7 % > 45 μ m*

Wet/dry finish-grinding

... for the optimization of existing grinding systems

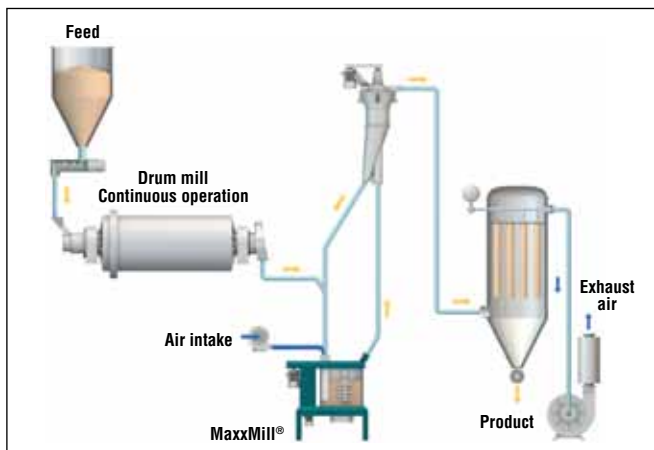


Drum mill (*wet grinding*) with downstream MaxxMill®

Finish-grinding of suspensions and dry solid matters

Advantages

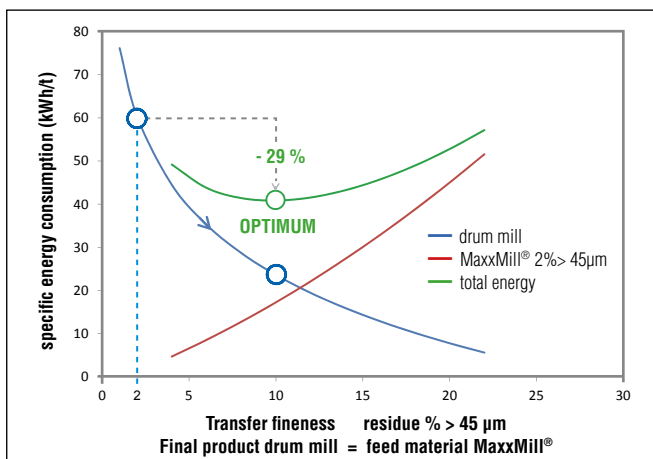
- combination with continuous and batch-type mills possible
- cost-effective increase of capacity with the same fineness of product
- cost-effective increase of product fineness with the same capacity
- far lower energy consumption overall
- small space requirement
- adaptation of product fineness and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



Drum mill (*dry grinding*) with downstream MaxxMill®

Application examples

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



Energy savings when using a conventional drum mill combined with a 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*

Industrial Mixing and Fine Grinding Technology

Tradition and innovation since 1863

EIRICH stands worldwide for a comprehensive range of products and services in the field of preparation technology. Its particular focus is on mixing and fine grinding technology, with know-how developed over 150 years of close cooperation with industrial users, universities and research institutions.

Pursuing a corporate philosophy of operating internationally and thereby ensuring close proximity to every customer, the EIRICH Group has secured its place in all the key economic regions of the world.

The focus is on innovative technology for machinery and systems engineering designed to offer solutions for high-standard preparation tasks from a single source.

Applications and process technology with own test centers, a high vertical range of production and comprehensive after-sales service provide the ideal basis for the development of modern and economical processes for a multitude of industries.

**Building materials – Ceramics – Glass – Carbon paste – Battery paste
Friction linings – Metallurgy – Foundries – Environmental protection**

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