MaxxMill®
Agitated media mill

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

The Pioneer in Material Processing®
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 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 quality
- reproducible product quality
- adjustable grain size distribution
- little product loss
- adaptable to changing quality requirements

in terms of service
- good access to wear parts and simple replacement
- easy cleaning when changing to a different product
The MaxxMill® agitated media mill

A multi-talent...

Feed material
Air
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.

<table>
<thead>
<tr>
<th>Data</th>
<th>MaxxMill® MM3</th>
<th>MaxxMill® MM5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capacity range (t/h)†</td>
<td>up to approx. 2.5</td>
<td>up to approx. 10</td>
</tr>
<tr>
<td>Grinding chamber volume (l)</td>
<td>190</td>
<td>800</td>
</tr>
<tr>
<td>Number of agitators (-)</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Drive rating up to (kW)</td>
<td>25 - 50</td>
<td>120 - 200</td>
</tr>
<tr>
<td>Grinding media/ball diameter</td>
<td>EIKORIT® oxide ceramic/EIDURIT® steel approx. 3 - 10 mm</td>
<td></td>
</tr>
<tr>
<td>Max. grinding media charge weight (kg)</td>
<td>up to 500</td>
<td>up to 2100</td>
</tr>
<tr>
<td>Feed material range (mm)</td>
<td>&lt; 2</td>
<td>&lt; 2</td>
</tr>
<tr>
<td>Final fineness (d97µm)</td>
<td>down to 5</td>
<td>down to 5</td>
</tr>
<tr>
<td>Dimensions approx. h/w/d</td>
<td>2600 x 900 x 1700</td>
<td>3500 x 2000 x 3100</td>
</tr>
<tr>
<td>approx. Weight</td>
<td>3 - 3.5 t</td>
<td>11.5 t</td>
</tr>
</tbody>
</table>

† dependent on feed material and required fineness of ground product
Grinding system MaxxMill® MM3 in the EIRICH test Center
Dry grinding
... up to $d_{97} = 5 \, \mu m$

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 $d_{97} = 5 \, \mu m$.

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®

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

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

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

... up to $P_{80} = 10 \mu m$

Application examples

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

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

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

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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