


Welcome
to the presentation

CMP „BETA-MILL“ –
The Solution for Cost Reduction
and Capacity Increase of
CEMENT GRINDING PLANTS

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CONTENT

- I. CMP AG - OVERVIEW
- II. PRESSURE GRINDING – BACK TO THE ROOTS
- III. CMP „BETA-MILL“

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THINKING GLOBALLY -
ACTING IN PARTNERSHIP




Cement and Mining Processing (CMP) AG
Alte Landebahn 15
D-06846 Dessau-Roßlau


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CMP R&D CENTRE :

- n Prototype of the „BETA-MILL“
- n Semi-Industrial grinding tests
- n Grindability tests
- n Classifying tests
- n Coating pilot plant
- n Bulk-specific analysis




CMP AG R&D Centre
Freilbusch 3, 31789 Hameln

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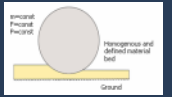
SOME FACTS CONCERNING SIZE REDUCTION

- n 6 – 10 % of the worldwide produced electrical energy is used for size reduction processes⁽¹⁾
- n 73 % of the electrical energy used for cement production is used for cement grinding and raw material preparation⁽²⁾
- n 90 % of cement grinding is done by ball mills
- n About 80 % of the energy put into a ball mill is lost
- n Pressure Grinding is the most effective Grinding

Source: (1) Taschenbuch der Verfahrenstechnik, K. Schwabter
(2) VDZ e.V. (Verband deutscher Zementwerke)

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Pressure Grinding – Historical Development

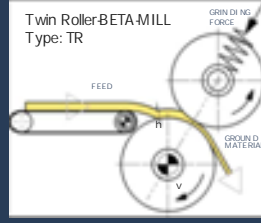
- Homogeneous material bed
- Defined Material bed
- Optimal and constant grinding pressure
- Material relaxing on the ground for better force transmission
- Constant pressure selected and defined for the requirement of the bed!

Source: Woodcutting, unknown artist, Germany 1586

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WORKING PRINCIPLE

- Prepared and defined material layer fed to the grinding zone
- The grinding force is applied by pressing on the upper roller
- Lower roller with frequency controlled drive system
- Material accelerated to working speed before entering the grinding zone
- Material layer thickness is a result of different grinding parameters like material, moisture, fineness & throughput



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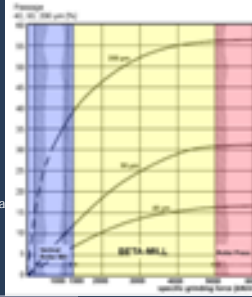
Today's Pressure Grinding – Comparison

	Vertical Roller Mill	High-Pressure Roller Mill (roller press)	BETA-MILL
Defined material bed	-	-	+
Material bed not moving	-	-	+
Optimal and constant grinding pressure	-	-	+
Control of all process parameters	-	-	+

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MAIN FACTS

- Pressure grinding mill
 - most energy efficient grinding
- Determined and stable grinding conditions
- Minimized speed differences and friction
 - low wear rate
- Free adjustable working speed
 - partial load operation with constant speed
 - Energy consumption
- Free adjustable grinding force
 - ideal stressing conditions for each material
- Standard drive and hydraulic components
 - cost reduced maintenance & easy spare parts handling



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PRACTICAL RESULTS FROM A GBFS GRINDING PLANT

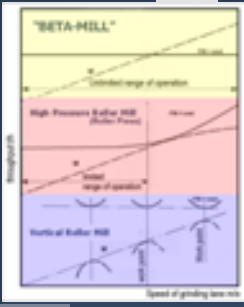
Performance data of a BM250 compared to the High Pressure Roller Mill (roller press)

Mill Type	Pre grinding, single-pass	
	Spec. Energy consumption [kWh/t]	Fineness [Pass 90 µm]
„BETA-MILL“ BM250	1.8 – 2.6	37 – 45 %
High Pressure Roller Mill (roller press)	3.0 – 3.5	max. 27 %

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THROUGHPUT/SPEED RATIO

- „BETA-MILL“
 - Constant throughput/speed ratio
 - Constant specific power consumption for the whole working range
- High Pressure Roller Mill is limited to a maximum economical speed
- Vertical Roller Mill has for every speed a different, not adjustable working point




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„BETA-MILL“ MINIMIZING INVESTMENT COSTS


- Less investment due to
 - Peripheral equipment with a smaller throughput capacity thanks to lower circulating loads
 - Smaller buildings
 - Smaller classifiers and more efficient classification due to lower specific loads [g/m²]

Mill Type	Mass of equipment	Related power requirement
Vertical Roller Mill	100 %	100 %
High Pressure Roller Mill	50 %	70 %
„BETA-MILL“	30 %	50 %

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THE CMP ANSWER


THE „BETA-MILL“




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MAIN FACTS

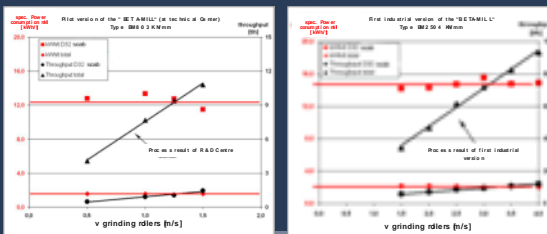
- Pressure grinding mill
 - most energy efficient grinding principle
- Determined and stable grinding conditions
 - smooth running behaviour
- Minimized speed differences and friction
 - low wear rate
- Free adjustable working speed
 - perfect for partial load operation with constant specific energy consumption
- Free adjustable grinding force
 - ideal stressing conditions for each material
 - minimized stressing conditions for machine parts
- Standard drive and hydraulic components
 - cost reduced maintenance & easy spare-parts handling




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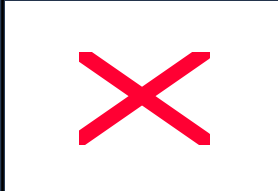
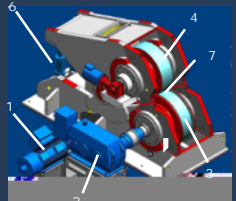
„BETA-MILL“ : THROUGHPUT AND SPECIFIC ENERGY CONSUMPTION

Comparison of two different „BETA-MILL“s:




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CMP „BETA-MILL“ BM500

1 Motor - 2 Standard gear box - 3 Lower grinding roller - 4 Upper grinding roller - 5 Material outlet - 6 Hydraulic cylinder - 7 Material feed

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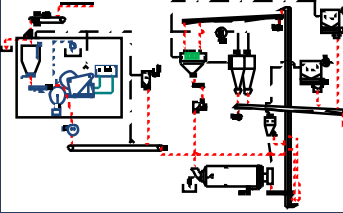
„BETA-MILL“ as Pregrinding System

Installation of BETAMILL as pregrinding system without other adaptations of the existing system:

- Increase of Production: ca. 25%
- Decrease of spec. Energy-consumption: ca. 20%

With optimization of the ball mill as second stage grinding system and -upgrading of the classifier to the CMP DEMISEP system:

- Increase of Production: 30% and more
- Decrease of spec. Energy-consumption: ca. 25%

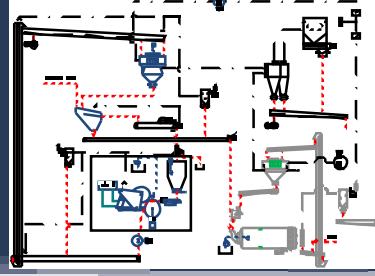


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„BETA-MILL“ as Semi- Pregrinding System

Installation of BETAMILL as pregrinding system without other adaptations of the existing system:

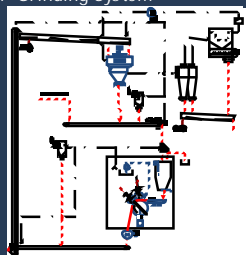
- Increase of Production: 60% and more
- Decrease of spec. Energy-consumption: 30% and more



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„BETA-MILL“ as Finish- Grinding System

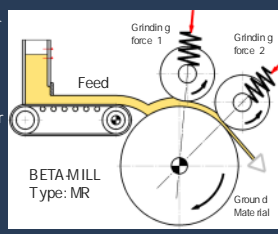
Installation of BETAMILL as finish grinding system without ball mill downstream:



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Coming soon: MULTI ROLLER BETA MILL (MRBM)

- Special version of BETA-MILL for high throughput finish grinding and/or coarse materials
- Two stage grinding in one machine
- Optimal de-aeration at first roller
- Max. grinding pressure at second roller
- Minimizing circuit loads



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THANK YOU FOR YOUR ATTENTION

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