

polysius® modular grinding plant



engineering. tomorrow. together.



thyssenkrupp

Grinding terminals drivers

Example of Africa

Market demand

- ✓ Booming demand
- ✓ White spot opportunities to be covered
- ✓ Taking the market white spots before competition

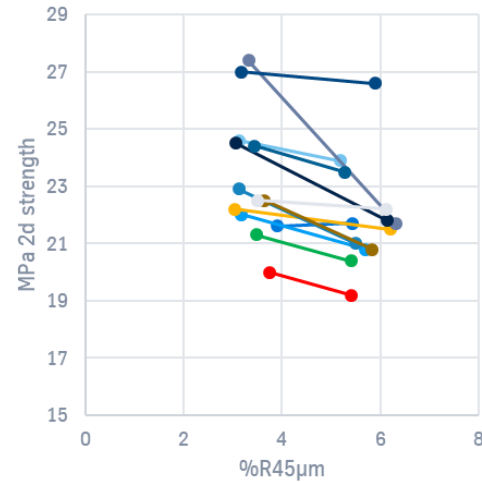
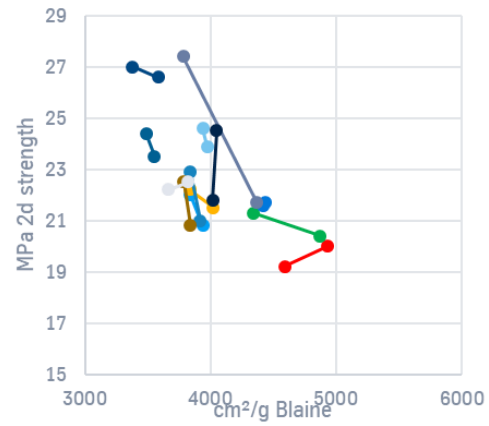
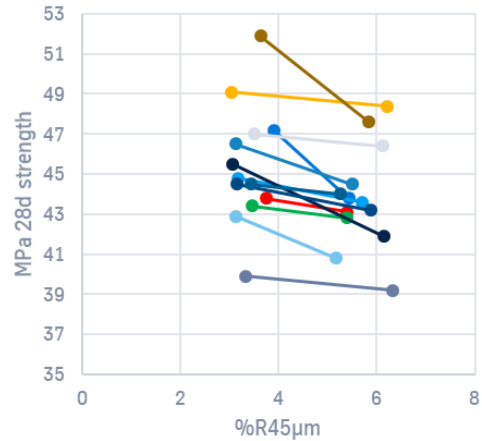


Leading to high clinker costs and varying quality



Quality of imported clinker varies... a lot

Real case cement strength variation from various imported clinkers



polysius® modular grinding plant

Design targets

✓ We bring the advantages of a modular grinding plant ...

- Low capex and fast implementation time
- Focus on cement quality

🤝 ... enhanced by:

- Digital operation
- and continuous help of our experts



How?
What makes it different?



polysius® modular grinding plant

Our solution package

- ✓ 50 t/h ball mill grinding plant (350,000 tpa)
Ref. cement: CEM II A/L, 350 m²/kg acc. to Blaine
- ✓ Half price of conventional plant with polysius® quality and European origin equipment
- ✓ Fully standardized/modularized with pre-engineered equipment & plant design
- ✓ Optimized along the engineering, purchasing, shipment, erection and operation process
- ✓ Maximum pre-assemblies to shorten erection
- ✓ 12 months from contract to cement production



polysius® modular grinding plant

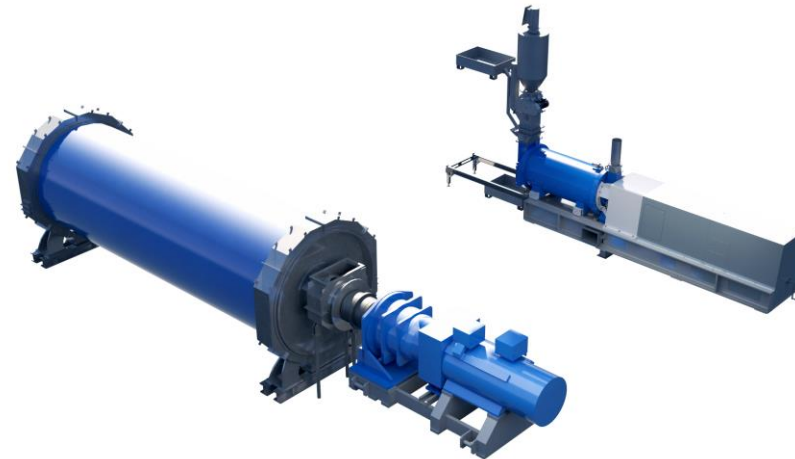
Boosting modular grinding plants to highest cement quality.

booster mill kit

Reliability of ball mill + flexibility and efficiency of the booster mill (dry agitated bead mill) to:

- Boost capacity + 10 tph
- Reduce clinker factor

Not just a ball mill!



polysius® ball mill



booster mill manufactured by Netzsch

polysius® modular grinding plant

Operating modular grinding plants at a whole new level.

polab® cal

“Real time” monitoring of incoming clinker quality + controlling cement strength

- Control loop between varying imported clinkers and grinding process settings
- Artificial intelligence cement quality control
- Completely automated sample preparation procedure
- Clinker reactivity and strength development data on pace with process control in less than 60 minutes

Automated quality control!



polysius® modular grinding plant

Operating modular grinding plants at a whole new level.

Real product performance data comes from physical lab

- Compressive strength data collected from daily composite samples
- How do we get fast information to tune separator settings?
- How can we avoid off-spec production during adaption to new clinker supplies?

Feedback from physical lab delayed by more than 48h from cement production

- earliest received date is one day strength
- When 28 days come, the cement is distributed in the market



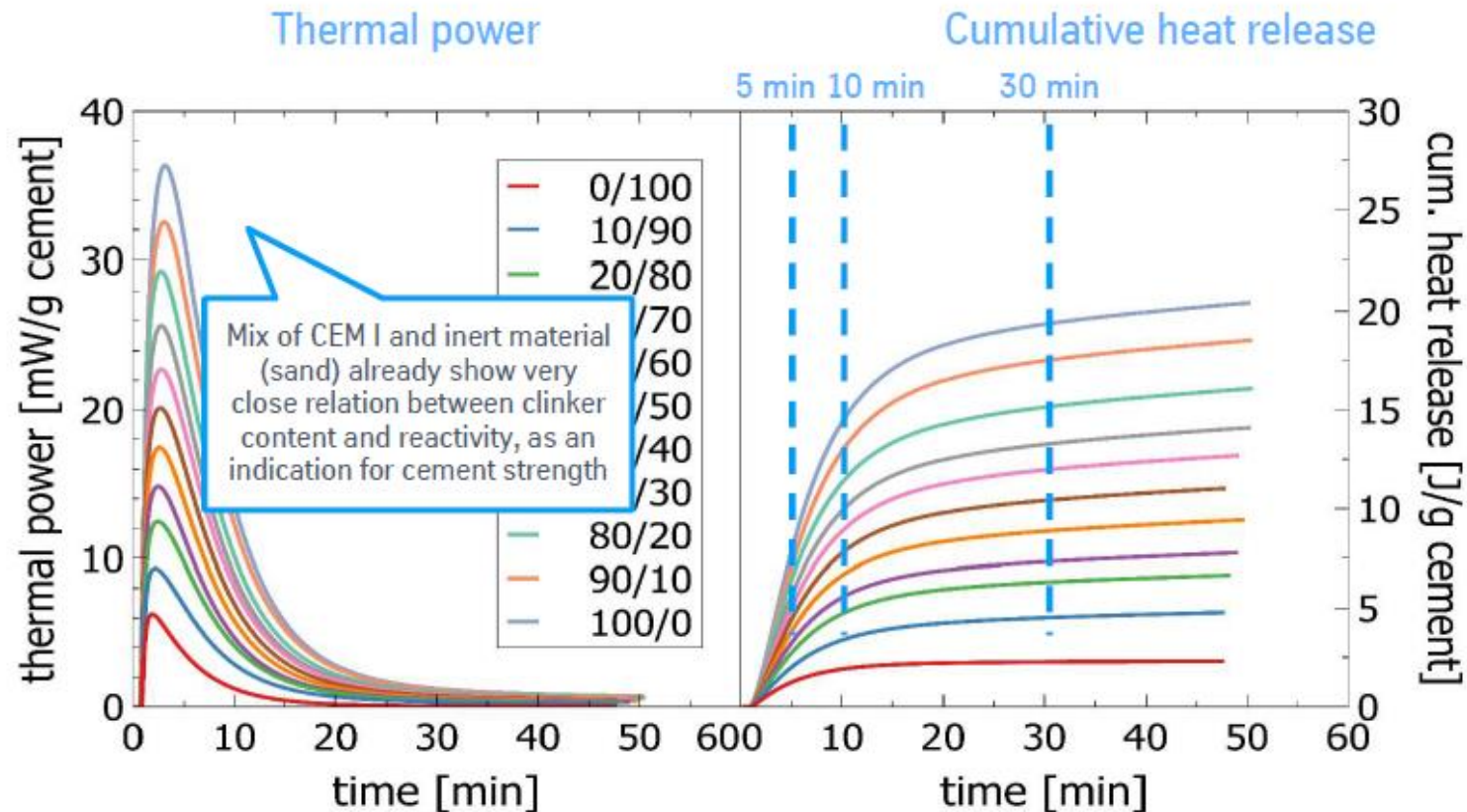
polab® cal



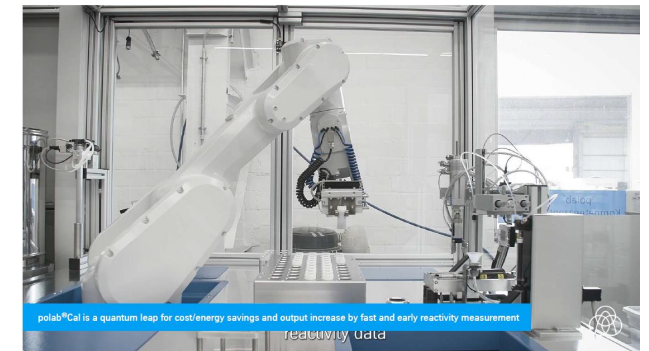
polysius® modular grinding plant

Operating modular grinding plants at a whole new level.

Accuracy of isothermal heat flow calorimetry with polab®Cal



polab® cal



polysius® modular grinding plant

Connecting modular grinding plants to our experts.

polysius® connect

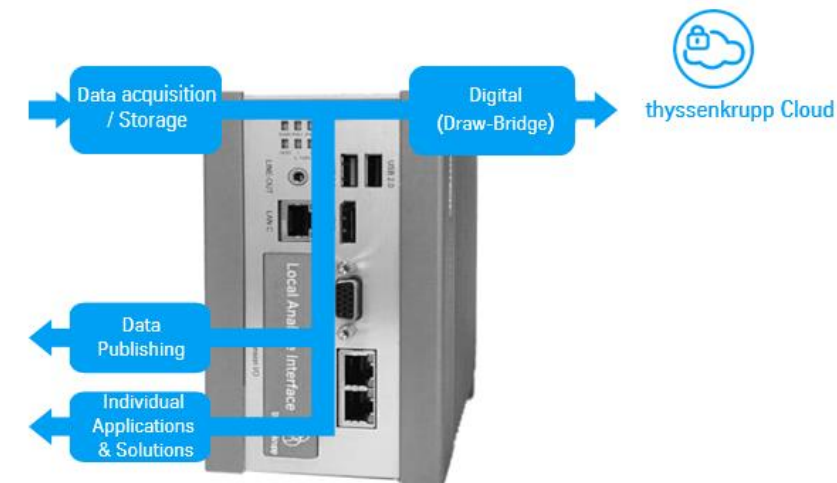
- Data Acquisition, Security & Management
- Digital assistance of construction & commissioning staff enhancing efficiency and reducing costs

Benefit from digital efficiency

Remote Services



LAI (Local Analyze Interface)



polysius® modular grinding plant

Putting “smart” to your modular grinding plants.

— polysius® digital solutions

Plant operation & maintenance:

- Expert Services
- Predictive Maintenance
- Performance Optimization

Increased efficiency and reliability!



Let's go into details



What are the concept and conditions of polysius® mgp?

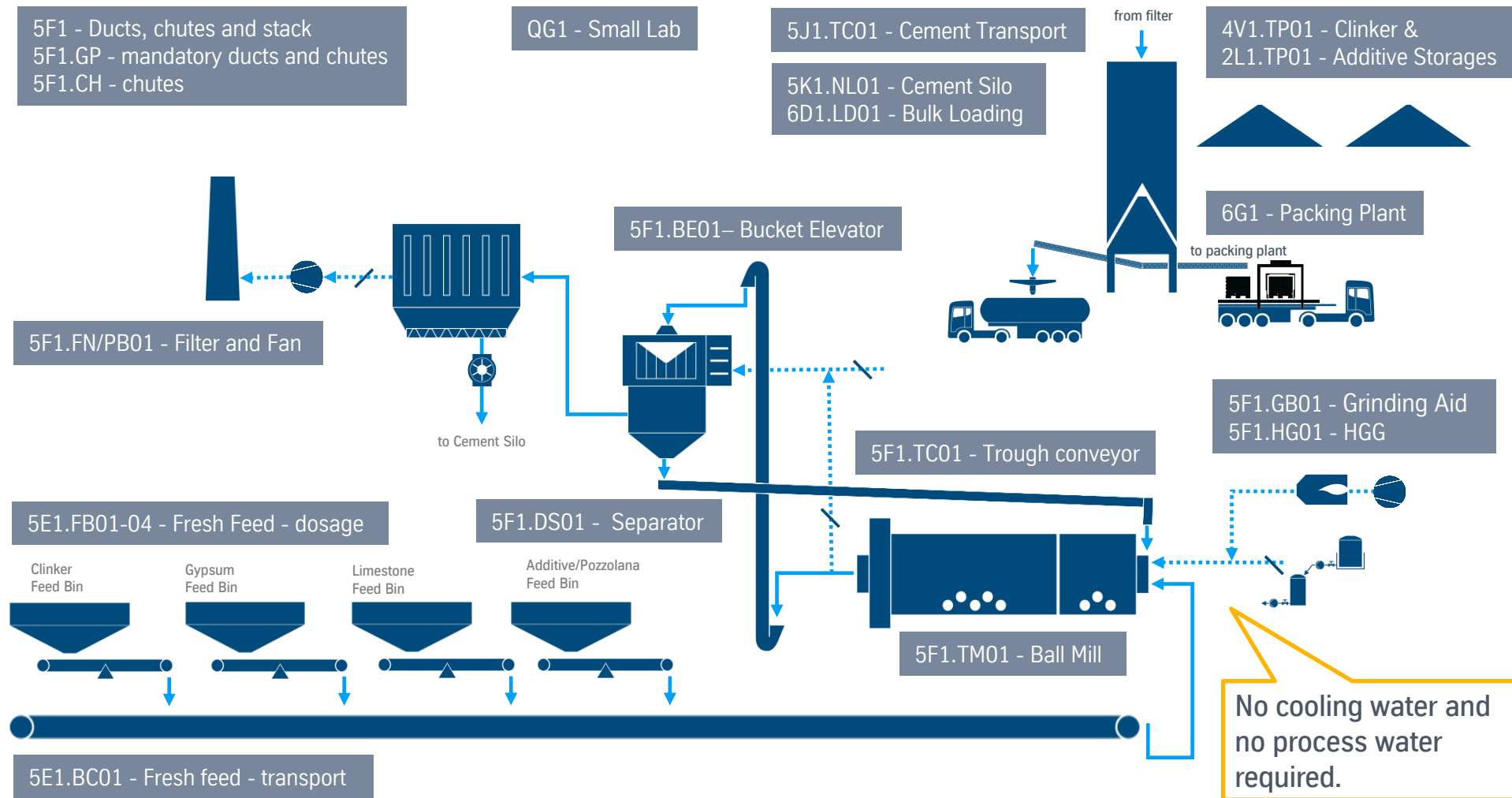
polysius® mgp process design – performance table

Product	Portland Cement			Portland Limestone Cement	
	CEM I 32,5	CEM I 42,5	CEM I 52,5	CEM II A/L	CEM II B/L
Composition				Ref. cement	
• Clinker (%)	• 90	• 95	• 95	• 80	• 75
• Gypsum (%)	• 5	• 5	• 5	• 5	• 5
• Limestone (%)	• 5	• 0	• 0	• 15	• 20
Fineness Blaine (m ² /kg)	300	400	500	350	360
Throughput (t/h)	55,0	34,0	25,0	50,0	55,0
Total spec. power (kWh/t) consumption mgp @ counter*	31,5	48,4	64,0	32,0	31,2
Total required power mgp (kW) @ counter	1,730	1,650	1,600	1,600	1,720
Yearly production (t/a) @ 7,000 h operation	385,000	240,000	175,000	350,000	385,000

*Clinker grindability acc. to Zeisel = 33.0 kWh/t | Performance data excluding booster mill.



Principle polysius® mgp flowsheet



- 501 - Cabling, earthing & lightning protection, fire detection and alarm
- 511 - Electrical control system, MCC
- 521 - Energy supply
- 531 - Lighting
- QC1 - Control system

JC1 - Civil & steel construction

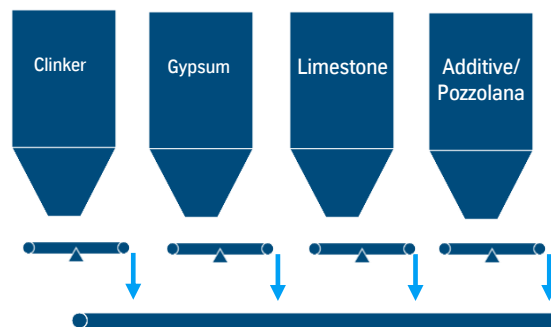
UL1 - Utilities - Fuels
UA1 -Utilities – Compressed air

- TD1 – Logistics
- XE1 – Erection
- XC1 – Commissioning
- XS1 – Supervision
- YX1 – Eng. / Order execution

polysius® modular grinding plant – How it works together with booster mill?

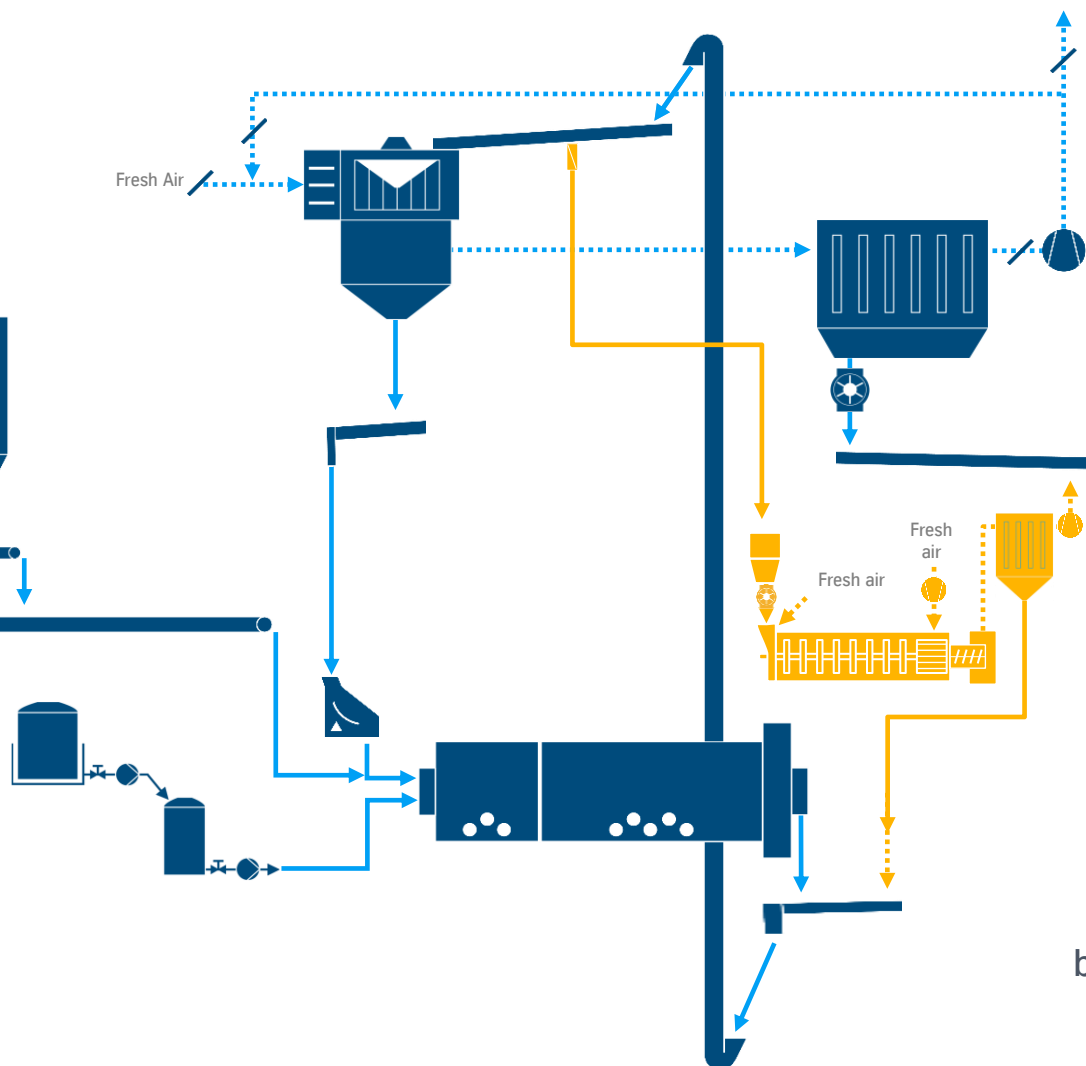
Process advantages

Very energy-efficient grinding process, boosting the extreme fine particle fraction for better cement quality



Range of applications

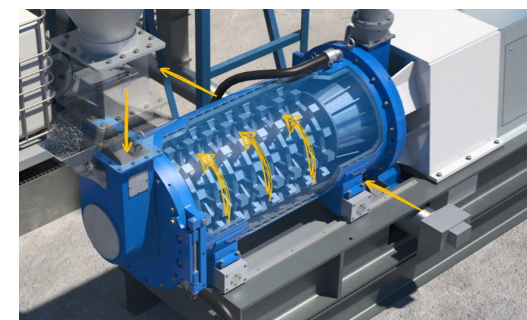
Broad range of usage: Low clinker cements, capacity increase



Installation

No additional footprint, a plug-in for the modular grinding plant

Optional



booster mill manufactured by Netzsch



polysius® modular grinding plant – must have

polysius® promise of premium quality

polysius® ball mill

- ✓ polysius® slide shoe bearings
- ✓ Large inlet & outlet diameter for optimal mill aeration
- ✓ Heavy duty gear box of 1st class European supplier



sepol® - separator

- ✓ Maximizing grinding system performance without deterioration caused by circulating fines from cyclone overflow
- ✓ Recuperating heat and increase drying capacity for composite cements
- ✓ Optimizing cement temperatures and sulfur dehydration for all cement types and operating conditions
- ✓ Producing outstanding cement strengths at low Blaine values with a steep particle size distribution

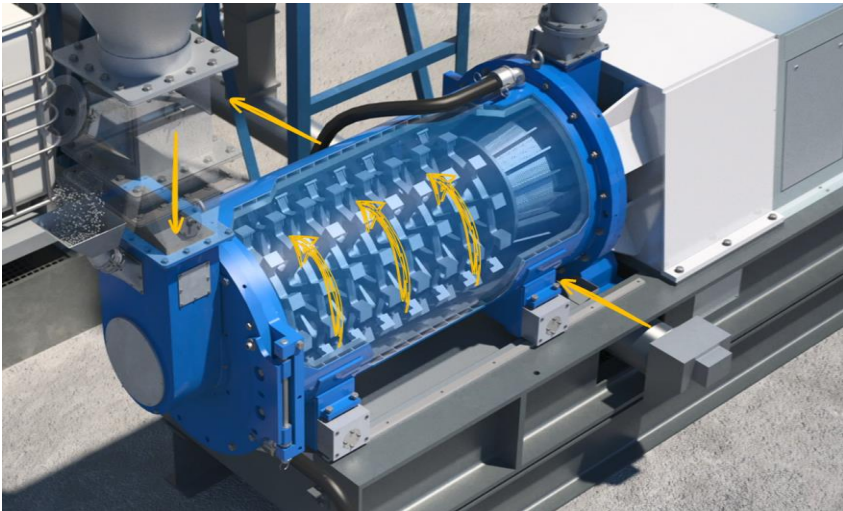


polysius® modular grinding plant – what makes the difference?

Capacity increase with booster mill

Key parameter

- Installed motor power: 400 kW
- Material feed typical: ~ 20 t/h



booster mill manufactured by Netzsch

Advantages

- ✓ Energy-efficient, especially in fine grinding
- ✓ 10 times higher energy density compared to conventional mills
- ✓ Broader PSD, beneficial for early cement strength
- ✓ Plug-in module due to smart & compact plant design
- ✓ Capacity increase up to 20%

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Get ready to grind!



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