Fosroc Grinding Aids & Performance Enhancers
CEMAX Technology

www.fosroc.com
ABOUT FOSROC INTERNATIONAL

Since the company’s beginnings over 80 years ago, Fosroc has developed into an International leader in delivering Constructive Solutions for projects across a broad range of market segments including transport, utilities, industrial and general buildings.

Fosroc’s commitment to customer service and technical support is second to none. We work closely with architects, structural engineers, contractors and owners to best understand their requirements. Together we can develop a bespoke solution for a construction project, adding value and becoming more than just a materials supplier, but a solution provider.

Fosroc has an extensive network of offices and manufacturing locations across Europe, the Middle East, India, North, South and East Asia, and is further represented in other regions across the world by distributor and licensee partners.

Selecting from the full portfolio of Fosroc products and services and integrating expert technical support, world class customer service and innovation, Fosroc goes beyond just product selling to ensure that we partner with our customers to deliver complete constructive solutions.

FOSROC DELIVER SOLUTIONS NOT JUST PRODUCTS

CAD Details
A library of standard CAD details are available, bespoke CAD details can be created for your specific project

Project Specifications
Dedicated specification managers on hand to assist with correct system choices and tailored solutions

Site Support
Expert product and application support made available from our specialist teams.

Seminar & Training
Comprehensive programme of seminars and training courses designed to expand and reinforce your knowledge.

Leader in delivering Constructive Solutions Worldwide!

> Admixtures > Grouts & Anchors
> Adhesives > Joint Sealants
> Protective Coatings > Surface Treatments
> Concrete Repairs > Grinding Aids
> Industrial Flooring > Waterproofing
Fosroc has developed Cemax - A unique product solution which focuses on adding value to cement production, considering all aspects relating to cement manufacturing process.

Fosroc’s Cemax works in number of different ways to improve the efficiency and effectiveness of grinding action during production and providing important application benefits in terms of Flow, Compressive Strength and Consistency of finished product.

Cemax works as a “Grinding Aids & Performance Enhancer” to meet various objectives of cement plants for their comminution process like Cement Mill, Raw Mill and Coal Mills.

Fosroc’s Cemax range of grinding aids and performance enhancers can save up to 40% of grinding cost.

Cemax Products
- Grinding Aids for Cement Mill
- Performance Enhancer/Quality Enhancer
- Special additives like Raw mill and Coal mill grinding aids

CONSTRUCTIVE & SUSTAINABLE SOLUTIONS TO CEMENT MANUFACTURERS

BENEFITS OF CEMAX TECHNOLOGY
- Reduced agglomeration
- Improvements in: energy consumption, cement fineness & mill output
- Improved consistent quality of cements with better flow characteristics
- Improved particle size distribution
- Increased strength
- Increased composites addition rate in the cement
- Improved setting time, especially in the cases of PPC and PSC

BENEFITS TO CEMENT MANUFACTURERS

Grinding Aids
- Increased mill output
- Improved particle size distribution
- Improved Pack Set Index (flowability)

Performance Enhancer/Quality Enhancer
- Improved strength of cement
- Improved desired quality of cement
- Increased mill output
- Improved cement Pack Set Index (flowability)

Special Additives
- Improved cement properties
CEMAX SOLUTION TO REDUCE AGGLOMERATION IN CEMENT GRINDING

Cemax Products
- Reduced agglomeration
- Increased mill output
- Reduced cement Pack Set Index (Improved powder flowability)

Mechanism of agglomeration
- Cement particles agglomerate between each others due to static changes
- CEMAX highly dipolar organic, adsorbs onto clinker
- CEMAX adsorbs into small cracks clinker, saturate the changes and reduce the surface energy forces
- CEMAX neutralizes electrostatic changes on newly formed cement particle surface
- Neutralized particles - reduce agglomeration between cement particles
- Re-agglomeration continues during grinding process

CEMAX SOLUTION TO REDUCE AGGLOMERATION IN CEMENT GRINDING

CEMAX GRINDING AID ACTIONS
- CEMAX is an organic compound that mostly active in the mill through adsorption on the particle surface
- It generates a very thin monomolecular film around the particles which soften electrovalence bonds as well as neutralize electrostatic charges on the particle edge
- Electrovalences of its organic group component act on the calcium (Ca++) and oxygen (O-) bond, ion formed by CEMAX, (OH-(CH\text{2}_n)) neutralized all electrostatic charges on the clinker and cement particles which eliminate coating and provide higher fluidity of the ground materials

Benefits
- Increased Mill Output
- Reduced production cost per unit of cement
- Improved cement flowability/Reduced Pack Set
- Improved Mill Equipment Performance

CEMAX - GRINDING AID ADVANTAGES

Values
- Improved Mill Efficiency
- Reduced recirculation load
- Reduced Blockages in Diaphragms and grinds
- Reduced Equipment wear and tear
- Reduced Silo outlet blockages and caking
- Improved cement transportation efficiency

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CEMAX PERFORMANCE ENHANCERS

Introduction
➢ Performance enhancer improves clinker grindability and cement quality by advanced chemical reactions
➢ It is a second generation of cement additives
➢ More and more companies now prefer to use Performance enhancers depending on the local cement market requirements and maturity

Benefits
➢ Enhanced cement quality
➢ Reduced agglomeration
➢ Increased mill output
➢ Reduced cement Pack Set Index (improved powder flowability)

PERFORMANCE ENHANCERS ACTIONS:

Higher Early Strength & Faster Setting Time
➢ Optimization of the particle size distribution
➢ Acceleration of the hydration of C3A, CEMAX accelerates the formation of Ettringite as well as its transformation into monosulphoaluminate to improve cement early strength

Reduce Pack Set Index
➢ Ion formed by CEMAX neutralized all electrostatic charges on the clinker and cement particles which eliminate coating and provide higher fluidity of the ground materials

Higher Late Strength
➢ Accelerate the hydration of ferrite phase, later, it leads to the promotion of silicate phases hydration which lead to better late strength enhancement.

Values
➢ Reduction in equipment wear and tear
➢ Producing better and unique type of cement
➢ Reduction in CO₂ Emission through clinker replacement
➢ Improvement in plant operation similar to the effects of grinding aids

CEMAX - Grinding Aids Advantages

CEMAX - Performance Enhancer Advantages

The FUTURE is insight...
# CEMAX SPECIAL ADDITIVES

## Benefits
- Enhanced SPECIFIC cement quality
- Applied for special type of cement
- Applied at specific process in cement production

### CEMAX AE – Air Entraining Additives for Masonry Cement
- **Dosage**: 0.03%–0.08%
- **Increased Mill Output**: 8%–15%
- **Air Entraining**: 12%–25%
- **Recommended for Masonry Cement**

### CEMAX RM – Grinding Aids for Raw Mill
- **Dosage**: 0.04%–0.10%
- **Increased Mill Output**: 8%–20%
- **Recommended for Raw Mill**

### CEMAX CI – Grinding Aids for Coal/Petcoke grinding
- **Dosage**: 0.05%–0.10%
- **Mill Output Improvement**: 10%
- **Recommended for both Ball and Vertical Mills**

## LATEST PRODUCTS

### Higher Performance Grinding Aids
- Allow higher mill output for challenging situations
- Mill output can be increased by up to 20%
- Higher power cost saving for cement plants
- Grinding slag cements
- Grinding limestone cement
- Grinding hard clinkers
- Grinding hot clinkers
- Allow higher power reduction

### High Performance Early & Late Strength Enhancers
- Cement early strength can be increased by up to 20%
- Allow higher addition of fillers such as Pozzolana, PFA & Slag
- Cement late strength can be increased by up to 15%
- Allow higher addition of fillers such as limestone up to 25%
- Low dosage application
- High value for money
- Higher clinker replacement - subject to local standard

## PRODUCT SELECTION

### Additive Types
- **CEMAX**: Grinding Aids and Performance Enhancers
- **AURACEM**: High Performance Grinding Aids & Performance Enhancers
- **CEMAX**: Air Entrainers
- **CEMAX**: Minerals Grinding Aids
- **CEMAX**: Coal & Petroleum Grinding Aids

### Application
- Cement early strength
- Cement late strength
- Allow higher addition of fillers
- Allow higher mill output
- Allow higher power reduction

### Type of Materials
- Ordinary Portland Cement
- Portland Pozzolana Cement
- Portland Fly Ash cement
- Portland Slag Cement
- Portland Limestone Cement
- Portland Composite Cement
- White Cement
- Masonry Cement
- Limestone
- Coal & Pet coke

### Mill Type
- Horizontal Ball Mill
- Vertical Roller Mill

### Dosage
- 0.03%–0.08%
- 0.04%–0.10%
- 0.03%–0.10%

### Increased Mill Output
- 8%–15%
- 8%–20%
- 8%–20%

### Air Entraining
- 12%–25%
- 12%–25%
- 12%–25%

### Recommended
- for Masonry Cement
- for Raw Mill
- for both Ball and Vertical Mills

### Improved coal/petcoke/and Particle size distribution

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Fosroc offers a full range of construction chemical solutions, helping to protect structures throughout the world. Please refer to our brochures, which include:

Details of your local Fosroc office can be found at www.fosroc.com

Important Note
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