



Berger Fosroc Grinding Aids & Performance Enhancers

CEMAX Technology



www.bergerfosroc.com



constructive solutions

Our Profile

Berger Fosroc Limited, Bangladesh is a new joint venture entity formed between Berger Paints Bangladesh Limited and Fosroc International Limited on 31st January 2018.

Berger is one of the renowned names in the paint industry and the country's major specialty paint business with products and ingredients dating back more than 250 years. Over the decades, Berger has evolved to become the leading paint solutions provider in Bangladesh and has diversified into every sphere of the industry- from Decorative Paints to Industrial, Marine and Powder Coatings.

Fosroc International is the flagship company of the JMH Group which over the years has emerged as a leading supplier of construction products and solutions across the world. Fosroc world-wide backed by its rich history of over 75 plus years of international presence has operating companies spread across Europe, Middle East, India and Asia besides other emerging geographies, with over 20 manufacturing locations and distribution network in over 100 countries worldwide.

Berger Fosroc Limited in Bangladesh will provide complete solutions to all sectors of the construction industry, specializing in solutions for the construction of buildings, industrial facilities, power plants and to all types of transportation and civil infrastructure.

This new entity will be supported by the parent companies Group Research & Development facilities located in various International locations with state of the art laboratories and a team of dedicated Scientists pioneering product development and innovation.

Berger Fosroc's wide range of constructive solutions portfolio includes

- Cement Grinding Aids such as Cemax, Auracem
- Admixture products such as Conplast, Structuro, Auramix, Auracast
- Waterproofing products such as Supercast, Nitoproof, Proofex
- Precision Grouts & Anchors such as Conbextra, Cebex, Lokfix
- Joint Sealants such as Thioflex, Nitoseal
- Flooring products such as Nitoflor, Cemtop, Adhesives
- Concrete Repair & Protection such as Renderoc, Nitomortar, Nitocote, Dekguard.

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CONSTRUCTIVE & SUSTAINABLE SOLUTIONS TO CEMENT MANUFACTURERS

Berger Fosroc has developed Cemax - A unique product solution which focuses on adding value to cement production, considering all aspects relating to cement manufacturing process.

Berger 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.

Berger 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



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
- > Attainment of desired Cement Quality
- > 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)

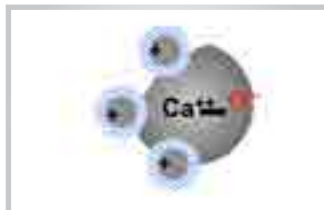
Mechanism of agglomeration



Cement particles agglomerate between each others due to static charges



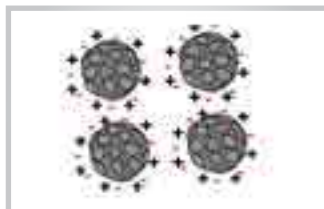
Re-agglomeration continues during grinding process



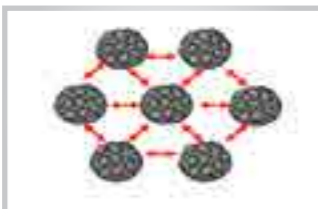
CEMAX a highly dipolar organic, adsorbs onto clinker



CEMAX adsorbs into small cracks clinker, saturate the charges and reduce the surface energy forces



CEMAX neutralizes electrostatic charges on newly formed cement particle surface



Neutralized particles - reduce agglomeration between cement particles



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, $(OH-(CH_2)_n)$ neutralizes 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
- > Improves Early Strength along with Productivity
- > Improves Later Strength along with Productivity
- > Reduces Setting Time
- > Allows for usage of Chemical Gypsum"

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



CEMAX PERFORMANCE ENHANCERS

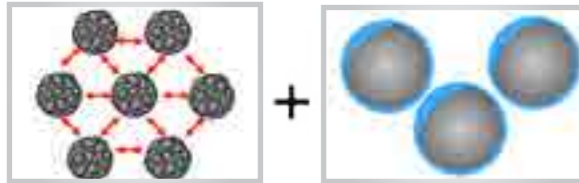
Introduction

- > 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)

CEMAX - Grinding Aids Advantages



CEMAX molecules adsorb onto newly formed cement particles, reduces agglomeration

Individually, CEMAX molecules enhance cement performance according to specific requirements

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 neutralizes 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.

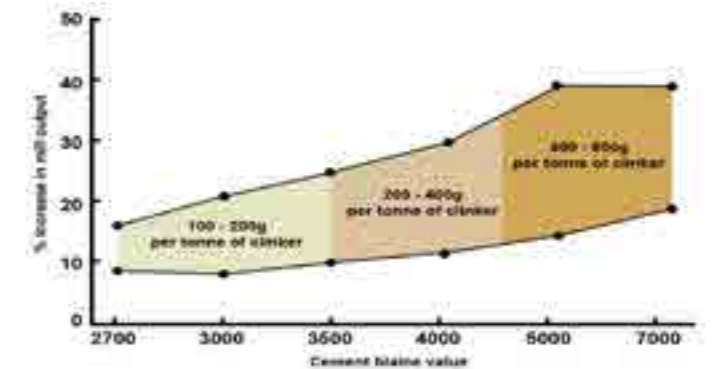


Benefits

- > Improved cement quality by solving the following:
 - > By aiding in utilization of low quality clinkers
 - > Customizable products and solutions as per customer requirements
- > Improved plant profitability by producing cement with lower clinker addition
- > Increased cement mill output

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



Reduces production cost and improves cement plants profitability



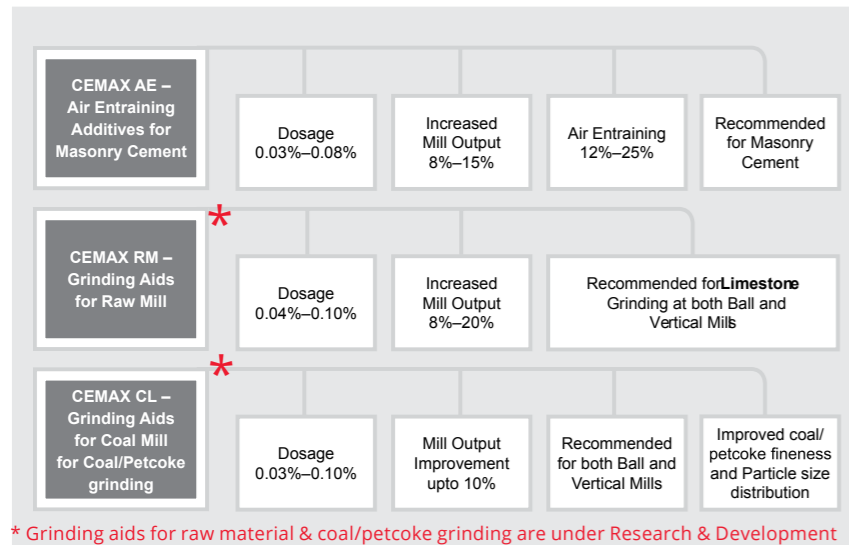
Improves cement physical properties consequently improving cement quality and thus allowing for higher clinker replacement

CEMAX - Performance Enhancer Advantages
The FUTURE is in sight...

CEMAX SPECIAL ADDITIVES

Benefits

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



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

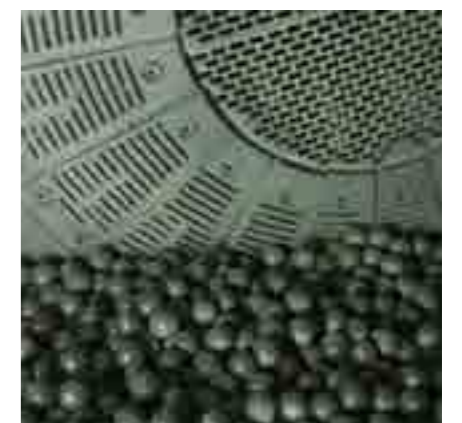
- > Cement early strength can be increased by up to 20%
- > Allow higher addition of fillers such as Pozzolana, PFA & Slag
- > Cement late strength can be increased by up to 15%
- > Allow higher addition of fillers such as limestone up to 25%
- > Low dosage application
- > High value for money
- > Higher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

GRINDING AIDS & PERFORMANCE ENHANCERS

Product	Description	Typical Uses	Dosage/Coverage/Yield
Cemax 333J	A liquid dispersing agent, for use as a grinding aid and performance enhancer for the production of Portland and other hydraulic cements	For use as a grinding aid and performance enhancer for the production of Portland and other hydraulic cements.	refer data sheet
Cemax 300G	A liquid dispersing agent, for use as a grinding aid for the production of Portland and other hydraulic cement	For use as a grinding aid for the production of Portland and other hydraulic cements, suitable for enhancing productivity of cement mills.	Dosage 0.01 - 0.07% by weight, depending on type of clinker, type of mill and desired results.
Cemax 691	Performance Enhancer for Blended and Portland Cements	To improve cement mill grinding efficiency and compressive strength of cement.	refer data sheet
Cemax 343M	A liquid dispersing agent, for use as a grinding aid for the production of Portland and other hydraulic cements.	For use as a grinding aid and performance enhancer for the production of Portland and other hydraulic cements.	Dosage 0.03 - 0.07% by weight, depending on type of clinker, type of mill and desired results.
Cemax 102S	A liquid dispersing agent, for use as a grinding aid for the production of Portland and other hydraulic cements.	For use as a grinding aid for the production of Portland and other hydraulic cements.	0.01 - 0.04% by weight, depending on type of clinker, type of mill and desired results

Berger Fosroc's chemical technology also encompasses supply of additives for the cement industry. Grinding aids and performance enhancers are a special category of products that are used in grinding clinker and non hydraulic additives to produce a variety of high quality cements. These products are tailor made to suit the different needs of the cement industry. Some of the major advantages of using these products are:

- Reduce specific energy consumption of grinding
- Enhance throughput of the mill
- Lower clinker content in PPC and PSC to conserve valuable resources
- Reduce pack set
- Promotion of better flow characteristics of cement



GRINDING AIDS & PERFORMANCE ENHANCERS

Product	Description	Typical Uses	Dosage/Coverage/Yield
Cemax 350CL	Grinding aid for coal grinding.	Cemax 350CL series are an aqueous solution of high performance dispersing agent for use as a grinding aid for coal/petcoke grinding.	0.03% - 0.10% by weight of coal/petcoke
Cemax 412	Grinding aid for performance enhancer.	For use as a grinding aid performance enhancer for the production of portland and other hydraulic cements.	0.03 - 0.07% by weight, depending on type of clinker, type of mill and desired results
Cemax 415	Grinding aid for performance enhancer.	For use as a grinding aid performance enhancer for the production of portland and other hydraulic cements.	0.03 - 0.07% by weight, depending on type of clinker, type of mill and desired results
Auracem 604	High performance grinding aid and performance enhancer.	For use as a grinding aid and performance enhancer for the production of portland and limestone cements.	0.03 - 0.07% by weight, depending on type of clinker, type of mill and desired results



PRODUCT SELECTION*

Additive Types	Berger Fosroc Products	Application										Type of Materials						Mill Type										
		Increase Production	Save power per unit	Reduce Pack Set	Increase early strength of cement	Increase late strength of cement	Reduce water demand	Reduce setting time	Delay setting time	Entrain air	Impart water repellency	Improve water retention	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 & Petcoke	Horizontal Ball Mill	Vertical Roller Mill			
CEMAX Grinding Aids and Performance Enhancers	CEMAX 102S																											
	CEMAX 135																											
	CEMAX 235ES																											
	CEMAX 300G																											
	CEMAX 303																											
	CEMAX 303C																											
	CEMAX 311S																											
	CEMAX 315																											
	CEMAX 316																											
	CEMAX 322																											
	CEMAX 327																											
	CEMAX 333																											
	CEMAX 333L																											
	CEMAX 334M																											
	CEMAX 350																											
	CEMAX 399																											
	CEMAX 415																											
	CEMAX 415E																											
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	CEMAX 599																											
	CEMAX 616E																											
	CEMAX 625PC																											
	CEMAX 673																											
	CEMAX 675																											
	CEMAX 691																											
	CEMAX 697VN																											
	CEMAX 699																											
AURACEM High Performance Grinding Aids & Performance Enhancers	AURACEM 200																											
	AURACEM 300																											
	AURACEM 400																											
	AURACEM 670																											
	AURACEM 675																											
CEMAX Air Entrainers	CEMAX AE500																											
	CEMAX AE316																											
	CEMAX AE550																											
	CEMAX AE600																											
CEMAX Minerals Grinding Aids	CEMAX 360RM																											
	CEMAX 365RM																											
	CEMAX 380RM																											
	CEMAX 390RM																											
CEMAX Coal & Petcoke Grinding Aids	CEMAX 350CL																											

■ Primary influence
 ■ Secondary influence
 ■ Main Application
 ■ Secondary Application

* Products/Formulations are subject to changes and are customizable based on end-user requirement



Leaders in constructive solutions

Important note :

Berger Fosroc products are guaranteed against defective materials and manufacture and are sold subject to its standard terms and conditions of sale, copies of which may be obtained on request. Whilst Berger Fosroc endeavours to ensure that any advice, recommendation specification or information it may give is accurate and correct, it cannot, because it has no direct or continuous control over where or how its products are applied, accept any liability either directly or indirectly arising from the use of its products whether or not in accordance with any advice, specification, recommendation or information given by it.

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