

# CBA®

Quality/strength-enhancing additive

---

## Product Description

The CBA® series of additives is a new concept in grinding aids – significantly different from any previous GCP product for the cement industry. The difference is that it is a “Grinding Aid Plus”. CBA additives offer all the benefits of traditional grinding aids, such as increased grinding efficiency and cement flowability. In addition, they offer a unique ability to improve cement strengths which might otherwise be deficient due to mechanical, physical or chemical shortcomings. Advantages include either reduced cost of production or increased cement strengths.

## Physical Properties

Product specifications for the most widely used CBA formulations are as follows:

PRODUCT	SG	PH
CBA 1102	1.06 (±0.01)	7 - 9
CBA 1104	1.07 (±0.01)	8 - 12
CBA 1115	1.10 (±0.01)	6 - 8

Specifications for other CBA formulations not shown above are available through GCP Applied Technologies Field Engineers.

## Primary Benefit

The CBA series of additives consists of tailor-made formulations to optimise performance and meet specific requirements at each plant.

The use of CBA allows the cement producer to reduce fineness and achieve lower unit power costs without sacrificing strength. Compared with conventional grinding aids, CBA offers unit power savings of up to 25% with no loss of strength. And the resulting production increases can greatly benefit plants operating at or near their grinding capacity.

## Applications

Laboratory mill evaluations of clinker and other additions are recommended to determine initial blend proportions, grinding efficiency, pack set index, mortar flow, compressive strengths of cements, etc. and to enable GCP to formulate the most effective CBA product for each condition.

## Compatibility

CBA additives, and cements treated with CBA, are compatible in concrete with all commercial admixtures such as air entrainers, water reducers, retarders and superplasticisers. The performance of concrete admixtures and the physical properties of concretes are not adversely affected by the use of CBA in cement production.

## Addition Rate

CBA addition rates of 0.02% to 0.06% by mass of cement are recommended.

The optimum addition rate of CBA should be determined in laboratory and cement mill tests.



## Advantages

The chemical action of CBA additives decreases the interparticle attraction between cement grains and increases the rate of hydration of cements. The key advantages of CBA additives include:

- Increased grinding efficiency with resulting increased mill output, higher cement fineness and/or reduced unit power input and grinding costs.
- Increased workability (flow) of cement mortars and concretes.
- Increased cement flowability and reduced pack set or "silo set" of cements resulting in lower handling costs and reduced waste.
- Increased early and long-term compressive strengths for production of better quality cements.
- Reduced cost of cement production through reduced unit grinding costs and through replacement of clinker with reactive additions such as pozzolans, blast furnace slag and fly ash or with fillers such as limestone.

- CBA additives are most effective in enhancing compressive strengths of blended cements using up to 40% limestone filler.
- When cement particle size is not reduced, the addition of CBA improves both early and long-term strength and produces higher quality cement.
- Strength increases ranging from 5% to 50% have been demonstrated during plant trials.

## Table Performance Data CBA 1104

### Objective A: Replacement of 10% Clinker by Limestone (Laboratory Test)

ADDITIVE	BLANK	CBA 1104	CBA 1104
Cement Composition:			
Clinker	65%	60%	55%
Gypsum	5%	5%	5%
Limestone	30%	35%	40%
CBA Dosage	-	0.06%	0.06%
Mill Revolutions	2700	2700	2600
Mill Production (t / h)	-	-	-
Power Input (k / Wt)	-	-	-
Blaine (cm <sup>2</sup> / g)	4070	3950	3980
Residues 40µm	24.5%	14.1%	14.7%
Flow (mm)	111	108	105
Compressive Strength (MPa):			
1 Day	2.8	3.6	3.1
3 Days	8.7	10.8	9.7
7 Days	12.3	15.8	15.1
28 Days	18.4	23.5	21.8

### Objective B: Replacement of 10% Clinker by Limestone (Laboratory Test)

ADDITIVE	BLANK	CBA 1104	CBA 1104
Cement Composition:			
Clinker	72%	71%	72%
Gypsum	4%	5%	5%
Limestone	24%	24%	23%
CBA Dosage	-	0.02%	0.04%
Mill Revolutions	-	-	-
Mill Production (t / h)	37.3	36.0	37.6
Power Input (k / Wt)	28.1	28.8	28.1
Blaine (cm <sup>2</sup> / g)	4380	4410	4160
Residues 40µm	27.0%	17.5%	12.8%
Flow (mm)	114	113	112

Compressive Strength (MPa):

1 Day	5.6	8.4	10.5
3 Days	13.4	18.8	19.2
7 Days	18.1	23.5	24.0
28 Days	22.6	27.4	29.3

## Typical Performance Data CBA 1115

Objectives: Compare the efficiency of CBA against competitive product (Plant Test

ADDITIVE	PRODUCT XYZ	CBA 1115	PRODUCT XYZ	CBA 1115
Cement Composition:				
Clinker	86%	86%	86%	86%
Gypsum	5%	5%	5%	5%
Limestone	9%	9%	9%	9%
Additive Dosage	0.20%	0.04%	0.18%	0.04%
<hr/>				
Cement Mill #	3	3	4	4
Mill Production (t / h)	13.1	17.2	21.2	28.8
Power Input (kWh / t)	62.8	47.7	38.7	28.5
Blaine (cm <sup>2</sup> / g)	4200	3950	3530	3160
Residues 40µm	7.0	3.4	15.3	12.0
<hr/>				
Mortar Compressive				
Strength (MPa):	18.3	18.1	12.5	11.5
1 Day	31.2	33.1	26.9	28.2
3 Days	38.8	44.6	34.1	38.2
7 Days	49.1	57.4	45.8	51.7
28 Days				
<hr/>				
Concrete				
W/C	0.06	0.56	0.62	0.59
Slump (cm)	16	16	17	17
<hr/>				
Compressive Strength				
(MPa):	9.9	10.2	8.4	8.2
1 Day	-	-	-	-
3 Days	26.2	29.4	22.0	25.7
7 Days	32.9	39.1	29.0	32.3
28 Days				

## Handling

CBA additives are sprayed into the mill's first compartment or added onto the clinker conveyor belt. Suitable dispensing pumps with adjustable flow rates should be used for accurate dosing and for optimum performance.

## Dosing Equipment

GCP grinding aids should be accurately proportioned through a calibrated dosing system, suitable for the cement mill and output required.

GCP can advise on all types of equipment suitable for installation, including manual, semiautomatic, automatic and computerised systems.

## Packaging

CBA is supplied in 210L drums. CBA may also be supplied in bulk in certain locations. It contains no flammable materials.

## Storage

Protect from freezing. Once frozen, the product should be thawed out slowly and re-mixed thoroughly prior to use. Shelf life is minimum 12 months in manufacturer's containers.

## Technical Services

Field Engineers from GCP Applied Technologies are available to assist in laboratory and mill test evaluations of CBA. Complete testing equipment and methods for analysing mill performance are also available during plant trials.

## gcpat.in | India customer service: +91 124 4885915

Australia 1800 855 525 New Zealand +64 9 448 1146 China Mainland +86 21 3158 2888 Hong Kong +852 2675 7898 India: Chennai +91 44 6624 2308 Manesar +91 124 488 5900 Indonesia +62 21 893 4260 Japan +81 3 5226 0231 Korea +82 32 820 0800 Malaysia +60 3 9074 6133 Philippines +63 49 549 7373 Singapore +65 6265 3033 Thailand +66 2 709 4470 Vietnam +84 8 3710 6168

We hope the information here will be helpful. It is based on data and knowledge considered to be true and accurate, and is offered for consideration, investigation and verification by the user, but we do not warrant the results to be obtained. Please read all statements, recommendations, and suggestions in conjunction with our conditions of sale, which apply to all goods supplied by us. No statement, recommendation, or suggestion is intended for any use that would infringe any patent, copyright, or other third party right.

CBA is a trademark, which may be registered in the United States and/or other countries, of GCP Applied Technologies, Inc. This trademark list has been compiled using available published information as of the publication date and may not accurately reflect current trademark ownership or status.

© Copyright 2017 GCP Applied Technologies, Inc. All rights reserved.

GCP Applied Technologies Inc., 62 Whittemore Avenue, Cambridge, MA 02140, USA

This document is only current as of the last updated date stated below and is valid only for use in India. It is important that you always refer to the currently available information at the URL below to provide the most current product information at the time of use. Additional literature such as Contractor Manuals, Technical Bulletins, Detail Drawings and detailing recommendations and other relevant documents are also available on [www.gcpat.in](http://www.gcpat.in). Information found on other websites must not be relied upon, as they may not be up-to-date or applicable to the conditions in your location and we do not accept any responsibility for their content. If there are any conflicts or if you need more information, please contact GCP Customer Service.

Last Updated: 2018-08-24

[gcpat.in/solutions/products/gcp-performance-enhancers/cba](http://gcpat.in/solutions/products/gcp-performance-enhancers/cba)