

OPTEVA™ ESE®

A family of non-chloride early strength-enhancing additives

Product Description

The OPTEVA™ ESE® series of additives, which involve a newly developed modified alkanolamine, are available for use to enhance the early strength of cement. Unlike other early strength enhancers, OPTEVA™ ESE® cement additives provide their performance benefit without the use of chloride or thiocyanate ions.

OPTEVA™ ESE® products are available in a variety of formulations that are optimised to maximise their performance in different cement types and compositions. All products are also formulated to provide the benefits of traditional grinding aids such as increased grinding efficiency, and reduced pack set of finished cement.

Physical Properties

Product specifications for the most widely used OPTEVA™ ESE® formulations are as follows:

| PRODUCT | SG | PH |
|------------------|-------------|-------------|
| OPTEVA™ ESE® 142 | 1.03 - 1.08 | 10.0-12.0 |
| OPTEVA™ ESE® 342 | 1.12 - 1.16 | 9.5 - 11.5 |
| OPTEVA™ ESE® 134 | 1.03 - 1.08 | 10.0 - 12.0 |
| OPTEVA™ ESE® 242 | 1.03 - 1.08 | 10.0 - 12.0 |
| OPTEVA™ ESE® 223 | 1.05 - 1.1 | 9.5 - 11.5 |

Specifications for other OPTEVA™ ESE® products are available through GCP Applied Technologies Field Engineers.

Benefits

The use of OPTEVA™ ESE® cement additives has been shown to increase the early strength (1, 2 and/or 7 Days) of cement without the addition of chlorides, thereby allowing its use in cements already rich in chloride. OPTEVA™ ESE® additives have performed in all types of cement, including Ordinary Portland and cements blended with slag, fly ash and/or limestone.

Early strength (2 Days) increases of up to 22% (versus a blank) have been demonstrated in trials. The resultant high early strength can be used to meet specific market needs or, if desired, the cement producer can trade off the strength increase for reduced cement fineness and lower unit production costs. This in turn will result in production increases that can greatly benefit plants that are operating at or near their grinding capacity. Alternatively, the producer can choose to increase the amount of filler in the cement, while retaining the previous level of early strength.

The choice of any of these three options will result in incremental savings and/or revenue gains.

Recommended Addition Rate

According to GCP experience, the dosage of OPTEVA™ ESE® ranges from 250-700g / t of cement. The optimum addition rate of OPTEVA™ ESE® cement additives should be determined through cement mill tests in consultation with GCP personnel.

Case Study

Performance of OPTEVA™ ESE® vs Traditional Chloride-containing Early Strength-enhancers

Compressive Strength (MPa): EN 196/1 Mortar 6.52-7.93

| CEMENT TYPE | I 52.5 R | I 52.5R | % CHANGE |
|--|------------------------------|---------|----------|
| Clinker % | 95.0 | 95.0 | |
| Gypsum % | 5.0 | 5.0 % | |
| Chloride-based Quality Improver (kg/t) | 1.300 | - | |
| OPTEVA™ ESE® 242 (kg / t) | - | 0.37 | |
| Blaine Fineness (cm ² / g) | 4331 | 4290 | -0.95 |
| Mill Output (t / h) | 50 | 51.7 | 3.4% |
| W/C Ratio | 0.50 | 0.50 | % Change |
| | Chloride Quality Improver | ESE 242 | % Change |

Compressive Strength (MPa): EN 196/1 Mortar

| | | | |
|---------|------|------|------|
| 1 day | 27.8 | 28.0 | 0.72 |
| 2 days | 41.4 | 44.1 | 6.52 |
| 28 days | 68.1 | 73.5 | 7.93 |



Application of OPTEVA™ ESE® Cement Additives

Laboratory mill evaluations of clinker and other additions are recommended prior to field use in order to determine initial blend proportions, evaluate performance parameters and to enable GCP to formulate the most effective OPTEVA™ ESE® product for the specific field use conditions. To arrange for a laboratory evaluation, contact your local GCP Field Engineer.

Compatibility

The performance of concrete admixtures and the physical properties of concrete are not adversely affected by the use of OPTEVA™ ESE® additives in cement production. OPTEVA™ ESE® additives, and cement treated with OPTEVA™ ESE® additives, are compatible with all commercial concrete admixtures, including air entrainers, water reducers, retarders and superplasticisers.

How to Use

OPTEVA™ ESE® products are sprayed into the mill's first compartment or added onto the clinker or feed conveyor belt. All additives should be accurately proportioned through a calibrated dosing system suitable for the cement mill and for the required output. GCP can provide advice on all types of dosing equipment, including manual, semiautomatic, automatic and computerised systems.

Quality Control

OPTEVA™ ESE® products are carefully controlled and accurately blended for constant quality and optimum performance. OPTEVA™ ESE® products are ASTM C 465 approved for use in the USA.

Packaging

OPTEVA™ ESE® Early Strength-enhancing Additive is supplied in 210L drums. OPTEVA™ ESE® products may also be supplied in bulk in certain locations. It contains no flammable material.

Storage

OPTEVA™ ESE® products should be protected from freezing. Once frozen, the product should be thawed out slowly and remixed thoroughly prior to use. Shelf life is minimum 12 months if kept in manufacturer's containers.

gcpat.sg | For technical information: asia.enq@gcpat.com

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.

OPTEVA ESE 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., 2325 Lakeview Parkway, Alpharetta, GA 30009, USA

GCP (Singapore) Pte. Ltd, 25 Tanjong Penjuru, Singapore 609024.

This document is only current as of the last updated date stated below and is valid only for use in Singapore. 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.sg. 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: 2022-01-28

gcpat.sg/solutions/products/opteva-quality-improvers/opteva-ese