

# OPTEVA® TDA®

Quality/strength-enhancing additive

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## Product Description

OPTEVA®TDA® additives are aqueous compositions of grinding aids with set-accelerating, water-reducing, and strength-enhancing compounds, all carefully controlled and accurately blended for constant quality and optimum performance.

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

Products	S.G.	pH
OPTEVA®TDA® 730	1.21 (±0.01)	8 - 10
OPTEVA®TDA® 735	1.20 (±0.01)	8 - 10
OPTEVA®TDA® 770	1.17 (±0.01)	8 - 10

Product specifications particular to other OPTEVA®TDA® formulations are available through GCP Field Engineers.

## 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 and to enable GCP Applied Technologies to formulate the most effective OPTEVA®TDA® product for each condition.

## Product Advantages

One of the key benefits of OPTEVA®TDA® additives is their ability to increase both grinding efficiency and cement strengths to a degree unequaled by conventional grinding aids.

- Increased early and long-term compressive strengths
- 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.
- The chemical action of OPTEVA® TDA® additives decreases the interparticle attraction between cement grains both in dry form and in water, and increases the rate of hydration of cements.
- Increased grinding efficiency resulting in increased mill output, higher cement fineness and reduced unit power input and grinding costs.
- Increased workability (flow) of cement mortars and concretes. Increased cement flowability for reduced pack set or "silo set" of cements, resulting in lower handling costs and reduced waste.

## Handling

OPTEVA®TDA® 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 of OPTEVA®TDA®.

## Addition Rate

Excellent results are usually obtained with OPTEVA®TDA® addition rates of 0.10% to 0.30% by weight of cement. Lower rates of addition also have produced satisfactory results when cement formulations have been particularly responsive to the additive.

The optimum addition rate of OPTEVA®TDA® should be determined in cement mill tests.

## Dosing Equipment

OPTEVA®TDA® additives should be accurately proportioned through a calibrated dosing system, suitable for the cement mill and output required.

## Specification Compliance

OPTEVA®TDA® is approved for use under ASTM C 465 specification as a non-harmful, processing addition for cements.

## Packaging

OPTEVA®TDA® is supplied in 210L drums. OPTEVA®TDA® 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 OPTEVA®TDA®. Complete testing equipment and methods for analysing mill performance are also available during plant trials.

## OPTEVA™ TDA® vs Current Grinding Aids

Types of Cements Treated with TDA	OPTEVA® TDA®	OPTEVA® TDA®	Grinding Efficiency Increase (%)	Pack Set Decrease (%)	Motar Flow Increase (%)	Strength Development	
	Product Used	Dosage Range (%)				Early	Longterm
	Increase %						
Rapid Hardening	OPTEVA® TDA®	0.20-0.30	5% to 15%	20% to 40%	10% to 25%	5% to 10%	10% to 250%
Ordinary Portland	OPTEVA® TDA® N	0.15-0.25					
Ordinary Portland	OPTEVA® TDA® 730	0.15-0.25	10% to 20%	20% to 60%	10% to 30%	5% to 15%	10% to 30%
Portland & Pozzolan	OPTEVA® TDA® 735	0.15-0.25					
Portland & Slag	OPTEVA® TDA® 770	0.15-0.25					
Portland & Pozzolan or Other Fillers i.e. Fly Ash or Limestone	OPTEVA® TDA® 730 OPTEVA® TDA® 735 OPTEVA® TDA® 770	0.10-0.25 0.15-0.25 0.10-0.25	5% to 15%	10% to 20%	0% to 5%	10% to 30%	0% to 5%

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

Additive	Blank	OPTEVA® TDA® 735	OPTEVA® TDA® 735
Cement Composition:			
Clinker	95%	95%	85%
Gypsum	5%	5%	5%
Slag	-	-	10%
Limestone	-	-	-
OPTEVA® TDA® Dosage	-	0.2%	0.2%
Mill Revolutions	3500	3310	3350
Mill Production (t / h)	-	-	-
Power Input (kWh / t)	-	-	-
Blaine (cm <sup>2</sup> / g)	3950	3980	3960
Residues 40µm	0.85%	0.78%	0.46%
Flow (mm)	100	100	100
Compressive Strength (MPa):			
Power Input (kWh / t)			
1 Day	15.3	20.1	14
3 Days	35.0	39.2	36
7 Days	-	-	-
28 Days	57.8	62.1	58

## Objective B) Increase Limestone Content from 27% to 32% (Plant Test)

Additive	Blank	OPTEVA® TDA® 770	OPTEVA® TDA® 770
Cement Composition:			
Clinker	68%	68%	63%
Gypsum	5%	5%	5%
Slag	-	-	-
Limestone	27%	27%	32%
OPTEVA® TDA® Dosage	-	0.2%	0.2%
Mill Revolutions	-	-	-
Mill Production (t / h)	45.0	49.0	50.5
Power Input (kWh / t)	35.0	31.5	30.9
Blaine (cm <sup>2</sup> / g)	4930	4870	5190
Residues 40µm	-	-	-
Flow (mm)	93	107	105
Compressive Strength (MPa):			
Power Input (kWh / t)			
1 Day	7.0	11.5	6.8
3 Days	15.1	20.3	15.6
7 Days	19.8	25.1	20.4
28 Days	25.5	31.8	26.1

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