

OPTEVA[®] TDA[®]

A Family of Strength Enhancing Cement Additives

Product Description

OPTEVA[®] TDA[®] Quality Improvers are a family of cement additives that improve the strength or other performance characteristics of cement. They are aqueous compositions of grinding aids with set accelerating, water reducing or 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:

	S.G.	PH
OPTEVA [®] TDA [®] J	1.22 (±0.01)	6 - 8
OPTEVA [®] TDA [®] N	1.21 (±0.01)	8 - 10
OPTEVA [®] TDA [®] 710	1.34 (±0.02)	8 - 10
OPTEVA [®] TDA [®] 770	1.17 (±0.01)	8 - 10
OPTEVA [®] TDA [®] 1223	1.15 (±0.05)	6 - 8
OPTEVA [®] TDA [®] 7014	1.03 (±0.02)	9 - 12

Product specifications for other OPTEVA[®] TDA[®] formulations are available through GCP Field Engineers.

Product Advantages

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

- Increased early and long-term compressive strengths for the 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.

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. Additional advantages of OPTEVA[®] TDA[®] additives include:

- 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.

Applications of OPTEVA[®] TDA[®]

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

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 Rates

Dosage rates of OPTEVA[®] TDA[®] can differ significantly (from 0.03% to 0.3%) depending upon the particular formula being used. Field Engineers can provide an estimate of the optimal dosage for any individual OPTEVA[®] TDA[®] product, but in all cases, the actual addition rate 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 the ASTM C465 specification as a non-harmful processing addition for cement.

Packaging

OPTEVA[®] TDA[®] is supplied in 210 L (55 gal) drums. OPTEVA[®] TDA[®] may also be supplied in bulk in certain locations. It contains no flammable materials.

Storage

Protect from freezing. However, if freezing should occur, 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 are available to assist in laboratory and mill test evaluations of OPTEVA[®] TDA[®]. Complete testing equipment and methods for analyzing mill performance are also available during plant trials.

Performance of Selected Products in the OPTEVA® TDA® Family

PRODUCTS	TYPICAL RANGE G/T	TYPICAL DOSAGE G/T	CONTRIBUTION TO CEMENT CL G/T	CEMENT FLOWABILITY PACKSET	GRINDING AID	WATER DEMAND	SETTING TIME	COMPRESSIVE STRENGTH 1-3 DAYS	COMPRESSIVE STRENGTH 28 DAYS
OPTEVA® TDA® J	1000-2500	1500	0-200	***	***	**	=	***	*/**
OPTEVA® TDA® N	1000-2500	1500	100	***	**	***	(+)	**	**
OPTEVA® TDA® 710	1000-2500	1500	180-450	***	***	=	(-)	****	=
OPTEVA® TDA® 770	1000-2500	1500	180	***	***	=	(-)	***	=
OPTEVA® TDA® 775	1000-2500		300	***	**	=	(-)	****	=
OPTEVA® TDA® 1223	300-600	400	0	****	****	=	(-)	*/**	***
OPTEVA® TDA® 1227	1000-2000	1500	180	***	***/**	=	(-)/=	**/**	**/**
OPTEVA® TDA® 7014	150-400	250	0	****	****	=	=/(-)	*/**	****
OPTEVA® TDA® 7519	250-500	350	0	****	****	=	=/(-)	*/**	****
OPTEVA® TDA® 7525	1000-2500	1500	0-150	***	***	****	=/(+)	*	=

Indication based on Typical Performance = Unchanged (-) Decrease (+) Increase * Improvement ** Good Improvement
 *** Strong Improvement **** Very Strong Improvement

Comparative Results of the Efficiency of OPTEVA[®] TDA[®] vs a Competitive Product (in industrial tests)

Objectives: OPTEVA[®] TDA[®] 7014 – Typical Performance Data

ADDITIVE	PRODUCT XYZ	OPTEVA [®] TDA [®] 7014	PRODUCT XYZ	OPTEVA [®] TDA [®] 7014
Clinker	86%	86%	86%	86%
Gypsum	5%	5%	5%	5%
Limestone	9%	9%	9%	9%
Cement Additive Dosage	0.20%	0.04%	0.18%	0.04%
Mill number	3	3	3	3
Mill Production	13.1	17.2	21.2	28.8
Energy consumption (kWh/t)	62.8	47.7	38.7	28.5
Blaine (cm ² /g)	4200	3950	3530	3160
40 μ residues	7.0	3.4	15.3	12.0
Compressive Strength (MPa) 1 Day	18.3	18.1	12.5	11.5
Compressive Strength (MPa) 3 Days	31.2	33.1	26.9	28.2
Compressive Strength (MPa) 7 Days	38.8	44.6	34.1	38.2
Compressive Strength (MPa) 28 Days	49.1	57.4	45.8	51.7
Concrete Water/cement ratio	0.60	0.56	0.62	0.59
Slump	16	16	17	17
Compressive Strength (MPa) 1 Day	9.9	10.2	8.4	8.2
Compressive Strength (MPa) 3 Days	-	-	-	-

Compressive Strength (MPa) 7 Days	26.2	29.4	22.0	25.7
Compressive Strength (MPa) 28 Days	32.9	39.1	29.0	32.3

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