

TECH DRY (INDIA) PVT. LTD

OFFERS

PROTEKTA SERIES

OF

4th GENERATION

CONCRETE ADMIXTURES

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Introduction & limitations of admixtures

Admixtures confer several beneficial effects on concrete including reduction in water requirements, increased workability, controlled setting, accelerated hardening, improved strength, better durability, desired coloration and volume changes

Unfortunately these additives or superplasticizers are available as proprietary products and this is slightly risky as quoted by A..M Neville **“Often, instead of using a special cement, it is possible to change some of the properties of the cement in hand by the use of a suitable additive. A great number of proprietary products are available: their effects are described by the manufacturers but the full details of the action of many of these additives, known as admixtures should be carefully checked before using them”**.

An important feature of the majority of admixtures for concrete is that they are used primarily on the basis of experience or *ad hoc* tests: theoretical information on a scientific basis is generally not available to permit a reliable quantitative prediction of behaviour in concrete under the various possible circumstances. This is due to the marketing of admixtures largely as proprietary products.

The basic requirement of water-retaining structures are simply to have dense and durable concrete that has sufficient resistance against hydrostatic pressure without seepage of water through the concrete elements. Concrete normally contains voids. Cracks are also formed due to stresses under external loading conditions, internal thermal and shrinkage strains and structural movements etc. Those are passages for water seepage.

The main factor influencing concrete compressive strength is the **water-cement ratio of concrete. The less water in a mix, the stronger and less porous the concrete. The permeability of concrete is even more sensitive to water-cement ratio changes than is the compressive strength.**

SUPERPLASTICIZERS & MECHANISM OF WORKING & ELECTROSTATIC INTERACTION

Please see figure 1 It clearly gives the performance of Lignin based, naphthalene based and this short comings led to the development of superplasticizers

Superplasticizers belong to a class of water reducers chemically different from the normal water reducers and capable of reducing water contents by about 30%. The admixtures belonging to this class are variously known as superplasticizers, superfluidizers, superfluidifiers, super water reducers, or high range water reducers.

The advantages derived by the use of superplasticizers include production of concrete having high workability for easy placement, and production of high strength concrete with normal workability but with a lower water content.

The most important property of a superplasticizer is ability of dispersing the cement particles.

Although superplasticizers show some remarkable advantages in producing concrete, there are some limitations associated with their use. Superplasticized concrete shows a high rate of slump loss. Most available data on superplasticized concrete pertain to the use of SMF- and SNF-based superplasticizers. Even within a single type, variations in the behaviour may occur because of the differences in the type of cation associated with the superplasticizer and in its molecular weight. Consequently most data indicate only general trends.

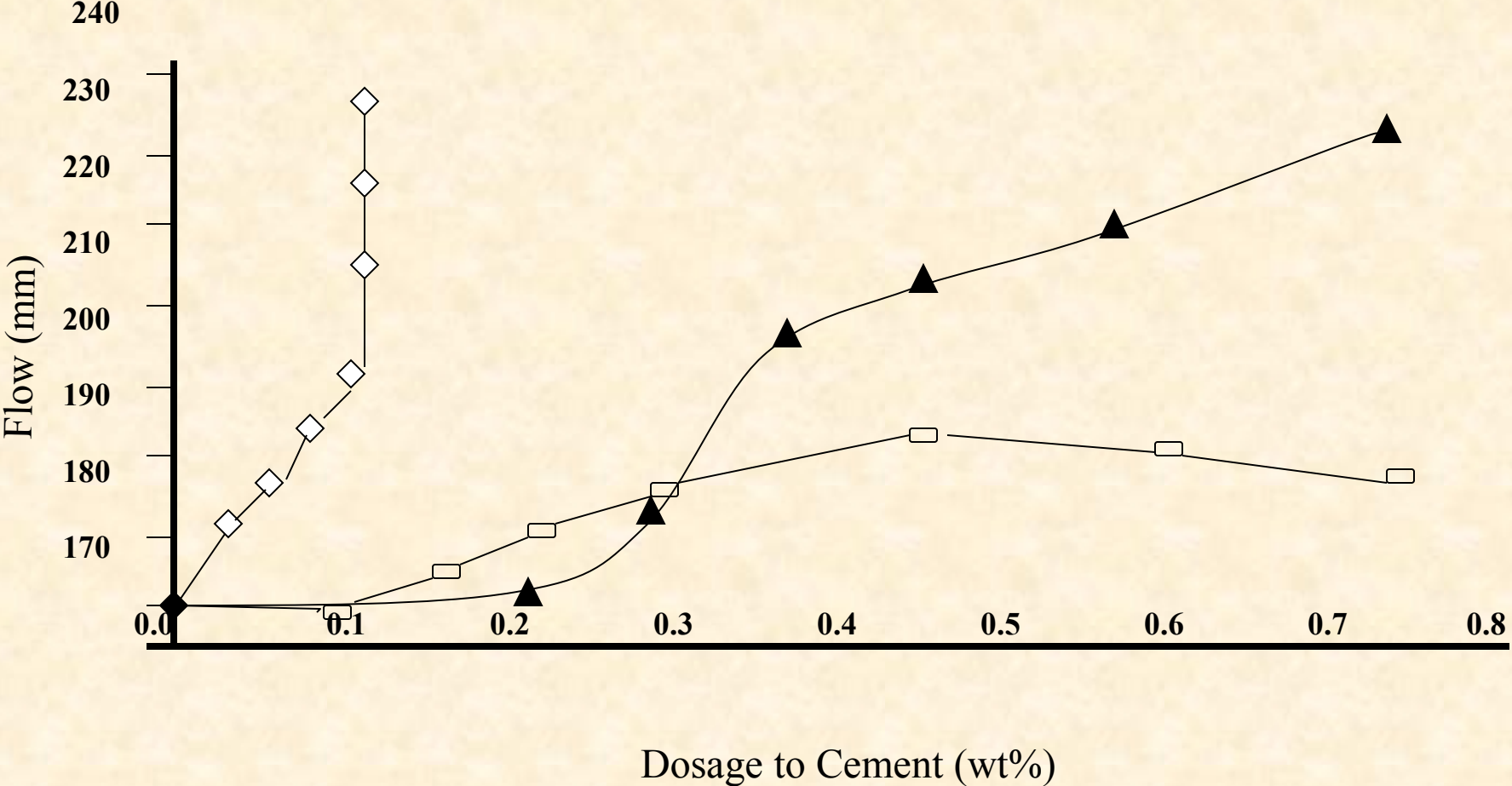
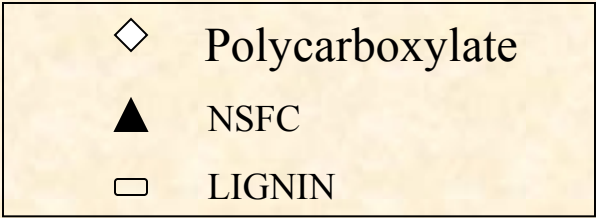


Figure : 1

PROTEKTA - LS

It is based on Lignosulphonate along with some other organic additives.

USES

- Dispersing agent
- Reduces the amount of water required to form plastic and workable mixtures
- Since the water required is less, the resultant concrete is of increased density
- Better uniformity
- Better durability
- As Retarding Agent – Where concrete needs to remain fluid over extended periods of time, Protekta LS are used to retard the setting time of concrete. With addition of small quantities of accelerator or retardants, these properties of concrete could be predetermined.
- The amount of air entraining admixture can be reduced from the normal when it is used in concrete.
- It helps in reducing water cement ratio.

TEST RESULT OF PROTEKTA LS

National Test House – Madras

Permeability to Water : 29% (as per IS:2645-1975)

	Dosage	0.8% of cement
Slump	0 hrs	200 mm
	1 hrs	120 mm
	2 hrs	70 mm
	3 hrs	50 mm
Setting time (hr)		8.5
Water Cement Ratio		0.55

TEST RESULT OF PROTEKTA LS

Civil-Aid Technoclinic Pvt. Ltd.,
(NABL Accredited laboratory as per ISO 17025)

Mix design		
Cement		1
Sand		1.5
20mm jelly		1.5
10mm jelly		1.5
Dosage		400ml / bag of cement
Water cement ratio		0.55
Slump	0 hrs	155 mm
	1 hrs	40 mm
	2 hrs	10 mm

TEST RESULT OF PROTEKTA LS

Civil-Aid Technoclinic Pvt. Ltd.,
(NABL Accredited laboratory as per ISO 17025)

	M20	M40
Design Mix in Kgs		
Cement	1	1
Sand	2.37	1.73
20mm Jelly	1.34	1.34
10mm Jelly	1.34	1.34
Water Cement Ratio	0.55	0.40
Dosage (% weight of cement)	0.8	0.8
Compressive Strength (Mpa)	23.9	39.8
Slump		
0 min	200	100
1.5 min		<50
2.20 min	<50	
Air Content %	4.2	6.0
Chloride Content (%)	0.0043	0.0043

PROTEKTA - T

It is based on sulfonated naphthalene-formaldehyde condensate.

USES

- Renders concrete impermeable by keeping water and cement ratio low.
- Suitable for Concrete to provide water reducing/workability
- Reduce water cement ratio

TEST RESULT OF PROTEKTA T

National Test House – Madras

Test for Permeability to water	22	IS: 2645-1975
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Test done in Tech-Dry Laboratory

Mix Design

Cement	1
Sand	1.5
20mm jelly	1.5
10mm jelly	1.5

Water cement ratio 0.45

Dosage 0.6% of cement

Setting Time 8

Slump

0 hrs	120
1 hrs	85

ACRYLATES

Acrylic polymers are polymer systems in which the monomers used are acrylates. The acrylates which are not commonly available in Indian Market are the 3rd generation products on which we have been working since last several years.

The acrylate based products Protekta SPR-2, Protekta SPR-3 & Protekta SPR-4 provide waterproofing and reduces the water absorption by 75-80% and increases the compressive strength by 30-35%, besides giving workability and reducing water cement ratio. Our yet another approach to produce waterproofing compounds with very high reduction of water/chloride absorption have also resulted in developments of Protekta KR-2 & Protekta Silane Cream.

With the commonly available superplasticizers there is one serious drawback and that is *higher workability produced by superplasticizers can only be maintained for 30-60 minutes. Loss of slump occurs after that adding of superplasticizers has been done at point of discharge also.*

Bleeding segregation may occur in flowing concrete if precautions are not taken. *When repeated dosages of superplasticizers are used to control the loss of slump, bleeding and segregation may occur if the repeated dosage exceeds two or three times.*

It must be noted that the characteristics with regard to mechanical strength and durability of this type of retempered cementitious composition are poor. This aspect is very important for the future of ready mix concrete in our country.

The following drawbacks and their limitations described earlier led to then- discovery of acrylate which overcomes some of these problems and are akin to chemistry of concrete and therefore do not interact to produce any undesirable ingredients.

Specially designed latest admixture for Ready Mix Concrete or for Green concrete.

PROTEKTA SPR-3

1. Reduces slump loss
2. Increases compressive strength by more than 25%
3. Reduces water absorption by 75%

TEST RESULT OF PROTEKTA SPR-3

Test done in Tech-Dry Laboratory

Mix Design in Kgs	
Cement	1
Sand	1.5
10 mm jelly	1.5
20 mm jelly	1.5
Dosage	100ml for 50 kg of cement
Slump in mm (0 Hrs)	40
Setting Time (Hr)	8.5
Water cement ratio	0.55
Reduction in Water absorption	75 %

PROTEKTA SPR-4

1. Reduces slump loss
2. Increases compressive strength by more than 20%
3. Reduces water absorption by 72%

TEST RESULT OF PROTEKTA SPR-4

Test done in Tech-Dry Laboratory

Mix Design in Kgs

Cement	1
Sand	1.5
10 mm jelly	1.5
20 mm jelly	1.5

Dosage 100ml for 50 kg of cement

Water cement ratio 0.55

Reduction in Water absorption 72%

TEST RESULT OF PROTEKTA SPR-4

Test done in National Test House, Madras. as per IS: 2645-1975

	With the admixture of WPC		Without the admixture of WPC	
	Hr	Min.	Hr	Min
IST	3	55	2	45
FST	6	05	4	35
Compressive strength, kg/cm² in				
3 days (average of 3 cubes)	237		261	
7 days	340		388	
Permeability to water (%)	28.0			
Chloride content	0.0			

However acrylates are normally expensive. The cost effectiveness necessitated further developments in this field which led to the development of polycarboxylate based admixtures on new chemistry because they worked on the basis of steric hindrance, which being a physical characteristics do not interfere with chemical reactions.

Protekta Emulsion KR-2

Protekta Emulsion KR2 is a solvent-free aqueous silane siloxane ester emulsion. It is designed to be used as an admixture during the in-plant manufacture of low slump cement containing blocks, paving products, and as an admixture in RMC, freshly made concrete and mortar for plaster. Protekta Emulsion KR2 impregnates into pores and capillaries to form a hydrophobic zone and gets permanently bonded to the substrate and cannot be washed out. 125 ml of Protekta KR-2 in 50 kg of cement would give you 80-90% reduction in water absorption.

TEST RESULT OF PROTEKTA KR2

Test done in Shriram Institute for Industrial Research

**Water absorption, % by mass
[after 24 hours]**

0.34

Mechanism –Which guide Protekta KR2

The water repellent material lines the pores of the masonry (figure 1) and on curing, the water repellent causes a modification of the interfacial tension between the wall of the pore and the water (figure 2).

In an untreated pore the 'contact angle' is less than 90° and the interfacial tension causes the water to rise. Following application of the water repellent the interfacial tension changes. The contact angle becomes greater than 90° and the resulting tension now cause a slight downward 'pressure' so preventing the future rise of water.

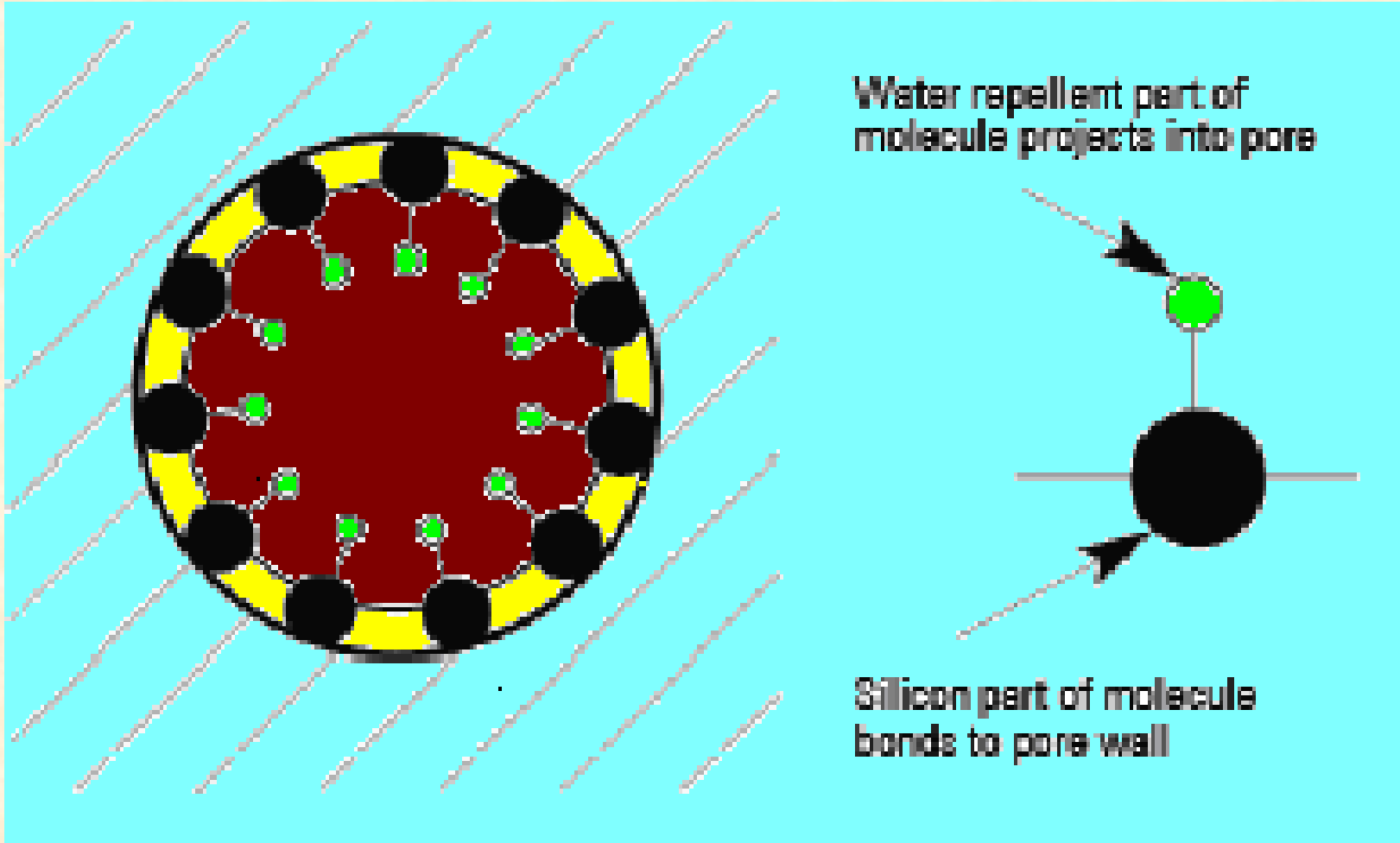
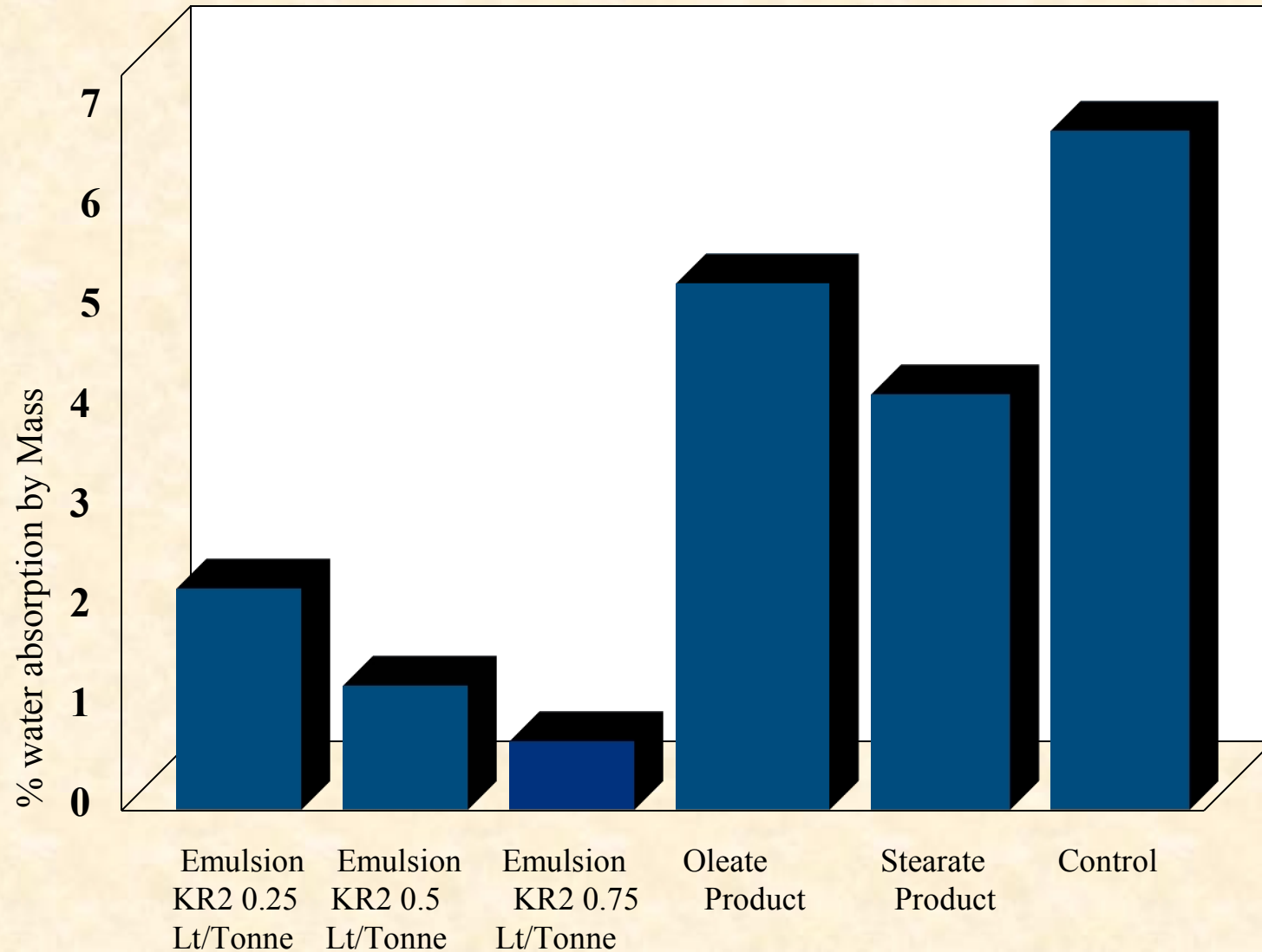


Figure 1: Water repellent lining pore

PROTEKTA KR-2

Figure 2: Reduction of Water Absorption



POLY CARBOXYLATE

We were following the developments in this field very closely and recently introduced polycarboxylate based admixture have been found to surpass the capabilities of current high range water reducing agents by providing a wide range of water reduction (5-30%) accompanied by a linear dosage response. This new chemistry of superplasticizers has recently emerged which is being referred to as comb polymers because their structure which involves a backbone consisting of a polycarboxylate polymer to which has been grafted polyoxyalkylene pendant groups.

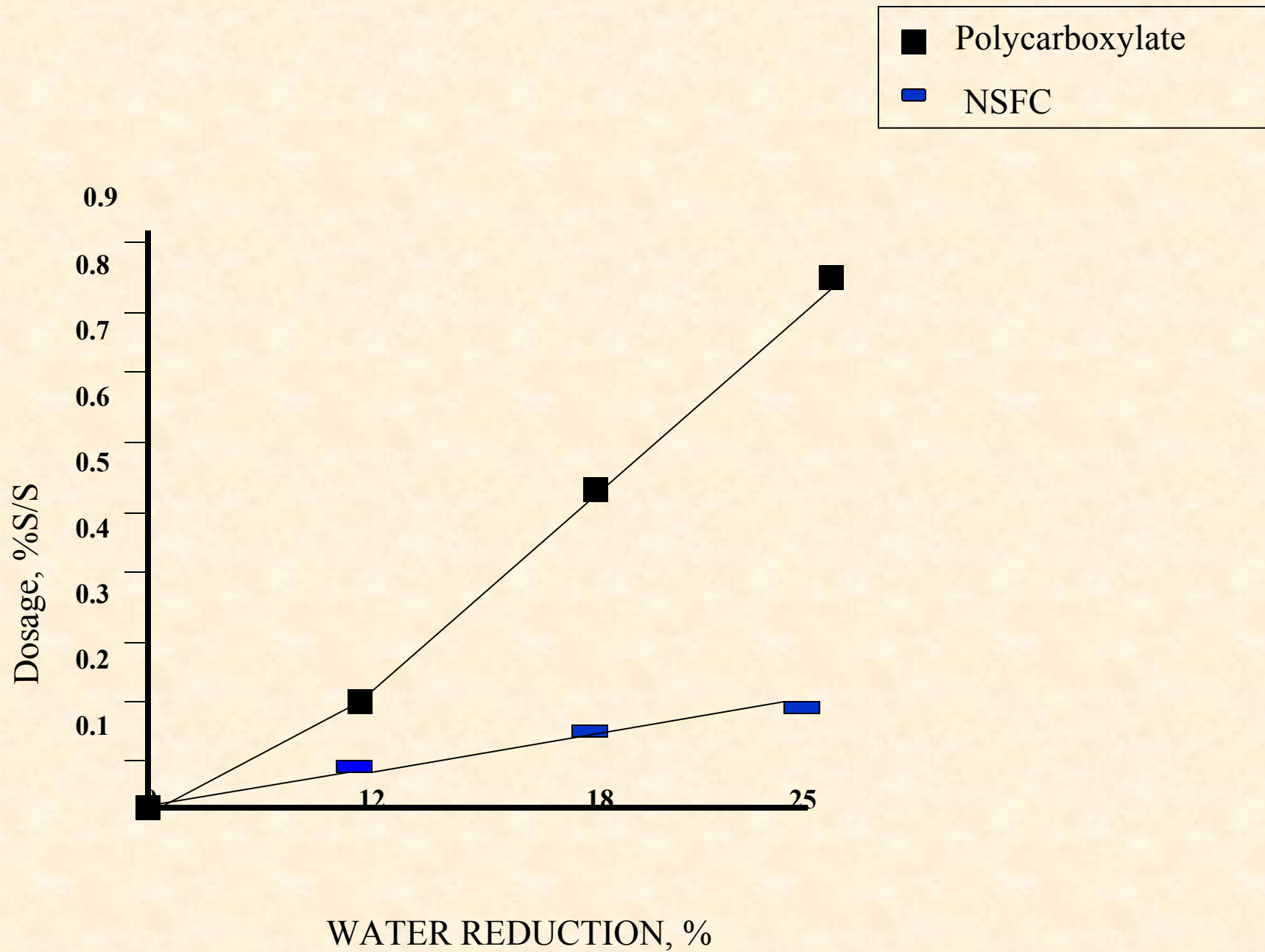
The polycarboxylates can be described to have the following dispersing mechanism

- **Mechanical Blending**
- **Physical adsorption**
- **Chemical adsorption**
- **Electrostatic repulsion**
- **Steric hindrance**

Unlike superplasticizers which work on the theory of Electro static repulsive forces, polycarboxylates works on Steric Hindrance which can over come the weakness of the conventional superplasticizers.

Characteristics

- **Superior water reducing effect with low air entraining & non-setting retardation in manufacturing of high strength concrete (40% or more)**
- **Excellent strength and durability of concrete by high water reducing effect**
- **Improvement in workability by long slump retention (for 2-3 hrs)**
- **Capability of manufacturing a fabric with high strength (1,200 kg_f/cm² or more)**
- **Less dosage (below 1/4) compare to conventional water reducer of PNS type.**



The above pictures clearly shows the difference between the **commonly available superplasticizers & polycarboxylates**. Our objective was to use the chemistry of these polycarboxylate, polyacrylates and Naphthalene based products etc to develop the admixtures which should over come most of the limitations associated with available superplasticizers in the market.

The other problem is that recent studies have shown that the cement variations have a greater effect on the workability and on the early reaction of concrete than in generally thought of. These variations are greater with superplasticized mixes but problems can exist also with normal concrete mixes.

The unexpected variations may lead to serious disturbances in production in the form of poor compaction, too low early strength and strand slippages. This is causing increased waste in production and considerable economical losses particularly at hollow core slab factories.

Cement variation is difficult to measure or control at a precast plant.

The quality information presently available from the cement supplier is not detailed enough to predict the behaviour of cement in a concrete mix. The aim of this study was to clarify the role of daily cement variations on concrete workability and to develop methods for cement quality control at precast concrete factories.

example:

- 1. Composition of clinker minerals**
- 2. Microstructure of clinker minerals**
- 3. Amount and form of calcium Sulphate**
- 4. Amount and form of alkalies**
- 5. Material temperature**
- 6. Particle size gradation (fineness)**
- 7. Particle shape**

Polycarboxylate based admixtures developed by R&D of Tech-Dry (India) Pvt. Ltd. do not use the above properties of polycarboxylate but uses it as a backbone to develop admixtures incorporating necessary properties based on synergic effect of different functionalities

We have taken into account all these factors to develop the products which incorporates the strength and other plasticizers also and the dominant product polycarboxylate in combination with other products work on the theory of synergy and this synergetic effect resulted in our development of the following production.

- 1. Superplasticizers which only reduce water cement ratio and workability**
- 2. Superplasticizers which provides waterproofing, increases compressive strength and**
retains the slump loss for as long as period as 3 hrs and we have classified them as

fully

Multifunctional waterproofing compounds for concrete

Protekta GL-5

Protekta GL-5 is designed for applications in the ready mix and precast concrete industries where the highest durability and performance is required.

Unlike Naphthalene, melamine & Ligno Sulphonate based admixtures, which works on the mechanism of Electrostatic repulsive forces and are therefore susceptible to further harmful reactions with the concrete by producing undesirable side products.

While polycarboxylates are safe since they work on the mechanism of Steric Hindrance, which can overcome the weaknesses of conventional superplasticizers and no undesirable side products are produced.

Uses:

- High workability without segregation
- Requires less vibration
- Improves surface finish

TEST RESULT OF PROTEKTA GL -5

**Civil-Aid Technoclinic Pvt. Ltd.,
(NABL Accredited laboratory as per ISO 17025)**

Mix design		
	Cement	2.85
	Sand	5.20
	20mm jelly	5.85
	10mm jelly	5.85
Dosage		1.2% of Cementitious material
Slump	0 hrs	200mm
	1 hrs	170 mm
	2 hrs	125 mm
	3 hrs	90 mm
Compressive Strength		
	2 days	15.7
	7 days	26.6

PROTEKTA GL-5(M)

Protekta GL-5 (M) is designed for applications in the ready mix and precast industries where the very high durability and performance is required in concrete and mortar.

It contains additives which can reduce the heat generated during hydration.

Protekta GL-5 (M) is an excellent combination of Protekta GL-5 and Protekta KR-2.

USES

Mortar, concrete, RMC's

High workability without segregation

Requires less vibration

Improves surface finish

PROTEKTA GL-5(M) (Multi purposes waterproofing Admixture)

	Civil Aid Techno Clinic Pvt. Ltd (NABL Accredited lab & ISO 17025) Test Method : IS:1199-1959 (Reaffirmed 2004) : IS 8142 –1976 (Reaffirmed 2002)	Tech Dry (I) Pvt. Ltd.
MIX DESIGN : CEMENT	460 kgs	
SAND	843 kgs	
20mm jelly	483.5 kg	
10mm jelly	483.5kg	
Dosage	0.6%	0.6 %
Water cement ratio	0.4	0.371
Slump		
0 Hrs	200 mm	210mm
1 Hrs	160mm	170mm
2 Hrs	130mm	130mm
3 Hrs	90mm	90mm
Setting Time : IST	8 hrs. 30 minutes	
FST	9 hrs. 10 minutes	
COMPRESSIVE STRENGTH @ ACT		--
7 DAYS	30.8	23 mpa
14 days	44.6	--
21 days		--
28 Days		--
Water Absorption as pr DIN 52617	2.1 %	0.8 %

TEST RESULT OF PROTEKTA GL-5(08)

		Tech Dry (I) Pvt. Ltd.	
MIX DESIGN : CEMENT SAND 20mm jelly 10mm jelly		M40	
Dosage		0.6 %	
Water cement ratio		0.39	
Slump	0 Hrs	200mm	
	1 Hrs	160mm	
	2 Hrs	130mm	
	3 Hrs	90mm	
COMPRESSIVE STRENGTH @ ACT		--	
	7 DAYS	30.8 mpa	
	14 days	--	
	21 days	--	
	28 Days	44.6 mpa	
Water Absorption(DIN 52617)		2.1	

TEST RESULT OF PROTEKTA GL-6

		Tech Dry (I) Pvt. Ltd.	
MIX DESIGN :	CEMENT		
	SAND	M40	
	20mm jelly		
	10mm jelly		
Dosage		0.6 %	
Water cement ratio		0.371	
Slump	0 Hrs	220mm	
	1 Hrs	210mm	
	2 Hrs	140mm	
	3 Hrs	90mm	
COMPRESSIVE STRENGTH @ ACT		--	
	7 DAYS	23 mpa	
	14 days	--	
	21 days	--	
	28 Days	43 mpa	
Water Absorption(DIN 52617)		0.8	

TEST RESULT OF PROTEKTA GL-8(05)

CIVIL AID TECHONOClinic Pvt. Ltd.

MIX DESIGN : CEMENT
SAND
20mm jelly
10mm jelly

M40

Dosage

0.9 %

Water cement ratio

0.43

Slump

0 Hrs

210mm

1 Hrs

160mm

2 Hrs

100mm

3 Hrs

COMPRESSIVE STRENGTH @ ACT

--

7 DAYS

23 mpa

14 days

--

21 days

--

28 Days

43 mpa

PROTEKTA ASLS

High workability without segregation

Requires less vibration

Improves surface finish

TEST RESULT OF PROTEKTA ASLS

Test done in Tech-Dry Laboratory

MIX DESIGN :

CEMENT	9000
Coarse Agg. (20mm)	12,810
Coarse Agg. (12mm)	8,100
10mm jelly	12,970
Dosage	0.6 % of cement
Water cement ratio	0.42
Slump	
0 Hrs	75mm
1 Hrs	75mm
2 Hrs	55mm
Setting Time	IST : 30 min FST : 600 min
COMPRESSIVE STRENGTH (Mpa)	
03 days	17.7

PROTEKTA ASTP

High workability without segregation

Requires less vibration

Improves surface finish

Long retention of slump

TEST RESULT OF PROTEKTA ASTP

Test done in Tech-Dry Laboratory

MIX DESIGN :

CEMENT	9000
Coarse Agg. (20mm)	12,810
Coarse Agg. (12mm)	8,100
10mm jelly	12,970

Dosage 0.6 % of cement

Water cement ratio 0.42

Slump	0 Hrs	200mm
	1 Hrs	160mm
	2 Hrs	150mm

Setting Time IST : 30 min
FST : 600 min

COMPRESSIVE STRENGTH
(Mpa) 03 days 11.11

PROTEKTA KRLS

High workability without segregation

Requires less vibration

Improves surface finish

Long retention of slump

TEST RESULT OF PROTEKTA KRLS

Test done in Tech-Dry Laboratory

MIX DESIGN :

CEMENT	9000
Coarse Agg. (20mm)	12,810
Coarse Agg. (12mm)	8,100
10mm jelly	12,970

Dosage 0.6 % of cement

Water cement ratio 0.42

Slump	0 Hrs	200mm
	1 Hrs	180mm
	2 Hrs	130mm

Setting Time IST : 30 min
FST : 600 min

COMPRESSIVE STRENGTH
(Mpa) 03 days 6.66

PROTEKTA KRTP

High workability without segregation

Requires less vibration

Improves surface finish

Long retention of slump

TEST RESULT OF PROTEKTA KRLS

Test done in Tech-Dry Laboratory

MIX DESIGN :

CEMENT	9000
Coarse Agg. (20mm)	12,810
Coarse Agg. (12mm)	8,100
10mm jelly	12,970

Dosage 0.6 % of cement

Water cement ratio 0.42

Slump	0 Hrs	190mm
	1 Hrs	140mm
	2 Hrs	140mm

Setting Time IST : 30 min
FST : 600 min

COMPRESSIVE STRENGTH
(Mpa) 03 days 13.30

Poly carboxylate based concrete superplasticizers

Protekta RR 1

- Gives high workability and is a high range water reducer.
- Excellent for pumping concrete
- Reduces water absorption
- Increases compressive strength
- Reduces slump loss

TEST RESULT OF PROTEKTA RR 1

Test done in National Test House, Madras. as per IS: 2645-1975

	With the admixture of WPC		Without the admixture of WPC	
	Hr	Min.	Hr	Min
IST	0	50	3	00
FST	1	20	5	40

TEST RESULT OF PROTEKTA RR-1

	Civil Aid Techno Clinic Pvt. Ltd (NABL Accredited lab & ISO 17025)	Tech Dry (I) Pvt. Ltd.
MIX DESIGN : CEMENT	1	1
SAND	1.5	1.5
20mm jelly	1.5	1.5
10mm jelly	1.5	1.5
Dosage	250ml / bag of cement	0.6 %
Water cement ratio	0.55	0.45
Slump		
0 Hrs	155mm	130mm
1 Hrs	15mm	110mm
2 Hrs	10mm	70mm
3 Hrs	05mm	60mm
COMPRESSIVE STRENGTH (Mpa)	44.6	---
Water Absorption		0.8

Protekta RR2

- Gives high workability .
- Excellent for pumping concrete
- Reduces water absorption
- Increases compressive strength
- Reduces slump loss

TEST RESULT OF PROTEKTA RR-2

	Civil Aid Techno Clinic Pvt. Ltd (NABL Accredited lab & ISO 17025)	Tech Dry (I) Pvt. Ltd.
MIX DESIGN : CEMENT	1	1
SAND	1.5	1.5
20mm jelly	1.5	1.5
10mm jelly	1.5	1.5
Dosage	300 ml/bag of cement	0.6 %
Water cement ratio	0.45	0.45
Slump		
0 Hrs	140mm	155mm
1 Hrs	120mm	125mm
2 Hrs	80mm	90mm
3 Hrs	70mm	--
Setting Time		
IST	6hrs 55 min.	8.48 (hr)
FST	8hrs 48 min	
COMPRESSIVE STRENGTH (Mpa) 7 days	44.6	44.0
Water Absorption		0.8

Protekta RR3

- Gives high workability
- Excellent for pumping concrete

- Reduces water absorption

TEST RESULT OF PROTEKTA RR-3

- Increases compressive strength by *43.6 MPa*

	Civil Aid Techno Clinic Pvt. Ltd (NABL Accredited lab & ISO 17025)	Tech Dry (I) Pvt. Ltd.
MIX DESIGN :		
▪ CEMENT	1	1
▪ SAND	1.5	1.5
▪ 20mm jelly	1.5	1.5
▪ 10mm jelly	1.5	1.5
Dosage	300 ml/bag of cement	0.6 %
Water cement ratio	0.45	0.45
Slump		
0 Hrs	140mm	150mm
1 Hrs	120mm	125mm
2 Hrs	90mm	95mm
3 Hrs	80mm	85mm
Setting Time		
IST	0 hrs 50 min	-
FST	8 hrs 45 min.	8.45 (hr)
COMPRESSIVE STRENGTH (Mpa)		
7 days	43.6	43.6
Water Absorption		0.8

Protekta RR4

- Long retention of the slump
- Increases the Compressive Strength

TEST RESULT OF PROTEKTA RR-4

Reduces water absorption

	Civil Aid Techno Clinic Pvt. Ltd (NABL Accredited ISI & ISO 17025)	Tech Dry (I) Pvt. Ltd.
<ul style="list-style-type: none"> ▪ Setting time is within permissible limit of ISI standards 		
MIX DESIGN : CEMENT	1	1
<ul style="list-style-type: none"> ▪ Reduces slump loss 	1.5	1.5
20mm jelly	1.5	1.5
10mm jelly	1.5	1.5
Dosage	300 ml/bag of cement	0.6 %
Water cement ratio	0.45	0.45
Slump		
0 Hrs	130mm	145mm
1 Hrs	120mm	125mm
2 Hrs	90mm	100mm
3 Hrs	70mm	75mm
Setting Time		
IST	6 hrs 50 min	--
FST	8 hrs 40 min	8.40 (hr)
COMPRESSIVE STRENGTH		
(Mpa)		
7 days	40.6	40.6
Water Absorption		0.8

PROTEKTA RR5

- Long retention of the slump
- Increases the Compressive Strength
- Reduces water absorption
- Setting time is within permeable limitation of ISI standards
- Reduces slump loss

TEST RESULT OF PROTEKTA RR-5

	Civil Aid Techno Clinic Pvt. Ltd (NABL Accredited lab & ISO 17025)	Tech Dry (I) Pvt. Ltd.
MIX DESIGN : CEMENT	1	1
SAND	1.5	1.5
20mm jelly	1.5	1.5
10mm jelly	1.5	1.5
Dosage	300 ml/bag of cement	0.6 %
Water cement ratio	0.45	0.45
Slump		
0 Hrs	130mm	135mm
1 Hrs	100mm	110mm
2 Hrs	90mm	95mm
3 Hrs	70mm	75mm
Setting Time		
IST	7 hrs	
FST	9 hrs 10 min	8.40 (hr)
COMPRESSIVE STRENGTH		
(Mpa)		
7 days	37.6	37.3
Water Absorption		0.8

PROTEKTA RR -6

New generation Superplasticizer which does not interact with cement and work on unique mechanism.

USES

- Polycarboxylate based superplasticizers
- Increases the Compressive Strength of the Concrete upto 42.0MPa
- Reduces Water Absorption 78%
- Setting time is within permissible limit of ISI Standards.
- Long retention of the slump
- Improved surface finish

TEST RESULT OF PROTEKTA RR-6

	Civil Aid Techno Clinic Pvt. Ltd (NABL Accredited lab & ISO 17025)	Tech Dry (I) Pvt. Ltd.	National Test House
MIX DESIGN :	1	1	
CEMENT	1.5	1.5	
SAND	1.5	1.5	
20mm jelly	1.5	1.5	
10mm jelly			
Dosage	300 ml/bag of cement	0.6 %	
Water cement ratio	0.45	0.45	
Slump			
0 Hrs	150mm	160mm	
1 Hrs	120mm	130mm	
2 Hrs	90mm	90mm	
3 Hrs	65mm	75mm	
Setting Time			
IST	7 hrs 25 min	8.40 (hr)	0hr 35 min
FST	9 hrs 25 min		1hr 15 min
COMPRESSIVE STRENGTH Mpa)	42.0	42.0	388
Water Absorption (as per DIN 52617)	5.6 (Done in Shriram Institute)	0.8	
Permeability Test			37
Chloride content (as Cl)			0.04

PROTEKTA TD-1

Designed for applications in the ready mix and precast concrete industries where the highest durability and performance is required.

USES

- High workability without segregation
- Requires less vibration
- Improves surface finish
- Increases compressive strengths
- Increases durability
- Lower permeability
- Increases flexural strength
- Reduces shrinkage

TEST RESULT OF PROTEKTA TD-1

Shriram Institute for Industrial Research	Result
Non Volatile Solids, % by Mass	26.8
Specific gravity at 27 C	1.2058
Viscosity, CST at 27 C	2.9
Silicates (as SiO ₂), % by mass	7.7
Iron, % by mass	0.005
Nikel, % by mass	Nil
Copper, % by mass	Nil
Zinc, % by mass	Nil
Zirconium, % by mass	8.6
Permeability to water, %	45
Water absorption, % (After 24 Hours) as per DIN 52617	5.7

PROTEKTA TD-2

Specially designed for RMC's where the slump retention is required.

USES

- High workability without segregation
- Requires less vibration
- Improves surface finish
- Increases compressive strengths
- Increases durability
- Lower permeability
- Increases flexural strength
- Reduces shrinkage

TEST RESULT OF **PROTEKTA TD-2**

Civil Aid Techno Clinic Pvt. Ltd
(NABL Accredited lab & ISO 17025)

Tech Dry (I) Pvt. Ltd.

MIX DESIGN :

CEMENT

M40

1

1

SAND

1.73

1.42

20mm jelly

1.34

1.46

10mm jelly

1.34

0.9

Dosage

400 ml/bag of cement

0.8 %

Water cement ratio

0.40

0.55

Slump 0 Hrs

210mm

210mm

1 Hrs

155mm

130mm

2 Hrs

110mm

70mm

3 Hrs

95mm

50mm

Setting Time

9 hrs 26 min

8.50 (hr)

COMPRESSIVE STRENGTH (Mpa)

24.1

23.4

Water Absorption

3.5

Air content (%)

4.9

Chloride Content (%)

0.0053

PROTEKTA TD-3

Specially designed Polycarboxylate based latest superplasticizer based admixtures for Roads.

USES

- High Range water reducers
- Specifically developed for use in high quality concrete mixes utilizing cement replacements.
- High dispersability
- High workability
- Increases compressive strengths
- Lower permeability
- Reduces shrinkage
- Increases durability

TEST RESULT OF PROTEKTA TD-3

Civil Aid Techno Clinic Pvt. Ltd
(NABL Accredited lab & ISO 17025)

Tech Dry (I) Pvt. Ltd.

MIX DESIGN :

CEMENT

1

1

SAND

2.3

1.42

20mm jelly

2.13

1.46

10mm jelly

0.71

0.9

Dosage

300 ml/bag of cement

0.6 %

Water cement ratio

0.40

0.40

Slump 0 Hrs

150mm

150mm

1 Hrs

70mm

70mm

2 Hrs

25mm

25mm

3 Hrs

Setting Time

9 hrs 43 min

9.43 (hr)

COMPRESSIVE STRENGTH (Mpa)

34.9

34.9

Water Absorption

PROTEKTA TD-6

Specially designed Polycarboxylate based latest superplasticizer based admixtures for Roads.

USES

- High Range water reducers
- Specifically developed for use in high quality concrete mixes utilizing cement replacements.
- High dispersability
- High workability
- Increases compressive strengths
- Lower permeability
- Reduces shrinkage
- Increases durability

TEST RESULT OF PROTEKTA TD-6

Civil Aid Techno Clinic Pvt. Ltd
(NABL Accredited lab & ISO 17025)

MIX DESIGN :

CEMENT	1
SAND	2.3
20mm jelly	2.13
10mm jelly	0.71

Dosage 300 ml/bag of cement

Water cement ratio 0.40

Slump	0 Hrs	20mm
	1 Hrs	--
	2 Hrs	--
	3 Hrs	

Setting Time 9 hrs 8 min

COMPRESSIVE STRENGTH
(Mpa) 07 days 37.3

Water Absorption

PROTEKTA TD-7

High performance polycarboxylate based superplasticising admixture. Specially designed for Ready Mix Concrete or for Green concrete.

USES

- To provide ultimate strength by reducing water cement demand in the concrete mix.
- To improve the workability
- To provide improved durability by increasing ultimate strengths and reducing concrete permeability
- Specifically developed for use in high quality concrete mixes utilizing cement replacements.

TEST RESULT OF PROTEKTA TD-7

	Civil Aid Techno Clinic Pvt. Ltd (NABL Accredited lab & ISO 17025)	Tech Dry (I) Pvt. Ltd.
MIX DESIGN :		
CEMENT	1	1
SAND	1.42	1.42
20mm jelly	1.46	1.46
10mm jelly	0.9	0.9
Dosage	450 ml/bag of cement	0.9% of Cement
Water cement ratio	0.42	
Slump	0	165mm
0 Hrs	0	
1 Hrs	--	95mm
2 Hrs	--	60mm
3 Hrs		
Setting Time	10 hrs 16 min	7.30 (hr)
COMPRESSIVE STRENGTH (Mpa) 07 days	35.4	42.44 (28 days)
Water Absorption		

PROTEKTA TD-8

Specially designed Polycarboxylate based latest admixture for Ready Mix Concrete or for Green concrete.

USES

Ideal for precast and ready mix concrete

- High Dispersion properties
- High range water reducer

TEST RESULT OF PROTEKTA TD-8

	Civil Aid Techno Clinic Pvt. Ltd (NABL Accredited lab & ISO 17025)	Tech Dry (I) Pvt. Ltd.
MIX DESIGN :		
CEMENT	1	1
SAND	1.42	1.42
20mm jelly	1.46	1.46
10mm jelly	0.9	0.9
Dosage	450 ml/bag of cement	0.9% of Cement
Water cement ratio	0.42	
Slump		
0 Hrs	140mm	160mm
1 Hrs	65mm	85mm
2 Hrs	15mm	45mm
3 Hrs		
Setting Time	14 hrs 57 min	9.40 (hr)
COMPRESSIVE STRENGTH (Mpa) 07 days	40.9	40.9

PROTEKTA TD-9

New generation Superplasticizer which does not interact with cement and work on unique mechanism. Specially designed Polycarboxylate based latest admixture for Ready Mix Concrete or for Green concrete.

USES

- High Range water reducers
- Specifically developed for use in high quality concrete mixes utilizing cement replacements.
- High dispersability
- Increases durability.
- Maintains slump with little set retardation

TEST RESULT OF TD-9		Tech Dry (I) Pvt. Ltd.
MIX DESIGN :		
CEMENT : SAND : 20mm jelly : 10mm jelly		1:1.42:1.46:0.9
Dosage		0.9% of cement
Water cement ratio		0.42%
Slump	0 Hrs	130mm
	1 Hrs	100mm
	2 Hrs	80mm
		60mm
Setting Time		8.30 (hr)
COMPRESSIVE STRENGTH (Mpa) 28 days		44.44

PROTEKTA TD-10

It is a ready to use admixture that is added to the concrete at the time of batching.

USES

- To provide ultimate strength by reducing water cement demand in the concrete mix.
- To improve the workability
- To provide improved durability by increasing ultimate strengths and reducing concrete permeability
- Specifically developed for use in high quality concrete mixes utilizing cement replacements.

TEST RESULT OF **PROTEKTA TD-10**

	Civil Aid Techno Clinic Pvt. Ltd (NABL Accredited lab & ISO 17025)	Tech Dry (I) Pvt. Ltd.
MIX DESIGN :		
CEMENT	1	1
SAND	3.21	1.42
20mm jelly	2.34	1.46
10mm jelly	1.56	0.9
Dosage	350 ml/bag of cement	0.7% of Cement
Water cement ratio	0.55	0.55
Slump		
0 Hrs	30mm	140mm
1 Hrs		
2 Hrs		100mm
3 Hrs		
Setting Time	10 hrs 8 min	8 (hr)

PROTEKTA TD-11

Specially designed Polycarboxylate based latest admixture for Ready Mix Concrete.

USES

- High range water reducers by reducing water cement demand in the concrete mix.
- To improve the workability
- To provide improved durability by increasing ultimate strengths and reducing concrete permeability

TEST RESULT OF **PROTEKTA TD-11**

	Civil Aid Techno Clinic Pvt. Ltd (NABL Accredited lab & ISO 17025)	Tech Dry (I) Pvt. Ltd.
MIX DESIGN :		
CEMENT	1	1
SAND	2.6	1.42
20mm jelly	1.9	1.46
10mm jelly	1.90	0.9
Dosage	400 ml/bag of cement	0.9% of Cement
Water cement ratio	0.55	0.55
Slump		
0 Hrs	120mm	220mm
1 Hrs	65mm	125mm
2 Hrs	15mm	80mm
3 Hrs		65mm
Setting Time	10hrs 38 min	10.15 (hr)
COMPRESSIVE STRENGTH (Mpa)		
07 days	15.3	41.1 (28 days)

PROTEKTA TD-12

Specially designed for precast and ready mix concrete

USES

- To provide ultimate strength by reducing water cement demand in the concrete mix.
- To improve the workability
- To provide improved durability by increasing ultimate strengths and reducing concrete permeability
- High range water reducers.

TEST RESULT OF PROTEKTA TD-12

	Civil Aid Techno Clinic Pvt. Ltd (NABL Accredited lab & ISO 17025)	Tech Dry (I) Pvt. Ltd.
MIX DESIGN :		
CEMENT	1	1
SAND	3.21	1.42
20mm jelly	2.34	1.46
10mm jelly	1.56	0.9
Dosage	350 ml/bag of cement	0.9% of Cement
Water cement ratio	0.55	0.42
Slump	30mm	160mm
0 Hrs	--	140mm
1 Hrs	--	80mm
2 Hrs	--	50mm
3 Hrs		
Setting Time	10 hrs 8 min	10.30 (hr)
COMPRESSIVE STRENGTH (Mpa)		
07 days	11.6	38.8 (28 days)

POLYFUNCTIONAL ADMIXTURES

Formulations with two or more compounds in which each compound may play a specific role, or a single admixture which does not fall under any of the above categories, are included under this group. They are based on organic, inorganic or organo-inorganic compounds.

PROTEKTA SP-1

General Waterproofing admixture supplies as clear colourless, water based liquid. Suitable for concrete, masonry, cement mortar, stucco plaster, non-shrink grout to provide waterproofing/water reducing /acceleration properties.

USES

- It is a waterproofing/accelerating/water reducing liquid mixture.
- This admixture is not simply a water reducing mixture It reduces the water absorption of the concrete or plaster by 70%
- This contains special accelerator and compensates for adverse retarding effect of the concrete and improves compressive and flexural strength of concrete.
- This admixture is free of chloride or plasticiser.
- It is most economical because of its outstanding properties of having properties of waterproofing compound and accelerator.

PROTKETA SP-2

Protekta –SP2 is a unique admixture, which has been designed in a manner that a synergistic affect of different components puts this admixture into more than one category.

A micro quantity of super plasticizers is use in synergy with an accelerating compound. Suitable for fresh concrete, cement mortars and RMC

USES

- Reduces the water absorption of the substrate by more than 70%.
- Produces workable and flowing concrete with very high slump and high strength concrete with W/C ranging from 0.4 to 0.56.
- Synergetic effect of a Retarder, accelerator and waterproofing compound.
- Reduces the porosity unlike plasticisers which are good as retarders and in reducing water cement ratio, but they are not by themselves waterproofing agents.
- Contracting alkali - aggregate expansion reaction.
- Avoids the problems associated with plasticisers, which sometimes leads to slump loss.

PROTEKTA SP-2

Test Result as per IS: 2645-1975

	With the admixture of WPC		Without the admixture of WPC	
	Hr	Min.	Hr	Min
IST	2	30	2	20
FST	4	00	3	50

Test Result as per IS: 2645-75

	Neat Mortar	Mortar + Compound (Using 200g of 50kg of cement)	IS: Requirement	Conformity
Permeability to water, %	--	34	50.0 max.	Yes
Setting time (Minutes)				
a. Initial	150	175	30.0 min.	Yes
b. Final	260	300	600.0 max.	Yes
Compressive Strength (Kg/Cm)				
a. At 3 days	400	375		
b. At 7 days	510	490		

PROTEKTA SP-3

A general waterproofing compound. The waterproofing is obtained by the use of water repellent compounds in conjunction with an Inorganic catalyst, which enhance performance of durability of concrete.

USES

- A general waterproofing admixture, greatly reduces water absorption and penetration.
- Reduces water absorption and permeability.
- It can fill the voids created by free water in the matrix.
- Most economical.
- Free of chloride/plasticiser.

PROTEKTA SP-3 Result

Test Result as per IS: 2645 - 75

	Neat Mortar	Mortar + Compound (Using 200g of 50kg of cement)	IS: Requirement	Conformity
Permeability to water, %	--	34	50.0 max.	Yes
Setting time (Minutes)				
a. Initial	150	180	30.0 min.	Yes
b. Final	260	310	600.0 max.	Yes
Compressive Strength (Kg/Cm)				
a. At 3 days	400	380		
b. At 7 days	510	500		

PROTEKTA SLM

- Strong adhesion, flexural strength, plasticity, abrasion, resistance and workability

POLYMER-MODIFIED SYSTEM

Addition of water soluble polymers or emulsified polymer to concrete is beneficial with respect to its several properties such as better workability, decreased water absorption, improved tensile, flexural

PROTEKTA 400

This is an Aqueous, anionic, dispersion of an acrylic-styrene copolymer based formulations specially prepared for making flexible mortar.

Flexible waterproofing slurries or flexible waterproofing mortar based on modern polymers are a very useful concept in building protection, like mortar where cement forms a firm frame work in the presence of water. The polymer bonds the mixture of sand and cement to yield a soft and flexible structure.

Latex modification of cement mortar and concrete is governed by both, cement hydration and polymer film formation processes in their binder phase. The cement hydration process generally precedes the polymer formation process. In due course, a co-matrix phase is formed by both cement and polymer film formation process.

It is believed that a co-matrix phase, which consists of cement gel and polymer films, is generally formed as a binder.

Test Result of Protekta 400

Product specification	Solid Content	57.2%
	Viscosity at 23°C	180 mPas
	pH	8.2
Other Properties of the dispersion	Density at 20°C	Ca. 1.02 g/cm ³
	Average particle size	Ca. 0.2 μm
	Minimum film-forming temperature	< 1 °C
	Resistance to frost	Not resistant
Properties of the film	Density at 20°C	Ca. 1.08 g/cm ³
	Glass transition temperature T _g	Ca. -6 °C
	Tensile stress at break	Ca. 0.3 N/mm ²
	Surface	Tacky
	Water absorption after immersion for 24 hours	5-10 %
	Appearance	Clear, transparent
	Resistance to ageing	Good
	Stability to light	Good

PROTEKTA -500

Anionic dispersion based on acrylic/styrene/butadiene

Protekta –500 is used mainly for modifying Hydraulic setting agents particularly cement mixtures. It is preferably used in cases where maximum demands are made on the mechanical properties of these products. Example: Touching up mortar and screed.

This is best suited to prepare:

Repair mortars

- Fine screed and corrosion protection and most important
- Repairing the old mortars

Mohs Scale Hardness Test Result

Sl.No.	Identification	Measured Dimension (mm)	Test Results
01.	Protekta 500	200 x 200 x 6.1	6

PROTEKTA -600

This is an aqueous polymer emulsion and when mixed with cement mortars, it makes the modified mortar as hard, tough and durable. It is superior adhesive and gives impact strength. This is an excellent waterproofing compound. Capability and the mortar made with it are resistant to many industrial chemicals, UV light and heat.

Mohs Scale Hardness Test Result

Sl.No.	Identification	Measured Dimension (mm)	Test Results
01.	Protekta 600	200 x 200 x 6.1	6

ANTI-SHRINKAGE/grouting

PROTEKTA AC-1

Cracks in concrete or plaster have been the problem for everyone engaged in construction activities. Most of the time the cracks are developed because of shrinkage or thermal expansion/contraction. We have developed Protekta AC-1, which when added to the concrete/mortar produce a non shrinkage concrete/mortar in which cell integrity is maintained and cell coalescing is substantially eliminated.

USES

- It is anti-shrinkage compounds.
- When added in the concrete or cement mortar they display a uniformly micro celled internally structure as compared to the control with a much-enlarged cells.
- The concrete and cement mortar containing these additives produce no shrinkage or thermal cracks
- It can also be used for grouting cement.
- If cementitious material or Protekta SB or combination thereof needs pushing. Combination with Protekta AC –1 is preferred (sometimes the grouted material tends to come out).

PROTEKTA -N

In concreting a phenomenon known as Plastic shrinkage occurs before and during the setting of the cement, when it is in an easily deformable state. It is caused by the rapid or simply by the action of the wind. It occurs mainly on exposed surfaces that are large in proportion to their thickness (and especially on slabs).

Plastic shrinkage cracks occur when moisture from the concrete surface evaporates faster than the rate of bleeding. The concrete shrinks as a result of the capillary tension forces generated by the menisci formed between the surface particles. The restraining forces imposed by the concrete below the shrinking surface subsequently cause tensile stresses to develop in the stiffening concrete. This eventually leads to cracking which occurs prior to final finishing and commencement of the curing process.

The cracks are characteristically short and random, forming a map pattern. Plastic shrinkage are typically shallow and do not extend to the edge of the slab. These cracks, together with those induced by temperature differences as cement hydrates, are typically dormant and do not increase in size with time. Such cracks can therefore undergo a self-healing process, often referred to as 'autogenous healing', if sufficiently narrow. The crack closure process arises from several factors, predominantly from continuing cement hydration or by precipitation of calcium carbonate due to carbonation of the concrete.

But some of the plastic shrinkage cracks can be very injurious and affects the durability of the concrete. We suggest that you can use our product Protekta -N to avoid plastic shrinkage in plastic and mortars.

USES

- Used as admixture in the concrete
- It is a universal sealant.
- It can be used as a final coat or to any modifying cement, sand mixtures.
- In building material systems Protekta -N control water retention and consistency while at the same time improving adhesion.
- *Water retention in building material systems is the most important property of Protekta -N.* Even small quantities delay the rapid uptake of water by the absorbent substrate, thus ensuring that the water remains present for uniform setting and hardening. Premature drying of plasters and mortars is prevented, permitting the longer working times required for efficient building operations.

ANTI-CORROSION

PROTEKTA RECOR

Steel corrosion in reinforced concrete structures has been a major problem inspite of the fact that concrete itself is one of the best protective coatings for steel. Reinforced Concrete gains its strength from the strong bond between the steel reinforcing and the concrete. If the bond is lost the concrete properties are diminished.

When the pollutant, which includes acids, salts, carbon dioxide, sulphur dioxide etc., penetrates concrete, the corrosion protection properties of concrete are lost. Sometimes aggregates and admixtures used also contain salt.

Corrosion inhibitor Protekta Recor developed by Tech-Dry (India) Pvt. Ltd., penetrates concrete to dramatically reduce corrosion and extends life of the structures.

Needless to say that our Protekta Base and Protekta Impregnants reduce the permeability of the concrete and it does make difficult for the pollutant to get to the steel in the concrete.

USES

- Protects against weathering
- Inhibits rust and corrosion

AIR ENTRAINING ADMIXTURES

Air entrainment is the process whereby many small air bubbles are incorporated into concrete and become part of the matrix that binds the aggregate together into the hardened concrete. The air bubbles are dispersed throughout the hardened cement paste but are not, by definition, part of it. This effect is accomplished by the use of an air-entraining agent that is called an admixture if it added with the other ingredients at the mixer or an addition if it is interground with the cement.

PROTEKTA INSAAS -04

Protekta INSAAS-04 is an air entraining agent formulated from modified occurring and synthetic surfactants. Promotes the uniform distribution of microscopic air bubbles throughout the cement matrix. The bubbles are of even size and shape but are not connected.

USES

- Lower permeability than plain concrete
- Reduces the water demand of the concrete for a given workability
- Increases the cohesion of concrete mixes which makes them easier to handle and place.
- Improves the durability of concrete.

PROTEKTA INSAA -041

- Improves the durability of concrete
- Increases the cohesion of concrete
- Lower permeability than plain concrete
- Reduces the water demand of the concrete
- Gives good workability.
