



Chem Coats (Pvt) Ltd.

ChemPlast 450 SP

High performance superplasticising admixture

DESCRIPTION

ChemPlast 450 SP is a chloride-free high performance superplasticising admixture based on proprietary blended sulphonated melamine formaldehyde condensate and selected lignosulphonates..

ChemPlast 450 SP has powerful wetting agents which when introduced to the mix, through the mixing water alter the molecular structure of the cement matrix, dramatically increasing workability levels, improving cement dispersion and enhanced cement hydration. **ChemPlast 450 SP** provides

- High workability and placing levels when maintaining water contents.
- High range water reductions when maintaining slumps.
- Higher early and ultimate strength development when maintaining Cement ratios.

USES

- To significantly reduce the water demand of a concrete mix without reducing workability, allowing greatly increased early and ultimate strengths development without the additional of cement.
- To significantly improve the workability of concrete without increasing the water requirement.
- To reduce concrete permeability and thereby reduce water penetration and enhance durability.

BENEFITS

- For use in the production of flowable concrete applications.
- Fast placing and compaction capabilities.
- Major increases in strength development at all ages without increased cement contents.
- Particularly beneficial in precast construction applications.
- Reduction in water / cement ratio enhances durability, producing low permeability concrete with reduced shrinkage cracking potential.
- chloride-free, safe for use in prestressed and reinforced concrete.

STANDARDS COMPLIANCE

ChemPlast 450 SP complies with ASTM C494 as Type A, F & G. Water reducing, high range & retarding admixtures for concrete.

MIXING

TYPICAL DOSAGE

Typical dosage of **ChemPlast 450 SP** is 1 ltr to 2.5 ltr / 100 kg of cementitious material, including PFA, GGBFS and Micro silica. For optimum performance and dosage, **ChemPlast 450 SP** should always be determined by running site trials using the materials intended for use under prevailing site conditions. This allows for the complete assessment of the concrete mix, optimization of materials and admixture dosage.



PHYSICAL PROPERTIES

Appearance	Brown liquid
Specific Gravity	1.17 @ 20 °C
Chloride Content	Nil (BS 5075)
Air entrainment	< 2 % (@ mid-range dosage)
Alkali content	< 60.0 gms Na ₂ O equivalent / ltr of admixture
Freezing point	Approx. -2 °C

MIX DESIGN

Where the primary intention is to improve strengths the addition of **ChemPlast 450 SP** will allow for the removal of approx. 18% – 30 % of the mixing water (depending on the materials used and type of cement) from the mix whilst maintaining the workability at the levels obtained before the use of the admixture.

Where the primary intention is to provide high workability concrete, **ChemPlast 450 SP** will elevate workability levels and increase slumps whilst maintaining the level of mixing water obtained before its addition.

The mix should be designed as a pump mix. In correctly designed flowing concrete, the improved dispersion of cement particles and more efficient use of water will improve mix cohesion. High workability mixes generally require higher percentages of fine aggregate to that of conventionally placed concrete mixes to prevent and overcome segregation at high slumps.

USE AT OTHER DOSAGES

Dosages outside the typical ranges quoted may be used if necessary, provided that performance is assessed through trial mixes and adequate supervision is available. Contact **Chem Coats** Technical Department for advice in these cases.

COMPATIBILITY

ChemPlast 450 SP is compatible with other **Chem Coats** admixtures in the same concrete mix. All admixtures should be added to the concrete separately and must not be mixed together prior to addition. The performance of concrete containing more than one admixture should be assessed by the trial mix procedure to ensure that effects such as unwanted retardation do not occur.



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DISPENSING

The correct quantity of **ChemPlast 450 SP** should be measured by means of a recommended dispenser. The admixture should then be added to the concrete with the mixing water to obtain the best results.

REDUCING WATER PERMEABILITY:

The single most important factor in concrete in its hardened state is durability. By effectively reducing the mixing water **ChemPlast 450 SP** reduces capillary reaction, porosity, and shrinkage. To produce a concrete with the benefits of low permeability and more durable concrete.

EFFECTS OF OVERDOSING

An overdose of double the intended amount of **ChemPlast 450 SP** will result in a slight increase in stiffening times as compared to that normally obtained at the intended dosage rate. Overdosing will greatly increase the plasticising effect of the admixture, if concrete is batched to target workability, increased plasticising will allow an increased water reduction. This will have the effect of increasing ultimate strength and partially or fully offsetting the effect of any increased entrainment. If no increase in water reduction is taken and a significant rise in workability is allowed, there is a strong possibility of mix segregation. Increased initial workability will tend to extend the working life of the concrete, which will delay finishing and stiffening times to some extent.

TYPICAL PERFORMANCE EXAMPLES

Trials should be made using relevant materials and conditions in order to determine the optimum mix design and admixture dosage to meet specific requirements.

Typical performance examples from evaluation studies of **ChemPlast 450 SP** are included in this data sheet. The values quoted are representative of results obtained with specific materials and are provided as illustrations of performance only.

See Table 1 & 2 below for Effects of compressive strength and workability.

CLEANING

Dispensing equipment, pumps and bulk storage tanks as well as spillages of **ChemPlast 450 SP** can be washed and cleaned with water.

PROTECTION ON COMPLETION

As with all structural concrete, good curing practice should be maintained. The most effective means of curing structures is by employing a good curing compound. Contact **Chem Coats** Technical Department for advice on the use of **Chem Coats** range of curing compounds.

MODEL SPECIFICATIONS

Incorporate **ChemPlast 450 SP** in to the concrete mix at the rate of 500 ml – 1.8 ltr / 100 kg of cementitious material, all in accordance with the manufactures instructions.

PACKAGING

ChemPlast 450 SP is available in 200 ltr drums.

HANDLING & STORAGE

ChemPlast 450 SP has a shelf life of 12 months provided the temperature is kept within the range of 2° C to 50° C. in the original packaging. In more extreme conditions this period might be shortened.

HEALTH & SAFETY

ChemPlast 450 SP is non-hazardous. The use of gloves, eye protection is advised. Immediately wash with water in the event of contact with skin. Splashes into eyes should also be washed immediately with plenty of clean water and medical advice sought thereafter. **ChemPlast 450 SP** is water based and non-flammable.

IMPORTANT NOTE

The information given in this data sheet is based on current development work and many years of field experience. Whilst every effort is made to ensure that the information is reliable. We cannot accept responsibility for any work carried out with our materials as we have no controls over methods of applications, site conditions etc. In view of the continuing research and development being undertaken in our laboratories, we advice customers in their own interest to ensure that this data sheet has not been superseded by a more up-to-date publication. All products are sold subject to our standard conditions of sale which are available on request. Field services, where provided, does not constitute supervisory responsibility. For additional information, please contact your local **Chem Coats** representative.

RANGE OF PRODUCTS

<u>WATERPROOFING SYSTEMS</u> <u>INDUSTRIAL FLOOR SURFACES</u> <u>PROTECTIVE COATINGS</u>	<u>PREPACKED REPAIR MORTARS</u> <u>CEMENTITIOUS & EPOXY GROUTS</u> <u>CONCRETE ADMIXTURES</u>	<u>SEALANTS</u> <u>CRACK INJECTION</u> <u>CONCRETE ADHESIVE</u>
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Table 1 Effects on compressive strengths at constant cement (OPC) contents of 350 kg / m³ and variable water reductions for a constant slump.

Table 1

Characteristics of wet mix					Compressive Strength MPA		
Mix	Dosage ltr / 100 kg OPC	Cement Kg / m ³	W/C Ratio	Slump Mm	1 day	7 days	28 days
Control Mix	-	350	0.571	75	8.0	21.0	32.0
ChemPlast 450 SP	1.80	350	0.457	75	15.0	34.5	45.0

Table 2 Effect on workability & compressive strength at constant cement (OPC) contents of 350 kg / m³ and variable water contents and increased slump.

Table 2

Characteristics of wet mix					Compressive Strength MPA		
Mix	Dosage ltr / 100 kg OPC	Cement Kg / m ³	W/C Ratio	Slump Mm	1 day	7 days	28 days
Control Mix	-	350	0.571	75	8.5	21.0	31.5
ChemPlast 450 SP	1.80	350	0.500	165	12.0	29.0	39.5