Duconmix ES PCE 860

TECHNICAL DATA SHEET (TDS)

High range water reducing superplasticising early strength ready-mix concrete Admixture based on PCE

DESCRIPTION

Formerly known as DUCONMIX WR SP 860.

DUCONMIX ES PCE 860 is an economical admixture based on modified polycarboxylic ether. It is a new generation admixture based on second generation polycarboxylic ether polymer with high early strength gains. **DUCONMIX ES PCE 860** is free of chloride & low alkali. It is compatible with all types of cements.

RECOMMENDED USE

- Precast concrete
- Capable for self-compaction
- Ready mixed concrete
- Concreting in cold weather
- High workability without segregation or bleeding
- High performance concrete for durability
- Congested/complex reinforced sections
- Mixes requiring >20% water reductions

FEATURES AND BENIFITS

- Low water cement ratio
- Obtain high early strengths
- Eliminate heat curing
- Improve surface appearance
- Rheoplastic & Rheodynamic concrete producing
- Optimize curing cycles by reducing curing time
- Increase productivity / reduction in cycle time
- Produce durable precast concrete elements
- Improved engineering properties, compared to traditional superplasticizer
- Early & ultimate compressive and flexural strengths, reduced shrinkage and low permeability

Chemistry and mechanism of action

DUCONMIX ES PCE 860 has a different chemical structure from the traditional PCE polymer based superplasticisers. The base PCE molecule used to formulate **DUCONMIX ES PCE 860** was custom made using nano-technology to enable effective dispersion with minimum hindrance of hydration process. It consists of a carboxylic ether polymer with long side chains and short main chains. At the beginning of the mixing process it initiates the same electrostatic dispersion mechanism as the traditional hyperplasticisers, but the short main chains facilitate quick start of hydration process. Rapid absorption of the molecule onto the cement particles, combined with an efficient dispersion effect maintains workability yet exposes increased surface of the cement grains to react with water. As a result of this effect, it is possible to obtain earlier development of the heat of hydration, rapid strength development of the hydration products and as a consequence, higher strength at a very early age.

Zero Energy System is based on a combination of the avant-grade admixture **DUCONMIX ES PCE 860** and the innovative technology of rheodynamic concrete. The Zero Energy System has been developed to help the precast concrete producer to rationalize his production process and save on energy costs combined with improved quality of the product and the working conditions.

PERFORMANCE TEST DATA

Aspect	Light Brown Liquid
Specific Gravity	1.08 ± 0.01 at 25°C
pH	≥6
Chloride ion Content	<0.2%

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TEST CERTIFICATION/APPROVALS

- ASTM C-494 Type A & F
- EN 934-2: T3.1/3.2
- IS 9103: 1999

DOSAGE

Optimum dosage of **DUCONMIX ES PCE 860** should be determined with trial mixes. As a guide, a dosage range of 350g to 750g per 50kg of cementitious material is normally recommended. Because of variations in concrete materials, job site conditions, and/or applications, dosages outside of the recommended range may be required in such cases.

Over dose effects:

- Reduced permeability
- Increase in air entrainment
- Bleed or segregation of mix, quick loss of workability
- Increased plastic shrinkage

A slight overdosing may not adversely affect the ultimate strength of the concrete and can achieve higher strengths than normal concrete, provided it is properly compacted and cured. Due allowance should be made for the effect of fluid concrete pressure on form work, and stripping times should be monitored.

APPLICATION

DUCONMIX ES PCE 860 is a ready to use liquid which is dispensed into the concrete together with the mixing water. The plasticizing effect and water reduction are higher if the admixture is added to the damp concrete after 50% to 70% of the mixing water has been added. The addition of **DUCONMIX ES PCE 860** to dry aggregate or cement is not recommended. Thorough mixing is essential and a minimum mixing cycle, after the addition of this admixture, of 60 seconds for forced action mixers is recommended.

SUGGESTED SPECIFICATION

The hyperplasticiser shall be **DUCONMIX ES PCE 860**, high range water reducing, high early strength gain, superplasticizer based on polycarboxylic ether formulation. The product shall be complying with ASTM C494 Type A & F and shall be free of lignosulphonates, naphthalene salts and melamine formaldehyde when subjected to IR spectra.

COMPABLITY

DUCONMIX ES PCE 860 is not compatible with Melamine or Naphthalene based admixtures and should not be used in conjunction in the same mix. It's compatible with lignosulphonates and carboxylic acid based plasticiser and retarders and also with most type of air-entrainers, accelerators, retarders, extended set-control admixtures, corrosion inhibitors, and shrinkage reducers. **DUCONMIX ES PCE 860** is also compatible with slag and pozzolans such as fly ash, metakaolin and silica fume.

CORROSIVITY – NONE CORROSIVE

DUCONMIX ES PCE 860 admixture will neither initiate nor promote corrosion of reinforcing steel embedded in concrete, prestressed concrete of concrete placed on galvanized steel floor and roof systems. Neither calcium chloride of any calcium chloride-based ingredients is used in the manufacture of **DUCONMIX ES PCE 860** admixture. In all concrete application, **DUCONMIX ES PCE 860** admixture will conform to the most stringent or minimum chloride ion limits currently suggested by construction industry standards and practices.

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PACKAGING

DUCONMIX ES PCE 860 is available in 5kg, 10kg, 20kg & 250kg drums or bulk.

WORKABLITY

DUCONMIX ES PCE 860 ensures that rheoplastic concrete remains workable in excess of 3 minutes at +25°C. Workability loss is dependent on temperature, and on the type of cement, the nature of aggregates, the method of transportation and initial workability. To achieve longer workability period please use retarding a retarder. It is strongly recommended that concrete should be properly cured particularly in hot, windy and dry climates.

STORAGE/ SHELF LIFE

DUCONMIX ES PCE 860 must be stored where temperatures do not drop below +5°C. If product has frozen, thaw at +5°C or above and completely reconstitute using mild mechanical agitation. Do not use pressurized air for agitation. Store under cover, out of direct sunlight and protect from extremes of temperature.

Shelf life is 24 months when stored as above.

Failure to comply with the recommended storage condition may result in premature deterioration of the product or packaging.

PRECAUTION

As with all chemical products, care should be taken during use and storage to avoid contact with eyes, mouth, skin and foodstuffs (which can also be tainted with vapor until product fully cured or dried). Treat splashes to eyes and skin immediately. If accidentally ingested, seek immediate medical attention. Keep away from children and animals. Reseal containers after use. Do not reuse containers for storage of consumable item. For further information, refer to the material safety data sheet.