

INFORMATION SHEET

19th October, 1992.

TEST FIRST – TRIALS ARE ESSENTIAL.

SUPER DISPERSANT

SUPER FLOW AGENT

SUPER WATER REDUCER

'COSMOTRON®' DPU-AC POWDER

An efficient water reducing – strength increasing – super plasticiser – cement dispersant admixture used in only small quantities in freshly prepared poured-in-place concrete, mortars etc., – which compliments the cement binder.

'COSMOTRON®' DPU-AC POWDER:

- * Is a safe-to-use, versatile non air-entraining cement lubricant, flow agent, water reducer and fluidifier for concrete and mortars.
- * Increases the durability, hardness, density, flexural, tensile, compressive, impact and bond strength of hardened concrete and mortars by dramatically reducing the water content, whilst maintaining the workability ease of a semi-fluid, uniform, homogenous, cohesive plastic mix.
- * Successfully and considerably reduces drying shrinkage, cracking and creep of hardened concrete and mortars. 'COSMOTRON®' DPU-AC is used with virtually all types of hydraulic cements including normal Portland cement.
- * Efficiently and effectively reduces energy for steam/burner controlled elevated temperature/humidity curing of concrete products, precast, pre-stressed and chemical pre-stressed concrete.
- * Can be added and re-added to any cement based mix in its plastic state to maintain slump with 15 – 30 % less water or increase slump at the same water content. Suitable for masonry cement; magnesium oxychloride; Portland pozzolan; sulphate resisting; oil well; white, off-white, grey and coloured Portland cements.

- * Allows the water content of plastic concrete to be kept low – thereby in the hardened state increasing corrosion resistance, mechanical strength and longevity, whilst maintaining placement ease at typical slumps (80mm.).
 - * Has the suggested optimum dose of typically 0.65Kg. ‘COSMOTRON®’ DPU-AC / 100Kg. cement which typically reduces the water/cement ratio (W/C ratio) from 0.55 to 0.38 and lower at normal consistencies.
 - * Although not necessary, it may be mixed with warm water prior to dosing if required. ‘COSMOTRON®’ DPU-AC dispersable powder – 40 parts by weight to 60 parts by weight of water – for addition to concrete / mortar mixes etc. as a liquid.
 - * USE ‘COSMOTRON®’ DPU-AC AT TYPICALLY 0.65Kg. PER 100Kg. OF CEMENT TO:
 - (a) Change target characteristic strength (F/C) 25 MPa concrete into 32 MPa hardened concrete at 28 days by reducing the water content of plastic freshly mixed concrete for the same slump.
 - (b) Change 80mm. slump 32 MPa concrete into flowing 32 MPa concrete at around a 160mm. slump – enabling placement in half the time. However, satisfactory vibration and compaction although easier is still required to remove all air voids in the plastic concrete and densify it.
 - (c) Change concrete to degrees within and without the bounds of these two (2) examples at different ‘COSMOTRON®’ DPU-AC dose rates.
 - (i) By reducing the water content and increasing ultimate strength.
 - (ii) High accuracy is unnecessary.
 - * ‘COSMOTRON®’ DPU-AC can be added to the plastic mix at the batching plant with the reduced water content (Approx. 15 to 25% less) or later on site. Alternatively, first make a gauging or mixing solution of the ‘COSMOTRON®’ DPU-AC with water.
 - * No special equipment is required.
 - * High accuracy is unnecessary.
 - * Results in normal setting time – but much higher early and ultimate strength.
 - * Is used to reduce the total water content in normal Portland cement based concrete, including all water in or on the aggregates – especially the water content of the sand, from (say) 160 litres to 120 litres per M_c (at approx. 0.8Kg./100Kg. cement), the strength is increased substantially and the setting time is unaffected – subject to and depending on cement content, concrete temperatures, sequence of addition, (Please Note That: used at the same dose rates, ‘COSMOTRON®’ DPU-AC does not retard the set and improves the performance in water reduction of regular, conventional water reducing admixtures). Another advantage is that the higher strength at early ages (from 18 hours after setting) allows earlier removal of formwork and therefore quicker construction.
- N.B. for quick setting as well as high early strength, the use of our ‘CEM-SWIFT’ non chloride set accelerating system in conjunction with ‘COSMOTRON®’ DPU-AC the setting time of the concrete at a given concrete temperature can be reduced by 20% approximately.
- * Powder ‘COSMOTRON®’ DPU-AC is packed in 15Kg. multi-wall paper sacks. Powder ‘COSMOTRON®’ DPU-AC can be pre-diluted with water before use. (Pref. At 50-60°C).
 - * Use ‘COSMOTRON®’ DPU-AC powder admix. to also produce:
 - Stronger, denser, crack-free, high bond, non-‘drummy’ cement renders/ wall finishes.
 - Low-shrink, flowable high-strength grouts.
 - Watertight concrete by designing a mix with a maximum of 190 Lt. of water per m_c.
 - High heat, high bond, refractory mortars – using our “Celerity” brand High Alumina (‘Fondu’) cement.

- Quality ‘stamp pattern’, normal or any other integrally pigmented coloured concrete paving - ‘COSMOTRON[®]’ DPU-AC eliminates ‘patchy’, blotchy spots and results in consistent, uniform colour over and within the total area of pavement.
- In temperatures above 25°C it allows multi-use of concrete moulds on a daily basis to produce two (2) precast concrete products from each mould. Use the quickset ‘CEM-SWIFT’ plus ‘COSMOTRON[®]’ DPU-AC system.
- Pump mix concrete that is thixotropic which flows exceptionally easily and does not bleed.
- Good looking, uniform, blemish-free, impressively smooth, architectural concrete of uniform colouration and appearance.
- More easily and economically placed flowing concrete in confined areas, large slabs, pavements, suspended floors etc.
- Low energy, elevated temperature and high humidity cured and hardened concrete.
- Concrete carted over long distances (use ‘COSMOTRON[®]’ DPU-AC retarding grade).
- Manufacture of highly aesthetic, quality precast concrete products with reduced fuel consumption for curing.
- Efflorescent and laitance-free poured-in-place concrete and concrete products.

- * **DISPERSION OF POWDERS IN WATER:**
Other grades of ‘COSMOTRON[®]’ DPU are highly recommended for use as particle repelling dispersants in many water based industrial processes. They reduce water content and lumpiness. ie. to produce free-flowing pastes without agglomerates or ‘seeds’ with less water. They reduce viscosity and/or allow the increase of particulate solids in a slurry or suspension.

‘COSMOTRON[®]’ DPU grades are also used as efficient secondary EMULSIFIERS, WETTING AGENTS-SURFACE ACTIVE for all water based liquids and are SEQUESTERING AGENTS.

Please request the relevant product data from Ability for your industry.

CURING:

Curing of concrete, that is, the prevention of evaporation of the mixing water used to make the concrete, mortars, grouts etc., after it has set it is very important to ensure that it remains available for the continuing chemical hydration process thus ensuring maximum strength, hardness and durability. When using an efficient water reducing admixture like ‘COSMOTRON[®]’ DPU-AC for making concrete with a film-forming membrane liquid, designed for the purpose, or keeping the set (but not completely hardened) concrete damp for as long as possible.

We recommended the following Ability Building Chemical products to achieve effective, easy curing.

- * ‘DY-ON-CRETE[®]’, CLEAR –
A liquid water wash-up, acrylic emulsion based coating material. Clear, white or colours. Water based adhesives can later be applied to surfaces treated with ‘DY-ON-CRETE’.
eg. To adhere vinyl, ceramic tiles, slate etc. to the concrete surface with water wash-up adhesives.
- * ‘LUBRI-TITE[®]’, WS-A, CLEAR –
A liquid wax and water based emulsion. Spray, brush or roller application. Supplied as a white emulsion liquid which dries to a highly watertight clear film. Spillage and application equipment is cleaned with water
- * ‘LUBRI-TITE[®]’, WS-A, WHITE –
As above but available on firm, advance order pigmented white with high quality TiO₂ Titanium Dioxide white pigment. Dries to a white film.

- * 'DURO-SEEL' – A PROPRIETARY PIGMENTED CURING COMPOUND & COLOUR SEALER
'DURO-SEEL' is a safe-to-use, solvent based, most highly efficient, innovative and durable product. It cures, colours and seals in one application. Available in various oxide/ochre type colours. eg. Black, brown, light brown, red, beige, marigold, yellow, green and white. This colour-sealer/ curing compound is normally applied by roller, spray or brush/ broom to 'just-set' freshly placed concrete very soon after finishing has been completed. It ensures very efficient curing and therefore ultimate strength and abrasion resistance of coloured or unpigmented plain concrete. Provides decorative, consistent, uniformly even colouring for coloured concrete of all types – particularly stamp patterned concrete.

'DURO-SEEL' can also be applied to clean, hardened, existing concrete as a decorative coloured, penetrative sealer. It is also popular for durable colouration of concrete roofing tiles, masonry brick and pavers, sand-stone, slate and other types of building stone. Application equipment is cleaned with a safe, easy-to-obtain solvent – mineral spirit (mineral turps).

- * 'DURO-SEEL' CLEAR RESIN SEALER –
As above for 'DURO-SEEL' colour sealer, but not pigmented. Dries to a translucent water vapour-proof clear, durable finish on either just set, freshly placed concrete or clean, sound, hardened, existing concrete. This clear sealer does not appreciably darken or change the colour of a concrete surface, giving a durable low sheen finish. Two (2) coats minimum are recommended for durability. The more coats, generally, the longer all coatings last.

- * SEQUENCE OF ADDITION:
'COSMOTRON[®]' DPU-AC powder can be added or re-added to concrete, mortars or grouts etc. at any stage of their liquid/plastic phase. However, some retardation of set can occur if it is added to a cement mix first. (ie. 'COSMOTRON[®]' DPU grades should preferably be added to a cement mix which has already been wetted and mixed to some degree with water if the shortest possible setting time is required such as for the earliest finishing of (say) a concrete pavement in cold weather conditions. It is therefore advisable to either: –

- (a) Add the 'COSMOTRON[®]' DPU-AC to the concrete after the water and some initial mixing.
- (b) Add the 'COSMOTRON[®]' DPU-AC to water first to make a dispersion of a concrete gauging or mixing liquid which is then added to the mix in a rotating mixer last.

(N.B. Dispersions of 'COSMOTRON[®]' DPU-AC in hot water at a 0.5% 'COSMOTRON[®]' DPU-AC weight/cement weight used as the mixing or gauging liquid for concrete or mortar, will reduce the setting time of that concrete in cold weather made to a given slump or degree of plastic consistency).

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