'COSMOTRON®' DPU-CA POWDER
A Rapidly Dissolving Industrial Dispersing Agent

A processing aid for aqueous systems of incomparable excellence used in small quantities to invariably result in better product colouration and quality with increased profits for many industries.

DESCRIPTION:

'COSMOTRON®' DPU-CA powder is a safe-to-use, biodegradable, high efficiency, non-foaming, surface active agent for industries required to disperse fine solid particulates in *aqueous water based* bound composite materials and products.

It is supplied in the form of a pale brown 'rapidly' dissolving powder.

Used in relatively small amounts, it is intended for beneficial use with one or more fine particulate powders such as colouring pigments, industrial minerals, synthetic or natural ground mineral extenders and fillers, silts, ores, unprocessed clays, cements, fly ashes, and crushed pulverised granulated blast furnace slag required to be uniformly and quickly dispersed (de-agglomerated) into discrete separated particles whilst being processed with and/or transported in water or water-containing liquids or to have the viscosities/flow rates of these modified. It is also most effective in speeding up the dissolving process in the uniform colour dying of fibres using soluble colouring dyestuffs.

'COSMOTRON®' DPU-CA for aqueous systems may also be used as a secondary emulsifier say, for instance in conjunction with Ability's 'ABILMELD' (primary emulsifier and particulate dispersant for *both* aqueous and non-aqueous systems) to produce (and help to maintain the stability of) suspensions, dispersions or emulsions of liquids immicible with water such as is required for the manufacture of acrylic emulsion latices, oil in water emulsions, liquid solvent (non-aqueous based) resins emulsified in water etc.

DISPERSANTS AND PROFITS.

Most surface active agents ('surfactants' for short) and particularly the rare breed of 'pure' *dispersants* [whose sole purpose is to disperse and de-agglomerate, agglomerated particulates *without* foaming in liquids] when used in mixtures of fine grain solid powders in any liquid cause the particles, which are usually 'clumped' or partially bonded together in agglomerates (or 'flocs') whilst being mixed, to immediately de-agglomerate (de-flocculate) and separate into their 'dispersed' individual form. This action and effect has significant commercial/economic significance for virtually all processors of fine and ultra-fine solid particle powders in liquids.

PROFITS RELATED TO TIME:

Most people would doubtless agree that one of the most important factors in the profitable manufacture of many industrial or consumer products and materials is the time factor. Whether we like it or not, commerce and industry are ruled by time. Many people nowadays are remunerated according to the time spent in producing a given number or actual amount of a product or service. As money only represents work done, output results related to time is of the utmost economic importance – 'time is money' as the old adage goes.

TEST FIRST. TRIALS ARE ESSENTIAL!

'COSMOTRON®' DPU-CA water dissolvable powder is an important raw material used as a mixing aid and dispersing agent - an excellent tool in providing *reduced costs and increased quality in less time.* These benefits can apply to the Manufacturer, Production Manager, Process Engineer, Architect, Civil Engineer and other professionals concerned with the efficient, rapid handling, manufacturing and processing of products that are, at least initially before they harden, based on mixtures of fine solid particles of material in a water-containing liquid or in water itself. Examples are, water-based coatings, aqueous liquid penetrative coating sealers, paints, lacquers, inks, baked clay bricks, 'cold' asphalt emulsion bound composites, cement mortars, grouts and concrete, adhesives, balloons, putties, sealants and crack fillers, as well as for manufacturing, polishing and water rubbing compounds, cosmetics and personal care products, the processing of oil well cements, mineral slurries and muds, industrial sludge and other similar composite materials.

Used as an integral additive, added to these composite materials in their 'liquid' or 'semi-liquid' form, rapidly dissolving, 'COSMOTRON®' DPU-CA powder is also of considerable assistance, without the addition of further water, in improving the floatation and flow and/or increasing the solids and/or reducing the viscosity of slurries, sludges etc, enabling their easier and/or quicker handling and transport – for example, slurries encountered in the mining, effluent control and wet-process cement manufacturing industries.

'COSMOTRON®' DPU-CA is also highly recommended for evaluation as a grinding aid for cement manufacture by both the dry and wet process routes, as well as for enabling the more efficient grinding of industrial minerals, pigments, dyestuffs and other particulate powders required to be of a fine grain size.

FINE Vs COARSE PARTICLES IN LIQUID MIXTURES:

Most mixtures of fine particle solids in a water-based (aqueous) liquid binding medium, vehicle or carrier are often regarded as being vastly superior in quality and having significantly better properties when the solid particles are very fine and in particular when they are properly dispersed or separated from one another in the liquid, eg as in the coatings manufacturing industries, a premium, high chroma, exceptionally high gloss pigmented automotive lacquer compared with a cheap undercoat or distemper or (a rather extreme baked clay example) a fine, thin, beautiful porcelain china jug compared with a cheap earthenware pitcher.

MIXING EQUIPMENT:

The physical separation of the particles in mixtures of fine particulate solids in liquids is the main reason for the process of mixing. The mixing blades or impellers of a mixer introduce their energy as 'shear' into the liquid. As a result, the shearing forces that are set up in the liquid, should eventually overcome the electrical surface charges causing the constant tendency of the non-dissolving particulate solid grains to 'clump', stick or agglomerate together and thereby achieve higher degrees of uniformity in such a mixture – particularly the colouring shade, consistency and full colouring strength development of fine colouring pigments.

Efficient, high shear mixers are often regarded by managers, imbued with the constant task of making good monetary profits by means of cost effective, efficient manufacturing, as *very* economically important to them. This is because *high shear* mixers achieve this de-agglomeration process more quickly than with those that are inefficient. Efficient processing/ mixing/ dispersing equipment capable of quickly achieving uniformly consistent, homogenous de-agglomeration, with the use of surfactants as processing aids, can produce quality particulate suspensions or dispersions in less time with therefore greater profit potential.

In a finished product comparison, all other things being equal, a solid/ liquid product such as a paint, adhesive, ink, suntan lotion (with ultra-fine particle Titanium Dioxide and/or Zinc Oxide pigment particles incorporated as a UV 'blockout' absorber), patching compound, eye shadow, other cosmetics etc, can therefore be produced at less cost. If all other costs are the same and at the same selling price as a competitive product, a product produced in a shorter time adds up to less cost/per unit and a higher profit to the producer as more of them can potentially be made per unit time.

Unfortunately, mechanical engineering 'masterpieces' – the cream of the best designed and constructed mixing/dispersing machines may not be able to achieve an ideal degree of dispersed uniformity of a composite liquid in the short mixing times often required for certain products to be competitive in the marketplace, and therefore instantly acting chemical surfactants added into the product mix may be used in combination with the physical shearing/mixing process to shorten the effective dispersing times of fine particulates.

SURFACTANTS:

Surfactants are not all the same but most, like their full name, Surface Active Agents introduce opposite electrical charges onto the surfaces of fine particles in liquids causing them to be repelled from one another – much the same as the opposite poles of a magnet repel each other.

The use of a good surfactant makes sound, economic sense in many of today's manufacturing processes including benefits additional to the improvement of the actual mixing and dispersing process such as superior workability or rheology, easier extrusion or shaping properties, less amounts of energy required for drying processes and better, easier and faster handling – in the logistics of transport, movement, packaging involved with solid/liquid mixtures – flowable liquids or semi-solids – in the factory, or elsewhere.

As an ultra-efficient chemical de-floculator/de-agglomerator 'COSMOTRON®' DPU-CA rapidly dissolving powder CAN SAVE YOU MONEY by assisting the mixing and dispersion process of fine particles in water very quickly – any amount of water – from thick, viscous semi-solid wet clays where more (dry or semi-dry) clay particles can be added per unit water content if required in the manufacture of baked clay products - to a thin, low viscosity liquid coating paint or lacquer in surface coatings manufacture. It may also assist you by reducing the viscosity and increasing the flow of the mixture *without* adding further water.

BENEFITS OF DISPERSING WITH A *NON-FOAMING* SURFACTANT:

Unfortunately almost all types and brands of readily available surfactants may potentially cause side-effect problems. One of the worst is foaming – the tendency to entrain air bubbles in the mixture.

Most surfactants reduce the surface tension of water (and mixtures containing water) and this effect combined with the mixing action, result in bubbles of air being introduced into the mixture – a phenomenon which may be beneficial in some cases such as for detergency in dirt lifting cleaning compounds and dish washing liquids but which is counter productive by causing problems associated with the occurrence of foaming. Suffice to say here that these problems include manufacturing, handling, canning/packaging and product quality problems. For instance subject to the degree, intensity, fineness and stability of the foam in the dispersion product, it is most difficult to pack the advertised full measure (volume or particularly weight) into product containers.

***AVOID* PROBLEMS ASSOCIATED WITH AIR BUBBLES!**

In a manufactured product that ultimately becomes a solid but is initially manufactured or processed as a liquid or semi-solid, such as a 'just' flowing, semi-solid plastic polymer being extruded or moulded into its final shape followed by subsequent hardening, air bubbles reduce the density (weight VS. volume) of the final product making it 'lighter in weight'.

Lower density than that intended for a particular product, can mean lower durability and particularly lower mechanical strengths to result in unacceptable, and often very poor service performance eg if only 10% by volume of hardened concrete, [which is a mixture of coarse aggregate, relatively fine aggregate (such as sand), hydrated Portland or other type of cement which when hydrated (hardened) includes chemically bound water], consists of entrained air voids, its compressive strength, load bearing capacity and abrasion resistance is reduced by the dangerous amount of about 50%!

Most fortunately 'COSMOTRON®' DPU-CA is a surfactant that does NOT reduce the surface tension of water and generally therefore does NOT of its own volition produce foam. It consequently allows users to be potentially free of these problems. Therefore in the large family of surfactants, 'COSMOTRON®' DPU-CA powder may be regarded as a fairly rare PURE dispersant rather than one which produces a 'soaping' or foaming action such as those used as the active component(s) of cleaning and laundry detergents, (eg 'TEEPOL').

'COSMOTRON®' DPU-CA non-foaming, high efficiency, rapidly dissolving industrial dispersant powder is available from Ability Building Chemicals Co packed in 25kg net multiwall, Kraft paper bags. A comprehensive combined Product Data Sheet and Specification as well as a Material Safety Data Sheet will be made available to you promptly upon request.

Variations of 'COSMOTRON®' DPU-CA are made by Ability for use in specialised industries. Example, **'COSMOTRON®' DPU-*AC*** which features the maintenance of normal setting times is intended for use in Portland cement bound concrete, all concrete products, mortars, flowable fill, grouts etc. This product's benefits are to increase the density, mechanical strength and chemical, weathering, abrasion and impact resistance of concrete. It can also assist in the manufacture of high strength, high performance Portland and other types of cement powders.

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ABILITY ARE MANUFACTURES OF FINE, UV RESISTANT **'abilox®'** AND **'duro®' COLOURING PIGMENTS, ADDITIVES ETC** FOR INDUSTRY: WE ALSO MAKE **CHEMICAL ADMIXTURES** TO MODIFY, PROTECT, DECORATE AND IMPROVE THE PERFORMANCE OF CONCRETE & MORTARS AS WELL AS BEING THE CREATORS OF A RANGE OF SPECIALISED, LONG-LIFE, HIGH PERFORMANCE **SURFACE STAINS** AND **COATINGS FOR CONCRETE** AND OTHER BUILDING MATERIAL SURFACES.

WAREHOUSE AND OFFICE:
(PO BOX 391)
133-135 NORTHERN ROAD
WEST HEIDELBERG VICTORIA, 3081, AUSTRALIA
TEL: **(03) 9457 6488**
INTERNATIONAL TEL: **+61 3 9457 6488**
FAX: **(03) 9458 4683**
INTERNATIONAL FAX: **+61 3 9458 4683**
www.abilityproducts.com.au
Email: service@abilityproducts.com.au

CONTACTS:
PETER GRAY - Manager
MICHAEL TREACY – Production Manager

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DPU-CA