PRODUCT INFORMATION -
DIATOMITE D5 INDUSTRIAL MINERAL POWDER

Diatomite D5

(Diatomaceous earth, ground Diatomite)

DESCRIPTION:
DIATOMITE D5 is derived from geological deposits of fossilised flowerless microscopic plants called Diatoms. The product has an *ultra-fine* particle size, safe-to-use non-crystalline amorphous siliceous mineral powders consisting of tiny irregularly shaped particles similar in shape to minute sponges with a myriad of 'valves' having a very high surface area and porosity.

Diatomaceous earth industrial mineral products are almost pure silica. They are also known as Kieselguhr, Fossil Flour and Infusorial Earth. They have been used industrially since antiquity.

The product is a white powder in air. Although it has normal refractive indices typical of most industrial minerals, it also appear white in hardened organic aqueous binders and coating vehicles ie in hardened WATER-based organic coating mediums, as well as in polymer resin emulsion latex modified inorganic mineral binders such as cement (grey), off-white and white cement and/or lime with or without modification with PVA^{c} (Polyvinylacatate) resin, SBR (Styrene Butadiene Resin), Acrylic resin latex emulsions (dispersions) etc. In oils and non-aqueous resin binders Diatomite D5 is virtually transparent*. It has high liquid absorption characteristics and matting (flatting) capacity – a characteristic used to reduce gloss in coatings manufacture. Diatomite minerals can absorb three times their own weight of liquid before saturation. They can occupy a large surface area and spread evenly. It is estimated that 1 gram of diatomite can cover an area of 8.5 square metres.

SUGGESTED USES FOR DIATOMITE D5:

1. This finely divided particulate minerals of Diatomite D5 - are used with the important procedure of curing** after setting as **Pozzolanic** additives (ultimate strength increasing admixtures) for Portland cement and/or hydrated lime bound concrete, mortars, grouts etc - particularly for all grades and classes of pre-mixed concrete, GRC - glass reinforced cement products and thin woven wire reinforced Ferro Cement panels, building structures and products such as boats, yachts, ships etc.

* *In oleo-resinous/non-aqueous solvent based paint, varnish and lacquer coating media and binders such as drying oils, solvent cut polymer resins etc without opacifying white pigment such as Ability's titanium dioxide based abilox®' Illumin-ite White oxide, Diatomite D5 appears translucent and semi-transparent having virtually no whitening or opacifying effect.*

****** *Curing is a procedure adopted to effectively retain the mix water in cement bound materials immediately after setting for a period of 7-28 days to thereby prevent its evaporation and in so doing prevent loss of their mechanical design strengths and performance.*

TEST FIRST BEFORE ACTUAL USE. TRIALS ARE ESSENTIAL.

The **ultra-**fine **Diatomite D5** (5µm mean particle size) grade in particular is used in this way as a pozzolan (pozzolana) to effectively **increase** the ultimate mechanical strengths, shrinkage and cracking resistance, impact resistance, abrasion resistance, surface hardness, chemical and water resistance of Portland cement bound concrete and mortars if properly cured.

Curing in this context means the adoption of any efficient process or procedure *immediately* after setting on the same day as placement to prevent the evaporation of the concrete's mix water over a 28 day or preferably longer period.

Typically, for the pozzolanic effect in concrete, 10-20 parts by weight of Diatomite D5 is added to 100 parts by weight of Portland cement. This ratio is used as the total binder in Ferro-Cement structures and products such as ships, boats and buildings using fine steel mesh as reinforcement, as well as potentially in cementitious (containing cement) paints, applied finishes, many grades and classes of Portland cement bound pre-mixed concrete as well as for virtually all mortars and engineering grouts.

2. For concrete floors and pavements that is more acid resistant than normal concrete.

3. As suspending and **flatting** or **matting** agents for coatings, (paints, lacquers, varnishes and inks) adhesives, transparent timber finishes and glazes, 'polishes', sealers etc. The incorporation by efficiently stirring in and dispersing the Diatomite powder – preferably by means of high intensity, high sheer dispersing equipment - of approximately 2-3% Diatomite powder by weight on binder resin solids – into solvent based polymer mixes; resins, paint media etc usually results, proportional to the dose rate in a considerably lower gloss or sheen of the dried films. Diatomite D5 is used in paint and ink formulations as secondary and primary non-hiding white filler pigments to impart this desired flatting, the achievement of impermeability to liquids and retention of prime pigments in service.

   DIAMOMITE D5 is also used as non-hiding white extender filler pigment to modify the rheological flow and working characteristics of liquid formulations, coatings and adhesives – particularly to increase **viscosity** and/or produce **thixotropy** in coatings to for example, reduce roller 'splatter' and 'run down' on vertical surfaces.

4. As a white filler in paper, synthetic rubber and plastics. Diatomite D5 is potentially suitable for applications in the paper industry because of its high brightness, uniform particle size distribution, low moisture and abrasive characteristics and binder absorbing matting capacity.
5. As an absorbent – the products is a *highly* absorptive powder material. It is used to absorb various gases and to soak up liquid spillages in industry, stains in carpets, other absorbent floor coverings and absorbent surfaces generally.

6. Mixed with water and detergent it is used as effective non-toxic, natural mineral sprayed insecticide for killing insects such as fruit fly, cockroaches, grasshoppers, aphids and coddling moth in 'organic' insecticide-free farming and horticulture.

7. As a carrier of disinfectants like **DDT.**

8. For ultra efficient filtering of liquids used or produced by various food manufacturing industries including the production of beer and other beverages, syrups, clean, clear water for swimming pools, antibiotic products and water treatment. Also in copper plating solutions, magnesium bicarbonate solutions etc, as well as for filtering industrial hard resins, resin solutions, oils etc after manufacture or processing prior to packing to eliminate 'cloudiness' and result in complete product transparency.

9. In brake and clutch linings for improved dispersed constituency of the abrasion resistant materials in the formula to achieve extra abrasion resistance.

10. As an additive for mildly abrasive cutting and polishing compounds of most types - used for polishing metal, glass, dimension stone such as marble and granite, automotive finishes etc.

11. In refractory and other baked clay products such as bricks and pavers.

12. Due to Diatomite's D5's thermal conductivity it may be used in bricks, batts and other products for insulation against temperature variance and noise control (thermal and acoustic insulation). The powders are bound with a suitable binder into blocks, bricks, batts etc.

TYPICAL CHEMICAL AND PHYSICAL PROPERTIES:

Amorphous Silica	SiO_2	88.4%
Magnesia	MgO	0.9%
Alumina	Al_2O^3	5.9%
Ferric Oxide	Fe_2O_3	2.3%
Titanium Oxide	TiO_2	0.41%
Other Oxides		5.17%
Lime	CaO	0.5%
Phosphate	P_2O_5	0.20%
Loss on Ignition:	(1000ºC)	5.9%
Sodium	Na_2O	0.7%
Potassium	K_2O	0.4%
GE Brightness		86-89%
pH	(20% suspension)	8-9
Specific Gravity	S.G.	2.4
Oil Absorption	(mls/100g)	110
Bulk Density	(compacted g/cm³)	0.3
Dry loose density		65-80 gm/litre
Particle Size		
D5:	Mean particle size: 5µm	
Refractive Index		Approx. 1.65
Colour		White
Wettability/Dispersibility		Easily dispersible in aqueous and non aqueous solutions and suspensions
Flow rate (ml/sec)		4.5 to 5.5
Clarity		About 60%
Solubility in acid		Insoluble
Temperature resistance		About 1400°C
Thermal conductivity ('K' factor)		0.3 to 0.5

PACKING:

(1) **DIATOMITE D5** is packed in 15kg net multi-ply paper sacks and 'Concrete Friendly'® degradable bags.

TEST FIRST BEFORE ACTUAL USE
- **COMPREHENSIVE EVALUATION IN YOUR PRODUCT OR PROCESS IS IMPERATIVE!**

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(PO BOX 391)
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WEST HEIDELBERG
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TEL: (03) 9457 6488
INTERNATIONAL TEL: +61 3 9457 6488
FAX: (03) 9458 4683
INTERNATIONAL FAX: +61 3 9457 4683
EMAIL: service@abilityproducts.com.au

CONTACT: PETER GRAY - Manager

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