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Nutech Paint Pty Ltd

Concrete Coatings & Sealers

Technical & Application Guidelines

Guidelines for product selection, surface preparation and application;

- **The different types of concrete paving and decorative surfaces,**
- **Nutech concrete coatings and sealers including PaveCoat™ Clear & Colours, Pavecoat H2o, Cure & Seal, Slate Sealer, SO 2000, Aqua Floor, Aqua Epoxy, PR 200 & 210 Petrol Resistant, Silicon Sealer, Epic Epoxy500, Epic PolyCryl and Epic Industrial Enamel.**

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1.0 Nutech Coatings and Sealers for Plain and Decorative Concrete

The use of clear and coloured coatings and sealers on plain and decorative concrete has become very popular today. It is a simple, attractive and cost-effective way of decorating and protecting concrete paving, driveways, garages, floors and factories. The purpose of coating concrete includes;

- To colour plain concrete,
- To provide a glossy wet look enhancing the appearance of decorative and patterned concrete finishes,
- To protect oxide colours, dyes and pigments in the surface from weathering and ultra violet light damage,
- To seal the surface and provide resistance to oil, staining and discolouration,
- To prevent dusting of the concrete surface,
- To assist curing of the concrete at the time of construction through 'same day' application on green concrete,
- To provide slip resistance on smooth concrete by incorporating a particle texture,
- To improve cleaning ability and ease.

Nutech manufactures a wide range of concrete coatings under the brand name **PaveCoat™** designed for various conditions and performance requirements. PaveCoat™ Concrete coatings and sealers are manufactured from a range of resins including solvent solution and water emulsion acrylic resins, silicon, enamel, epoxy and polymer resins.

Nutech PaveCoat™ Clear and Coloured Concrete Sealer is the most popular brand. This product is manufactured from a solvent solution acrylic resin, commonly referred to as a polymer resin or solution acrylic.

Nutech PaveCoat™ PR 200 & PR 210 Concrete Sealer is manufactured from a special grade of polymer resin providing special petrol resistant properties for garage and workshop floors. The Nutech Epic Enamel, PolyCryl and Epoxy coatings are best suited for commercial applications. Nutech also manufactures a clear water based concrete sealer called, Pavecoat H2o and a clear water based two component Epoxy coating called Nutech Aqua Epoxy.

The wide range of different sealers available from Nutech include;

- PaveCoat™ Clear which incorporates ultra-violet light protectives to enhance durability (internal/external),
- PaveCoat™ Cure & Seal Clear to improve penetration and adhesion and to assist curing of freshly poured or 'green' concrete – this is described in the industry as a 'wet-on-wet' concrete sealer (internal/external),
- PaveCoat™ High Gloss Clear and Colour which provides an enhanced 'wet look' appearance (internal/external),
- PaveCoat™ Low Sheen Clear and Matt Clear which give a more natural and less glossy appearance (internal/external),
- PaveCoat™ Coloured Sealer which provides a fully pigmented solid colour (internal/external),
- PaveCoat™ PR 200 Clear and PR 210 Coloured petrol resistant sealer (internal/external),
- PaveCoat™, Pavecoat H2o clear & coloured water based concrete sealer for internal applications with benefits including low odor and non-flammability (internal/external).
- Nutech PolyCryl Clear & Coloured two-pack non-isocyanate cross-linking polymer sealers for improved durability, adhesion and chemical resistance – internal and external use recommended (airless sprayable)
- Nutech Epic Epoxy 500 two-pack epoxy resin internal floor coating systems for ultimate durability, adhesion and chemical resistance (internal use only),
- Nutech Epic Epoxy 100 clear and coloured self-leveling solvent free two pack epoxy resin for ultimate durability, adhesion, chemical resistance and high film build properties (internal use only),
- Nutech Aqua Epoxy clear and coloured two pack water based epoxy resin for ultimate durability, adhesion, chemical resistance and very low odor properties (internal use only).

Before applying a concrete sealer, a number of factors should be carefully considered. These factors include, but are not limited to the following;

- Variables in surface conditions - smooth steel trowelled or rough float finished concrete

- Existing surface treatment - hardened, stone dust, coloured topping etc.
- Decorative finishes - plain, coloured, pattern, stencil, slate look, spray-on, pattern
- Weather conditions - hot, cold, wet, night condensation
- Age of concrete - new green uncured & partially or fully cured concrete
- Surface preparations - to remove contamination, salts, laitance and concrete powder
- Application factors - broom or spray application
- Existing surface coating/s - acrylic, silicon, enamel, polyurethane, epoxy, fluorosilicate etc.

All Nutech concrete coatings and sealers perform exceptionally with the performance criteria established in the relevant Data Sheets subject to correct surface preparation and application procedures.

Product price and properties, surface preparation requirements, ease of application, re-coatability, wear resistance, external durability and chemical resistance each play important roles in the customer selection process. Our best recommendation is that you obtain expert advice from your local Supplier and our Nutech Paint Specialists to choose the correct product for your specific application requirements. You will not be disappointed if you chose the correct product and follow application instructions carefully.

It is important to state at this point that even the best coatings and sealers will fail if the manufacturer's instructions are ignored. The important lesson is that it is the role of the Concreter/Applicator to ensure that the concrete surface is correctly prepared and that the correct sealer is applied properly to prevent problems both during application and when resealing occurs at a future date.

2.0 Performance and Application of Nutech Concrete Coatings

Each Nutech concrete coating and sealer has a specific set of performance criteria which must be carefully understood. For example when applied correctly Nutech PaveCoat solvent and water based acrylic sealers are durable, non-yellowing and long lasting. However they are subject to mechanical and chemical damage.

Nutech Epic Epoxy coatings are much more durable when used internally and less affected by mechanical and chemical damage. However they are not suitable for exterior exposure and will chalk, fade and ultimately fail when exposed to exterior weather conditions.

Nutech non-isocyanate Polycryl can be airless spray applied with minimum safety precautions. On the other hand, Nutech premium two pack isocyanate Polycryl can only be airless spray applied when careful safety and environmental issues are addressed due to Occupational Health and Safety requirements.

In summary all coatings lose flexibility, become brittle and lose some adhesion properties with age. All concrete coatings will require re-application after a period of time, subject to coating thickness, weather, moisture exposure and wear characteristics.

As a general rule to guarantee both short and long term adhesion, all Nutech coatings must penetrate into the concrete surface to obtain a physical key. When any Nutech concrete coating is applied to a smooth non-porous surface it will develop adhesion problems, unless precautions are taken.

Therefore it is very important to understand the nature of various concrete paving and floors, to ensure the appropriate surface preparation and the correct coating selection and application.

Correct product selection is critical when coating industrial or factory floors. Please refer to Nutech Epic Epoxy, Epic Enamel and Epic Polycryl Data Sheets and the Epoxy and Motor Repair Workshop Guidelines in conjunction with this information.

3.0 Types of Concrete Paving

Different types of concrete paving require different preparation and sealing practices. The following are guidelines only and specific Nutech Product Data Sheets, Product Guidelines and Material Safety Data Sheets should always be carefully read before application.

3.1 Plain Concrete - Smooth Trowelled and Rough Stippled Surfaces

The concrete may be uncoloured or coloured using a liquid or powder additive or surface coloured with hand cast topping powders trowelled into the surface. Topping colours usually contain coloured oxides, hardeners such as chemicals, cement or stone dust and casting or texture aids such as sand. Clear and coloured PaveCoat sealers are commonly used on these surfaces.

PaveCoat™ Cure & Seal can be applied on green uncured concrete provided the surface is not wet and the weather is suitable. In winter 'same day' sealing may not always be possible. If the surface is not sealed on the 'same day', waiting is recommended until the concrete surface has started to whiten. This indicates adequate surface curing allowing preparation of the surface for sealing. In summer this can take one or two days and in winter from several days to a week.

It is wrongly believed by many concreters that new concrete does not require preparation before coating or sealing. Preparation of all cured new and old concrete surfaces should include high pressure water blasting. This removes salts, laitance, concrete powder, dirt and contamination. Brooming the surface, cleaning with a garden hose (with or without clip on attachments) or using a fire hydrant is not recommended as a substitute for high pressure cleaning.

Before coating new and old concrete it is essential to remove all grease, oil and food contamination. Acid etching will not remove these contaminants. Degreasers and floor cleaning detergents are required to remove these contaminants prior to acid etching. Floor grinding will not adequately remove contaminants. In new factories, floors are contaminated by oil and grease from work vehicles, forklifts, scissor lifts and food scraps. Degreasing these areas is essential before coating. Sometimes identification is impossible and these small contaminated areas can result in localized adhesion problems in future.

To guarantee successful coating of all concrete surfaces acid etching is highly recommended using a solution of 1 part Hydrochloric Acid to 15 parts clean water. It is essential that smooth steel trowelled and topping hardened surfaces are acid etched before applying any sealer. There are two exceptions to this requirement where acid etching is not recommended;

- (i) On rough wood floated stencil concrete,
- (ii) On spray on cementitious/polymer coated concrete

Except in these cases acid etching improves the surface porosity of the concrete helping the sealer penetrate into the surface to guarantee adhesion. This is particularly useful on old hard concrete, new and old smooth steel trowelled concrete, polished concrete and surface hardened concrete. The surface must be thoroughly flushed with clean water to remove the acid solution. Neutralising the acid with a household grade cloudy ammonia solution is a good practice prior to flushing, but is not essential.

To apply the first coat of sealer, follow the Product Data Sheet regarding dilution and coverage. Adding 1 part suitable Thinners to 4 parts PaveCoat for the first coat is common on rough concrete. Add 1-part suitable Thinners to 1 part PaveCoat for the first coat on smooth topping hardened concrete surfaces. A coverage of approximately 4 to 5 square metres per litre is normal for PaveCoat Clear and Coloured Sealers. Nutech Thinners is suitable for most PaveCoat products.

Pavecoat H2O can be diluted with water, maximum 20% on bare concrete to assist surface penetration. No dilution required for subsequent coats.

Coverage and dilution rates for Nutech Epic Epoxy, Epic Polycryl and Enamel Coatings differ greatly and specific Thinners are supplied for each product. Refer to your Nutech Supplier for details.

If the surface is correctly cleaned and prepared the first coat should partially penetrate into the concrete leaving a patchy appearance (except on cementitious/polymer coated concrete). With spray-on cementitious/polymer coated concrete diluting the first coat of sealer is not required as it will increase any surface softening and retard the curing process.

A second coat of sealer is always recommended for an even appearance and durable surface. Adding thinners to a second coat of sealer is usually not required. In hot weather adding 10% thinners to the second coat can reduce the possibility of surface bubbles forming.

If the concrete is finished with a heavy stipple or broom finish, the strength of the concrete surface should be taken into consideration if a coloured sealer is to be applied. If the stipples can be easily broken off the concrete the surface is weak and applying a coloured sealer is not recommended without special surface preparation. Refer to your Nutech Supplier for details.

Allow at least several days for a sealer to harden before vehicle traffic is allowed. Ensure additional time is allowed in hot weather to avoid tyre adhesion problems. It is a good practice to prevent parking of very hot car tyres on new sealer for at least one week. Vehicles can be parked on the street until tyres cool, or drive the vehicle quickly across the sealed concrete to access a garage or unsealed area.

3.2 Slip Hazard and Pedestrian/Vehicle Safety

Coating or sealing any concrete floor or paving will always create the risk of a slip hazard for vehicles and pedestrians especially on smooth and sloping surfaces, particularly when the surface is wet. On sloping surfaces multiple coats of PaveCoat can result in a slippery surface, particularly when the surface is wet due to increased coating buildup.

For this reason coating or sealing on steep slopes is not recommended.

The use of Nutech Anti-Slip Powder additive in the final coat of sealer will improve slip resistance, however testing is always recommended before application to confirm satisfactory results. The manufacturer and supplier make no guarantee or promise that the inclusion of the anti-slip additive in the coating will prevent slipping or ensure pedestrian and vehicle safety.

The use of the anti-slip additive will not be sufficient to overcome slip problems on steep smooth driveways in wet weather. Previously non-slip surfaces can also become slippery on re-sealing due to coating build up.

It is always the responsibility of the applicator to test and establish that a safety risk is not caused by coating, or re-coating on each and every job. Due to variations in surface texture, pattern and slope specific guidelines to assist applicators cannot be made. It is the applicators sole responsibility to ensure that pedestrian and vehicle safety is not compromised. The manufacturer and supplier cannot be on-site to assist in this decision and will not accept any legal or other responsibility in this regard.

It is recommended that Nutech Anti-Slip Additive is incorporated in the final coat. The additive is a fine particle size powder which provides moderate slip resistance on smooth and flat surfaces. The powder becomes invisible in clear coatings, although a surface texture effect will result in both clear and coloured coatings.

Larger particle size additives including Nutech Course Antislip and Carborundum are also available for sloping surfaces and Industrial areas. These larger particles are only suitable for coloured Nutech Epoxy and Polycryl Coatings. Testing of these surfaces is recommended to satisfy users in each particular situation.

Nutech Anti-Slip Additive should be added to the liquid sealer and stirred briskly to achieve an even distribution of the particles before application. Larger particles are hand cast onto the wet applied first coat and the coating allowed to dry. The surface is then top coated to seal the particles into the surface.

3.3 In-Situ Stencil Concrete - Coloured Brick or Tile Pattern

The concrete is float finished and while still wet a paper or plastic stencil with cut out brick or tile patterns is placed on the surface. Powder topping colours containing hardeners and texture sands are hand cast on the wet concrete surface and trowel finished. Often a second coat of topping is added and wood floated creating a rough pattern surface.

The stencil is removed after partial curing of the surface leaving a slightly raised brick or tile pattern and an uncoloured recessed grey concrete imitation mortar joint.

The surface can have a rough finish to imitate a brick or a smooth steel trowelled finish similar to a tile. There are a number of commercial stencil systems including Decorative Technology, Faux Brick, Cobblestone, Ad-tex, Decorative Concrete Concepts, Australian Slate Crete and Bescon. Rough float finished surfaces require minimal preparation before sealing due to the naturally porous nature of the surface. To protect the coloured surface two coats of PaveCoat™ Clear are recommended, diluting the first coat with 10% Thinners. Anti-Slip Additive is usually not required on rough surfaces, although each case must be assessed individually. Acid etching is not normally required.

Special preparation is required on smooth steel trowelled surfaces which should be treated similar to stamped concrete or other smooth hardened concrete surfaces. The surface should be pressure washed, acid etched (1 part acid to 15 parts water) and thoroughly flushed.

In some cases a 'hit and miss' finish is applied which leaves partly rough and very smooth surfaces in the brick patterns. In this case acid etching is always required to guarantee sealer adhesion.

On smooth steel trowelled surfaces two coats of sealer should be applied, diluting the first coat 1 part thinners to 1 part PaveCoat to guarantee penetration and adhesion. A second undiluted coat should be applied. It is recommended that Anti-Slip Additive is included in the final coat on all smooth surfaces.

PaveCoat™ Cure & Seal same-day sealer may be used on rough or smooth stencil surfaces in accordance with Nutech application recommendations, followed by second coats as specified. Use of PaveCoat™ High Gloss Clear Sealer, PaveCoat™, Pavecoat H2o and Nutech non-isocyanate Epic Polycryl are suitable on stencil concrete surfaces.

3.4 Spray-On Stencil - Refinishing System for New or Old Concrete Surfaces

An existing concrete surface is prepared by high pressure water blasting and acid etching. New or old concrete may be suitable, subject to adequate surface hardness. A polymer surface primer is sometimes used to seal the surface. A coloured or neutral grey Base Coat of polymer modified cementitious coating is spray applied with a hopper gun over the whole surface.

A self-adhesive stencil is then applied on the concrete surface which leaves exposed a brick or tile pattern.

A single or multi coloured polymer modified cementitious topcoat is then spray applied with a hopper gun over the stencil. The stencil is removed before the coating is fully cured.

One coat of Nutech SO-2000 clear sealer is spray applied same day to prevent concrete efflorescence and to protect the coloured oxide surface. A second coat is recommended for durability. Each coat is applied at 4 to 5 square metres per litre.

A number of commercial spray-on systems are available including Cova-Crete, Duratex, Ad-TEX, Decorative Concrete Concepts, Australian Slate Crete and Bescon.

Because the spray-on coating is acrylic modified, no special surface preparation is required to ensure surface adhesion. Two coats of sealer are recommended. Thinning of the first coat is not recommended. Anti-slip additive may be required in the final coat of sealer.

Nutech SO-2000 can soften new spray-on coatings which are not fully cured. It is necessary to prevent pedestrian and vehicle traffic until the surface is sufficiently hardened.

On fully cured surfaces Nutech PaveCoat™ Clear, Pavecoat H2o, High Gloss and non-isocyanate Polycryl are also recommended. Recoating with SO-2000 and any of these products is suitable.

3.5 Slate Impression Concrete - Stamped Coloured Slate Look Finish

Slate impression is a popular decorative concrete treatment for domestic and commercial paving in Australia. New concrete is laid and float trowelled. While the surface is wet a single or multiple coloured oxide topping mix is hand cast onto the wet concrete, followed by a layer of coloured or neutral mould release powder. The surface is then stamped with rubber moulds to impress a slate look pattern into the surface.

The concrete is allowed to cure for several days and the release agent is removed using a high pressure water blaster or detergents and water. In some states the release agent cannot be washed into drains and excess material must be swept up vacuumed up.

One coat of PaveCoat™ Clear Sealer diluted 1 part thinners to 1 part PaveCoat applied at 4 square metres per litre. A second coat of undiluted sealer is applied at the same application rate containing the Anti-Slip Additive. Sloping surfaces can be very slippery when wet and this surface is regarded as unsuitable for steep driveways.

Problems encountered with sealing and resealing slate impression paving are now widely recognised within the industry. Special steps are recommended for sealing and resealing. Most sealer problems can be attributed to inadequate surface preparation, application procedure and variables in the concrete including porosity, surface hardness and excess release agent.

Factors, which must be taken into consideration when resealing slate impression paving include;

- Has the original coat of sealer been applied correctly?
- Was the surface correctly prepared?
- Is there excessive release agent under the sealer?
- Is the original sealer delaminating or flaking leaving a silvery white appearance?
- Is the original sealer weathered leaving a powdery white surface?
- Is there a salt efflorescence problem with fluffy white salt powder or hard yellow calcium deposits?

Typically Concreters leave an excess of coloured release agent to colour the deep cracks and grooves in the surface to provide a natural slate appearance. The release agent is a water proofing material designed to prevent the rubber mould sticking to the concrete during the stamping process. When excess release agent is left a concrete sealer cannot penetrate into the surface and adhesion problems usually develop in 1 or 2 years. Hot car tyres are a major problem on poorly sealed surfaces resulting in removal of patches of sealer and colour.

Refer to your Nutech Supplier for specific details regarding Nutech Seal Repair Solution and Slate Concrete Reseal Guidelines.

3.6 Stamp Pattern Concrete – Bluestone Pattern Pressed into the Wet Concrete

Stamp concrete is similar to plain coloured concrete. Usually metal stamps are used in the wet concrete during construction to leave a bluestone pattern in the surface. Treatment of this surface is the same as plain concrete.

The surface can be coloured with liquid concrete colours which usually fade extensively within 12 months or coloured oxides which do not significantly fade. PaveCoat™ Clear and Coloured Sealer is recommended for this surface.

Care should be taken to avoid an excess buildup of sealer in the deep grooves. If this occurs large bubbles and moisture affected sealer in these grooves can result. The top of the pattern can become slippery when wet, particularly if very smooth. Use of Nutech Anti-Slip Additive in the second coat may improve grip.

3.7 Factory and Motor Repair Workshops Floors

Factory floors are usually steel float finished and can be extremely hard and non-porous. Degreasing, cleaning, acid etching and product selection are very important criteria.

PaveCoat™ Clear and Coloured sealers are easily applied and recoated, however they are easily damaged by forklift tyres, pallets and other mechanical events. In warehouse and storage conditions this may be an economical and preferable solution. For high wear activity factories, dangerous and slippery activities and mechanical workshops more durable and/or non slip surfaces will be required including PaveCoat™ PR 200 & 210 or Nutech Epoxy or PolyCryl Coatings.

For recoating existing motor repair workshop floors the cleaning process is critical. Single chemical washing, grinding, low or high pressure water washing or acid etching alone will most likely not be suitable. Consider using PaveCoat™ Epic Enamel if adequate surface preparation cannot be undertaken and accept less than optimum long-term performance under these conditions.

Refer to your Nutech Supplier for specific details regarding PolyCryl , Epoxy and Motor Repair Workshop Floor Guidelines.

4.0 Concrete Coating and Sealer Problems

Most coating problems can be attributed to a number of basic problems. These problems can usually be scientifically determined (and often rectified) at a later date.

4.1 Faulty Coating or Sealer

Nutech produces large batches of sealer and due to our Quality Assurance Program the possibility of a single drum of sealer being faulty is extremely unlikely unless water or another contaminant has entered the drum. Laboratory testing of a liquid coating can detect this possibility.

Problems will develop if the wrong thinners are mixed with a particular brand of sealer, or if the sealer is contaminated with moisture before, during or immediately after application. Only use the appropriate Nutech Thinner and Tinter with the correct Nutech coating or sealer. Seek advice from your supplier if you are uncertain.

All Nutech concrete sealers will provide at least two or three years protection and be capable of recoating successfully. Epoxy and PolyCryl will provide longer protection and durability. Nutech concrete coatings have many years of proven industry performance, subject to correct surface preparation, product selection and application.

4.2 Inadequate Surface Preparation

This is the main cause of failure for most coatings and sealers. Problems which can be directly attributed to this problem include delamination, silver/whitening of clear coats, apparent loss of colour and poor durability and hardness.

With coatings which can be dissolved with thinners i.e., PaveCoat™ Clear and Coloured Concrete Sealer, there are three possible ways to solve surface adhesion problems.

1. Reactivate the existing sealer with Thinners or stronger Nutech Reactivating Solvents to thoroughly dissolve all the remaining coating. It may be possible to achieve penetration and re-establish adhesion. This process may not be successful if the concrete surface is very hard and non-porous with excess release agent or if the sealer is old, hard and brittle.
2. Thoroughly broom scrub the surface with Nutech Seal Repair Solution. This product dissolves the old sealer and restores the UV absorbers, flexibility and adhesion agents. Refer to the Seal Repair Solution Guidelines for full details. The surface will remain tacky after drying and will require re-coating with a coat of clear or coloured sealer. After treatment with Seal Repair Solution protect the surface from contamination caused by wind-blown dirt or lawn clippings for example. Re-seal and soon as possible to eliminate this problem.
3. Chemically strip the old sealer, prepare the surface by high pressure water cleaning, acid etching and re-apply the sealer. Refer to Nutech Seal Stripper Guidelines.

It is recommended that an area is tested thoroughly using one of these methods before wholesale treatment. The area should be kept under observation for at least 6-8 weeks to detect any further sealer failure. If the test area fails, chemical stripping and acid etching prior to resealing is the only method that will work successfully.

4.3 The Type of Sealer is Unsuitable for the Concrete Surface

A particular type of sealer may not be suitable for a specific type of concrete surface or finish. For example;

- Strong solvent based sealers are not suitable for new spray-on polymer surfaces because they soften the surface and retard curing, or they do not prevent salt efflorescence.
- Thick viscous sealers such as PaveCoat™ High Gloss are not suitable for first coats on surface hardened, steel troweled smooth concrete due to the non-porous nature of the surface,
- Hard inflexible sealers may not be suitable for priming uncured concrete i.e. stencil concrete or hardened concrete and other wet on wet applications – use Cure & Seal instead,
- Where non UV stable Epoxy coatings are used externally, premature chalking and adhesion failure normally results in 1-2 years,
- A non-petrol resistant grade of coating used in a motor repairs workshop will continually dissolve when exposed to solvents and petrol,
- A single pack coating used in a high traffic area will wear out prematurely,
- A single pack thermoplastic acrylic sealer used in a forklift area will be burned and black tyre marked very quickly due to skidding wheels. The burns/marks cannot be removed,
- Sealers that soften at lower temperatures tend to tyre mark more easily in hot weather.

4.4 First Coat Failure

The first coat of sealer may not be applied correctly or is applied to a moisture, salt, oil contaminated or high temperature affected surface;

- **Moisture** saturated concrete will not absorb the first coat of sealer and the coating will effectively be chased to the surface of the concrete. Because it fails to penetrate adhesion problems usually result;
- After the first night new concrete may have **salt efflorescence** on the surface. These **strongly** alkaline salts prevent sealer penetration. The salt crystals will continue to grow (crystallise) on the surface and will lift any coating off the surface of the concrete over time;
- Any **oil or grease** contamination will prevent sealer penetration into the concrete. Removal is an essential requirement before sealing;
- On a very **hot day** the sealer dries immediately it touches the hot concrete surface. Surface penetration under these conditions is usually very minimal. This can lead to premature delamination and blister/bubbling problems.

Applying a new coat of sealer over an old damaged coating with poor adhesion will not solve a delamination problem. With sealers that are easily dissolved with thinners, reactivating the old coat may re-establish adhesion. Refer to Nutech Reactivating Solvent or Seal repair Solution Guidelines.

Coating that cannot be re-dissolved, such as a two pack epoxy or polyurethane coating, must be stripped and re-sealed correctly. Whether reactivating or stripping, careful testing is always recommended before proceeding.

4.5 Insufficient Coating Thickness

A very thin coat of sealer will not provide long-term durability and adhesion properties. In external application situations sufficient dry film is needed particularly for clear coating to enable UV blockers in the sealer to work adequately. Nutech used UV blockers in clear **PaveCoat™** Sealers which require a minimum of 100 microns dry film thickness before they are effective. A single coat of most Nutech products will provide a dry film build of less than 100 microns therefore UV blocking efficiency will be minimal.

The accepted Industry Standard for an acrylic resins including **PaveCoat™** Clear and Colour recommends two coats of sealer applied at 4 square metres per litre with a resin solids of between 20% to 25%. This will provide a dry film thickness of approximately 100 to 125 microns.

Solvent diluting the first coat of sealer will assist penetration but reduce the resin solids. This will result in a very thin dry film after curing. One diluted coat of **PaveCoat™** Clear sealer on a driveway will provide less than 40 microns dry film thickness and provide only 6-12 months protection, even though the sealer contains UV light blockers. On the other hand 2 coats which achieve 100 microns in this situation will provide 3-5 years' service.

5.0 Resealing Concrete Coatings

In general, applying a new coat of sealer over existing sealed concrete simply involves cleaning the surface and applying an additional two coats. This is very simplistic because it assumes the existing coating has excellent adhesion and is adequately clean.

Care must be taken to remove grease, oil and similar contaminants, particularly in motor repair workshops. Up to four cleaning steps may be required involving degreasers, multiple hot high pressure water blasting, caustic cleaners and detergent rinsing. Refer to Nutech Motor Repair Workshop Guidelines.

Very old hard solution acrylic coatings become more resistant to the solvent in a new coat of sealer. Applying the new coat with a broom and scrubbing the surface will assist inter-coat adhesion due to the scrubbing action. Simply spray applying or rolling a coat under these conditions may not guarantee adequate intercoat adhesion. Alternatively reactivating the surface with thinners before coating is recommended, particularly in hot weather.

If the original coat of sealer did not penetrate into the concrete when originally applied, adhesion problems usually occur within the first year or when resealing is attempted. The smoother and harder the concrete surface, the more likely and faster delamination problems will occur.

As previously stated, if an old sealer is losing adhesion, resealing will not be successful without reactivating the sealer or stripping, acid etching and resealing. An area should be tested by reactivating before proceeding.

On slate impression paving sealer coats are often applied incorrectly and rely only on surface adhesion rather than a physical key. In these cases the sealer may begin to show signs of adhesion failure after only weeks or months. Alternatively, problems may not happen until the sealer loses flexibility and becomes brittle.

This creates a very difficult situation because resealing will often accelerate delamination of the old sealer and cause widespread failure of both the new and old coats of sealer. The problem is caused when solvent in the new sealer is absorbed by the old sealer resulting in swelling of the older brittle layer. This swelling is capable of breaking any remaining surface adhesion between the concrete and the old sealer.

Delaminating due to resealing typically results in silvery white patches spreading over Clear sealed surfaces fully exposed to weather and sun within 3 to 6 weeks of resealing. The silvery white appearance is caused by air trapped between the concrete surface and the sealer, which alters the refractive index of the clear sealer. When the surface is wet the white appearance disappears temporarily because the trapped air under the sealer is displaced by moisture. The silvery appearance reappears when the surface dries.

Areas under carports, verandahs and building eaves do not usually exhibit the white appearance because ultra-violet sunlight and moisture have not damaged the original sealer to the same degree as fully exposed surfaces.

Solvent washing, reactivating or resealing will usually only temporarily restore the original appearance, and the delamination problem usually reappears in the first months.

One common problem with resealing slate impression occurs when the original coat of sealer has poor surface penetration although the surface adhesion is good because the surface is either slightly rough due to finishing or partial acid etching. The surface can often be re-sealed several times over several years without any problems. After resealing again for the third, fourth or fifth time for example, the coating can begin to delaminate due to the solvent absorption problem described earlier in this section. Although the original coat of sealer has become brittle and inflexible, it takes longer to delaminate due to slightly better surface adhesion.

Recently "Seal Repair Solution" products have become available which melt and repair old damaged coats of sealer, re-establishing adhesion and resistance to UV light. Scrubbing old damaged sealer to thoroughly melt and work the Seal Repair Solution into the surface is required prior to re-sealing. Refer to Nutech Seal Repair Solution Guidelines.

The most common problem with coloured sealer is either a flaking sealer or a worn dull surface. A worn dull surface can easily be restored by recoating. A flaking sealer requires additional preparation. The following preparation is recommended;

- Degrease/clean adequately,
- High pressure water blasting (> 2500 PSI),
- Briskly scrub the surface with Seal Repair Solution to dissolve the sealer (refer Guidelines),
- Apply two coats of sealer, thinning the first coat on exposed concrete surfaces.

Reactivating the surface cannot guarantee success and flaking sealer may require stripping and suitable surface treatment prior to re-sealing.

6.0 Common Sealing and Resealing Problems and Lessons

Experience has shown us that it is not always possible to guarantee resealing success unless the first coat of sealer is correctly applied. Testing an area of several square metres is often the only way you can be certain on an individual job.

Usually coatings that flake or show silvery/white patches in the first 12-18 months indicates a problem with the surface, and reactivating or resealing is not usually successful without additional surface preparation.

The following sub-sections deal with a number of common issues relating to sealing or resealing not fully detailed in the preceding sections.

6.1 Suitable Application Methods

In hot weather it is essential to reactivate an older sealer with thinners or reactivating solvent before resealing, particularly if spray applying the sealer. Reactivating the surface involves vigorously scrubbing the surface with thinners or reactivating solvent to dissolve the existing sealer. It is possible to completely dissolve the existing sealer by continuing to scrub the surface. It is also important to ensure that the thinners are allowed to evaporate before re-applying sealer. Allow 2 hours prior to coating.

When applying sealer by broom the scrubbing action assists penetration, dislodging contamination and stamp release agents and will assist intercoat adhesion by reactivating the surface of an old sealer. Spray applying a sealer will not achieve these benefits, particularly in hot weather when solvents evaporate very quickly.

Spray applying a 'same day' sealer on a fresh concrete surface is recommended because it avoids any surface damage that can result from broom application, particularly on a softer stipple finish or a spray on polymer cement coating.

Spray applying a second coat of sealer can ensure an even coat, while minimizing build up in grooves and patterns. This is particularly useful on stamp and pattern paving.

6.2 Milky Whiteness in the Sealer

If a sealer is affected by moisture during curing it can appear milky or hazy. If the weather is suitable reactivating the sealer with thinners or reactivating solvent may allow the moisture to evaporate from the sealer when it dries. If the sealer is not reactivated in the first week or so the milkiness may not disappear and stripping and resealing may be required.

6.3 Silvery White and Flaking Appearance

Silvery whiteness usually indicates an adhesion problem. This can be tested by scratching the sealer and observing any flaking or powdery sealer. Stripping or using Seal Repair Solution will usually be required prior to resealing. Treatment of the surface after stripping to redress the inadequate surface preparation is also usually recommended.

6.4 Fluffy White Powder on the Sealer

When water is removed from the concrete surface by evaporation, dissolved salts are carried to the surface and deposited as a white powder.

These soluble salts are produced by concrete during curing and in wet weather they are transported onto the surface of concrete paving. This is commonly referred to as Efflorescence.

Water soluble salts in ground water which permeate through the concrete under hydrostatic pressure can also be a source of powdery salt deposits.

These salts are usually water soluble and can be removed with water. A very weak solution of 1 part Hydrochloric Acid and 100 parts Water will assist cleaning. Flush and scrub the area thoroughly after acid washing.

One or two coats of sealer may not prevent the appearance of efflorescent salts, particularly if there is some hydrostatic source of ground moisture which contains salts. This is because single pack acrylic sealers are moisture vapor permeable, which means soluble salts can permeate through the sealer. It has been observed that three or more coats of PaveCoat™ will block salts in most cases, provided the first coat has adequate adhesion.

In situations where very high concentrations of ground water salt occurs, sealers can delaminate in small areas due to crystallisation of salts between the sealer and the concrete, particularly if the concrete has not been prepared correctly and the sealer does not key into the surface. This is often observed adjacent to garden beds or in situations where hydrostatic pressure of ground water is high due to ground slope and level differences.

Often salts on paving are only observed in the first few months due to 'primary' efflorescence resulting from new concrete curing. Weaker concentrations of 'secondary' efflorescence usually do not cause sealer problems.

Where salts appear continually over a period of years, ground water is the likely cause. Often this problem can only be resolved with the installation of additional site drainage works.

It is important to note that efflorescence results due to the integral chemical composition of concrete and that the problem cannot be eliminated. When problems occur the concrete sealer is not responsible, although sealers can highlight or disguise the appearance of the salts.

6.5 Hard White or Pale Yellow Salt Deposits

Calcium based salts also occur in concrete efflorescence and in ground water. Calcium hydroxide deposited on the surface will mix with carbon dioxide forming insoluble calcium carbonate.

Calcium Carbonate is not water soluble and cannot be washed off the surface. Mild acid washing will remove this contamination. Resealing over a discoloured area may be required.

6.6 Summer and Winter Sealing Differences

Concrete behaves quite differently in winter compared to summer due to slower curing times. In summer hand trowelled concrete can be sealed on the same day as the concrete is poured, or several days later after it has adequately cured. In winter, the concrete is usually too wet on the day the concrete is poured and the surface is often inadequately cured to allow high pressure water blasting or acid washing for up to a week, subject to weather and drainage conditions. Machine trowelled concrete is usually harder and can be sealed same day in winter and summer.

Therefore in winter it is often not possible to seal concrete for at least several days after it has been poured. Combined with a higher occurrence of efflorescent salts in winter than in summer, more adhesion problems tend to occur due to sealing in winter.

In summer high temperatures can prevent sealers penetrating into the concrete adequately. Rapid drying of the surface skin of the coating can also lead to air entrapment and bubbling, referred to as gassing or cissing.

Failure to prepare the surface correctly and take temperature and weather conditions into consideration in winter or summer can result in coating problems, typically including peeling, flaking or bubbling.

6.7 Dirt and Contamination

The surface must be clean and dry before sealing or resealing. High pressure water blasting is strongly recommended. Any dirt, leaves, grass, bird droppings or other contamination on the surface will be permanently sealed on the surface during the coating process.

6.8 Black Tyre Marks
Acrylic concrete sealers are manufactured from thermoplastic resins, which can be burned by spinning or skidding rubber tyres leaving ugly black marks.

These marks cannot be washed off because the rubber and burnt sealer become imbedded in the surface.

Sometimes a particular tyre compound is affected by the solvent which continues to evaporate from curing sealer over a period of up to several months. In rare cases during hot weather, these tyres may leave black imprints on clear or coloured sealer.

To remove black tyre marks apply thinners or reactivating solvent and scrub to dissolve the sealer. Remove the sealer and rubber with a clean rag and re-apply sealer.

Tyre marks on non-thermoplastics like polyurethane and epoxy coatings can be scrubbed or washed off. Nutech Grease Magic will assist this process, although care needs to be taken due to the flammability of this product. Mixing Grease magic 1:1 with clean water before using will overcome this problem.

6.9 Tyre Imprints on Single Pack Sealers

If the first coat of an acrylic sealer does not penetrate into the concrete due to inadequate surface preparation, adhesion problems due to car tyres can result.

When a car with hot tyres is parked on the concrete the surface of the thermoplastic acrylic sealer may stick to the tyre. This is amplified if the ground is wet similar to the effect of wetting a toy rubber arrowhead.

When the vehicle is moved the adhesion between the sealer and the tyre may be greater than the sealer and the concrete surface. When the car is moved a tyre pattern impression is left where the sealer has been pulled off the surface. This often leaves a lighter patch on slate impression where excess coloured release agent under the sealer is also removed.

The reason this occurs is that a cars tyres become hot when driven a distance in hot or cold weather. Acrylic sealers are thermoplastic, meaning they become softer when heated and hot tyres can partly vulcanise on the surface of the acrylic sealer.

This may indicate that a vehicle has been parked on the coating before it has adequately cured. This can be a problem during hot summer weather when sealers may take up to a week to completely harden.

It may also demonstrate that there is a sealer adhesion problem due to inadequate surface preparation or application. Patch restoring the damage may not prevent reoccurring problems. Sometimes tyres may stick for the first few weeks, after which the problem does not reoccur for several years when the sealer becomes less flexible due to age and then adhesion problems develop.

To restore a tyre print, reactivate the surrounding sealer using Nutech Thinners or reactivating solvent. Spread the liquid sealer over the print to disguise the damage. Resealing the area may also be required. This will not resolve the underlying adhesion problem which will require additional treatment.

It has been observed that the addition of anti-slip powder in the topcoat will reduce the problem of tyre sticking. Adding a new coat containing Anti Slip Additive will reduce the problem.

6.10 Patchy Coloured Sealer

Moisture and dew can cause colour and gloss variations in a newly applied colour sealer. Usually reactivating the surface with thinners when the weather is more suitable will remove the patchy appearance.

6.11 Concrete Colour Variations

Clear sealing uncoloured concrete can highlight natural colour variations in the surface, leaving a patchy or blotchy appearance. This cannot be fixed without stripping the sealer or colour sealing.

Sometimes colour variations occur in topping coloured concrete due to a number of factors including weather, different oxide colours, different concrete pours, etc. Clear sealing this surface can exaggerate these colour differences. You can minimise the variations by adding some colour to the sealer.

Adding 1 or 2 litres of appropriately coloured sealer to 20 litres of clear sealer creates a transparent stain which can disguise colour variation. To prevent problems due to colour inconsistency during application care must be taken to prevent;

- runs in the sealer during application (likely on steep concrete), and
- application inconsistencies such as broom sweeps.
- colouring of plain pointing in stencil concrete

6.12 Damaged Sealer

Petrol, brake fluid, mower fuel, acids and many household chemicals and cleaners can damage clear and coloured sealer. Cleaning and stripping damaged areas followed by resealing may be required to disguise discoloured areas.

Sealers can also be physically damaged by scratching or mechanical wear. This can include hard plastic wheeled toys and dragging outdoor furniture. Sealers which are easily damaged can also indicate other problems such as a soft concrete surface or poor surface preparation and sealer application.

6.13 Resealing a Powdery Weathered Sealer Surface

If the original sealer surface is weathered, dull and powdery although not delaminating, reactivating the surface with solvent or reactivating solvent prior to resealing will ensure intercoat adhesion.

If the sealer is partially delaminating this technique may not be successful. In this situation stripping the sealer, preparing the surface and resealing may be necessary.

6.14 Surface Porosity of the Concrete

The porosity of a given concrete surface can vary considerably subject to many factors including, but not limited to, weather, wind, moisture content, slump, placement, compaction, finish surface hardeners and texture. Adhesion on rough or stippled concrete is easy to guarantee as a physical key can be achieved. Smooth trowelled concrete is usually impervious and adhesion is difficult to guarantee without special preparation.

Without testing it is sometimes difficult to determine the porosity of a particular concrete surface. Two concrete surfaces may have a similar appearance. One surface may require only two coats of sealer because it is relatively non-porous. Another surface may be like a sponge and three coats of sealer appear less adequate by comparison.

If a surface is porous and the first coat of sealer soaks quickly into the surface, it is advisable to wait until the first coat has cured adequately before recoating i.e., the next day. Otherwise, subsequent coats of sealer applied on the same day can redissolve the first coat and also soak into the surface.

6.15 Sealing Powdery Soft Damaged Concrete

If the concrete surface is soft and powdery sealing the surface with a clear or coloured sealer may not be recommended. In some cases applying a surface hardener such as a sodium silicate before sealing is required. In worst cases grinding the concrete surface may be required to remove the damaged surface before sealing.

6.16 Sealing Concrete Hardened with Fluro-Silicate, Siloxane Silicone or Sodium Silicate

Curing concrete can be treated with Fluro-Silicate, Siloxane Silicone to harden the surface. Sodium Silicate is also used to harden a soft concrete surface.

Generally acrylic, polymer or epoxy coatings cannot be applied over concrete hardened with a fluro-silicate without surface grinding and acid etching first. Acid etching alone is usually not suitable because the surface is impervious to moisture. Some factory floors are cured in this manner. It is impossible to determine if a fluro-silicate has been used by observation alone. Sealer adhesion problems will usually result without special preparation.

Siloxane Silicone and Sodium Silicate treated surfaces are usually suitable for sealing with normal surface preparation. Refer to manufacturers' specifications for specific advice. Often testing an area is the only guaranteed way to avoid problems.

6.17 Acid Washing of Existing Sealer

Concreters understand that new and old concrete may require acid etching prior to sealing. Therefore it may seem logical that acid washing is required before resealing. ***This is not the case!*** Acrylic sealers are moisture permeable and acid can be transported through an existing sealer damaging the concrete surface and affecting sealer adhesion.

If an old sealer is acid washed delamination problems can result whether or not the surface is re-sealed.

It is important to reinforce the fact that acid cannot remove oil, grease, food and many other contaminants. These contaminants must be removed with a combination of chemical washing, high pressure blasting, mechanical cleaning and/or hot water washing

6.18 Concrete Sealer Incompatibility

There have been cases where an old sealer is prepared correctly and a coat of a different brand of sealer is applied in accordance with the manufacturers' specification. The two resin systems and the solvent may react adversely and problems such as blistering and delaminating can result. The problem is observed more in summer than in winter and is probably temperature related.

Reactivating the damaged surface with thinners allowing several days prior to recoating has been observed to repair a damaged surface adequately.

6.19 Oil, Grease, Food and Silicon Contamination

If a sealer is applied over a concrete surface impregnated with oil, grease or food, the sealer will not adhere.

During application of a second coat of sealer, the first coat may be easily damaged, and often a roller will easily pull up a first coat. ***This always indicates inadequate surface preparation.***

Applying a thick second coat may disguise any immediate surface coating defects, however it will not resolve the adhesion problem caused by inadequate surface preparation.

Acrylic sealers will not adhere to silicone jointing compounds or adhesives. Removal of the silicon will be required before sealing. Replacing a silicon joint compound with a flexible moisture cure urethane is recommended. Suitable products include Sika 15 LM or Bostik Seal'n'Flex. Applying a solvent based coating over water based acrylic house paint will often result in wrinkled blisters. Remove old paint drops before coating to avoid this problem.

6.20 Resealing Very Old Sealer

As a sealer ages it becomes harder and more solvent resistant. Intercoat adhesion problems can result, particularly in warmer weather, when solvents evaporate quickly. Reactivating the surface of the old sealer will assist inter-coat adhesion when resealing.

6.21 Multiple Thick Coats of Sealer

After many coats of clear sealer the appearance of a decorative concrete finish usually degrades. To restore the original appearance the sealer must be stripped and re-sealed. This is a very subjective matter and must be individually assessed. Acid etching at this stage is recommended to ensure future adhesion.

Using Seal Repair Solution will extend the life of old sealers but ultimately stripping will be required.

Coloured sealers usually do not require stripping unless adhesion problems develop.

6.22 White Spots on Clear Sealer

The appearance of small silvery white spots in the clear sealer can usually be attributed to two factors. Both factors relate to poor surface adhesion of the sealer at the time of application.

The first cause is salt crystallisation between the concrete and sealer surface. Normally this does not occur and sealer delamination does not occur. If the sealer has poor surface adhesion salt crystals may form underneath the sealer causing small white spots.

The second cause is usually related to a sand or glass anti-slip additive in the sealer. Sand and glass are not flexible and expand and contract at different rates to sealer and concrete. If a sealer has poor surface adhesion the expansion and contraction of the particle of sand or glass may cause the sealer to delaminate from the concrete around the particle resulting in a small white spot.

These cases can usually only be resolved by fixing the sealer adhesion problem which requires application of Seal Repair Solution or stripping and treating the surface prior to resealing.

6.23 Effect of Moisture on Concrete Sealers

The polymers in concrete sealers are damaged by UV Light and moisture.

Acrylic coatings on concrete which is continually moist, will not be as durable as sealer on dry concrete. Therefore the use of plastic barriers under concrete paving improves the durability of concrete sealers. Epoxy coatings are not affected by moisture under most conditions, unless the moisture is contaminated with incompatible chemicals.

6.24 Osmotic Bubbling

Sealing concrete with water resistant epoxy and polycryl coatings can result in osmotic bubbles or blisters if hydrostatic water pressure or moisture escaping the concrete affects a newly applied coating. Using plastic membranes under the concrete and testing for moisture content (recommended below 5% moisture content) can prevent this problem. Consult a Nutech specialist for additional information.

6.25 Epoxy & PolyCryl Part A/Part B Mixing and Ratio

All two pack coatings are supplied with the correct Part A/Part B components to guarantee correct curing. The two components must be mixed together for the coating to cure correctly. Adding more or less of one Part will detrimentally affect the strength, curing and properties of the coating.

The two components must be adequately mixed with a high speed drill and allowed to react before final blending and application. Mixing with a stick is not adequate and gloss variations, retarded curing and other problems will most likely result.

6.26 Blushing of clear coatings in cold weather

Clear coating can blush in cold weather, particularly two pack epoxies and Polycryl. Avoid application in temperatures below 15 Degrees C. or use artificial heating to increase ambient temperatures before applying. Two pack components can also be heated in hot water baths to 20 Degrees C. to improve curing time, although pot life will be affected.

6.27 Nutech Epic Epoxy 500, Epic Epoxy 100 and Aqua Epoxy pot life

Nutech Epic Epoxy 500 and Epic Epoxy 100 solvent based and 100% solids epoxy coatings have a pot life of between 1-2 hours at 20 Degrees C. After reacting they go solid and cannot be applied.

After mixing the Part A and Part B components of Aqua Epoxy the pot life is approximately 2 hours at 20 Degrees C. However the coating does not go solid like conventional epoxy coatings. **Any unused Aqua Epoxy must be discarded after 2 hours** as the coating will not cure, even though it can be applied.

6.28 Nutech Epic Epoxy 500, Epic Epoxy 100 and Aqua Epoxy & Exterior Exposure

These products are recommended for internal use only. When used in exterior applications the coating will weather badly and become oxidized and powdery within 1-2 years. Surface chalking and loss of gloss can be expected within 1 year.

6.29 Nutech Epic Enamel

When over coating old enamel floor paint with a solvent based acrylic such as PaveCoat™ wrinkling and blistering is common. Nutech Epic Enamel will prevent this problem.

When coating a motor repair workshop or garage, grease and oil contamination is a common problem time shortages often prevents adequate cleaning. Nutech Epic Enamel and Aqua Epoxy will adhere to a contaminated floor better than other Nutech products and is recommended for this situation.

7.0 When to Apply Concrete Sealers

Because many sealers can be applied 'same day', many concreters think that sealers can be applied the next day. This seems logical because the concrete should be drier, however it is wrong.

When new concrete (including slate or stencil concrete) is poured and machine or hand finished until it is firm and resistant to light foot traffic, it can be sealed with Nutech Cure & Seal same day sealer. This sealer is described as a wet on wet coating and assists moisture retention improving the curing process.

On the same day concrete is poured it is warm, absorbent and has no concrete dust, efflorescent salts, oil or other contamination on the surface. Provided the surface has no liquid water on the surface, the new sealer usually penetrates into the concrete guaranteeing adhesion and durability.

On the second day (next morning) the concrete is usually moist, cold and not absorbent. There is also a possibility that it is affected by efflorescent salts, powder and dirt. The concrete at this stage is too green to acid etch or high-pressure wash and therefore additional surface preparation to increase the porosity, remove salts or contamination cannot be undertaken.

Subject to weather, temperature, concrete strength and other factors the concrete may not be ready to prepare for several days in summer and up to a week in winter.

Therefore concreters who apply sealers on new concrete on the second to fifth days take some risk that future adhesion problems will develop. This is often very difficult to predict and explains why concreters become frustrated when they seal next day with unpredictable results.

Epoxy and Polycryl coatings can only be applied on fully cured concrete surfaces i.e. after 28 days.

8.0 Summary

This document is a general guide only and combines the observations and experience of a wide range of people working in the decorative concrete and sealer industry.

The purpose of the information is to enable readers to better understand some of the technical and practical aspects of coating and resealing different types of concrete paving commonly found in practice today, using the wide range of Nutech products.

As this information is a general guideline only it cannot be relied on in every case. Individual advice should be obtained and adequate on site testing conducted to ensure the suitability of Nutech products on a particular concrete surface and to guarantee completely customer satisfaction.

Customers should refer to specific Nutech Product Data Sheets, Material Safety Data Sheets and Product Labels for additional application and safety information.

Specialist advice can be obtained from your local supplier and your nearest Nutech Branch Office.