

## **FOR SPECIFIERS:**

### **SUCCESSFUL COATINGS FOR CONCRETE**

#### **INTRODUCTION:**

Builders, painters, plasterers and other building industry trades are often called on to apply coatings to concrete surfaces, to decorate or protect them. A range of variables – from the nature and finish of the concrete all the way through to the clients' expectations of the finished job – means the task is rarely a simple one.

This article examines some of the issues that complicate coating projects, and offers some suggestions to help you achieve an optimal outcome.

For a more technical discussion of these issues, refer to Robert F Barber's paper, *Some Important Requirements for Paints & Coatings Intended for Concrete Surfaces*, available from Ability Building Chemicals, 133-135 Northern Road, West Heidelberg, Victoria, 3081 (PH: [03] 9457 6488), or download the paper from Ability's Web site: [www.abilityproducts.com.au](http://www.abilityproducts.com.au). Mr Barber is a licentiate of the prestigious Surface Coatings Association of Australia (SCAA) as well as being Technical Manager and Managing Director of Ability Building Chemicals Co.

#### **COATINGS ON THE CHEAP? FORGET IT!**

The old saying "You only get what you pay for" has particular relevance to coatings for concrete, particularly in exterior applications.

Think about it! The coating will be expected to look good and provide optimum protection – for instance, to prevent water penetration and concrete degrading salt solutions – for 24 hours a day, 7 days a week, for anything up to 20 years. That's a big ask!

If you specify the preparation of an existing concrete surface properly (it can be a labour-intensive job), if you get the best technical advice available and if you insist on superior paint/coating materials available from Ability, you will doubtless be able to guarantee your clients that the coating will live up to their expectations in terms of long-life protection and decoration.

However, if short cuts are taken with the preparation, if you get advice from the local hardware store and if you choose to use cheap materials, then you are virtually guaranteeing an expensive call-back within the period of the workmanship guarantee.

The message is clear; don't even think about a cheap coating for a building project. It will almost certainly let you down!

There are only two basic reasons surface coatings such as concrete paints and sealers fail – particularly on exterior pavements:

- ✱ Because they have been applied too thinly and are not thick enough to stand up to everything Mother Nature will throw at them during their expected design life, or
- ✱ Because they shrink, crack, lift, and/or stop sticking to the surface they are meant to be protecting and decorating.

Before we go further, we had better define what is meant by the term 'coating'. In the building industry context, it can be anything from a sealer or paint to make concrete last longer to a cement render for walls or a trowel applied finish for hardscapes, pavements designed to protect and/or beautify the concrete surface through the use of texture and colour. Obviously, coatings vary considerably in thickness, from something thinner than human skin to trowel applied finishes, which, in places, can be as much as 5 to 20 millimetres thick. Proper preparation is essential for all coatings.

### **STEPS TO TAKE:**

Proper preparation begins as far back as the formulation (mix design) of the concrete itself and particularly *how* it's cast and processed. There are a number of important steps to take to get the best job. For new concrete you should:

- ✿ Select an ethical pre-mixed concrete supplier, preferably one who is a member of the Concrete Division of the Australian Cement Concrete & Aggregates Association, Australia;
- ✿ Ensure that the concrete is made from sound, quality raw materials;
- ✿ Insist that the concrete is made according to the relevant Australian Standard – AS 1379-2005, 'Specification and Supply of Pre-Mixed Concrete';
- ✿ Realise that typically concrete has only 26% of its strength at one (1) day after it sets at 23°C and takes time - 28 days to reach 85% of its ultimate strength.
- ✿ Ensure that the concrete is properly placed on the site, and that it is adequately compacted, float finished and cured by a suitable procedure according to AS 3600-2000, 'Concrete Structures'. That means no extra water is added at the site where the concrete is to be used and faithfully following the important procedure to prevent the concrete's mix water from evaporating to ensure it cures (hardens) properly.

Ability recommends the use of their 'Duro-Seel' Clear as an easy-to-use, one coat curing compound. Kindly request information.

All coatings for existing concrete should be applied only to surfaces that are prepared to be sound, firm, and strong.

Laitance is a particular problem, one that affects probably 80% to 90% of all non-weathered concrete pavements and floors in Australia.

When concrete is being finished by trowel floating, excessive mixing water brings the finer grains of cement and sand to the surface. Unless the curing regime outlined in AS 3600 is adopted such as the use of a curing compound, the result will be laitance - an unsound, low-strength, often dusty, light-coloured whitish 'skin' of cement 'scum' covering the surface of set concrete.

A hardened concrete surface with laitance is unsuitable for coating because it is weak, has poor abrasion resistance, and the applied coating will temporarily stick only to the laitance.

If the concrete is affected by laitance, this weak top layer must be removed before any coating is applied. The most effective removal methods are 3000 psi water blasting from a 'Gerni' type machine, grit blasting, or acid etching.

### **STICKING WITHOUT HELP:**

You will sometimes hear people in the building industry talk about "adhesion by penetration", which is a theory that enough of the paint coating material will go down the tiny air capillaries and voids that form in uncompacted concrete to hold the coating in place.

However, the facts don't support the theory, because concrete that has been properly compacted by a vibration process to remove air bubbles, float-finished and moist cured should not be porous enough to increase the innate adhesion of any coating. More and more builders are insisting that concrete used in the building industry – for pavements, suspended slabs, walls and roofs – is *properly* compacted, float finished and cured by a procedure to prevent the mix water from evaporating, to result in dense, low porosity concrete. Therefore, you will come unstuck if you accept the theory.

Long-life coatings for concrete should not depend on any porosity of the substrate to gain “adhesion by penetration”. They must have adequate innate adhesion characteristics, regardless of how rough - or, more particularly, smooth - the surface of the concrete is. That applies even if the substrate has the shiny surface that has been for example achieved by pre-casting concrete against glass; the coating must still be able to achieve a long-term ‘stick’.

The variety and quality of coatings on the market is huge. Each is intended to achieve a particular outcome – to seal and protect the concrete, to colour it, to alter the texture, to increase its durability, to boost its wear resistance and longevity, to give it a non-slip or non-skid surface, etc.

One of the most common is the protection of steel-reinforced concrete, to guard against spalling, which is not just ugly but can also affect a building's structural integrity. Spalling – or ‘concrete cancer’, as it's more commonly known - can only happen if water can penetrate into the concrete as deep as the steel reinforcing rods or mesh to cause their rusting.

Your choice of coating will depend on the client's brief and the desired outcome, and if you follow the steps outlined above you should achieve a satisfactory, long-life result.

Ability Building Chemicals, a proudly Australian-owned company based in West Heidelberg, Melbourne, offers a range of watertight, high adhesion, most durable clear and coloured, textured or smooth, glossy or matte long-life coatings with expert advice on their application to people in the building industry.

An associate member of the Australian Pre-Mixed Concrete Division of the Cement, Concrete & Aggregates Association, Ability Building Chemicals specialises in ‘GEO®’ paint coatings such as the sandy textured, matte ‘the Paint’, the smooth version called ‘X55 HI-SEAL’, and the ultra-smooth, low sheen ‘DUROSHEEN®’, all guaranteed and made available in ANY colour requirement – because it believes they are superior to many other coatings for building applications.

The company is located at 133-135 Northern Road, West Heidelberg, Victoria, 3081 (PH: [03] 9457 6488) – with Sales Agents in all States and key locations. For details of its product range, click on to its Web site: [www.abilityproducts.com.au](http://www.abilityproducts.com.au).

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