

DAVCO SURFACE PREPARATION GUIDE FOR TILING



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EXCELLENCE IN
TILING SYSTEMS

Preparing Substrates for Tiling

Inadequate or incorrect surface preparation is the most common cause of failure when bonding to building surfaces. Substrates must be sound, clean, free from dirt, dust, sealers, curing compounds and any other contaminants. Similarly, substrates must be designed or prepared for tiling in accordance with the relevant Building Codes.

Common Substrates for Ceramic Tiles

It should always be borne in mind that no two surfaces are the same. Each type of surface has its own characteristics. These include; rate of expansion and contraction; porosity; dimensional stability etc.

Methods for Preparing Substrates

Below are methods for correct preparation of commonly encountered substrates. If the substrate which you wish to tile is not reviewed in this section, or you are unsure of the advice we offer, please consult the Davco Technical Advisory Line on 1800 653 347.

Concrete

The performance of Davco Tile Adhesives largely depends on the standard of preparation of the concrete floor surface. Sound performance over a weak substrate is generally not achievable, as premature failure in the substrate will occur. Conversely, poor bonding to sound substrates can occur if surfaces are not properly prepared. The main problem in practice is a lack of effective penetration of the coating into the substrate. In recommending what type of preparation is required for concrete there are many factors which need to be considered:

- **Age of Concrete -**
Typically, the concrete needs to be a minimum of 28 days old, to allow for proper cure to take place, and for the residual moisture level to drop to an acceptable level.
- **Type of Concrete -**
There are many types which generally are rated in accordance to their rate of set, and ultimate strength.
- **Surface Finish of Concrete -**
Two generic types of finish cover most concrete surfaces, these being a float finish (generally referred to as wood float), and a steel trowel finish.
- **Presence of Contaminants -**
These can be present in many forms and types, but the most common are curing compounds, laitance, release agents, sealers, grease, oil, wax, and construction site dirt/dust.

But the end result that needs to be achieved is simple; A clean dry surface of sufficient porosity to allow penetration. A rule of thumb often used is that the surface of the concrete should have 80% of the sand/aggregate exposed or alternatively the surface of the concrete should have a texture similar to 80 grit (medium grade) sandpaper.

Laitance

Laitance is the fine layer of cement which floats to the surface when concrete is laid. It is found on ALL poured concrete and has a poor bond to the body of the concrete and poor strength. Laitance MUST be removed to ensure a successful installation, and the best method of handling this is described below.

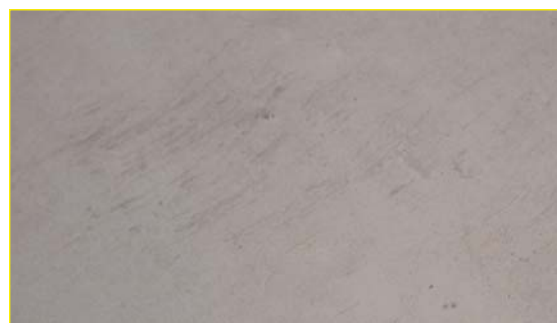
Wood Float Finish



Wood Float Finish

With this type of finish, a wood trowel is worked over the surface to consolidate and embed both fine and coarse aggregate, leaving a sand paper type texture. For best results, the concrete must be at least 28 days old. As a rule of thumb, allow 1 week curing time per 25mm of concrete, or refer to the relevant Australian Standard. If any laitance is present, it is recommended to remove it from wood float concrete by etching the surface with a weak solution (5%) of hydrochloric acid, then rinse off with clean water. Allow the slab to surface dry and then prime using Davco Ultraprime prior to tiling.

Steel Trowelled Concrete



Steel Trowel Finish

This type of floor surface is produced by multiple finishing operations with a steel trowel, which consolidates and greatly densifies the surface of the concrete, making it smooth, and difficult to bond to. If the concrete has a steel trowelled finish and assuming no surface hardeners have been used, then preparation must be made to remove the densified concrete and laitance on the surface.

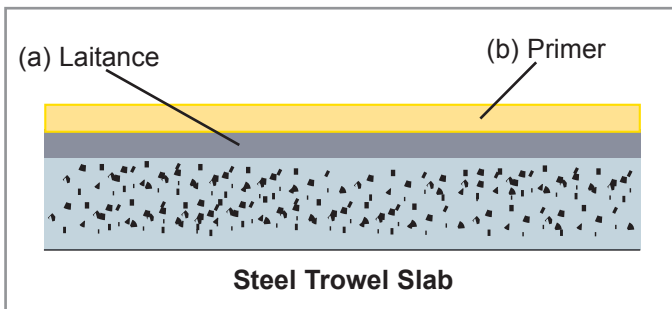
This can be done by one of two methods:

Acid Etching:

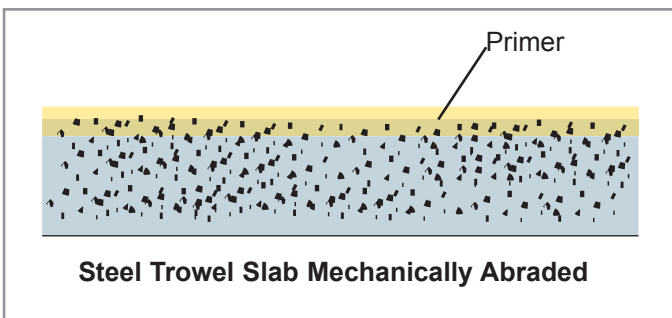
Etch the surface with a weak solution (5%) of hydrochloric acid, then rinse with clean water. The surface should be allowed to dry for 24 hours and then primed with Davco Ultraprime prior to tiling.

Mechanically Abrasion:

This is done by shot blasting, scabbling, or grinding the surface to expose at least 80% of the aggregate or give a finish like 80 grit (medium grade) sandpaper. After abrasion, all residual dust should be removed and the surface wiped with a damp mop. Allow the slab to surface dry and prime with Davco Ultraprime prior to tiling.



An unprepared surface, without the laitance removed (above) will not allow the primer to penetrate the surface, however a prepared surface with the laitance removed (below) will allow a sufficient bond.



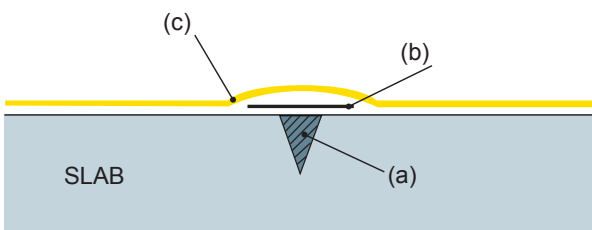
Treatment of Expansion Joints and Cracks

Ensure expansion joints and cracks in concrete slabs are treated in the following manner.

Non Structural Cracks (NOT Subject to Movement) < 0.5mm

- These cracks can be covered using the ceramic tile adhesive. A flexible tile adhesive is recommended.

Non Structural Cracks (NOT Subject to Movement) > 0.5mm



- Route out the joint to form a 'V' shaped groove with a hand or power chisel, to a depth and width of approximately 25mm. Fill the crack with a flexible sealant - Davsil (Silicone) or Sodaflex 603 (Polyurethane). Allow 24 hours to cure.

In the case of large cracks, Abelrod can be used to pack the body of the crack, before filling with Davsil or Sodaflex 603.

- Apply a 50mm wide strip of Polyethylene/Polypropylene tape over the total length of the crack - extending 100mm either side of where the crack finishes.
- Apply Davco Ultraprime and continue with the tiling installation.

Structural Cracks (Subject to Movement)

Structural cracks highlight problems within the substrate which need to be further investigated and issues resolved prior to the application of tile adhesive. It is recommended that an Engineer is consulted before proceeding.

In all cases where structural cracks exist, irrespective of the means of remediation, when tiling over the substrate, the crack must be carried through to the tile surface - it cannot be tiled over.

Fibre-Cement Sheets

Includes Compressed Fibre-Cement Sheeting (interior / exterior floors), Fibre-Cement Sheet/Villaboard (interior walls) and Ceramic Tile Underlay (for sheeting timber floors).

In all cases the manufacturer's recommendations for installation must be followed - paying special attention to treatment of joints. Most sheets have a surface layer of dust that should be removed by wiping down with a damp cloth or mop, and then allowing it to dry. Some are highly absorbent, therefore you must prime all types and grades of fibre cement sheets prior to tiling, with Davco Ultraprime.

Cement Render

All cement render finishes should be at least 7 days old before being tiled over. Cement render is usually a 3:1 sand:cement mix or proprietary pre-mixed render, fixed over brickwork, masonry or blockwork, and can be very porous. Due to a high sand content, the surface may contain a layer of loose sand particles that should be removed by brushing the render with a stiff bristle brush. The surface should then be made free of dust by wiping with a damp cloth, allowed to dry, and then primed with Davco Ultraprime.

Light Weight Concrete

These surfaces have a low tensile strength and therefore where direct stick applications are required, a flexible adhesive should be used. The surface can be friable, so all loose particles should be brushed off with a broom, all dust removed by wiping it down with a damp cloth. Dampen the surface down and whilst still damp, prime with two coats of Davco Ultraprime prior to tiling.

Brickwork / Blockwork / Masonry

These surfaces should be rendered prior to tiling. Allow at least 7 days for the render to cure. Refer to Cement Render section for best method of preparation.

Plasterboard

In all cases, boards must be fixed in accordance with manufacturer's instructions. When using in wet areas, it is important that a wet area grade of board is used - refer to board supplier for more detailed information. All dust must be removed from the surface by wiping down with a damp cloth and allowing it to dry. The sheets should then be primed using Davco Ultraprime.

Set Plaster

These substrates are gypsum based, and are highly absorbent. Firstly the surface should be lightly abraded, and all dust removed by wiping down with a damp cloth, then allow the surface to dry. The plaster should then be primed with Davco Ultraprime prior to tiling.

Timber - tongue & groove, particleboard, plywood

All timber floors must be structurally sound, and fixed according to the manufacturer's installation instructions. They must be free from any varnish, stains, oils or other contaminating coatings. If unsure at this point, please contact your local Davco State office for further advice. The floor must be sanded to both expose timber fibres (for good adhesion) and to smooth out any lipping in the joints between sheets. Take care when using a mechanical sander, ensure a sharp sanding pad is used, otherwise, the sanding can actually seal and close the surface of the timber, making it more difficult to adhere to.

The floor must be fixed, to ensure that the load deflection/deformation in the substrate does not exceed 1/360 of the span, when measured under 140kg concentrated load. This means that for a timber floor with 450mm centres, there can be no more than a 1.25mm vertical movement when measured under a 140kg concentrated load.

Once the floor is sanded, remove any dust and sanded timber contaminants from the floor, wipe over with a damp mop, and allow to dry. The floor then must be primed with Davco Ultraprime prior to tiling.

NB - In any case where the floor has greater than the specified degree of deflection, and this cannot be corrected, Davco recommends that the floor be sheeted using compressed fibre cement sheeting - refer to the manufacturer's instructions for full installation details.

In all situations, if any timber floor has been exposed to rain during construction, this may render the floor unsuitable for tiling over. In this instance contact the board manufacturer to determine the course of action.

Miscellaneous

Cork tiles

Tiling over cork tiles is not recommended as the cork has a tendency to part from the substrate when tiled over. Consequently, removal of cork tile or sheeting the floor with compressed fibre cement sheeting is recommended. If the tiles are removed, the surface can then be made ready for

tiling with the use of Davco Ultrabond - refer to your local Davco state office for more details or contact our Technical Advisory Line.

Existing Vinyl Tiles, Rubber Flooring and Linoleum

In every case, the flooring medium must be checked to ensure it is firmly fixed. The floor must be free from any dust, dirt, grease, oil or other contaminating materials. The floor should then be cleaned with Ormonoid Vinyl Floor Cleaner, and allowed to dry. The floor should then be coated using Davco Ultrabond prior to tiling.

NB - in the case where some of the vinyl floor is loose and needs removing, there is no need to remove the old adhesive prior to tiling. Simply remove any loose or semi-loose adhesive, prepare the substrate as above, and apply Davco Ultrabond over the old adhesive prior to tiling.

Painted Surfaces

In every case, the painted surface must be checked to ensure it is firmly adhered, with no signs of any flakiness. The surface must be free from any dust, dirt, grease, oil or other contaminating materials. The surface should then be cleaned with a suitable cleaner (eg sugar soap), and allowed to dry. Then the painted surface should be coated using Davco Ultrabond prior to tiling.

Existing Ceramic Tiles/Natural Stone and Terrazzo

In every case, the existing ceramic tiles must be checked to ensure they are firmly fixed, with no signs of any loose or drummy tiles. They must be free from any dust, dirt, grease, oil or other contaminating materials. The floor should then be cleaned with a suitable cleaner, and allowed to dry. The floor should then be coated using Davco Ultrabond prior to tiling.

Metal Surfaces

All metal surfaces must be free of any rust. Any rusted spots should be cleaned off using a wire brush, and the area treated with a suitable rust treatment. The substrate should be then primed with an etching primer. Davco recommends the use of Hornex for all metal tiling installations, but suggests you first contact our Technical Advisory Line to review the requirements of your specific installation prior to starting.

Correct Adhesive Selection

To ensure a sound tiling installation the correct selection of your tile adhesive is essential. Refer to the Davco Adhesive and Grout Selection Guide or contact **Davco's Technical Advisory Line on 1800 653 347 for further information or visit our website www.davco.com.au.**

This document is intended as a guide only, the relevant Australian Standards should be followed. For detailed information or assistance on applications not covered by this guide, contact our Technical Advisory Line 1800 653 347

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