Preparation of Concrete for Direct Bond Applications of Mortars and Membranes

TDS 1118

Before any tile, stone or membrane can be installed by a direct bond and for that matter thick bed method, the surface must be clean and free of any grease, wax, oil, dust, dirt and any other material that can act as a bond breaker. The best tile, stone or membrane installation is only as good as its adhesion to the substrate. Therefore, it is very important that the substrate be carefully cleaned and prepared to assure maximum bonding properties and finished tolerances.

Concrete substrates shall comply with AS3958.1 & 2, in particular AS3958.1- Clause 4.3 and 4.5. The surface should be true, flat and pitched to drains where required. Concrete sealers or curing compounds should not be applied to the surface of concrete slabs that are to receive finished flooring. If the concrete surface does have a sealer or curing compound present, it must be removed. Also note that a concrete slab with a very smooth shiny surface, due to over-trowelling, should be mechanically scarified to ensure that the mortar or membrane can achieve a suitable bond to the concrete. Prior to the application of the installation system, the concrete surfaces should be thoroughly cleaned to remove any loose particles of plaster, soil, preparation residuals and other foreign material.

Where possible concrete surfaces should be trowel finished and particular attention should be paid to ensuring the finishing process eliminates the incidence of laitance on the surface of the concrete. Off form concrete surfaces should have weak powdery surfaces mechanically removed during the preparation process.

Oil, grease and wax must be removed from old concrete slabs to insure a good bond. A mechanical scarifier will remove oil, grease or wax, as well as paint, adhesives, and even layers of asphalt tile from the surface.

Concrete surfaces that are to be membraned, tiled or have mortar beds applied to them, ideally should be finished to produce a sound, open pored, clean surface.

Mechanical scarification can be by means of grinding, grit blasting, sand blasting, scabbling, hydro blasting or by whatever means produces a sound, open pored that exposes the fine aggregates of the concrete.

If a mechanical scarifier is not used it will be necessary to remove oil, grease, or paint by chemical means. This can be accomplished by using a strong detergent solution such as tri-sodium phosphate or a solution of lye and hot water. The solution is mopped on the surface and allowed to stand 10 or 15 minutes or until it loosens the paint or grease. The solution is then squeegeed or mopped off and the treatment repeated. When all of the material has been removed from the floor, the surface should be flushed thoroughly with water to remove any remaining cleaning solution, and then vacuumed to remove any residual water.

Whether the concrete surface is new or old the following table and additional guideline for subsurface tolerance should be met for thin-set, thick bed (mortar bed) ceramic and stone tile installations and self-levelling methods.

Table 4.3 - Concrete Floor Preparation

Fixing method		**Applicability of finish**				**Minimum drying time of concrete**	**Maximum variation in plane of concrete***
Fixative	System	Screed	Wood float or broom	Power float	Steel trowel		
Mortar	In situ underlay	Yes	Yes	Yes	Yes	4 weeks	5mm in 3m
	Separating layer	Yes	Yes	Yes	Yes	4 weeks	5mm in 3m
	Sand/cement mortar bed	Yes	Yes	No	No	6 weeks	20mm in 3m
Adhesive	Thick-bed	Yes	Yes	Yes	No	6 weeks	10mm in 3m
	Thin-bed	No	Yes	Yes	No	6 weeks	5mm in 3m
	In situ underlays	Yes	Yes	Yes	No	4 weeks	5mm in 3m

* Where tile size does not require more stringent tolerances as discussed on the next page.

Additionally for thin-bed ceramic tile installations when a direct cementitious bonding material will be used, including medium bed mortar: consideration should be given to the maximum allowable variation in the tile substrate being – for tiles with edges shorter than 375mm, maximum allowable variation is 5mm in 3m from the required plane, with no more than 1.5mm variation in 300mm when measured from the high points in the surface. For tiles with at least one edge 375mm in length, maximum allowable variation is 3mm in 3m from the required plane, with no more than 1.5mm variation in 600mm when measured from the high points in the surface. For modular substrate units, such as exterior compressed cement sheet or adjacent concrete masonry units, adjacent edges should not exceed 0.8mm difference in height. Should the architect/designer require a more stringent finish tolerance than 3mm in 3m, the subsurface specification must reflect that tolerance, or the tile specification must include a specific and separate requirement to bring the subsurface tolerance into compliance with the desired tolerance.

CRACKS: Non-structural cracks that occur in slabs can transmit through any thin bed tile work. It is possible to prevent these cracks from coming through the finished flooring by applying LATICRETE Hydro Ban™ or LATICRETE 9235 Waterproofing Membrane over these cracks. Tile can also be installed with LATICRETE 125 Sound & Crack Adhesive to provide excellent adhesion and crack isolation.

CAUTION: STRONG DETERGENT SOLUTIONS, SUCH AS TRISODIUM PHOSPHATE OR LYE, MAY IRRITATE EYES AND SKIN. WEAR PROTECTIVE CLOTHING AND GOGGLES WHEN PREPARING OR USING SUCH MATERIALS. ALWAYS READ MANUFACTURER'S INSTRUCTIONS BEFORE USING.

LATICRETE Pty Ltd ▪ 29 Telford Street, Virginia, QLD 4014 Australia
1800 331 012 ▪ technicalsupport@laticrete.com.au ▪ www.laticrete.com.au