

# SURFACE PREPARATION GUIDELINES

*For Adhesive and Thin-set Mortar Installation of Ceramic and Porcelain Tiles, Quarry Tiles, Mosaics, Natural and Engineered Dimension Stone*

## Environmental Conditions

- ◆ Provide and maintain adequate health and environmental conditions including work protection during and after installation. Comply with trade standards and product instructions requirements. Follow product MSDS and label instructions regarding safety, health and other related precautionary and environmental protection. Comply with all applicable federal, provincial, local and statutory regulations.
- ◆ Close all doors and windows and turn off direct forced ventilation systems and apparatus. Turn off radiant floor heating systems and protect the work area from direct wind, draft, sun and heat exposure during installation and for at least 72 hours after work completion.
- ◆ When necessary, build a temporary shelter and use indirect auxiliary heaters to maintain the temperature level within the recommended range for proper installation and curing.
- ◆ Exhaust temporary heaters to building exterior to prevent health hazards and damage to work from toxic fumes and emanations.
- ◆ Set and maintain the substrate and ambient temperature in the tiling area within the 10°C (50°F) minimum and 35°C (95°F) maximum temperature range during installation and for 7 days after completion unless otherwise required by product instructions and/or by ANSI A 108 INSTALLATION STANDARD requirements.

### ◆ **Note:** Before starting and proceeding with the installation:

Always examine the substrate, site and ambient conditions. Report all deficiencies and non-conformities in writing to the general contractor, architect, engineer, owner or project superintendent. Do not proceed with any of the work until surfaces and conditions are in compliance with product instructions requirements and ANSI A108 Installation Standard requirements. Refer to the latest edition of the "TCA HANDBOOK FOR CERAMIC TILE INSTALLATION" and of the TTMAC Specification Guide 09300 Tile Installation Manual for details.

Examine the tile or dimension stone backs for possible dust or other contaminants. If necessary, use a slightly damp towel and wipe the contaminated backs to remove such dust or contaminant residue.

## Surface Preparation

- ◆ **Note:** If more stringent subsurface tolerances other than the generally accepted standard tolerances indicated herewith are required, the tile or dimension stone specification must include a specific and separate requirement notification to bring the subsurface standard [e.g. 6 mm (1/4") in 3 m (10'-0")] tolerance into compliance with the required more stringent [e.g. 3 mm (1/8") in 3 m (10'-0")] tolerance. See TCA HANDBOOK 'Notes and definitions - Subsurface Tolerance' and ANSI Guidelines for details).

## General

- ◆ All supporting surfaces must be structurally sound, solid, stable, level, plumb and true to a tolerance in plane of 1/4" in 10'-0" (6 mm in 3 m) in accordance with ANSI A108 Specification requirements.
- ◆ Surfaces must be clean and free of dust, oil, grease, paint, tar, wax, curing agent, primer, sealer, form release agent or any deleterious substance and debris which may prevent or reduce adhesion.
- ◆ Acids, concentrated alkaline conditions and cleaning chemical residues must be neutralized or removed.
- ◆ Mechanically sand, shot blast or scarify the substrate as required to completely remove all paint, loosely bonded topping, loose particles and contaminants. Surface etching or contaminant removal by chemical process should never be performed. Wear an approved dust mask while sanding or scarifying surfaces that might contain silica sand. Surfaces containing asbestos must be prepared and handled by specialized-trade professionals in accordance with current EPA regulations.
- ◆ All substrates must be dry.
- ◆ For ceramic and porcelain tiles up to 30 x 30 cm (12" x 12"), the structural design of the substrate must not allow a deflection greater than L/360 when tested to 136 kg (300 lb) concentrated loads in accordance with ASTM C 627 Standard test method. For square and rectangular tiles with one edge dimension 38 cm (15") and 45 cm (18") up to 58 x 58 cm (23" x 23") the maximum deflection should not exceed L/540 unless an effective CIM (crack isolation membrane) is used in the installation system. For tiles 60 x 60 cm (24" x 24") or larger and for ALL dimension stone installation, the maximum deflection must not exceed L/720. In all cases the system deflection and curvature should be uniform over the length of the span.

## Concrete Surfaces

- ◆ The concrete substrate must be completely cured, solid, sound and have a direct tensile cohesive strength greater than 1.2 MPa (175 psi) when tested in accordance with ACI 503 R –(Appendix A) procedure.
- ◆ On grade or below grade concrete slabs must be installed over an effective vapor barrier. The on-going contact of free water with the under side of the tile substrate must be avoided in order to prevent the unleashing of potentially damaging chemical reaction.
- ◆ The concrete substrate must be dry and free of hydrostatic conditions and/or extreme moisture problems. Perform a calcium chloride moisture emission test (ASTM F-1869) on the concrete substrate before proceeding with the installation of the floor preparation primer, floor leveler or tile-setting product. The moisture vapor emission of the concrete should not exceed 2.26 kg per 93 m<sup>2</sup> (5 lb per 1 000 sq. ft.) per 24 hours when tested in accordance with this procedure.



# SURFACE PREPARATION GUIDELINES

## For Adhesive and Thin-set Mortar Installation of Ceramic and Porcelain Tiles, Quarry Tiles, Mosaics, Natural and Engineered Dimension Stone (continued)

### Concrete Surfaces (continued)

- ◆ New concrete surfaces should be wood floated or light- broom-finished to achieve a finish profile equal to a CSP 5 as described in the ICRI Technical Guideline # 03732 when a self-leveling floor preparation mortar is to be applied or CSP 3 for direct thin-set mortar bonding.
- ◆ Mechanically sand, shot blast or scarify old concrete substrates as may be required to remove contaminants and loosely bonded topping and achieve a finish profile equal to a CSP 5 as described in the ICRI Technical Guideline # 03732 when a self-leveling floor preparation mortar is to be applied or CSP 3 for direct thin-set mortar bonding.
- ◆ Excessively dry or porous concrete should be wetted down and kept continuously moist for at least 24 hours before proceeding further with the surface preparation or tile installation. All excess water or standing water must be removed, allowing the surface to become saturated surface dry (SSD), before installing the leveling coat or setting mortar.

### Cement Backer Units (C.B.U.)

- ◆ The C.B.U. must conform to ANSI A118.9 quality standard requirements, be from a reputable manufacturer and composed of stable Portland cement, aggregates and reinforcements suitable and recommended by the manufacturer for INTERIOR (and/or EXTERIOR) Wall Installation.
- ◆ The (CBU) panels must be installed to framing with the long dimension across framing in strict accordance with ANSI A108.11 standard procedure for INTERIOR (or EXTERIOR) INSTALLATION OF CEMENTITIOUS BACKER UNITS. End and edge joints must be centered on framing and staggered in successive rows. Panels must be properly gapped in accordance with manufacturer's instructions
- ◆ Panels must be fastened to framing with corrosive resistant sheet metal screws with a sufficient head diameter to achieve a minimum 125 lb (56.7 kg ) fastener pull through and pull out resistance. Screw length must provide a minimum ¼" (6 mm) thread engagement. Screws should be placed with 15 cm (6") maximum spacing.
- ◆ Provide additional blocking where required to permit proper attachment. Edges or ends of unit parallel to framing shall be continuously supported.
- ◆ Fill all CBU panel joints with the tile setting mortar system used and tape according to manufacturer's instructions.

### Exterior Wall Substrates (Concrete, Masonry or CBU)

- ◆ With a flat-edge trowel, apply a thin leveling coat of PRO BOND / PRO BOND PLUS, (a 2 component flexible acrylic Portland cement mortar system) approximately 1/16" (1,5 mm) to 1/8" (3 mm) thick to cover the entire substrate. In this case, allow at least 24 hours curing time before installing tiles. (For complete details, refer to the respective product data sheets by visiting the PROMA ADHESIVE INC website at: [www.proma.ca](http://www.proma.ca)

### Gypsum Drywall Surfaces (for Interior dry areas only)

- ◆ Gypsum Drywall panels (ASTM C 36-97) and plaster joints must be completely primed with a one-coat application of PRO SET PLUS latex primer. Allow primer to dry-out completely before applying the setting mortar or adhesive. (refer to the respective product data sheets for details)

- ◆ **Note:** Gypsum-based floor levelers and patching compounds are not acceptable substrates.

### Exterior-Grade Plywood

#### (for interior residential floors and countertops in dry areas only)

- ◆ Plywood substrate and underlay for direct bonding must be (EGP) Exterior Glue Plywood A.P.A. rated GROUP 1 EXTERIOR - C.C. plugged or better, conforming to U.S. Voluntary Product Standard PS 1-95 or 'CAN/PLY'- rated EXTERIOR "SELECT" or (SEL TF) CSA 0121 Douglas Fir plywood in accordance with ANSI A 118.11 Standard requirements for (EGP) Exterior Glue Plywood. (Refer to ANSI A108.12 - AN-3.4.3 requirements for carpentry for EGP Latex Portland Cement Mortar)

- ◆ **Note:** Presswood, particle board, chipboard, masonite, gypsum floor patching and leveling compounds, asbestos board, Luan, OSB and similar dimensionally unstable materials are not acceptable substrates.

- ◆ Plywood must be new and acclimatized to room temperature and normal humidity conditions.
- ◆ The Smooth face of plywood must be facing up with the long grain running across joist. Panel joints must be straddled in accordance with industry standards.
- ◆ When on joists 40 cm (16") O.C. the sub-floor must consist of 2 layers each of 15 mm (19/32") thick plywood panels gapped with 6mm (1/4") spacing between sheets and between all materials which they abut such as walls, drains and posts. The top plywood panels must be fastened with non-corrosive floor screws at every 15 cm (6") around the perimeter and at 20 cm (8") intervals in all directions throughout the body of the panel.
- ◆ Plank or board substrates shall be covered over by a 19 mm (3/4") thick EGP plywood layer fastened with screws at intervals not exceeding 200 mm (8") O.C. in all directions and around the perimeter of each sheet.
- ◆ In all cases, the adjacent plywood sheets shall not be higher or lower than 0.75 mm (1/32") from one another. (Refer to ANSI A108.12 - AN-3.4.3 requirements for carpentry for EGP Latex Portland Cement Mortar)

### Resurfacing Old Surfaces (Interior installation only)

- ◆ Old cement terrazzo, ceramic tile, pavers and quarry tile, vinyl composition tile, and vinyl sheet floor covering (except cushion vinyl) must be sound, solid, well bonded, stripped clean and free of dust, wax, grease, sealer, soap residue and all other deleterious substances and contaminants which may reduce or prevent adhesion. (Refer to the most recent TCA HANDBOOK DETAILS TR-712 and TR-713 or TTMAC Specification Guide 9300 Tile Installation Manual Details 323 RW and 324 RF)
- ◆ Lightly sand, shot blast or scarify old existing substrates as may be required to remove contaminants and to achieve a light textured profile equal to a CSP 3 as described in the ICRI Technical Guideline #03732.

- ◆ **CAUTION:** Asbestos is a carcinogenic substance. Dust inhalation may cause cancer of the respiratory tract. The risk is aggravated with persons who are in direct contact with asbestos fiber fumes. NEVER scarify, sand, perforate, saw, shot blast or mechanically shred any material or old floor covering susceptible of containing asbestos fibers and/or crystalline silica. If in doubt, always presume that the old floor covering contains asbestos and therefore must be handled by specialized-trade professionals in accordance with current federal, provincial, state or local regulations.