SURFACE PREPARATION GUIDELINES

Ceramic Tile and Stone Installation

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 safety data sheet (SDS) and label instructions regarding safety, health and other related precautionary and environmental protection. Comply with all applicable federal, state, territory, 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 all temporary heaters outside to building exterior in order to prevent health hazards and damage to work from toxic fumes and emanations, which can cause carbonation and contaminate surfaces causing an installation failure.

Set and maintain the substrate and ambient temperature in the installation 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 "TCNA 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

General

Notes: PRO SUPERPRIME™ and PRO SUPERPRIME™ 1C can be used to ready nearly any surface for PROMA tile setting installation products without the need for scarifying or shotblasting, saving valuable time and money (refer to respective technical data sheet for details).

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 tolerance into compliance with the required more stringent tolerance. See TCNA HANDBOOK 'Notes and definitions - Subsurface Tolerance', TTMAC specification guidelines, and ANSI Guidelines for details.

All supporting surfaces must be structurally sound, solid, stable, level, plumb and true to a tolerance in plane of 6 mm (1/4") in 3 m (10'-0") and 2 mm (5/64") in 30 cm (12"); or 3 mm (1/8") in 3 m (10'-0") and 1.5 mm (1/16") in 60 cm (2') for large-format tiles with an edge longer than 38 cm (15") on any side. Reference ANSI A108 specification requirements and TTMAC specification guidelines for complete details.

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.

Surfaces must be clean and free of dust, oil, grease, paint, tar, wax, curing agent, form release agent or any deleterious substance and debris which may prevent or reduce adhesion. Mechanical removal of poorly-bonded or weak non-asbestos-containing substrates may be necessary.

- When removing poorly-bonded or weak non-asbestos-containing substrates, mechanically diamond grind, sand, shot blast, shave or scarify the substrate as required to completely remove all delaminating or weak paint, loosely bonded topping, loose particles and contaminants. **Note: If surface etching or contaminant removal by chemical process is performed, a certified letter must be obtained from the contaminant removal company that guarantees that all residual chemicals have been completely removed or any subsequent PROMA warranties will be deemed null and void.** Follow all regulatory requirements for protective eye, ear and respiratory PPE as required by law during any preparation method. Surfaces containing asbestos must be prepared and handled by specialized-trade professionals in accordance with federal, state, territory, provincial, local and statutory regulations.

- Any areas with oil contamination on existing concrete substrates, including but not limited to, sections where pipe cutting occurred may require cleaning with an appropriate degreaser, such as PRO DECAP™ (reference technical data sheet for details), or an oil-eating microbial product (i.e. Amoeba Cleaner for either petroleum or food-based oils). When clean, the concrete should absorb water freely and darken slightly with no water beading. For large areas with oil contamination, treat the entire substrate with the desired cleaning product and using either an orbital low speed swing buffer with a soft bristle nylon scrub brush or an auto scrubber with a soft nylon scrub brush to agitate the cleaner following the cleaner manufacturer's instructions. Use clean, potable water to rinse thoroughly until no soap residue or bubbles remain. Allow the floor to completely dry. Using an auto scrubber for this process will speed up the cleaning and drying process.

Acids, concentrated alkaline conditions and cleaning chemical residues are not recommended and must be neutralized or removed.

Substrates must be dry.

Note: Do not apply directly over particleboard, chipboard, presswood, Lauan, masonite, asbestos board, gypsum floor patching and/or leveling compounds or other similar dimensionally unstable materials. Reference "Gypsum and Light-Weight Concrete Surfaces" section for details over these materials. Mechanically-fasten plywood over all other materials mentioned to create a suitable substrate (reference "Exterior-Grade Plywood" section for details). In certain cases, some installation products may be used over properly prepared OSB; always reference a product's technical data sheet for suitable substrates, limitations and other relevant instructions.

Concrete Surfaces

Smooth, chemically-densified, burnished or Power-Troweled concrete substrates must be either **PRIMED** with PROMA PRO SUPERPRIME™ or PRO SUPERPRIME™ 1C primer **OR** mechanically roughened in accordance with an engineer-approved procedure (shot-blasting, scarification, grinding, sand or water-blasting, etc) to provide sufficient surface texture and profile for the adequate bonding of the subsequent thin-set mortar (please refer to the PRO SUPERPRIME™ or PRO SUPERPRIME™ 1C technical data sheet for full details).

Some silicate-based densifiers weaken when cleaned with citric-based degreaser at a heavy cleaning dilution ratio. Polished concrete densifiers may contain sealers with chemicals used in non-stick cookware for stain protection properties. Mechanical preparation may be required over chemically densified and polished concrete.

Excessively dry or porous concrete must be primed with PRO SUPERPRIME™ or PRO SUPERPRIME™ 1C (refer to respective technical data sheet for details), or wet down and kept continuously moist for at least 24 hours before proceeding further. All excess water or standing water must be removed, allowing the surface to become saturated surface dry (SSD), before installing the thin-set mortar.

New Concrete:

Note: ASTM E-155 the ACI guidelines require specific FF (Floor Flatness) be assessed within 72 hours of new concrete placement to ensure accuracy.

Concrete substrates must be completely cured, sound, solid and have a direct tensile cohesive strength greater than 1.2 MPa (175 psi) when tested in accordance with ACI 503-30, ASTM D-4541 or ISO 4684. On grade or below grade concrete slabs must be installed over an effective vapor barrier and tested for humidity in accordance with ASTM F1869 and ASTM F2170.

New concrete surfaces should be wood floated or light broom-finished to achieve a finish profile equal to a CSP 3 as described in the ICRI Technical Guideline # 03732 when a mortar is to be applied. If the new concrete has a smooth finish, it is recommended to achieve a CSP 3-5 profile by mechanical means to ensure that topical salts and/or curing compounds, etc. are removed to ensure proper adhesion to the substrate with no remaining bond breakers present.

Existing Concrete:

On grade or below grade concrete slabs must be installed over an effective vapor barrier. The on-going contact of free water may unleash a potentially damaging chemical reaction.

Existing concrete substrates must be dry and free of hydrostatic conditions and/or extreme moisture problems. Moisture testing must be performed, and no individual test method should be considered conclusive by itself. A combination of the following test methods is recommended to help determine the moisture content and permeability of the concrete:

- Perform a calcium chloride moisture emission test (ASTM F-1869) on the concrete substrate before proceeding with the application of primer, thin-set mortar or adhesive. The moisture vapor emission of the concrete should not exceed 2.26 kg per 93 m² (5 lb per 1,000 sq. ft. per 24 hours) when tested in accordance with this procedure. A pH test is recommended in conjunction with this test. Note: a pH level reading below 9 pH indicates a problem or a sealer and therefore deeper preparation is required to get an accurate moisture reading, even when testing old concrete.
- Perform an in-situ Relative Humidity probe test (ASTM F-2170) using Equilibrium Relative Humidity probes that have acclimated for up to 72 hours prior to reading. The moisture content should not exceed 85% RH depending upon the product being used (refer to respective product technical data sheet or contact our Technical Services department for appropriate recommendations).

Note: PROMA's PRO BLOCK MMS™ moisture mitigation system can be used to remediate moisture problems on certain properly-prepared concrete substrates (reference technical data sheet for details).

Existing concrete slabs with old cutback adhesive or non-water soluble adhesive residues must be properly scraped, roughened and cleaned prior to the application of a thin-set mortar.

- The adhesive residue should look like a thin, transparent, well-bonded stain or film with no trowel ridge definition remaining.
- Never apply thin-set mortar over adhesive residues on floors with moisture problems, adhesives over existing substrates (i.e. adhesive over Vinyl, wood, Terrazzo, epoxy, etc.) or that may be submerged under water, exposed to constant high humidity, etc. Adhesives should be completely mechanically removed in these circumstances. Only apply thin-set mortar over adhesive residue that is directly over concrete substrates once properly prepared.

Note: Consult respective thin-set mortar technical data sheet prior to use as some are not recommended over properly prepared cut-back or non-water soluble adhesive residues.

Mechanically preparation (Diamond Grinding, Shaving, Shotblasting, Sanding or scarifying) of old concrete substrates may be required to remove contaminants, loosely bonded topping/mortars, penetrating sealer/densifiers and achieve a finish profile equal to a CSP 3-5 as described in the ICRI Technical Guideline # 03732. Weak, crystalized or water soluble adhesives can be mechanically removed using a scraper, orbital sander or grinder.

For more jobsite specific questions, please contact our Technical Services department for appropriate recommendations.

Cement Backer Units (CBU)

Cement Backer Units (CBU) 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.

CBU panels must be installed to framing with the long dimension across framing in strict accordance with ANSI A108.11 standard procedures 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 backer screws with a sufficient head diameter to achieve a minimum 56.7 kg (125 lb) fastener pull through and pull out resistance. Screw length must provide a minimum 6 mm (1/4") thread engagement. Screws should be placed with 15 cm (6") maximum spacing. DO NOT use drywall screws to fasten cement backer boards.

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 appropriate ANSI A118.4 tile setting mortar and tape according to manufacturer's instructions.

Exterior Wall Substrates (Concrete, Masonry or CBU)

Using a flat-edge trowel, apply a thin leveling coat of PRO HPX™, PRO QUICK SYSTEM™ (PRO QUICK™ with PRO QUICK PLUS™) or PRO BOND SYSTEM™ (PRO BOND™ with PRO BOND PLUS™) approximately 1.5 mm (1/16") to 3 mm (1/8") thick to cover the entire substrate. In this case, allow at least 24 hours curing time for PRO HPX and PRO BOND SYSTEM and 2-3 hours for PRO QUICK SYSTEM before installing tiles. (Refer to the respective product technical data sheet for complete details).

Gypsum and Light-Weight Concrete Surfaces

Gypsum-based floor levelers and gypsum-based patching compounds are NOT acceptable substrates unless a tensile bond strength of 0.5 MPa (72 psi) is reached as a minimum for thin-set mortar application, and they are properly primed with PRO SUPERPRIME™ or PRO PRIME LP™ (reference respective technical data sheet for details).

Gypsum Drywall Surfaces (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 PRIME LP™ or PRO SUPERPRIME primers. Allow primer to dry completely before applying the thin-set mortar (refer to respective technical data sheet for details.)

Exterior-Grade Plywood (interior residential floors and countertops in dry areas only)

Plywood substrates and underlayments 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).

Plywood must be new and acclimatized to room temperature and normal humidity conditions.

Existing plywood should be clean and may require sanding to remove surface contamination. Replace any broken, rotten or missing areas with new exterior-grade plywood underlayment prior to thin-set mortar installation. 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 6 mm (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 must be covered by a 19 mm (3/4") thick EGP plywood layer fastened with screws at intervals not exceeding 20 cm (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 installations 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 TCNA HANDBOOK DETAILS TR-712 and TR- 713 or TTMAC Specification Guide 9300 Tile Installation Manual Details 323 RW and 324 RF).

Ensure the existing substrate contains no remaining wax or floor finish. All wax/floor finish must be thoroughly stripped with an appropriate floor stripping product using an orbital scrubber, low speed buffer, etc. Once all wax/floor finish has been removed and has thoroughly dried, priming with PRO SUPERPRIME or PRO SUPERPRIME 1C may be required (reference respective technical data sheet for details).

For mechanical preparation, lightly sand, diamond grind, 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.

- As an alternative to mechanical preparation, use PROMA PRO SUPERPRIME or PRO SUPERPRIME 1C for direct bonding to approved substrates, such as Terrazzo, concrete, resinous floor coatings (i.e. Epoxy, Urethane, Polyaspartic/Polyurea, Epoxy Terrazzo, Polyurethane), and tile (Quarry, Ceramic, Porcelain, Marble, Granite), homogeneous PVC Vinyl, VCT/VAT, asphaltic plank, prepared asphaltic cutback residue and Non-water-soluble adhesive residues (reference respective technical data sheet for details).
- **CAUTION: Mechanical preparation and/or priming is NOT recommended for any existing material that may contain Asbestos. Any substrate that may contact Asbestos should be tested prior to preparation methods. 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 federal, state, territory, provincial, local and statutory regulations.**

Note: All substrates must achieve a minimum direct tensile bond strength of 1.2 MPa (175 psi) for direct bonding of tile.

Metal

Existing metal surfaces may have contamination or corrosion, which must be mechanically removed prior to priming with PRO SUPERPRIME or PRO SUPERPRIME 1C for thin-set mortars, or the application of a specialty adhesive that can adhere to metal, such as PRO GROUT XTREME™ MORTAR or PRO SEAL & SET 100 NS™ (refer to respective technical data sheet for details).

Ensure any old paint does not contain lead using a home lead paint test kit available at a local hardware store. Use a wire brush, shotblast or grind as necessary to remove any paint, loose coatings, corrosion, etc. Vacuum the entire metal surface and wipe clean with denatured alcohol or other proper solvent and allow to completely dry.

Note: New metal surfaces may have a thin film of oil on the surface which must be removed prior to priming with PRO SUPERPRIME or PRO SUPERPRIME 1C or the application of a specialty adhesive that can adhere to metal, such as PRO GROUT XTREME™ MORTAR or PRO SEAL & SET 100 NS™ (refer to respective technical data sheet for details).

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