

TECHNICAL BULLETIN **Substrate Preparation**

Prior to the application of ProSpec[®] Level Set[®] Products

Proper preparation of any substrate is the most important step in achieving a successful installation of all Level Set products. The Level Set product being used to restore or repair a damaged surface will only be as strong as the surface over which it is bonded. This surface must not act as a bond breaker at the interface between the self-leveling system and the substrate. Therefore it must be sound, clean, dust free and not be contaminated with oil, grease, paint, wax, curing compounds, asphalt or any such material that may act as a bond breaker. The key to having a successful installation is to create a good bond between the substrate and the Level Set products.

There are no shortcuts. Installing the Level Set system is usually faster and less intensive than preparing the surface. However without the proper prep-work and planning installation problems may occur. The installer is responsible for the proper subfloor preparation prior to the application of the ProSpec products.

Doing the substrate preparation the right way the first time is the key to a successful Level Set installation.

We are about to outline recommendations for preparing various types of floors, however local and varying conditions cannot be anticipated and therefore this is only meant to be a general guide and a reference. It is recommended that test applications, including the final floor covering, must be done to insure that the product meets the suitability of the final requirements. Additionally contact the floor covering and adhesive manufacturer in regarding their needs, such as the maximum allowable moisture content before covering with a self-leveling product. Extra steps may need to be taken based on their needs.

SUBSTRATE PREPARATION RECOMMENDATIONS

Concrete Substrate Preparation

Mechanically removing all contaminants and bond breakers is the ONLY way to ensure an acceptable, clean solid substrate prior to the application of Level Set products. Remember to penetrate deep enough to eliminate all contaminants and then remove all dust and latencies by sweeping and vacuuming.

Typical mechanical substrate preparation methods are: sandblasting, scarifying, bush hammering, grinding, sanding, shot blasting*, high pressure water blasting, chiseling, and etc.

All of these methods depending upon situations, job conditions and environmental restrictions have their advantages. However we have found that shot blasting (Blastrac) the substrate is both time and cost effective. By utilizing varying sizes of steel pellets and different size machines, large surfaces can be easily prepared prior to receiving the underlayment or topping.

* The floor finish when mechanically profiled should conform to an ICRI CSP 3-5 Finish.

Never use chemical methods such as acid washing/etching, solvents or adhesive removers. All of these means, especially on porous concrete, will not completely remove the contaminant, force it deeper into the substrate resulting in further problems, or by itself weaken the concrete.

Chemical methods also pose environmental and disposal restrictions as well as safety and hazardous material constraints due to their toxicity and flammability.

Concrete

Level Set underlayments and toppings are intended for interior use only and installed over sound, non-contaminated, and dry substrates. The Level Set system, encompassing primer, underlayments and topping, is not a vapor barrier and will transmit moisture through it. Maximum moisture vapor transmission through concrete when tested per the Calcium Chloride Test (ASTM F1869) should not exceed 5-6 lbs. (2-3 kg) / 24 hr. /1000 sq. ft. (93 sq. m), or the Relative Humidity method (ASTM F2170), should not exceed 90%. Therefore do not apply Level Set in areas of constant and/or periodic substrate moisture transmission since this will jeopardize performance. When in doubt ProSpec recommends testing the moisture content of the subfloor, and contacting the floor covering supplier regarding maximum allowable moisture level and if needed take remedial action prior to installing Level Set products. Remember if the floor appears dry, but still has residual moisture that is too high it could transmit through the Level Set system and affect adhesive bond.

Contamination Affecting Bond

Concrete floors must be solid and sound. All loose, unsecured, weak parts of the concrete substrate must be removed down to a sound base and free of grease, oil, dirt, paint or any contaminants that will interfere with adhesion. Any residue of such bond breakers will lead to job problems and need to be removed mechanically, not by chemical means, since chemicals may themselves leave a bond breaking residue.

All asphalt and coal tar on concrete substrates, that are to receive the Level Set system, must be completely mechanically removed down to a solid concrete surface. Cutback adhesive removal will be addressed later.

Below are examples of substances and conditions that will interfere with bond and hinder the application of the Level Set system:

- New “Green Concrete”: New concrete must be cured for a minimum of 28 days. If this is not done potential continued movement may result in cracks that mirror through the Level Set layer. Additionally, residual moisture in “green” concrete may interfere with bond. All leading to an unacceptable job.
- Curing and Sealing Compounds: The chemistry of curing and sealing compounds varies considerably. Some are water based and VOC compliant, while others are formulated using oils and/or solvents. Others state they contain no waxes or oils. Additionally the contractor does not know or remember what was used, with the end result being that a good bond cannot be guaranteed. Consequently complete mechanical removal is needed prior to proceeding with the installation of the underlayment or topping.
- Loose, Frozen, Spalled, Weak Surfaces: All unsound, scaled, delaminated, crumbling or other unsuitable surfaces must be mechanically removed down to a solid clean surface.
- Lightweight Concrete: ProSpec does not recommend the use of the Level Set products over concrete that is less than 125 lbs. ft³ (2,002 kg m³) in density and has a compressive strength less than 3,000 psi (20.7 MPa).

Repairs, Cracks and Joints

Simply stated, movement is a natural part of all construction installations and this is why movement joints are present. Movement joints in the slab including expansion and isolation joints must be maintained throughout the installation and should not be covered by the underlayment or topping. They are integral to the construction and movement of the building and must not be contained. Isolation can be accomplished by filling the joints with foam or creating an edge barrier. Such joints include isolation and expansion joints.

All stationary cracks, in order to minimize their mirroring through the Level Set products or reflection on to the floor covering, should be repaired. However, hairline cracks do not threaten the performance of the Level Set products or the proposed floor covering (less than 1/32" (1 mm)).

Larger inactive cracks (1/4" (6 mm)) should be cleaned out, opened up and repaired using cement based patching compound, such as ProSpec Feather Edge or Floor Patch Pro. Do not use a gypsum based patch. Consult ProSpec literature and bag for detailed instructions. Let repairs completely cure before placing the underlayment or topping.

In the case of active cracks, that are a result of structural inadequacies or design weakness, a structural engineer and repair specialist should be consulted. The need for epoxy injection, foundation stabilization may be necessary. Until such remedial measures are taken we do not recommend the Level Set system.

After application, if a crack should mirror onto the surface and is larger than a hairline (1/16" (1 mm)) flash-patching with ProSpec Feather Edge Patch will negate the possibility of reflection into certain floor coverings.

Cutback Adhesive

Subfloor preparation of concrete having asphalt based adhesive residue, after the removal of the old vinyl tile etc., is critical to a successful installation of the Level Set products. Not only could the remaining cutback cause bleeding adversely affecting the new floor covering but result in contamination interfering with bond causing delamination of the Level Set product.

Therefore proper removal of non-water soluble cutback is important. On subfloors not covered by cutback, mechanical preparation is recommended, however on substrates containing adhesive residue mechanical removal could be hazardous due to potential asbestos content. Consequently, if possible consult with the contractor or adhesive manufacturer for guidelines concerning asbestos content.

Weak, powdery, brittle, loose and unsound adhesives must be cautiously removed using the wet scraping procedure as depicted in the Resilient Floor Covering Institutes booklet "Recommended Work Practices for the Removal of Resilient Floor Coverings" (Tel: 301-340-8580). The end result should be a thin, transparent layer of residue. Before priming check for loose areas, remove and then wet mop and vacuum the floor eliminating any bond breaking contaminants.

The Level Set product can be placed over properly prepared floors containing a thin layer of non-water soluble cutback that is still bonded to the substrate. The only primer recommended for Level Set applications over cutback adhesive is Level Set Primer Plus.

NOTE: Inhalation of asbestos dust can cause respiratory damage and should be avoided. Therefore avoid dust producing remediation such as grinding or sanding.

Wood Substrates

The surface of the wood floor, as in the case of a concrete floor, must be clean, free of oil, grease, wax, paint, dirt, varnish, shellac or any bond breaking contaminant. A bare wood surface free of debris and dust is required. A commercial sander would be an acceptable means; however do not use chemicals, strippers or solvents. If acceptable contamination removal cannot be accomplished a firmly secured overlay of 1/2" plywood can be used.

All wood subfloors must be sound, firm, solid and securely fixed. Re-nail all panels that are loose. Any open joints between the panels should be filled with ProSpec Feather Edge or Floor Patch Pro. When using ProSpec

Level Set self-leveling underlayment the subfloor must be at least 3/4" tongue and groove APA – rated Type 1 exterior plywood or OSB equivalent. Remember that wooden floors, as a rule, will have more deflection than more ridged concrete flooring, therefore follow installation instructions printed on the ProSpec Technical Data Sheets or call ProSpec Technical Service. The only primer recommended for Level Set applications over wood is Level Set Primer Plus.

There are differing types of wooden subfloors, which are acceptable to floor covering manufacturers, such as Luan plywood, wafer board or wood composites. These are all subfloors that may require a smooth surface. The application of non-gypsum based ProSpec Feather Edge or Floor Patch Pro will provide an ultra-smooth surface. Consult the specific manufacturers' recommendations concerning the use of a skimcoat.

As in all cases the surfaces must be free of all contaminants such as grease, wax and coatings that would act as a bond breaker. Mechanical cleaning is recommended since it removes any penetrated contaminants and abrades the surface, promoting bond.

Non-Porous Substrates

These substrates include, but are not limited to the following materials being installed over subfloors; fully adhered vinyl tile, non-cushioned sheet vinyl, tiles, stone, cement terrazzo, epoxy coatings and ProSpec Moisture Guard Max must be firmly attached to the surface and solid. Any parts not bonded must be removed, including the setting mortar and adhesive down to sound concrete. When installing over non-porous, non-absorbent surfaces use Level Set Primer Plus or Level Set Epoxy Primer.

As in the case with other metal substrates must be clean, free of rust, oil, wax, grease, structurally sound, properly anchored and free of any contaminants that may interfere with bond. Mechanical means such as sand blasting, wire brushing or other means to remove contaminants is recommended. When covering corrosive substrates and after proper cleaning, paint the surface, to prevent recurring rust, with an anti-corrosive coating. Please refer to the Level Set product literature for detailed placement procedures relating to Level Set applications over metal. The only primer recommended for Level Set applications over metal is Level Set Primer Plus or Level Set Epoxy Primer.

ProSpec always recommends first doing a test area (mock-up) to evaluate the compatibility of the products and with job conditions.

Consult the individual product data sheets for more details concerning technical data and installation procedures.

If you have any questions please call ProSpec Technical Service. Always consult the Safety Data Sheets prior to installation.