SUBSTRATE PREPARATION GUIDE
FOR THE APPLICATION OF UZIN PRODUCT SYSTEMS

Ken Smith, V.P. of Vortex Commercial Flooring, Chicago, IL used UZIN product systems on the West Chicago Parks District ARC Center, a Starnet Design Awards Gold winner in Hospitality.
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INTRODUCTION

Substrate preparation is a vital part of the success of any floor covering installation. Regardless of the substrate composition, it is the base or foundation which serves as the platform for the floor covering to be installed. Proper substrate preparation starts with a thorough inspection and assessment of jobsite conditions to determine what concerns need to be addressed to meet the specification and to ensure a successful installation for the life of the floor covering. When assessing a substrate, the flooring contractor must take into consideration the type of flooring, the area in which it will be used and the stresses it will be subjected to during its service life. Improper or inadequate assessment and substrate preparation lead to construction delays, costly repairs and/or premature failure of the flooring system.

The key to success is achieving a proper bond between all materials through correct substrate assessment, preparation and application.

This guide is intended to communicate jobsite qualification requirements, common industry surface preparation methods and equipment, and methods to avoid in order to produce an acceptable substrate ready for the use of UZIN products. In addition, it also communicates appropriate UZIN product systems that meet the floor covering manufacturer’s specifications. Contact the UZIN Technical Services Department for conditions that are not listed or for additional clarification.
JOBSITE QUALIFICATION

Prior to selecting or qualifying a specified flooring product, a thorough jobsite inspection should be conducted along with appropriate substrate testing to meet installation requirements and to assess what other environmental conditions exist. Once the conditions are known and documented, the flooring contractor can choose the products and finalize the system or qualify the specified products for the project.

MOISTURE TESTING

Excessive moisture is one of the leading causes of floor covering failures therefore appropriate substrate testing must be conducted in order to meet the floor covering manufacturer’s requirement. Refer to ASTM F2170-11 “Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes” and ASTM F1869-11 “Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride”. Where concrete substrate moisture exceeds the flooring manufacturer’s maximum allowable values, it must be mitigated prior to the application of leveling compounds and floor coverings.
Caution: Do not sand or grind adhesive residue, as harmful dust may result. The inhalation of asbestos dust may cause asbestosis or other serious bodily harm. Refer to the Resilient Floor Covering Institute’s publication “Recommended Work Practices for Removal of Resilient Floor Coverings” for instructions. Comply with all local and federal laws. Listed below are frequently used methods and equipment for the surface preparation of concrete. Each has its advantages and disadvantages, so the method chosen must carefully take into account the material being removed, the material being installed and also the environmental conditions.

**Shot blasting** is the most common form of removing laitance, old coatings and other contamination from cement substrates. It is a dry process and may allow for floor prep to commence in adjacent areas.

**Grinding** is a useful method for smoothing out level floors to remove laitance and some curing compounds or sealers. Particular attention must be paid to compacted dust in the pores of the concrete which could inhibit a good bond. It may require mechanical brushing or vacuuming of the substrate for removal.

**Abridging** is generally done with an STR multi-purpose floor preparation machine, which uses abrasive papers or carborundum blocks. These machines are lightweight and typically used in small areas.

**Concrete planing** has options regarding types of cutters and spacing so that the surface profile can be grooved or flat. This method is noisy, dusty and slower than shot blasting.

**Methods to avoid**

Methods to avoid on any type of substrate including wood are acid washing and any type of solvents or adhesive removers. These methods pose a high risk and should never be used. There is potential for the liquid to drive the contamination further into the substrate only to migrate back to the surface later risking partial or catastrophic failure. Contact the UZIN Technical Services Department for recommendations.

**Things to consider**

Old surfaces are often contaminated, damaged, have moisture issues and often present a greater risk than new substrates. All substrates should be tested to determine if they are adequate for their intended use. In extreme cases, it may be advisable to contact an independent inspector.
Curing Compounds / Sealers / Coatings / Laitance

Curing compounds, sealers, coatings and laitance frequently interfere with adhesion and must be removed using one of the surface preparation methods listed above. Mechanically remove all traces of compounds down to clean, solid, sound concrete. Substrates that exceed the flooring manufacturer’s moisture requirements should be treated with a suitable UZIN moisture vapor retarder. Use a suitable UZIN patching, smoothing or self-leveling compound for preparing the subfloor. Refer to product data sheets regarding specific usage and instructions. Contact the UZIN Technical Services Department for specific product recommendations.

Dealing with Cracks and Joints in Concrete Slabs

All moving joints in the concrete slab such as expansion and isolation joints must not be covered and must be honored up through the finished floor covering. Dormant cracks or joints may be filled using a suitable UZIN patching or repair compound or UZIN KR 518 2-Component Joint Filler (refer to Product Data Sheets). Larger cracks should be thoroughly cleaned out, chased and filled using a suitable UZIN patching or repair compound. UZIN RR 203 Substrate Crack Bridging Material, a highly tear-resistant reinforcing layer with extreme tensile strength, may be used for bridging substrate cracks and construction joints (saw cuts) up to 1/4” wide. UZIN RR 201 Substrate Reinforcing Mesh may be used in conjunction with UZIN RR 203 as a composite system for floor areas in need of renovation. Refer to product data sheets regarding specific usage and instructions. Contact the UZIN Technical Services Department for specific product recommendations.
Power Troweled Concrete Slabs

Power troweled concrete is the most common finishing technique used today. It provides a very smooth, dense, slick surface. Most power troweled slabs are cured with a curing agent rather than using the wet cure method. The curing agent may be acrylic-based, wax-based or silicate-based. These products, including the so-called “dissipative curing compounds” are all well-known bond breakers and will inhibit the bond performance of materials applied directly on top of them. These should be removed by mechanical means. In addition, power troweled slabs and especially those cured with curing agents will take considerably longer to dry.

Adhesive Residues

Any weakly bonded or soft surface material, such as loose adhesive residues, leveling compounds, floor coverings or coatings must be removed by shot blasting, abrading, grinding or wet scraping.* UZIN PE 460 Moisture Vapor Retarder or UZIN PE 414 Turbo Surface Strengthener/Primer/MVR may be used over a properly prepared solvent and non-solvent (water-based), well-bonded adhesive residues. They may also be used for mitigating residual high substrate moisture prior to the application of self-leveling compounds. To create a mechanical key for leveling compounds, broadcast sand into the final MVR coat while still wet using the roller application method. When using the one coat trowel/ squeegee application method for MVR’s, the application of UZIN PE 280 Super-Fast Primer may be used in lieu of broadcasting sand. Only use PE 280 when applying leveling compound at a depth of no more than 1”**. Always use the sand broadcast system when installing hardwood flooring. A full system bond test is always recommended. Refer to product data sheets regarding specific usage and instructions. Contact the UZIN Technical Services Department for assistance.

*NOTE: Some previously manufactured asphaltic “cutback” adhesives may contain asbestos. Other flooring adhesives may contain crystalline silica. Removal instructions can be found in RFCI, Resilient Floor Covering Institutes “Recommended Work Practices for the Removal of Resilient Floor Covering”. **See Uzin PE 280 Product Data Sheet Technical Data for additional information
Non-Absorbent Surfaces

Surfaces that will not allow or significantly slow the passage of water through them are considered non-absorbent. Paint, ceramic tile, terrazzo and power troweled concrete are examples of non-absorbent surfaces.

A. Surface Moisture Vapor Retarders

Membranes such as UZIN PE 460 2-Component Epoxy Resin or PE 414 Turbo 1-Component Polyurethane Moisture Vapor Retarder are non-absorbent surfaces and can be covered with leveling and smoothing compounds. When applying leveling compounds over these UZIN moisture vapor retarders, broadcast sand into the final coat using the roller application method. When using the one coat trowel/squeegee application method and in cases where the leveling compound depth is not to exceed 1”*, UZIN PE 280 Super-Fast Primer may be used in lieu of broadcasting sand. Always use the sand broadcast (grit-binding) system when installing hardwood flooring. Refer to product data sheets regarding specific usage and instructions. Contact the UZIN Technical Services Department for assistance.

NOTE: UZIN dispersion primers, leveling compounds or patching products are not moisture barriers and should never be used as such.
*See Uzin PE 280 Product Data Sheet Technical Data for additional information

B. Curing Agents and Admixtures

These types of products are designed to repel water, prevent dusting or water from escaping from the concrete slab. Regardless, adhesion will be compromised if leveling compounds or adhesives are applied directly on top. The substrate should be prepared by mechanical means such as shot blasting prior to the application of moisture vapor retarders or smoothing compounds. A full system bond test should always be performed prior to the final application.

C. Terrazzo, Ceramic and Quarry Tiles

These materials may be covered provided they are sound, well-bonded to the substrate and free of moisture. Cracked or loose material should be removed. The surface must be thoroughly cleaned and all traces of contamination completely removed. Prime the surface with the appropriate UZIN primer prior to the application of self-leveling compound. Refer to product data sheets regarding specific usage and instructions. Contact the UZIN Technical Services Department for specific product recommendations.
**Gypsum Substrates**

Gypsum-based materials are a popular option for use over wood substrates. Gypsum materials offer good fire resistance and sound deadening. Standard gypsum materials usually require a minimum thickness of ¾". Quite often, old gypsum substrates (and sometimes new) are found to be distressed and suffering from degradation.

Prior to the application of UZIN subfloor preparation products all gypsum substrates should be clean, solid, sound and dry. All laitance should be removed by grinding or sanding and vacuumed thoroughly to remove all dust. Cracks in lightweight concrete/gypsum topping that are directly over subfloor panel joints may indicate excessive subfloor movement and should be checked, and corrected if necessary. Test substrate for moisture in accordance with the finish flooring manufacturer’s instructions. To strengthen surfaces that are highly absorbent and are not sound, solid or are weak, UZIN polyurethane or epoxy resin moisture vapor retarders may be used. Refer to product data sheets regarding specific usage and instructions. Contact the UZIN Technical Services Department for specific product recommendations.

**Existing Floor Coverings**

Most floor coverings such as vinyl, linoleum and carpet must be removed and substrate prepared prior to the application of a new topping or covering. However, some floor coverings such as non-cushion-backed sheet vinyl, VCT, VAT, ceramics, terrazzo and stone may provide a suitable base provided they are clean, solid, sound and dry. UZIN Epoxy Resin Moisture Vapor Retarder PE 460 may be considered for use as a bonding agent and strengthener on abraded ceramic tile, stone and terrazzo surfaces. Refer to product data sheets regarding specific usage and instructions. Contact the UZIN Technical Services Department for specific product recommendations.
**Wooden Substrates**

As with all other substrates, wood must be clean and free of all contaminants such as dust, dirt, oil, grease, wax, varnish or shellac or any other contaminant that might act as a bond breaker. It may be necessary to sand the substrate to bare wood. Never use solvents, strippers or cleaners to remove contamination from the surface of a wood substrate. Adequate ventilation must be provided under suspended wood substrates to maintain equilibrium. Perform moisture tests per floor covering manufacturer’s requirements.

Wood substrates must meet the following structural requirements for the application of UZIN self-leveling compounds; wood substrates must be a minimum thickness of ¾ inch tongue and groove, APA-rated, Type 1, exterior grade or OSB equivalent. UZIN patching and repair compounds can be used over wood substrates (excluding pressure-treated or fire-rated) to patch seams, fill voids or for smoothing. The use of UZIN RR 201, RR 203 and/or UZIN Reinforcing Fibers will help to mitigate the effect of deflection in the floor. Refer to product data sheets regarding specific usage and instructions. Contact the UZIN Technical Services Department for specific product recommendations.

**NOTE:** Refer to ASTM F1482-04(2009)e1 - “Standard Practice for Installation and Preparation of Panel Type Underlayment’s to Receive Resilient Flooring.” Consult the individual resilient flooring, underlayment or adhesive manufacturer for specific recommendations. Manufacturer’s instructions supersede the recommendations included in this practice.

**CONCLUSION**

The information within this document is to be used only as a general guide for preparing substrates to receive UZIN products. The flooring system used and specific service conditions must be taken into consideration during the assessment phase to determine the best suitable products. Always install test area’s including the entire system and follow the floor covering manufacturer’s requirements.

If in doubt consult the UZIN Technical Services Department (Telephone 866-505-4810, e-mail uzin.us@uzin-utz.com)

Always refer to Uzin Product Data Sheets (PDS) for details regarding product suitability in advance of installation (us.uzin.com).
Always refer to the floor covering manufacturer’s specification or requirements and applicable industry publications such as the ones listed below for industry best practices and guidelines. Conform to all local, state and federal building codes and laws.

- ASTM F710 – “Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring”
- ASTM F1869 – “Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride”
- American Concrete Institute (ACI) “ACI 302.1R-04, Guide for Concrete Floor and Slab Construction” / www.concrete.org
- Resilient Floor Covering Institute (RFCI) – “RFCI IP #1, Recommended Installation Practice for Homogeneous Sheet Flooring, Fully-Adhered” / www.rfci.com
- Resilient Floor Covering Institute (RFCI) – “RFCI IP #2, Recommended Installation Practice for Vinyl Composition Tile (VCT)” / www.rfci.com

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