

L O N S E A L

TECHNICAL MANUAL FOR INTERIOR FLOORING PRODUCTS

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Note: Lonseal reserves the right to change our products' design, material, and/or to improve products or processes at any time without notice. Installation procedures and use of Lonseal adhesives must be in strict accordance with Lonseal's technical documents for warranty terms to be valid. **Please review the website for the most current technical information.**

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ABOUT THIS MANUAL

AUDIENCE AND QUALIFICATIONS

AUDIENCE

Information in this manual is intended for use by flooring contractors and flooring specifiers.

FLOORING CONTRACTOR QUALIFICATIONS

The awarded contractor shall be an established firm with experience in the installation of the specified product, and have complete access to Lonseal's required technical documentation, specifications, and other related documents. The flooring contractor shall have completed at least three projects of similar scope, material, and complexity.

INSTALLER QUALIFICATIONS

Lonseal flooring shall be installed by someone determined by the contractor to be an experienced installer, who has specialized in the installation of work similar to that required for the project. Installation procedures should be in strict accordance with Lonseal's published technical documentation and shall not begin until the work of all other trades has been completed. Refer to *Installer Responsibility* on page 12.

DOCUMENT REFERENCES

All documents referenced in this manual will be per their most current revision at the time of installation. Please refer to www.lonseal.com for the most current documents.

SAFETY WARNINGS

Safety on the job site is critical. Read and obey all health and safety warnings on Safety Data Sheets (SDS) and labels.

CHEMICAL-RELATED EMERGENCIES

For 24/7 guidance, call Infotrac Poison Control Hotline: Emergencies 800-535-5053

CAUTIONS REGARDING COMPLETE FLOOR COVERING REMOVAL

When removing any type of floor covering, ensure that all applicable local, state, and federal regulations are observed. Those who undertake removal shall be familiar with the most current revision of *RFCI – Recommended Work Practices for Removal of Resilient Floor Coverings*, and are properly trained and licensed as required.

DISCLAIMERS

To preserve the warranty and deliver the best possible installation to your customer, follow the instructions in this manual.

Lonseal implies no warranties or fitness for any non-Lonseal products mentioned in this manual. All warranties and guarantees regarding the suitability of non-Lonseal products mentioned herein rest with their respective manufacturers and not with Lonseal. Other than stated in our warranty, responsibility for the use of any product or method discussed in this manual is the responsibility of the specifier and/or installer.

Lonseal is not liable for damage resulting from telegraphing of any substrate disfigurement or hazard created due to installations over cracks or expansion joints, improper substrate preparation, or allowing adhesive(s) to dry before laying the flooring.

Lonseal will not consider a claim for flooring or sundries shipped, stored, or installed under unfavorable conditions including, but not limited to: damage resulting from careless handling, storage of the flooring on its side, inadequate light, inadequate heating or cooling systems, interference by other trades, or allowing access to the floor before the adhesive has cured or protective covering is in place.

Lonseal is not responsible for residential installations of our products. Lonseal flooring products are commercial products intended for commercial use only.

ABOUT LONSEAL PRODUCTS

Lonseal's flooring is stylish, durable, and can be efficiently installed and maintained for commercial and institutional use. These products come with textures ranging from smooth to heavily embossed.

Product specifications are available on Lonseal's website (www.lonseal.com).

- ▶ Click **Technical** to display the Technical Documents page.
- ▶ Select **Specifications** to display a listing of product specifications from which to choose.

PRODUCT DESCRIPTION AND FEATURES

COMPOSITION AND CONSTRUCTION

The wear layers of Lonseal flooring products are formulated to provide maximum resistance to foot traffic and most industrial chemicals. Select products are available with a matte (Topseal) or glossy factory-applied urethane finish.

Calendared construction allows for maximum flexibility of layers, reducing fatigue and impact injury. The product's backing layer enhances adhesion and dimensional stability.

Standard product roll sizes are 6' (1.83 m) wide x 60' (18.29 m) long with a total thickness ranging from 0.080" – 0.217" (2.00 – 5.50 mm).

QUALITY CONTROL

All Lonseal flooring products are closely inspected for appearance and conformity throughout the production process to ensure they meet Lonseal's rigorous production standards. Uniform thickness and deeply saturated color ensures a long lasting and beautiful installation.

COLOR SHADING

Because a certain degree of color variation can occur as a result of the manufacturing process, all rolls of Lonseal flooring product must be installed sequentially by roll number and all cuts must be installed in the order of their removal from the roll. **DO NOT** reverse the sheets when installing Lonseal flooring. Lonseal is not responsible when shading issues arise due to misapplication. Variations in color can exist between dye lots. It is recommended that the same dye lot be used within the same space whenever possible.

THERMAL PROPERTIES

Substrate and ambient air temperatures must not exceed 85 °F (29.4 °C).

FLASH COVING

All Lonseal flooring products can be flash coved for those applications in which flash coving is required (healthcare applications are often flash coved since this method provides a high degree of sanitation). Without complex pattern scribing, it is possible to install the vinyl up the walls to a minimum height of 4" (10.2 cm) and a maximum of 6" (15.2 cm).

PRODUCT SAMPLES

Product samples are cut from actual Lonseal flooring products and are intended to show pattern and color. Slight variations in color between dye lots may occur. When exact color matching is required, Lonseal suggests that color matches be made from sample swatches cut from the actual material that has been reserved for the job. Lonseal is not responsible for replacement of materials when the color selection, based on a random sample, fails to exactly match the material shipped.

DESIGN APPLICATIONS AND CONSIDERATIONS

Lonseal's extensive palette of stunning patterns, dense solid colors, and embossed textures provide a variety of design options. For small patterns, or icons like leaves or geometric shapes, templates made of hardboard or metal enable consistent replication. For larger patterns involving intersecting colors, the installer may use tempered wire to replicate graceful swooping curves and arcs. Lonseal flooring is supple enough to be cut freehand, but may be patterned as determined by the installer's skill and the complexity of the job.

Custom Cutting

Configuring Lonseal flooring into any number of designs is possible with CNC or water jet cutting.

Disclaimer: Sheet vinyl is subject to dimensional change to a greater degree than vinyl tile. Lonseal accepts no responsibility for dimensional changes to Lonseal flooring products that are cut into shapes or cut outside recommended environmental conditions. The amount of change will depend on the environment in which the material is cut versus the environment in which it is installed. Keeping the material acclimated in similar, if not the same, environments can help reduce or eliminate this natural occurrence, as can cutting the material slightly larger than needed, and trimming to the correct size just prior to installation.

Furniture

Furniture should be equipped with non-staining, minimum 1-1/2" (3.8 cm) diameter, flat-surfaced protectors or glides which avoid concentrating weight loads. Use protectors or glides that properly distribute the load over the surface of the flooring. Excessive point loading can cause adhesive displacement and/or permanent damage to Lonseal flooring products.

Disclaimer: Lonseal is not responsible for damage resulting from the use of inappropriate, improperly designed, or inadequate floor protection devices, and any warranty for these products rests with the furniture, appliance, or equipment manufacturer. Rolling-type castors on furniture/appliances/equipment may damage the flooring, and their suitability for use on a sheet vinyl should be confirmed with that manufacturer.

LONSEAL ADHESIVES AND SUNDRIES

Lonseal adhesives, sealers, and tape products are designed to be used specifically with Lonseal flooring products. Always use Lonseal brand adhesives and sundries with Lonseal flooring.

- ▶ **#400 Contact Adhesive:** A nitrile rubber-based, high-strength contact adhesive formulated for roller or brush application.
- ▶ **#650 Two-Component, Solvent-Free Epoxy Adhesive:** A wet set epoxy adhesive for high performance installations of Lonseal flooring, ideal for locations which will experience temperature extremes, heavy point loading, or heavy/dynamic rolling loads.
- ▶ **Premium Bond #755 Sheet Vinyl Adhesive:** A hard-setting, low VOC, latex-based adhesive designed for use in interior commercial, and institutional installations.
- ▶ **Double Face Tape (DFT):** An aggressive seam tape with dry adhesive film that provides a clean zone at the seam.
- ▶ **Lonsealer:** A liquid seam sealer for chemically welding two sheets of vinyl flooring.
- ▶ **Welding Thread:** A PVC welding thread, 4 mm in diameter, which comes color matched to the corresponding, chosen flooring (whenever applicable).

Disclaimer: The use of adhesives and sundries not specifically recommended by Lonseal may result in damage to the flooring, jeopardizing appearance and/or performance.

ACCLIMATION, HANDLING, AND STORAGE

ACCLIMATION

The storage and installation areas of materials listed in this manual are to be maintained between 65 °F – 85 °F (18.3 °C – 29.4 °C) for 48 hours before, during, and for 48 hours after completion of the installation.

HANDLING AND STORAGE

Proper storage is necessary to ensure the best performance and appearance from Lonseal flooring and related installation products. The storage area must be clean, dry, and temperature controlled.

Remove rolls from the shipping pallet immediately and store standing on end. Rolls left on the pallet will develop indentations, which may be permanent if left for too long. Rolls stored lying horizontally may also develop humps that can take considerable time to relax and lay flat. These humps may become permanent if the rolls are left on their side for too long.

On the job site, wrap opened rolls tightly, face out, to avoid material distortion, and store standing on end.

PRE-INSTALLATION

SITE AND SUBSTRATE CONDITIONS

SITE CONDITIONS

The site should be dry and should not have been flooded for a minimum of two weeks prior to installation. The installation location shall have a fully functioning, permanent HVAC, which shall maintain the work area and substrate temperatures between 65 °F – 85 °F (18.3 °C – 29.4 °C) for 48 hours before, during, and for 48 hours after completion of the installation. Relative humidity level extremes should also be avoided because of their influence on proper drying and curing of patching compounds and adhesives. General recommended humidity control level is between 35% – 55%.

If a system other than a permanent HVAC source is utilized, it must provide proper control of both temperature and humidity to the recommended levels for the specified time duration.

Note: Do not use temporary gas-fired space heaters to warm the installation area. These heaters cannot only create emissions that contaminate the substrate and raise the relative humidity level, but carbon dioxide from the exhaust can create a condition called carbonation, requiring the floor to be mechanically cleaned.

SUBSTRATE CONTAMINATION

Take precautions to ensure that the substrate is not contaminated. Contamination can include sweeping with oil-based products and applications of curing compounds, sealers, or paints. All surface contaminants must be removed and abated prior to installing Lonseal flooring. If contaminated, mechanically remove all contaminants per ASTM F710 or ASTM F1482.

SUBSTRATE REPAIR

All existing substrates must be sufficiently repaired prior to installation, resulting in a substrate that can be considered in “as new” condition. This may include, but is not limited to, the following steps to ensure this condition is met:

- ▶ Fill and make smooth any abandoned pipe or conduit holes in slabs using fast setting Portland cement.
- ▶ Holes in plywood panels require that both the affected areas of the underlayment and subfloor be sawn out and replaced with new material.
- ▶ Repaired substrates shall be blocked, fastened, sanded, and smoothed, as needed, to restore the structure and floor components to “as new” condition.
- ▶ Fill or level minor surface cracks, grooves, and other irregularities using an approved patching compound. Refer to *Patching Compounds* on page 10.

CONCRETE SLABS

All concrete slabs, whether existing or new, must conform to the requirements of ASTM F710, including moisture testing and preparation, prior to installation of Lonseal flooring. Floors containing lightweight aggregate, excess water, and/or concrete on metal decking may require longer drying time than on-grade slabs.

Minimum Smoothness (F_F/F_L)

All-purpose, commercial concrete slabs shall conform to the requirements of ACI 302 and be within the tolerances of ACI 117. ACI 117 specifies that overall conformance to design grade shall be within 3/4" (19 mm) of design elevation. Prior to installing, the installation company must obtain a report from the project General Contractor stating that the substrate has been tested in accordance with ASTM E1155.

Moisture and Alkalinity Testing

Lonseal requires that moisture and alkalinity testing be performed and documented by an accredited engineering firm/laboratory/person(s) prior to the installation date so that corrective measures can be performed. The flooring contractor is to ensure testing has been completed prior to initiating installation of Lonseal flooring. A certified concrete slab moisture testing technician (CCSMTT) may be located by visiting www.icri.org.

In all forms of concrete, moisture drive can carry alkaline salts to the surface which chemically react with the adhesive, eventually destroying the bond. The presence of alkaline concentrations can indicate elevated moisture vapor emission.

Regardless of age or grade level, testing for moisture and alkalinity shall be conducted in strict accordance to the following three, required tests:

- ▶ ASTM F1869 – MVER shall not exceed 5.0 lbs./1,000 ft²/24 hrs.
- ▶ ASTM F2170 – Maximum relative humidity (RH) shall not exceed 75%.
- ▶ ASTM F710 – Alkalinity shall not exceed 9.

Disclaimer: Test results can only indicate the slab condition at the time of testing. Moisture vapor emissions are subject to seasonal fluctuations and site conditions, and any subsequent damages are beyond the control of Lonseal. Installation of Lonseal flooring constitutes acceptance of the slab and acknowledgement by the General Contractor/Flooring Installer/Architect/Building Owner that the slab/substrate meets all Lonseal requirements and recommendations for site conditions. Reports that are completed by a non-accredited source or incorrectly documented will not be considered by Lonseal.

Vapor Retarders

Vapor retarders should always be used beneath on- or below-grade concrete slabs per ASTM E1745. For existing slabs, the presence of a vapor retarder should be verified. If none is present a moisture mitigation system (MMS) should be applied.

Moisture Mitigation Systems

If a moisture mitigation system (MMS) is to be applied, the slab's moisture test results should be utilized to determine which MMS is most suitable. This can be done by contacting the MMS manufacturer. When contacting the manufacturer they should also be informed whether a vapor retarder is present or not, and confirm the compatibility of their product with Lonseal adhesives and/or an approved patching compound. Refer to *Patching Compounds* on page 10. All installed MMS should meet the requirements of ASTM F3010.

A bond test should be performed to ensure the compatibility of the MMS with the entire flooring system. See *Bond Tests* on page 11.

Expansion Joints and Control Joints

Expansion joints are designed to permit slab movement which cannot be controlled. Do not install Lonseal flooring over expansion joints. Make sure the material stops short of the expansion joint, and install a suitable transition cap or threshold. This product should be designed to permit slab movement, while preserving the quality of the installation and preventing damage to the flooring.

Control joints are designed to decrease cracks during slab movement. Following the manufacturer's directions, open, clean, and fill control joints, saw cuts, and chase cuts with an approved patching compound. Refer to *Patching Compounds* on page 10.

Disclaimer: Lonseal is not liable for damage resulting from telegraphing of any substrate disfigurement or hazard due to installations over cracks, control joints, or expansion joints.

Permanent HVAC

Using the permanent HVAC system, ensure the slab is conditioned to a temperature between 65 °F – 85 °F (18.3 °C – 29.4 °C) for 48 hours before, during, and for 48 hours after completion of the installation.

OLD ADHESIVE RESIDUE

Different kinds of adhesives can react adversely to each other. This can result in chemical reactions that cause adhesive emulsification, bond failure, indentations, and/or staining of the flooring.

The slab shall be thoroughly cleaned to remove all contaminants and adhesive residues, using the following suggestions:

- ▶ Mechanically remove contaminants and adhesives with shot-blasting or grinding, assuring rapid and complete removal of surface contaminants.
- ▶ If water-based adhesives are hand scraped, at least 95% of the residue must be removed to avoid bond failure.

Note: Read warnings regarding removal of old cutback adhesives as published in the most current revision of *RFCI – Recommended Work Practices for Removal of Resilient Floor Coverings*.

SUBSTRATES AND PREPARATION

All substrates and preparations shall be per ASTM F2678.

WOOD SUBFLOORS

Structural Requirements

The system must be composed of double-layer construction, and shall be smooth, sound, and made of solid, exterior grade plywood with a minimum overall thickness of 7/8" (22.2 mm). All panels used must meet the criteria set forth by APA – The Engineered Wood Association. Refer to the most current *APA Document E30* for additional information on selection, placement, and installation. A list of manufacturers who provide plywood panels meeting the requirements noted in this manual may be found at www.apawood.org.

All subfloors panels (bottom layer) must be 5/8" (15.9 mm) thick minimum, and classified as APA Panel Subflooring. Panel thickness must increase for joist spans over 16" (40.6 cm) on center to minimize deflection.

Underlayment panels (top layer) must be 1/4" (6.4 mm) thick minimum and meet the requirements noted in *Underlayment Panel Selection* below.

Other requirements are as follows:

- ▶ Provide a minimum of 18" (45.7 cm) well-ventilated air space, measured from the bottom of the floor joists.
- ▶ Provide a 0.004" polyethylene membrane on grade, with a 6" (15.2 cm) overlap at the seams, as a ground moisture barrier where necessary.
- ▶ Provide insulation as required by code.

Underlayment Panel Selection

Lonseal flooring should only be installed over plywood underlayment panels. Plywood panel selection, conditioning, installation, and preparation shall conform to ASTM F1482 and *APA Document E30*. Installation over any other type of underlayment panel, including, but not limited to, Luan, OSB, fiber-cement panels, gypsum fiber panels, particleboard, hardboard, waferboard, MDF, or HDF, can result in installation or performance issues, and will not be covered by the warranty.

- ▶ Do not attempt to install flooring on plywood panels that are wet, not properly acclimated, pressure treated, or fire-retardant treated.
- ▶ Do not install flooring on underlayment panels that are fastened or adhered directly to concrete.

Underlayment Panel Fasteners

Use ring shank fasteners, such as annular-grooved or screw shank nails, or staples which are exterior rated. Avoid resin coated nails and staples, as these items can move within the panel, resulting in nail pops and squeaks. Make sure the fastener length does not exceed the combined thickness of the underlayment and subfloor panels.

For staples, use the correct fastening schedule as detailed in the ICC-ES ESR-1539, available from www.isanta.org.

Screws are recommended only on panels 3/8" (9.5 mm) and thicker. They should be exterior rated, properly spaced, countersunk, and filled with an approved patching compound. Refer to *Patching Compounds* on page 10.

Note: Never use cartridge-type construction adhesives as a replacement for fasteners when installing underlayment panels. Fumes from some construction-type adhesives can cause discoloration and damage the vinyl.

CONCRETE SUBFLOORS

All concrete subfloors shall meet the requirements of ASTM F710 and have a minimum density of 100 lbs./ft³ (1842 kg/m³) and compressive strength of 3500 psi. Refer to *Concrete Slabs* on page 6 for additional information.

Steel-troweled Concrete

If the concrete has a dense steel-troweled surface, it should be mechanically abraded, by diamond grinding or shot blasting, to provide a surface optimized for adhesion.

Cracks and Joints

Repair all cracks in new and old concrete. Large dormant cracks such as those typically found due to settling, or in control joints, should be cleaned out, opened up with a crack chaser where necessary, and patched with an approved patching compound (refer to *Patching Compounds* on page 10). If the crack is too large for patching or extends entirely through the concrete slab, use epoxy injection.

GYPSUM CONCRETE UNDERLAYMENTS

All gypsum concrete underlayments shall meet the requirements of ASTM F2419 and have a minimum density of 105 lbs./ft³ (1460 kg/m³), with a minimum compressive strength of 2000 psi (13.8 MPa) over wood subfloors or a minimum 3000 psi (20.7 MPa) over concrete subfloors. Minimum thickness over wood subfloors shall be 3/4" (19 mm) and concrete subfloors shall be 1/2" (13 mm). Due to the porosity of this type of underlayment, consult the manufacturer to determine if a primer is necessary, prior to application of a patching compound or Lonseal adhesive.

Note: Use of a gypsum concrete underlayment will require written approval from the Lonseal Technical Department prior to installation for warranty terms to apply. When contacting Lonseal, the product being used must be submitted for review.

LIGHTWEIGHT CELLULAR CONCRETE UNDERLAYMENTS

All lightweight cellular concrete underlayments shall meet the requirements of ASTM F2471 and have a minimum density of 110 lbs./ft³ (1762 kg/m³), with a minimum compressive strength of 2000 psi (13.8 MPa) over wood subfloors or a minimum 3000 psi (20.7 MPa) over concrete subfloors. Minimum thickness shall be 1-1/2" (3.8 cm). Due to the porosity of this type of underlayment, consult the manufacturer to determine if a primer is necessary, prior to application of a patching compound or Lonseal adhesive.

Note: Use of a lightweight cellular concrete underlayment will require written approval from the Lonseal Technical Department prior to installation for warranty terms to apply. When contacting Lonseal, the product being used must be submitted for review.

STRIPWOOD FLOORS

If the stripwood is 3" (7.6 cm) or less in width, and is tongue-and-groove with a smooth surface, use an approved underlayment panel with a minimum thickness of 1/4" (6.4 mm).

If the stripwood is wider than 3" (7.6 cm), not tongue-and-groove, or with a rough surface, use an approved underlayment panel with a minimum thickness of 1/2" (12.7 mm).

Refer to *Underlayment Panel Selection* on page 8 for additional information.

RADIANT HEATED FLOORING SYSTEMS

If being installed over a radiant heated flooring system, the maximum substrate temperature shall be 85 °F (29.4 °C). Ensure the system is functioning properly prior to installation of the flooring, and be aware of "hot spots", as these can lead to potential issues after installation.

Note: Constant exposure to temperatures greater than 85 °F (29.4 °C) can result in discoloration of the flooring, in addition to possible adhesive failure. Do not operate the radiant heated flooring system until the adhesives have fully cured.

FIBERGLASS AND METAL

Ensure the substrate is sound, dry, and free of debris (dust, dirt, wax, loose paint, curing compounds, grease, sealers, and other foreign matter such as rust or oxidation). For metal, apply denatured alcohol to a clean cloth and wipe the surface to remove any contaminants. Always use caution when working with denatured alcohol.

Lightly abrade the surface with 60 grit sandpaper, then brush or vacuum, prior to applying the adhesive.

EXISTING FLOOR COVERINGS

Lonseal recommends complete removal of any existing floor covering and adhesive residue prior to installation.

Disclaimer: There is an increased likelihood of indentation when installing over an existing floor covering, especially from commercial fixtures, hospital beds, and equipment. Telegraphing of existing floor coverings through the surface of the new flooring is possible over time.

Should Lonseal flooring still be chosen for installation over an existing floor covering, the following requirements must be met:

- ▶ The existing floor covering must be a single layer of non-foam backed, resilient flooring that is fully and securely bonded (not perimeter bonded) to an approved, “as new” substrate (see *Substrate Repair* on page 6).
- ▶ The existing floor covering must be prepared sufficiently to provide a smooth surface for installation.
- ▶ The existing floor covering must be compatible with Lonseal adhesives.
- ▶ If the subfloor is concrete, it must still be tested for moisture and alkalinity (see *Concrete Slabs* on page 6).
- ▶ The installation must meet all other criteria noted throughout this manual.

Compatible, existing floor coverings can include: sheet vinyl, VCT, SVT, linoleum, epoxy paint, urethane coating, ceramic tile, terrazzo, or marble. Non-compatible floor coverings include, but are not limited to, rubber or asphalt surfaces.

An existing floor covering should always be considered a non-porous surface, unless a self-leveling underlayment with a minimum thickness of 1/4” (6.4 mm) is used.

Disclaimer: Lonseal makes no guarantee of the compatibility between Lonseal flooring and the existing floor covering. It is up to the installer to determine this, and it is highly recommended that the manufacturer of the patching compound/self-leveling underlayment be contacted for their recommendations, and to also perform a bond test to further determine compatibility (see *Bond Tests* on page 11). The following information is provided as the best possible suggestion to prepare an existing floor covering to receive Lonseal flooring.

Existing Resilient/Adhered/Tile Floor Covering Preparation:

- ▶ Repair or replace damaged or missing tiles, and eliminate gapped seams.
- ▶ Completely remove dirt, coatings, or other surface treatments.
- ▶ Sand (non-asbestos) flooring to remove all traces of wax and/or contaminants, to knock down rough edges, and to provide a suitably abraded surface for optimal patch and/or adhesive bond.
- ▶ Smooth and fill any surface imperfections with an approved patching compound/self-leveling underlayment. Always check with the underlayment manufacturer to confirm which product is best suitable for this type of installation, and confirm the use and type of primer. Refer to *Patching Compounds* on page 10.

Existing Fluid-Applied Coating Preparation:

- ▶ Ensure the coating is well bonded, and remove loose and scaly areas.
- ▶ Abrade with 60 grit sandpaper.
- ▶ Smooth and fill any surface imperfections with an approved patching compound/self-leveling underlayment. Always check with the underlayment manufacturer to confirm which product is best suitable for this type of installation, and confirm the use and type of primer. Refer to *Patching Compounds* on page 10.

Existing Terrazzo/Marble Preparation:

- ▶ Sand or grind the surface to ensure complete removal of any sealers/coatings, and to provide a suitably abraded surface for optimal patch and/or adhesive bond.
- ▶ Smooth and fill any surface imperfections with an approved patching compound/self-leveling underlayment. Always check with the underlayment manufacturer to confirm which product is best suitable for this type of installation, and confirm the use and type of primer. Refer to *Patching Compounds* on page 10.

PATCHING COMPOUNDS

Portland cement-based products can be used for smoothing and filling indentations, holes, and minor cracks on commercial projects and for all applications over concrete. These patching products must have minimum cured compression strength of 3000 psi per ASTM C109/C109M. Lonseal suggests using the highest quality underlayment products like those manufactured by Ardex® or Mapei®.

Gypsum-based patching compounds are not recommended and should not be used for this application.

Why Patches Fail and How to Prevent It

When a patching compound is improperly mixed, force dried, or mixed with too much water, the patch is prevented from reaching full cure strength. Loss of strength can cause indentations when exposed to heavy point or rolling loads. Typical reasons for problems associated with floor patching compounds include:

- ▶ Using substandard products.
- ▶ Over-watering or using additives not called for by the manufacturer of the patch. This weakens the patch and causes loss of “internal cohesion” and shear resistance, ultimately reducing cured compressive strength.
- ▶ Force drying, which stops the hydration process needed to develop full cure strength.
- ▶ Using a patching compound that is incompatible with the substrate.

Note: Priming the substrate, whether concrete or wood, makes application of properly mixed patching and smoothing products easier and increases the performance. Check with the patch manufacturer for primer recommendations.

SELF-LEVELING UNDERLAYMENT

Self-leveling underlayment is an alternative to traditional hand troweled smoothing that can save time and money. Once poured or pumped into place, these products seek their own level to provide a flat, smooth surface. Self-leveling underlayment can be applied over virtually any dry, cured, clean, solid, and properly prepared substrate. Use primer as directed by the underlayment manufacturer. All self-leveling underlayments used under Lonseal sheeting must be Portland cement based and cure to 4100 psi or greater at 28 days.

Note: Always check with the underlayment manufacturer for suitability of use in your application, including moisture-related issues.

BOND TESTS

Lonseal always recommends that a bond test be performed, regardless of substrate or underlayment. A bond test will help the installer to test the overall bond strength between the primer (if used), patching compound/self-leveler, and adhesive. The bond test should be performed at various locations throughout the installation area by adhering 3' x 3' pieces of flooring following the installation instructions as detailed in this manual. Allow a full 72 hours for the adhesive to cure. Removal of the flooring should be difficult, and adhesive should be evident on both the substrate and the back of the flooring.

Other benefits to a bond test are:

- ▶ While applying the adhesive, the installer can get a feel for the appropriate open and working times for the installation area. This is especially useful when installing in an area where a system other than a permanent HVAC is being used to control the temperature and humidity.
- ▶ Allows the installer to verify the suitability of the adhesive for use with the substrate, as well as determining the appropriate trowel size and spread rate, when dealing with a porous or non-porous surface.
- ▶ When an end-user will subject the flooring to heavy rolling loads (e.g. money carts, freight dollies, clothing racks, tool chests, pallet jacks, hospital beds, etc.) they have the opportunity to repeatedly roll these loads over the adhered flooring, to determine if the system can be deemed fit for the application.

MOCK-UPS

Prior to installing Lonseal flooring, mock-ups can be used for approval by the end user/specifier. A mock-up must show the actual product as it will ultimately look installed and should present every finish detail including:

- ▶ Heat or chemically welded seams.
- ▶ Flash coving, including inside and outside corners, complete with cove stick and cap.
- ▶ Surface finish treatment, whether standard acrylic dressing, aftermarket urethane, or factory applied urethane surface.
- ▶ Game lines or insets, if applicable.

INSTALLATION

Lonseal flooring shall be installed in strict accordance with the requirements and recommendations noted throughout this document, and any other technical documentation related to the installation, including Technical Data Sheets (TDS) and Installation Guides. Always ensure the most current revision of the document is being used. This includes printed labels and documentation included with adhesives and sundries, as revisions may have been made since their last printing. For these products, their TDS will supersede the information on the label or insert when it differs. All related products not manufactured by Lonseal, including patching compounds and self-leveling underlayments, shall be installed per those manufacturers' instructions. Failure to do so may result in a failure of the flooring system to perform as intended.

INSTALLER RESPONSIBILITY

Although Lonseal products are closely inspected prior to shipping, if a defect becomes evident that cannot reasonably be worked around during the course of installation, STOP the installation and notify the supplier or sales representative immediately.

The installer should verify that all materials and adhesives are correct for the job, and ensure that the pattern, color, style, and lot numbers match those called for in the finish schedule as specified for the job. Installation of any Lonseal flooring and related products constitutes acceptance of all material and site-related conditions by the installer.

Before beginning the installation process, the installer should become familiarized with the tools used as well as the products required for the project such as patching compounds, self-leveling underlayments, and adhesives. It is critical that all instructions for these products, be thoroughly reviewed, noting all cautions and warnings.

The information contained within this manual will supersede all other documents, printed or otherwise. It is the installer's responsibility to confirm that they have the most current information.

PRIOR TO INSTALLATION

Store all flooring and sundries in the installation area for a minimum of 48 hours prior to installation, with the flooring being kept in its packaging and standing on end. Storage and acclimation temperature shall be between 65 °F (18.3 °C) and 85 °F (29.4 °C), with the relative humidity between 35% – 55%. The installation area must have an operating, permanent HVAC, or a system which provides proper control of both the temperature and humidity. The optimal acclimation environment will be the same as the one the flooring will occupy after installation is complete.

Note: If the flooring is not allowed to acclimate properly, shrinkage may occur, leading to issues such as seam failure.

After acclimation, unroll and allow the flooring to lay flat. This process may require up to 8 hours, depending on acclimation temperature and how tightly wound the material was on the roll. Allow extra length when cutting, as shrinkage may occur if temperatures are unstable from acclimation to installation.

Disclaimer: Sheet vinyl is subject to dimensional change to a greater degree than vinyl tile. Lonseal accepts no responsibility for dimensional changes to Lonseal flooring products that are cut off site, and then brought to the installation location. The amount of change will depend on the environment in which the material is cut versus the environment in which it is installed. Allowing the material to properly acclimate on the job site prior to cutting the flooring will reduce or eliminate this natural occurrence.

LAYING OUT

Do not reverse sheets, except for Lonsafe (refer to the *Lonsafe Installation Guide* for more information). Lonseal flooring must be installed sequentially by roll number, and all cuts must be installed in the same direction and order they are removed from the roll. Some Lonseal flooring products are continuously marked on the back approximately 8" – 9" (20.3 – 22.9 cm) from the edge with green thread woven into the backing cloth. Others have no directional indicators and must be marked onsite by the installer with pencil to indicate direction and order taken from the roll. DO NOT use marker, as it will bleed to the surface of the product and permanently damage the flooring.

Disclaimer: Lonseal is not responsible when shading issues arise due to misapplication. Variations in color can exist between dye lots, and it is recommended that the same dye lot be used within the same space.

Lay out the flooring with seams out of high traffic locations, preferably in unobtrusive locations. Avoid placing seams at pivot points. Use full sheets whenever possible to avoid cross-seams. Mark the locations of the seams on the substrate using a pencil or chalk line

only. DO NOT use marker, paint, or any other surface contaminant on the substrate as it will bleed into the surface of the product and permanently damage the flooring.

PATTERNING

For all patterned products, it is recommended to match the pattern at the center of the installation and work the pattern out from the center.

Embossed patterns may not always side-match along the entire length of the seam. However, seams should appear balanced throughout the length, and not taper off into the seam.

For wood grain patterned products, refer to the *Wood Grain Pattern Installation Guide* for more information.

INSTALLING

For all adhesives and sundries, refer to the corresponding Technical Data Sheet (TDS) for complete installation information and guidelines.

1. Make relief cuts as necessary to fit the floor to the installation area.
2. Apply Lonseal DFT at seam locations (if required).
3. For simple rooms/installations, select the sheet nearest the wall and tube (fold the flooring over itself lengthwise) towards the center of the room. Take care, and keep the radius large when folding the material. Failure to do so could result in damage to the flooring, and visual imperfections may appear on the surface.
4. Spread the appropriate adhesive over the substrate, and after sufficient open time, roll the flooring into the adhesive.
5. After anchoring the first section down, tube the other half of the sheet, and the adjacent sheet, if present. Spread the adhesive over the substrate and seam location, including any DFT. After sufficient open time, roll the flooring into the adhesive, removing the DFT liner beforehand.
6. Continue until the entire area is fully adhered.
7. Trim seams, and roll the flooring securely into the adhesive or DFT with hand roller.
8. Heat or chemical weld the seams. Do not heat weld seams less than 24 hours after installation, unless DFT was used. Heat welds should always be glazed.

Note: For larger areas, it may be beneficial to start towards the middle of the installation, and carefully tube two sheets open at the seam. Then continue to install in both directions away from the anchor point.

SEAMING TO OTHER FLOORING TYPES

Lonseal flooring can usually be chemically or heat welded to most other PVC sheet vinyl flooring using Lonsealer or welding thread. However, where this is not possible, apply a 3" (7.6 cm) band of #650 epoxy adhesive beneath the Lonseal flooring at the transition, and consider installing a transition strip to further protect the seam.

INSTALLATION OPTIONS

Lonseal flooring may be installed in a variety of settings, from Healthcare to Gymnasiums. Special installation instructions for these types of applications may be obtained at www.lonseal.com. These Installation Guides are located in the Technical section of the website. Below is a list of some of the guides currently available:

- ▶ Flash Coving
- ▶ Hot Yoga
- ▶ Patient Rooms
- ▶ Sport Flooring
- ▶ Stairs

AFTER INSTALLATION

INITIAL MAINTENANCE

48 hours after installation, the initial maintenance should be performed. Refer to the corresponding *Maintenance Guides* available on the website. Ensure proper walk-off mats are in place to reduce soiling.

PROTECTING THE FLOOR

To reduce the chance of product damage or conflict with activities by other trades, Lonseal flooring should be the last finish material installed. Other trades must remain out of the work area and off the floor until the installation contractor advises it is safe to enter or at least 72 hours after installation. Where trade work must take place on and around Lonseal flooring after installation, provide adequate protective covering using plywood (1/4" thick minimum) in order to protect the flooring from damage caused by ladders, scaffolding, and construction traffic.

Note: Kraft paper with certain dyes can cause permanent staining on the surface of the vinyl.

CONTACTING LONSEAL

FOR ORDERS

Please fax your completed Purchase Order to Customer Service at 888-LONSEAL (888.566.7325) or send by email to orders@lonseal.com

FOR SAMPLES

or general questions call 800.832.7111 or visit our website at www.lonseal.com

ADDRESS

Lonseal 928 East 238th Street Carson, California 90745, USA phone: 310.830.7111 fax: 310.830.9986 e-mail: info@lonseal.com

TECHNICAL SUPPORT

There are many non-standard applications/installations that require prior approval of Lonseal Technical Support in order for Lonseal warranty terms to apply. To obtain approval from Lonseal for these types of installations, please contact the Technical Department via the following methods:

EMAIL technical@lonseal.com. Include the words, "TECH SUPPORT" in all caps in the subject line of your email.

ONLINE Contact us via the website at www.lonseal.com. Click on Contact Us. Be sure to include "TECH SUPPORT" in all caps at the start of the comments/questions field.

FAX (310) 952-7651. Include "TECH SUPPORT" in all caps in the subject line.