

LONSEAL

TECHNICAL MANUAL FOR INTERIOR FLOORING PRODUCTS

As changes can occur, in installation parameters and application,
please visit our website for the most current technical information.
www.lonseal.com

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About This Manual

Purpose

This manual contains information about Lonseal, Inc.'s line of resilient sheet vinyl for commercial and institutional use.

Audience

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

Handling & Storage

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

1. Remove rolls from the shipping pallet immediately and store standing on end. Rolls stored on the pallet or lying horizontally may develop flat spots that can take considerable time to relax and lay flat. Keeping rolls on the pallet too long can cause permanent damage to the flooring.
2. On the job site, wrap opened rolls tightly face out to avoid material distortion; then store standing on end.
3. Maintain storage temperature range 65° - 85° F (18° - 29° C).
4. It is the responsibility of the installation contractor to make sure all materials and adhesives are correct for the job, and to ensure that the pattern, color, style and lot numbers match those called for in the finish schedule as specified for that project. (also see Section 7 – ***Installer Responsibility***)
5. DO NOT use marker, paint or any other surface contaminant on the substrate or backing of the material as it will bleed to the surface of the product and permanently damage the flooring. For all markings use a lead pencil.

NOTE: Surface contaminants must be removed/abated prior to installing Lonseal sheet vinyl flooring products.

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About Lonseal Products

Lonseal's resilient sheet vinyl 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.

Technical Specifications

Technical specifications are available via Lonseal's website (www.lonseal.com):

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

Product Description & Features

Design Applications

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.

Flash Coving

All Lonseal sheet vinyl 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 inches (10 cm) at a maximum of 6 inches (15 cm).

Lonseal sheet vinyl flooring is supple enough to be cut freehand, but, may be patterned as determined by the installer's skill and complexity of the job.

- Use the boot or butterfly method for finishing outside corners.
- When heat welding, consider using a hot spoon tool to "solder or fuse" seams through the radius of the cove and up the wall, instead of grooving and welding with thread.

Composition & Construction

- The wear layers of Lonseal sheet vinyl flooring products are formulated to provide maximum resistance to foot traffic and most industrial chemicals. (Note that an additional wear layer of matte or glossy urethane is available on select products [i.e. TOPSEAL]).
- Calendared construction allows maximum flexibility of layers of material that reduce fatigue and impact injury. The product's backing layer enhances adhesion and dimensional stability.
- Some Lonseal sheet vinyl flooring products are continuously marked on the back approximately 8-9" (20-22 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.
 - All rolls of Lonseal sheet vinyl flooring product must be installed in the order of their removal from the roll.
- DO NOT use marker as it will bleed to the surface of the product and permanently damage the flooring.
- Standard product roll sizes are 72" (1830 mm) wide x 60' (18 m) long with total thickness ranges from .080-.220" (2-4 mm). Special order rolls can be modified in length and width.

NOTE: Some products/colors are available in alternate roll sizes. See product specifications for details.

Thermal Properties

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

Quality Control

All Lonseal sheet vinyl 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 coloration ensures a long lasting and beautiful installation.

Lonseal Product Samples

Product samples are cut from actual Lonseal sheet vinyl flooring products and are intended to convey the idea of the pattern and the 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 (i.e. specific dye lot). Lonseal is not responsible for replacement of materials when the color selection, based on a random sample, fails to exactly match the material shipped.

Furniture Profiles

- Furniture legs should be equipped with non-rubber large 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 sheet vinyl flooring products.

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Before Getting Started

Before you begin the installation process, it's important to familiarize yourself with the products that you'll be using and as well as tools required for the project. **It is critical that you carefully review all instructions, noting all cautions and warnings** (see Section 8 – **Safety Warnings for important information**).

Color Shading

Because a certain degree of color variation can occur as a result of the manufacturing process, all rolls of Lonseal sheet vinyl 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 sheet vinyl flooring. Lonseal is not responsible when shading issues arise due to misapplication. Variations in color can exist between dye lots. It is recommended to use the same dye lot within the same space.

Products Used in the Installation

NOTE: Use only Lonseal brand adhesives.

Lonseal adhesives, sealers, and tape products are designed to be used specifically with Lonseal sheet vinyl flooring products. Note that use of adhesives and sundry items not specifically recommended by Lonseal will void the wear warranty, and may result in damage to the vinyl sheeting, jeopardizing appearance and performance.

Lonseal adhesives may be safely used on the following substrates:

- Fully cured interior dry concrete
- Approved wood underlayments such as APA exterior-grade plywood, Group 1, CC type, other approved wood underlayments
- Cement-based self-leveling underlayments and patching compounds
- Properly prepared and fully bonded cement terrazzo
- Ceramic tile
- VCT (one layer)
- Radiant-heat systems that have been properly installed and do not exceed 85°F (29°C)
- Gypsum underlayments that meet the ASTM F2419 requirements for compressive strength
- Sanded/abraded metal (60 grit)
- Properly prepared fiberglass

#300 Epoxy Adhesive

Lonseal Sundries (Adhesives, Tape and Seam Sealer)

#300 Epoxy is a two-component, exothermic, reactive epoxy adhesive that provides outstanding adhesion for high performance, indoor-outdoor installation of Lonseal sheeting over approved underlayment surfaces.

Use **#300 Epoxy** for such applications as:

- Temperature extremes like saunas, cold storage, commercial kitchens, and walk-in freezers.
- Locations where flooding is possible, including around drains, shower areas, public bathrooms, pool/whirlpool aprons, and laundry rooms.
- Areas with heavy point loading like hospital beds.
- Locations where Lonseal sheet vinyl is installed adjacent to another flooring type that cannot be heat or chemically welded to sheet vinyl, and where there will be no transition covering [i.e. rubber flooring].

Recommended Substrates: 1) Underlayment grade plywood, 2) fully cured concrete, 3) all nonporous surfaces, including fiberglass, sanded/abraded metal (60 grit), existing well-bonded epoxy paint, and 4) properly-prepared existing vinyl floors.

Application of Lonseal Adhesive #300 Epoxy

#300 Epoxy adhesive consists of two parts labeled PART A and PART B that, when mixed, equal a gallon.

- Thoroughly mix Part A and Part B *separately*, and then mix them together making sure all contents of one can are removed, and mixed completely with contents of the other.
- Pour adhesive into an open flat pan, or on the floor immediately after mixing.

WARNING! Do not leave mixed epoxy adhesive in original container. The heat generated by this chemical mixture can cause burns and greatly reduces the open time of the adhesive.

- Spread adhesive with a notched trowel (per **Appendix I – Trowel Specification & Roller Spread Rate Table** on page 48). Coverage will vary with sub floor porosity.
- Allow open time before laying the vinyl sheet material into it.
- Ensure correct transfer of adhesive by installing the sheeting before a skin forms on the surface of the adhesive. Open time at 70° F (21°C) up to 40 minutes (open time may vary). Always check for proper transfer of adhesive by lifting material and inspecting for full transfer of adhesive to backing.
- Immediately roll the material in both directions by starting at the center and working toward the edges using a 100 lb. three-section roller. Stay 2” away from the seams. Repeat rolling after one hour and then at hourly intervals until bubbling stops.
- Do not allow foot traffic for a period of 24 hours. Allow for a minimum 72 hours, for adhesive to set and dry, prior to setting heavy furnishings and allowing rolling traffic. It takes 72 hours for adhesive to completely cure.

#300 Epoxy Adhesive

Clean Up: While still wet, clean any residual adhesive from tools and the sheet vinyl surface with a warm damp cloth and dishwashing detergent or denatured alcohol. CURED ADHESIVE IS IMPOSSIBLE TO REMOVE FROM THE SURFACE OF THE VINYL SHEET.

CAUTION: USE DENATURED ALCOHOL WITH CARE.

Limitations: Adhesive is freeze/thaw stable to 0° F (-18° C), but avoid prolonged exposure to low temperatures and multiple freeze/thaw cycles.

Displacement or Bubbling

Displacement: Displacement occurs when uncured adhesive, under the vinyl sheet, is pushed aside by some form of weight. Typically, indentations are created by pressure points from the installer's knees and toes as he/she works on the vinyl sheeting. Additional causes include foot traffic, pressure from ladder feet, and heavy rolling load indentations from hospital beds, pushcarts and dollies traveling over uncured adhesive.

Bubbles: Gaseous moisture vapor released from the fresh adhesive, in combination with other factors, allows formation of bubbles (blisters) in places where the adhesive is thinnest and where the wet bond is weakest. When cured, exothermic reactive epoxy adhesive sets firm with no residual grab. Therefore, bubbles that are not immediately attended to during the curing process can become permanent.

Bubbles can result from:

- Applying adhesive too thickly and not allowing sufficient time for the exothermic reaction to off gas before laying the Lonseal sheet vinyl flooring.
- Not rolling the vinyl a sufficient number of times during the curing process.

Effects of Temperature on Uncured Epoxy: *Do not mix or apply #300 epoxy when temperatures exceed previously stated limitations.* Epoxy will not cure when substrate temperatures drop too low. Conversely, it will cure exceedingly fast when applied to hot substrates that are subsequently heated. Therefore, in order to avoid problems, maintain both ambient and substrate temperature within Lonseal's specified limits.

How to Avoid Displacement Issues and Bubbling

- Eliminate point loads while working on freshly spread or uncured adhesive by cushioning knees and feet with oversize foam to disperse weight, or placing plywood sheets to distribute weight more evenly. Do not allow any foot traffic or objects onto the floor until the epoxy has "set", typically 24 hours.
- Do not lay the vinyl sheeting into the epoxy adhesive too early before it has sufficiently off-gassed.
- Reduce the quantity of adhesive by using a smaller notched trowel and allowing adequate open time.

NOTE: Use Lonseal double face tape (DFT) under seams when working with #300 Epoxy. DFT provides a "clean zone" free from adhesive contamination allowing seam-finishing methods to work optimally. DFT contains an aggressive acrylic adhesive that securely holds seams down and virtually eliminates the possibility of the vinyl curling allowing seams to set flat.

#400 Contact Adhesive

Nitrile rubber-based, high-strength adhesive formulated for roller or brush application. Fast drying, Lonseal #400 forms an instant bond. Use #400 to bond Lonseal vinyl to any approved substrate. When cured, Lonseal #400 is highly resistant to water, acids, alkalis, oil, gasoline and most solvents.

Adhesive #400 is the only contact type adhesive recommended for use with Lonseal sheet vinyl.

Preparation

1. Maintain the adhesive, floor covering, and the job site at a temperature of at least 65° F (18° C) for a minimum of 48 hours before, during and 48 hours after the installation.
2. Metal and impervious surfaces must be abraded with #60 sand paper or steel wool, then cleaned and primed with Denatured Alcohol.
3. Ensure both, the substrate and backing of the sheet vinyl flooring material, are thoroughly cleaned and free of oil, dirt or grease.

Application

1. Using a compressed air gun, disposable paint brush, or non-shedding medium nap roller, apply a uniform coating to both substrate and backing of the sheet vinyl flooring material.
2. When adhesive becomes slightly tacky to the touch, join the material to the substrate and roll as needed until fully bonded. **DO NOT LEAVE OPEN TOO LONG AS LOSS OF GRAB AND LONG-TERM BOND WILL RESULT.** To minimize bubbling and develop optimum bond on non-porous substrates (metal, painted metal, fiberglass, etc.), abrade the bonding surface making sure that the solvent has sufficient time to evaporate before combining.
3. Drying time should be approximately one hour; however, the bond reaches maximum strength in 48 to 72 hours.

Coverage: Depending on surface porosity, approximately 150-200 square feet per gallon.

Packaging: One-gallon metal container, weighing 8 lb.

Shelf Life: Six months. For maximum shelf life store material in a cool dry area and keep container tightly sealed. Maintain storage temperature at 60° F-80° F.

CAUTION! This Adhesive Contains Acetone: #400 Contact Adhesive is EXTREMELY FLAMMABLE! Toxic vapors may ignite explosively. Provide fresh air cross ventilation to prevent build-up of vapors. Until vapors are dissipated, avoid prolonged or repeated breathing of vapors. Close container after dispensing adhesive.

DO NOT INHALE VAPORS - - KEEP OUT OF THE REACH OF CHILDREN -If swallowed do not induce vomiting; call a physician immediately.

#755 Premium Bond Adhesive

Lonseal Premium Bond #755 is hard-setting, latex-based adhesive with outstanding green strength designed specially for installing all indoor Lonseal Sheet Vinyl Products. With its excellent open time, superior bond and low-odor, it is ideal for use in commercial and institutional installations and for use on all grade levels.

Note: Applications of Loncourt I and Lonwood Performa require using 1/16" square notch trowel. See Lonseal's, "**Technical Manual for Sport Flooring**".

Suitable Substrates: Fully cured interior dry concrete, approved wood underlayments such as APA exterior-grade plywood, Group 1, CC type, other approved wood underlayments, cement-based self-leveling underlayments and patching compounds, properly prepared and fully bonded cement terrazzo, ceramic tile, VCT (one layer), radiant-heat systems that have been properly installed and do not exceed 85°F (29°C) and gypsum underlayments that meet the ASTM F2419 requirements for compressive strength.

Recommended Notch Size: Refer to **Appendix I – Trowel Specification & Roller Spread Rate Table** on page 48. Spread adhesive with a notched trowel for flooring applications. Coverage will vary depending on notch size and substrate porosity. (Use a 3/8" nap cover on a standard paint roller for non-porous surfaces).

Installation Conditions: Using the permanent HVAC, the substrate, flooring material and adhesive must be conditioned at room temperature minimum 68° -85° F (18°-29° C) for 48 hours before, during installation and 48 hours after installation (see Section 4 – **Site Conditions**).

Application:

1. Spread #755 Premium Bond adhesive evenly over the substrate, with a new trowel, keeping the trowel at a 45° angle to the surface. Maintain proper notch depth throughout the installation.
2. Roll the floor using a 100-pound, three section roller when installation is complete. Start at the center of the floor and roll toward the edges. Lonseal is not responsible for telegraphing of too much adhesive or for poor bond due to insufficient adhesive.
3. Ensure there is full adhesive transfer to the back of the vinyl.
4. Allow no foot traffic for a period of 24 hours. Do not allow rolling traffic or set heavy furnishings on the floor for 48 hours. Allow an average of 72 hours for adhesive to completely cure.

Limitations: Adhesive is freeze/thaw stable to 0° F (-18° C). Protect from freezing. Avoid prolonged low temperatures and multiple freeze/thaw cycles.

Shelf Life: Shelf life is 2 years when stored in original, unopened container at room temperature [73°F (23°C)] in a dry heated area.

Clean Up: Promptly clean any adhesive smudges from the flooring material's surface with water while the adhesive is still fresh/wet. Clean tools with water while the adhesive is still fresh/wet. Clean with mineral sprits once dried.

CAUTION: Use in a well ventilated area. Open doors and windows to create cross-ventilation during use and until adhesive dries. Do not take internally. Avoid contact with eyes.

Contents: 3.5 Gallons (13.3 L) or 1 Gallon (3.8 L) or Quart (.95 L)

Lonseal Double Face Tape (DFT)

Lonseal DFT is an aggressive, dry adhesive film that provides a “clean zone” free of adhesive contamination. For all same day welded seams, apply DFT before the underlying adhesive has been troweled. With some exceptions (as noted below), It must be used under all **straight** seams.

Exceptions include:

- DFT is not necessary where the seam is to be heat welded, if the seams will remain unwelded overnight (minimum 24 hours), to allow adhesive to cure.
- Not for application under curved seams, decorative insets, or flash coving.
- Not necessary when repairing or patching.

Recommended Substrates: Any approved surface that is clean and dry. Dusty surfaces may require priming.

Application: After seams are located and *marked in pencil*, apply and roll with seam roller to assure good contact. Do not attempt to install to a wet or dusty surface. **DO NOT use marker on the substrate of back of material as it will bleed to the surface of the product and permanently damage the flooring.**

Limitations: Protect from freezing or overheating. Do not use a heavy chalk line to mark the position of a seam as large quantities of chalk dust prevents a secure bond to substrate.

Shelf Life: 12 months when stored at room temperature in a dry heated area.

Clean Up: Dispose of paper backing into approved container.

Caution: Handle releasable paper with care to minimize contact with overspread adhesive. Do not take internally. Avoid contact with the eyes.

Packaging: Individual rolls 2” (51 mm) wide by 60’ (18.28 m) long.

Lonsealer Type A

Lonsealer chemically welds seams on Lonseal sheet vinyl flooring products, or can be used to weld Lonseal sheet vinyl flooring to any other PVC based floor covering. It is a fast-flash solvent supplied in a metal tube that has a “needle” protruding from the nozzle.

Application: Shake tube vigorously, insert the needle entirely into the seam and apply evenly along the entire seam length. Lonsealer will dry and cure on the surface leaving approx ¼” of residue upon the seam. Do not wipe the residue off. Effects of the residue will diminish once floor finish is applied (non-urethane floors). Additionally, there is also a technique to virtually lessen or eliminate sealer residue on the surface using the methods described in Section 5; **Making Low Visibility Seams**. For urethane surfaced products (i.e. TOPSEAL), Lonsealer fuses only to the PVC layers. The cured sealer residue usually rolls off the urethane surface, but may also diminish over time due to traffic.

IMPORTANT NOTICES:

- Use at temperatures between 65°-85° F (18°-29° C)
- Use Lonseal DFT under all chemically welded seams (exceptions: curved seams and insets).
- When seams are contaminated (with dirt, moisture or adhesive residue) chemical fusion of the two sheets is compromised with resulting loss of performance and possible failure(s) can occur.
- During and after the chemical welding process, dirty seams cannot be cleaned, as the solvents within the Lonsealer are instantly evaporated and the curing process has initiated. Particular care must be taken to handle the seam area of light colored material carefully and with clean hands.
- The edges at the seam of the two Lonseal sheet vinyl flooring products must touch throughout the length of the seam for successful chemical welding to be possible.
- Simply coating the seam is not sufficient in the successful bonding of Lonseal sheet vinyl flooring as this process can result in gapping and seam failure.
- The needle must penetrate into the seam, gently contacting the substrate, allowing the Lonsealer to flow between the two sheets of flooring product.

Limitations: Protect from freezing. Lonsealer is freeze/thaw stable to 0° F (-18° C). Avoid prolonged exposure to low temperatures and multiple freeze/thaw cycles.

Shelf Life: 12 months when stored at room temperature in a dry heated area.

Coverage: A 4.7 oz. tube covers approximately 150-250 linear feet of seaming depending on texture.

Accidental Spill Clean Up: While still wet, Lonsealer may be removed from skin, vinyl and tools with an absorbent cloth and mineral spirits.

CAUTION: EXTREMELY FLAMMABLE MIXTURE! FOLLOW SAFETY WARNINGS ON SEAM SEALER BOX AND TUBE. NO SMOKING– KEEP AREA WELL VENTILATED- KEEP OUT OF REACH OF CHILDREN-DO NOT POUR EXCESS DOWN ANY DRAIN.

Patterning

Embossed patterns may not always side-match along the entire length of the seam. However, the seams should appear balanced throughout the length and not taper off into the seam. Match the pattern at the center of the installation and work the pattern out from the center.

Eliminate partial “boards” at side seams of our Lonwood Dakota **wood pattern** by trimming the selvage in order to assure an aesthetically pleasing transition from sheet to sheet

Discoloration/Staining/Yellowing

Although discoloration is not limited to the following, these items are representative of common permanent staining agents: Petroleum and rubber-based products like wheels, castors, vehicle tires, mats, asphalt, and certain dyes and inks.

- DO NOT use marker, paint or any other surface contaminant on the substrate or backing of the material as it will bleed to the surface of the product and permanently damage the flooring.
- To prevent premature aging, automotive tires and many rubber products contain antioxidants like butylated hydroxytoluene (BHT). Products, such as tires (i.e. car, truck, bicycle, trailer, motorcycle), *rubber-backed door mats*, rubber backed carpet, planters, furniture feet etc. containing BHT can permanently stain vinyl.
 - When a product containing BHT comes into contact with vinyl flooring, the chemicals migrate into the surface of the vinyl flooring. Some antioxidants are yellow in color. These antioxidants react with the plasticizers in the vinyl flooring causing permanent staining – a chemical reaction known as plasticizer migration.
- Refrain from placing such items in direct contact with the vinyl flooring. For example, cut and place Plexiglas under vehicle tires, planters and the like in order to prevent permanent staining of the vinyl.
- Mold and mildew can stain a floor that is installed over a damp substrate, this occurs when using inferior patching compounds that do not contain inhibitors.

Lonseal will not replace flooring due to permanent discoloration (refer to Lonseal's *Commercial Interior Flooring Products Warranty*).

Approved Type Smoothing and Filling Compound

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 3500 psi per ASTM C109 or ASTM C 472. Lonseal recommends using the highest quality underlayment products like those manufactured by Ardex® or Mapei®.

Gypsum-based smoothing and filling products are not recommended and should not be used for this application.

Why patches fail and how to prevent it: When smoothing and patch compound is improperly mixed, force dried, or if too much water is added, the patch is prevented from reaching full cure strength. Typical reasons for problems associated with floor patching compounds include:

- Using substandard patching, smoothing or self-leveling products.
- Over-watering or using additives not called for by the manufacturer of the patch, weakens the patch and causes loss of “internal cohesion” and shear resistance, ultimately reducing cured compressive strength. This loss of strength can cause indentations when exposed to heavy point or rolling loads.
- Force drying which stops the hydration process needed to develop full cure strength.

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

Self-Leveling Underlayment

Self-leveling underlayment makes timely and cost effective alternatives to hand troweled smoothing practices possible. These products can be poured or pumped and then seek their own level state to provide a flat, smooth surface. Following the manufacturer’s instructions, self-leveling underlayment can be applied over virtually any dry, cured, clean, solid, properly prepared substrate.

- Use primer as directed by the underlayment manufacturer.
- All self-leveling underlayment used under Lonseal sheeting must be Portland cement based and cure to 4100 lb. psi or greater.

NOTE: Always check with the underlayment manufacturer for suitability of use in your application including moisture vapor emission (MVE) related issues.

A permanent, effective vapor retarder barrier, of the specified thickness and permeance, is required under all on- or below-grade concrete floors.

If no vapor retarder barrier was used beneath the concrete slab and moisture exists above the recommended levels, a topical moisture barrier may be necessary upon the concrete slab.

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Getting Started

Site & Substrate Conditions

Lonseal sheet vinyl flooring must be installed in strict accordance with manufacturer's technical requirements including those cited below.

Site Conditions

The site should be dry and have not been flooded for a minimum of two weeks prior to installation. The general contractor shall provide and operate permanent HVAC and maintain the work area and substrate at temperatures (at the floor level) between 65° F-85° F (18°-29°C) for a minimum of 48 hours prior to, during installation and 48 hours afterward.

NOTE: Do not use temporary gas-fired space heaters to warm the installation area. These heaters can not 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 (including sweeping with oil-based products, curing compounds, concrete sealers or paint). Other trades must remain out of the work area and off the floor until the installation contractor advises it is safe to enter or 48 hours post installation.

Protecting the Floor

To reduce the chance of product damage or conflict with activities by other trades, Lonseal resilient sheet vinyl should be the last finish material installed. Where trade work must take place on and around Lonseal sheeting, provide adequate protective covering such as Masonite or Homasote panels in order to protect the vinyl from damage caused by ladders and construction traffic.

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

Old Substrates Must Meet “As-New” Criteria

Repair damaged substrates:

- Fill and make smooth any abandoned pipe or conduit holes in slabs using fast setting Portland cement.
- Holes in plywood or composite 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 approved type smoothing and filling compound. (See *Section 3, Approved Type Smoothing and Filling Compound*).

Minimum Smoothness (FF/FL)

All-purpose, commercial concrete slabs, should 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 GC stating that the substrate has been tested in accordance with ASTM E1155-96 (2008).

Moisture & Alkalinity Testing

Lonseal strongly recommends to the General Contractor/Architect/Building Owner, 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 sheet vinyl flooring.

Regardless of age or elevation or floor location, testing for moisture vapor emissions shall conform to the following three required standard tests:

ASTM F1869-10 - MVER shall not exceed 5.0 lbs/1000 ft²/24h.

ASTM F2170-09 - Maximum relative humidity shall not exceed 75%.

ASTM F710-08 - Alkalinity shall not exceed 9.

NOTE: Test results can only indicate the slab condition at the time of testing. Moisture vapor emissions are subject to seasonal fluctuations and any subsequent damages are beyond the control of Lonseal.

In all forms of concrete, moisture drive carries alkaline salts to the surface and these chemically react with the adhesive eventually destroying bond. The presence of alkaline concentrations also indicates elevated moisture vapor emission.

When to Test: Slabs of 4-inch depth typically require at least 30 days to cure before they may be considered ready for moisture testing. Floors containing lightweight aggregate or excess water, and with steel or plastic pan construction may need a much longer drying time, and should not be covered with Lonseal flooring until tests for moisture vapor emission and alkalinity content (pH) satisfy Lonseal requirements. Regardless, of age or location, always test slab for moisture and pH.

Disclaimer: Installation of Lonseal sheet vinyl flooring constitutes acceptance of the slab and acknowledgement by the General Contractor/Architect/Building Owner that the slab/substrate meets all Lonseal requirements and recommendations for site conditions. If MVE or pH conditions are found to exist after installation this is not the responsibility of the installer or Lonseal.

Permanent HVAC

Using the permanent HVAC system, condition the substrate, flooring material and adhesive to a temperature of 65° F - 85° F (18° C - 29° C) for 48 hours prior to, during installation, and afterward.

Old Adhesive Residue

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

Clean the slab and remove all contaminants and adhesive residues by:

1. Mechanically remove with shot-blasting or grinding which assures rapid and complete removal of surface contaminants.
2. Water-based adhesives can be hand scraped but removal must consist of a minimum of 85%.
3. Apply encapsulating primer per manufacturer's instructions. Once encapsulant is dry, apply approved type patch and/or skimcoat as needed to stop plasticizer migration between the new adhesive and old adhesive residue,

Encapsulating Primer Note: Always follow manufacturer recommendations regarding suitability, storage, application, drying time, and moisture and pH testing.

CAUTION: READ WARNINGS REGARDING REMOVAL OF OLD CUTBACK ADHESIVES AS PUBLISHED BY THE RESILIENT FLOOR COVERINGS INSTITUTE (RFCI).

Expansion Joints Expansion joints are designed to permit slab movement which cannot be controlled. It is not recommended to install Lonseal sheet vinyl flooring over expansion joints. Ensure the material “stops short” at the expansion joint and install a suitable transition cap or threshold product designed to permit slab movement while preserving the quality of the installation and preventing damage to the Lonseal sheet vinyl flooring.

Control Joints Control joints attempt to decrease cracks during slab movement.

Following the manufacturer's directions, open, clean and fill control joints, saw cuts, and chase cuts with approved cementitious filler.

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

Perform a Bond Test

Test for primer (if used), patch and adhesive bond by adhering 3' x 3' pieces of Lonseal resilient sheeting at various locations throughout the installation area. Roll with a 75 lb or 100 lb 3-section roller and allow 72 hours to cure before removing. Removal should be difficult.

Perform bond tests when:

- End-user requirements will subject the installation to heavy rolling loads, (i.e., money carts, freight trolleys (dollies), clothing racks, tool chests, pallet jacks, hospital beds, etc). Have the end-user pass the rolling load repeatedly over the adhered vinyl until the system is deemed fit for the application.
- Installing to lightweight concrete with minimum 3200 PSI.

Supplying Mock-Ups

Prior to installing Lonseal sheet vinyl 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:

1. Heat welded or chemically welded seams.
2. Flash coving, including inside and outside corners complete with cove cap and stick.
3. Surface finish treatment, whether standard acrylic dressing, aftermarket urethane or factory applied urethane surface.
4. Game lines or insets (as applicable).

Substrates and Preparation

Lightweight Concrete: Qualifications and Preparation

Lonseal recommends installing over lightweight concrete at a minimum thickness of 1.5" (4cm) thick and with a density of 115 lb/ft.³ (1841 kg/in³) with compressive strength at greater than 3200 psi over concrete or greater than 2000 psi over wood. Refer to ASTM F2419-05 for further information on the requirements for preparing substrates for sheet vinyl flooring.

1. Lonseal recommends performing several bond tests to determine the suitability of the substrate/adhesive system. (See Section 4 **Perform a Bond Test**)
2. Floors containing lightweight aggregate, excess water and/or concrete on metal deck constructions require much longer drying time than on-grade slabs.

Lightweight Insulating Concrete

Lightweight insulating concrete is not structural and typically used for sound or thermal insulation, has low compressive strength, and exhibits soft, weak surfaces.

Lonseal does not recommend the use of lightweight insulating concrete, as substrate for the installation of Lonseal sheet vinyl flooring, as it does not provide a solid structural surface.

NOTE: Cellular lightweight, vermiculite, gypsum below 3200 PSI, perlite and other lightweight fill materials are typically used in this category of insulating concrete.

Steel-troweled concrete

If the slab has a dense steel-troweled surface, it should be mechanically abraded to remove all possible contaminants and 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 can be cleaned out, opened up with a crack chaser where necessary, and patched with approved patching compound. If the crack is larger or extends entirely through the concrete slab, use an epoxy injection.

Tempered Hardboard Panels

Tempered hardboard panels specifically designed for stage applications may be used on stage if they are acclimated and properly fastened to prevent telegraphing through the face of Lonseal sheet vinyl flooring. See **Appendix – Alternate Fastener Types Schedule** for more information.

Radiant Heated Flooring Systems

1. Test slab for moisture and alkalinity as directed in Section 4 - ***Moisture and Alkalinity Testing***.
2. The substrate, flooring material and adhesive must be conditioned at room temperature minimum 65° -85° F (18°-29° C) for 48 hours before, during installation and 48 hours afterward. Slab temperature must not to exceed 85° F (29° C).
3. For warranty terms to apply, use only Lonseal Sundries (i.e. adhesives, sealers, tape).

Heat Discoloration: Constant exposure to temperatures greater than 85° F (29° C) may result in discoloration of lighter colored vinyl.

Underlayment Panels

Please refer to the most recent APA (Engineered Wood Association) Engineered Wood Construction Guide and ASTM F1482-04 (2009) for placement and installation information on underlayment panels.

Panel Selection

Disclaimer: Responsibility for the performance of any panel rests solely with the panel manufacturer and with the installer. Lonseal provides the following information about underlayment panels to ensure correct selection, conditioning, installation and preparation. Lonseal is not responsible for panel performance for any reason for the life of the installation.

Underlayment panel selection, conditioning, installation and preparation shall conform to **ASTM F1482-04 (2009)**.

IMPORTANT: Do not attempt to install on WOOD or COMPOSITE PANELS that are WET, NOT PROPERLY ACCLIMATED or that have been FIREPROOFED.

Conditioning & Installing

Store and acclimate ¼" (6 mm) underlayment panels on site prior to installation for at least 24 hours. Follow panel manufacturer requirements for acclimation, shipping and storage for all panels.

NOTE: Installing Lonseal sheet vinyl flooring on underlayment panels that are fastened or adhered directly to concrete voids the Lonseal warranty.

UNDERLAYMENT FASTENERS

Use ring shank fasteners like "annular grooved" or "screw-shank", nails, or staples. Avoid resin coated nails and staples. These items can move within the panel resulting in nail pops and squeaks. Ensure fastener length does not exceed the combined thickness of the underlayment and substrate.

- For staples, use the correct fastening schedule as stipulated in the ***Alternative Fastener Types Schedule*** in the Appendix of this manual.
- Screws are recommended only on panels 3/8" (1 cm) and thicker, spaced accordingly, countersunk and filled over with approved smoothing compound.

IMPORTANT! 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.

Multiply Underlayment

Columbia Forest Products *Multiply* panels satisfy Lonseal requirements for underlayment panels. Properly, installed and handled, these panels have a limited lifetime warranty. Obtain complete installation instructions from Multiply at <http://www.multiplyplywood.com/install01.html>.

Unsuitable Underlayment Panels

Luan, particleboard, hardboard, gypsum fiber panel, fiber-cement underlayment, waferboard, and OSB (oriented strand board). Installations over unapproved panels void the warranty.

IMPORTANT: Do not install Lonseal resilient sheet vinyl over “sleeper” type floor systems in proximity to concrete slabs.

- Stripwood floors that are sound, solid and in good condition with planks up to 3” (75 mm) or less in width and is tongue-and-groove and with a smooth surface, use a minimum ¼” (6.4 mm) approved panel underlayment.
- Stripwood and plank floors wider than 3” (75 mm) or not tongue-and-groove, or with a rough surface, use a minimum ½” (12.7 mm) thick approved panel underlayment.

Suspended wood systems**Structural Requirements**

- A. Wood floors of double-layer construction should be smooth, sound and solid plywood (APA stamped, Sturd-I-Floor) of a minimum 1-1/8” (26 mm) total thickness. Substrate panels shall be underlayment grade, APA stamped, sanded and filled face.
- B. Single-layer suspended subfloor systems shall be 3/4” (20 mm), tongue and groove plywood panels properly acclimated, glued and fastened to joists on 16” (40.5 cm) centers. Single layer systems must be overlaid with minimum ¼” (6 mm) underlayment panels conforming to ASTM F1482–04 (2009), except as noted herein.
 - Provide a minimum of 18” well-ventilated air space measured from the bottom of the joists.
 - Provide a .004” polyethylene membrane, 6” (152 mm) overlap at seams as a ground moisture barrier.
 - Provide insulation as required by code.
 - Where joists exceed 16” (40.5 cm) between centers, the underlayment panels must be gradually thicker to minimize deflection.

Preparation

Clean surfaces to remove all adhesive residues, oil, grease, wax, dirt, varnish, shellac, loose or scaly paint, or any contaminant that might act as a bond breaker. To obtain a clean surface, sand down to bare wood and vacuum all dust and debris.

- Eliminate protuberances like nail heads.
- Sand high spots and joints smooth and fill any voids with approved type patch.

If contamination exists which cannot be effectively removed by

sanding, encapsulate with approved underlayment panel or replace the affected area with new plywood, glue and fasten securely to joists.

DO NOT use liquid solvents, strippers, or cleaners to remove wood surface contamination.

MDF, Fiberglass & Metal

Prepare the substrate to ensure proper adhesive bond.

- Substrate must be sound, dry, and free from dust, dirt, wax, loose paint, curing compounds, grease or foreign matter including rust or oxidation.
 1. Using a clean cloth, apply denatured alcohol to the cloth and wipe the aluminum surface to remove any contaminants.
 2. Lightly abrade non-porous surfaces (not containing asbestos) using medium grit sand paper (60 grit) to roughen the surface.
 3. Brush or vacuum clean the surface.
 4. Apply the #300 epoxy** or #400 contact** adhesive to the substrate.

NOTE: **Refer to Section 3 – **Lonseal Sundries** to select the correct adhesive for the project.

Millwork & Fixtures

Store Lonseal sheet vinyl flooring as detailed in Section 1 – **Handling and Storage**. Using the permanent HVAC system, condition the substrate, flooring material and adhesive to an average temperature of 72° F (22° C) for 48 hours prior to, during and after installation.

- Allow cut material 6 to 8 hours to stabilize before installing.
- To minimize the possibility of shrinkage, use only Lonseal #400 contact or #300 epoxy adhesive. Refer to Section 3 – **Lonseal Sundries** for working characteristics of each Lonseal adhesive and select that which best suits the requirements of the application.

Pre-Existing Floor Coverings

Lonseal recommends complete removal of any floor covering and adhesive residue prior to installation. It is important to evaluate the substrate for moisture and pH (see Section 4 – **Moisture and Alkalinity Testing**) or structural deficiencies prior to installing Lonseal sheet vinyl flooring.

However, in some cases it is possible to install Lonseal products over a single layer of existing non-foam resilient flooring. In such cases, the pre-existing floor covering must be prepared sufficiently to provide a smooth, hard surface for the installation of Lonseal sheet vinyl flooring.

Additionally, there is an increased likelihood of indentation from commercial fixtures, hospital beds and equipment. Telegraphing of pre-existing floor coverings through the surface of new resilient sheet vinyl is possible over time.

NOTE: Substrates under pre-existing floor coverings must conform to “as new” requirements.

“AS NEW” Substrate

The original substrate must be determined to be in “as new” condition as possible prior to installation of Lonseal sheet vinyl flooring. “As new” substrates must first be tested for moisture and alkalinity as described in section 4 - ***Moisture and Alkalinity Testing***).

Requirements

Compatible pre-existing floor coverings can include VCT, SVT, LVT, ceramic tile, terrazzo, fiberglass, epoxy painted, urethane coated, linoleum, etc. Non-compatible floors include, but are not limited to, rubber or asphalt surfaces.

The following details must exist to prepare all compatible pre-existing floor coverings to receive Lonseal sheet vinyl flooring.

- Must be compatible with Lonseal adhesives.
- Must be in a climate-controlled environment.
- Must only be a single layer that it is fully and securely bonded (not perimeter bonded) to an acceptable, “as new” original substrate.
- Must not be cushioned in any way.
- Must be a clean surface that is free of dirt, contaminants, wax, grease, etc.
- Must not exhibit any curling at seams (such as may be due to alkaline efflorescence) nor be subject to moisture.

PreparationFluid Applied Coatings: Epoxy/Urethane

- Ensure coatings are well bonded and mechanically remove loose, scaly areas. Abrade with #60 paper or screen, prime and skimcoat to smooth.

Adhered floor coverings:

- Repair or replace damaged or missing tiles and gapped seams.
- Completely remove dirt, coatings, or other surface treatments.
- Sand (non-asbestos) flooring to remove all trace of waxes and/or contaminants, to knock down rough edges, and to provide a suitably abraded surface for optimal patch and/or adhesive bond.
- Smooth any surface imperfections with an approved smoothing compound.
- Perform bond tests per Lonseal instructions (see ***Perform a Bond Test*** in this section).

5

Floor Installation Guidelines

Reminder

- Allow material to acclimate, while laying flat, for a minimum of 6-8 hours. Shrinkage can occur from improper acclimation time of material.
- Allow extra length during installation. Shrinkage can occur if material is pre-cut net (form of entropy).

Laying Out

Do not reverse sheets. Lonseal sheet vinyl flooring product must be installed sequentially by roll number and all cuts must be installed in the same direction and order of their removal from the roll.

Lonseal is not responsible when shading issues arise due to misapplication. Variations in color can exist between dye lots. It is recommended to use the same dye lot within the same space. Most of our products are equipped with directional lines to ensure proper installation.

1. Lay out material with seams out of high-traffic patterns, in unobtrusive locations and avoid placing seams at pivot points. Use full sheets to avoid end seams.
2. Mark location of the seams on the substrate with **pencil only**. DO NOT use marker as it will bleed to the surface of the product and permanently damage the flooring.

Anchor the Installation

1. After making relief cuts, select a place to start applying adhesive:
 - If doing a simple room, select the sheet nearest to the wall and tube (turn the length of the sheet) towards the center of the room, (go to step 4).
 - If installing a large area, it is best to start near the middle of the area and carefully tube two sheets open along the seam, and (go to step 4). After anchoring a section down, proceed to install in both directions away from the anchor point.
2. Spread adhesive over the entire area of the substrate and (where applicable) over the tape. Remove the backing from the tape before laying the sheets into the adhesive.
3. Roll up to, but NOT over the seam. Roll the vinyl in two directions with a 75 - 100 lb. resilient flooring roller and check to ensure complete transfer of adhesive to the back of the sheeting.

NOTE: Tube (fold lengthwise) adjacent sheets apart and repeat steps 4 and 5 until adhesive application and rolling steps are completed.

Final Steps

4. Trim seams and roll the sheeting securely into the double-face tape with a hand roller.
5. Clean the seams before applying Lonsealer or heat welding. (Refer to **Seaming Guidelines** below)

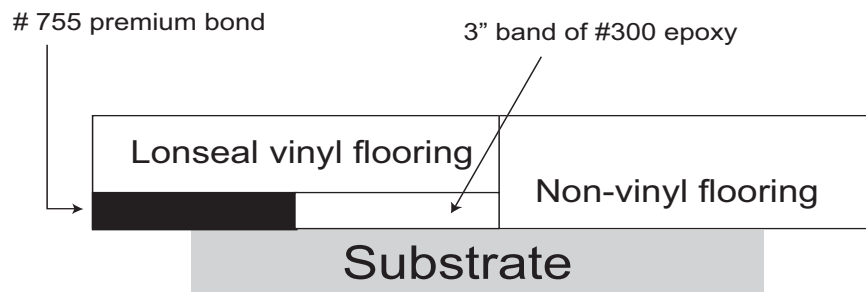
Seaming Guidelines

Without exception, all seams require sealing by either chemical welding with Lonsealer or heat welding with matching PVC welding thread. Chemically-fused seams must be tight and clean while heat welded seams must be neatly trimmed and well bonded to the vinyl on both sides of the seam. **No gaps should exist with either method.**

Seaming to other flooring types

Lonseal sheet vinyl can usually be chemically or heat welded to most other PVC sheet flooring using Lonsealer or standard PVC welding thread.

- In cases where Lonseal sheet vinyl cannot be chemically or heat welded to another non-PVC floor covering (i.e. Linoleum, Rubber), use a transition strip, or
- Apply a 3" band of Lonseal # 300 epoxy at the seam transitioning from Lonseal sheet vinyl flooring to the non-vinyl flooring product.



IMPORTANT: Thread designed for seaming linoleum or rubber will not bond to Lonseal sheet vinyl flooring.

**Heat Welded vs.
Chemical Welded Seams**

Properly executed seams of either method provide equally durable service. Failure to achieve proper fusion is a factor in both seam types with contamination the chief factor in chemical seam failures and improper temperatures the most common with heat-welded seam failures. Using DFT eliminates adhesive contamination in the seam and allows for immediate seaming by both methods. The use of DFT for heat welding eliminates the need to allow sufficient cure time of the adhesive, to avoid “boiling” from the heat gun. (see Section 3 - **Lonseal Double Face Tape**).

- Seams may be made by double cut, trace cut, and under scribe and cut, or by butting factory edges. All seams must appear balanced and uniform.

Heat welded seams are recommended for:

- Healthcare installations (sanitation)
- High traffic areas
- Floors subjected to heavy rolling loads
- Floors exposed to excess moisture (frequent washing)

**Suggested Selection
Criteria for Heat Welded
Seams**

1. Heat welding thread available for pearlescent and metallic patterns may not match the surface appearance due to the limitation of thread composition that can cause the completed seam to stand out in contrast to the rest of the sheet.
2. Aesthetic appearances of how a heat-welded seam looks when completed.
 - On non-urethane coated products, the finished seams have a shiny glaze due to the heat required to fuse the thread and vinyl. Application of floor finish (see section 6 – **Maintenance** in this section) minimizes or eliminates the appearance of the glaze.
 - On urethane surfaced products, both glossy and matte (TOPSEAL) a urethane nozzle prevents the urethane surface from blistering. This nozzle works for any heat welded application and reduces the typical glaze and must be used at a slower pace than the standard speed nozzle.
 - When trimming heavily embossed patterns, it is only possible to trim the thread even with the top of the embossing.

NOTE: Lonsealer will dry and cure on the surface leaving approx ¼” of residue upon the seam. It will eventually wear down, but will always be evident to some degree, even with application of floor finish.

Visual Effects of Seaming

Pattern Matching

Embossed patterns may not match across the seam from sheet to sheet. They expand and contract in relation to their environment.

For best results, match the pattern in the center of the seam and let the pattern run towards the ends.

The installer must ensure that the embossed pattern is balanced along the length of the seam. If cutting the seam requires splitting the embossed pattern, each side of the seam must be balanced even though the pattern does not match across the seam.



Printed (wood-look) patterns shall be considered non-repeating and sheets simply calculated to fit net to room. However, they must be matched so that there are no partial “boards” remaining in the seam area that are not at least visibly as wide as those across the face of the sheet. Remove any pattern that is less than a full “board” wide.

Description of Heat Weld Method

Lonseal heat welding thread is packaged on spools containing 500 lineal feet and is 4.0 mm. in diameter.

- Use a straight edge and grooving tool equipped with a #4 blade to make a groove for the thread to lie into.
- If using a power groover (router), leave a small gap about the thickness of a credit card for the tool to follow.
- Whether using a hand tool or power tool, maintain a consistent depth in the groove. Groove depth **never** to exceed 1/2 *thread* thickness.
- When welding a flash cove, use rigid cove stick and ensure that the material is installed tight because an unsupported weld can fail.
- Keep the groove area clean and dry. Practice grooving and welding on scrap material.
- Use only equipment specifically designed for heat welding sheet vinyl flooring. Adjust the temperature of the gun so that a piece of welding thread will melt but not burn quickly when held in front of the nozzle. Insert the welding thread through the properly heated nozzle. Keep the nozzle perpendicular to the floor, apply slight downward pressure and draw it along the seam at a smooth and constant speed.
- Test seam strength by tugging at a length of welding thread. It should break before pulling away from the sheeting.

Trimming and Skiving

- Allow the welding thread to cool before trimming and skiving.
- Trimming is done in two passes
 - i. Trim the top of the welding thread using a trim plate and a crescent knife.
 - ii. Skive the welding thread flush to the surface of the material using the crescent knife only.

EMBOSSSED NOTE: On the trim pass, substitute the usual spatula for the pastille trim tool. This tool has blunt edges to allow for gliding over the raised embossing and a sharpened notch for shaving the thread. The thread is only trimmed to the top of the pastille.

IMPORTANT: Do not use automatic welding machine on urethane surfaced products.

Glazing

It is recommended to glaze the surface of the welding thread after skiving. First remove the nozzle from the heat gun. With the gun set to 4 or less, aim it 6 inches above the trimmed thread and move slowly enough to melt the top of the thread, but fast enough not to blister the surface.

Glazing will correct color matching of thread to the flooring product. Unglazed thread may not match the color of the flooring material exactly. It is recommended to glaze the thread to color match the material and to seal the surface of the welding thread to reduce soiling. Unglazed seams can attract more soiling.

Heat Welding Urethane Finished Surfaces

Lonseal's urethane finished products, both matte and glossy, enhance appearance and eliminate the need for initial maintenance. Refer to Section 6 – ***After Installation Maintenance Guidelines***.

A urethane nozzle (Lonseal part #65) is required to heat weld seams on all urethane products.

The urethane nozzle prevents the factory-applied urethane from blistering the surface as well as reduces the typical glaze on the outskirts of the seam. It is slower than the standard speed nozzle and designed specifically for flooring materials with a factory-applied urethane finish.

Use the urethane nozzle and make practice runs to develop a feel for the speed and heat setting that will work best. To avoid scratching the urethane surface, be sure that the trim plate and knife are smooth.

Glazing urethane finished surfaces:

MATTE (TOPSEAL) - To glaze the thread, after trimming the welding thread, use the urethane nozzle from the heat gun, with the gun set to 4 or less, aim it just above the trimmed thread and move slowly enough to melt the top of the thread, but fast enough not to blister the urethane. Unglazed thread can make the seams visibly dirty.

GLOSSY - To glaze the thread, after trimming the welding thread, remove the urethane nozzle from the heat gun. With the gun set to 4 or less, aim it just above the trimmed thread and move slowly enough to melt the top of the thread, but fast enough not to blister the urethane. Unglazed thread can make the seams visibly dirty.

Description of Chemical Welding Method

Use Lonsealer to chemically fuse seams as directed in the Lonsealer section of this manual. Seams must be fused completely from bottom to top. This can only be done by fully inserting the needle into the seam as described herein. **Apply following label directions and maintain adequate ventilation at all times.**

NOTE: Lonsealer will leave a residue on the surface of the vinyl that will eventually wear down, but will always be evident to some degree, even with application of dressing. Protect chemically-welded seams from traffic and dirt **for a minimum of two hours.**

While still wet, Lonsealer may be removed from skin and tools with an absorbent cloth and mineral spirits. If Lonsealer is spilled on the face of the vinyl, do not attempt to blot, as this will mar the surface of the vinyl.

CAUTION: EXTREMELY FLAMMABLE MIXTURE! FOLLOW SAFETY WARNINGS ON SEAM SEALER BOX AND TUBE. NO SMOKING– KEEP AREA WELL VENTILATED- KEEP OUT OF REACH OF CHILDREN-DO NOT POUR EXCESS DOWN ANY DRAIN.

Making Low Visibility Seams

Apply masking tape to the seam after it has been cut. Slice the masking tape and apply Lonsealer in the seam. Remove the masking tape before the Lonsealer dries being careful not to let any drip onto the surface of the flooring material.

Chemical Welding Urethane Finished Surfaces

Lonsealer will not fuse to the urethane surface and will simply roll right off when cured. Follow all the above guidelines and ensure that adequate Lonsealer is used to foster proper fusion of the Lonseal sheet vinyl material below the urethane surface.

Installing on Stairs

NOTE: When installing on stairs, the following guidelines should be followed to achieve satisfactory results.

Adhesive

Depending on requirements of the installation, specify either Lonseal #755 Premium Bond or Lonseal #400 Contact adhesive. Review adhesive characteristics to determine appropriate adhesive for the project. (See Section 3 – **Lonseal Sundries**)

Apply adhesive to both vinyl and substrate with a solvent resistant medium nap paint roller or disposable paintbrush. Follow adhesive label instructions for open times.

Roll the surface of the material with a laminate roller to ensure good adhesion.

If necessary, repair the stair structure so that it is level, sound and true.

1. Match pattern (if applicable) evenly from bottom to top of stairway.
2. Install stairs individually:
 - Install tread and riser *when applying stair nosing*.
 - Install riser and then tread when stair nosing is not specified.
 - Wrap floating stairs.
3. For a good fit where the material is to flash up the riser or over the nose onto the tread, groove the material from the back for enhanced flexibility. Do not make the groove too deep or risk cutting through to the face of the vinyl. Use warm air to make the vinyl pliable for better fit at corners and edges. *Do not overheat the vinyl.*
4. If installing stair nose edging, use suitable adhesive or fasteners. Some stair nose trim is available with slots to accommodate insertion of matching or contrasting Lonseal vinyl. Do not use rubber-based products as they can discolor the Lonseal sheet vinyl flooring product.
5. Provide suitable finishing trim for the exposed edge of open stairways.

Installing Under Hospital Beds

NOTE: When installing directly under hospital beds (minimum 4' x 8' area), the following guidelines should be followed to achieve satisfactory results. The epoxy should extend a minimum of one foot beyond the wheel base load (footprint of bed casters).

Adhesive

For standard patient room(s), use Lonseal's #300 Epoxy directly under hospital beds, due to its firm setting properties. Coverage will vary depending on notch size and substrate porosity. Only apply as much adhesive as needed to assure a good bond while having the thinnest possible glue line.

Ensure the #300 Epoxy has sufficient curing time otherwise displacement can occur. Uncured adhesive will "displace" when heavy loads, especially rolling loads, are placed too soon. See section 3 - **Lonseal Sundries** - #300 Epoxy for further information.

#755 Premium Bond Sheet Vinyl adhesive can be used in the remainder of the installation within the patient room(s).

Primer

We recommend using a primer upon the substrate, making the underlayment compound easier to apply due to the excessive moisture loss to the slab. As a result, easier spread and greater coverage without the need to over-water the concrete to compensate for the moisture loss.

Installation

1. Prime the substrate to make the installation process consistent by removing substrate inconsistencies.
2. Accurately mix and apply floor patch to achieve best performance.
3. Ensure not to apply adhesive too thickly as this does not allow sufficient time for the exothermic reaction to off-gas before laying the Lonseal sheet vinyl flooring and can cause bubbling.

Note: Additional open time is necessary when installing over a non-porous surface (i.e. existing floor covering)

4. Ensure correct transfer of adhesive by installing the sheeting before a skin forms on the surface of the adhesive. Open time at 70° F (21°C) up to 40 minutes (open time may vary). Always check for proper transfer of adhesive by lifting material and inspecting for full transfer of adhesive to backing.

5. Immediately roll the material in both directions using a 75 or 100 lb. three-section roller. Repeat rolling after one hour and then at hourly intervals until bubbling stops.

6. For a period of 24 hours, allow no foot traffic, rolling traffic and do not set heavy furnishings on the floor for 48 hours. Normally, it takes 72 hours for adhesive to completely cure.

Spray Adhesive Alternate

As an alternative to #300 Epoxy, Spray-Lock® 3500 Sheet Goods Spray Adhesive, can be used to provide immediate shear strength and allows immediate traffic after installation (including hospital beds).

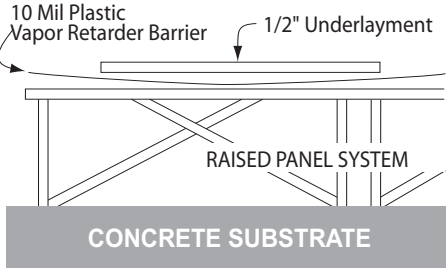
Installing on Alternative Substrates

Modular or Raised Panel Systems: As Tiles on Individual Modules

- Specify CNC or water jet method to cut Lonseal sheet vinyl to fit individual panel modules.
- Adhere with #300 Epoxy using a fine notch trowel, allow sufficient open time and roll with a laminate roller (pictured at right).
- Secure edges to module with 2" wide masking tape until cured and stack face-to-face to eliminate bubble formation.



Modular or Raised Panel Systems: As Full Sheets

- Where the system is to be completely covered over, it must be "capped, overlaid" with minimum 1/2" (13 mm) underlayment grade panels.
 
- The panels must be installed in the same manner as though over a suspended subfloor and fastened at standard intervals with compatible screws, which must be countersunk.
- Sand uneven panel joints and fill all indentations with approved smoothing compound.
- Measure any concrete subfloor beneath the raised panel system for moisture as directed in this manual.
- When moisture vapor emissions are excessive, as detailed, supply minimum .010" (0.25 mm) plastic membrane (in compliance with ASTM E1745) installed under the plywood for a vapor retarder barrier as illustrated.

Installing Lonsafe Underlayment

Lonsafe is a closed cell foam underlayment to be used beneath Lonseal Sheet Vinyl Flooring for sound absorption and comfort underfoot.

Installation conditions and floor preparation should meet all Lonseal requirements stated within this manual (See Section 4 – *Getting Started*).

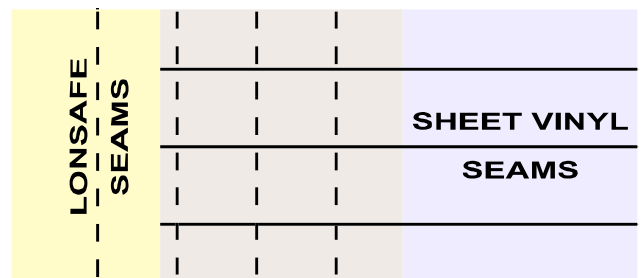
1. Maintain the site conditions using the permanent HVAC system. Installation temperature should be maintained at the floor level in the range of 65° - 85° F (18° – 29° C).
2. Prior to installation, a moisture vapor emission, RH and alkalinity test should be performed in accordance Section 4 – ***Moisture and Alkalinity Testing***.

Floor Preparation

1. Remove all contaminants and adhesive residues from the substrate.
2. Ensure the substrate is properly leveled.
3. Repair minor substrate irregularities with an approved cementitious patching compound.
4. Before installation, clean the surface of substrate by brushing or vacuuming.

Installation: Layout, Seams and Adhesive

1. Double-cut the seams of the Lonsafe prior to installation.
2. Lonsafe should be installed with the printed side down.
3. Seams of Lonsafe and Lonseal’s sheet vinyl flooring are to run in opposing directions (perpendicular). No end joints or seams shall be within 2 feet of one another.
4. Lonsafe sheets should be reversed to create a level underlayment surface.
5. Pull Lonsafe material back to apply the adhesive to the substrate using the proper trowel (see ***Appendix I – Trowel Specification & Roller Spread Rate Table*** on page 48).
6. Apply Lonseal’s #755 Premium Bond full spread onto the substrate. * See note below for HOT YOGA installations.
7. Allow enough open time for the adhesive to become tacky (between 20-35 minutes) before setting the Lonsafe into the adhesive. Force trapped air out with a core section or push broom, then roll with a 100lb three section roller.
8. No sealer is required.
9. The Lonsafe is to be installed & allowed to cure a minimum of 24 hours prior to installation of Lonseal sheet vinyl flooring atop the underlayment material.
10. When installing the Lonseal sheet vinyl flooring over the Lonsafe apply #755 Premium Bond adhesive with a 3/8” nap roller to both the backing of the material and the Lonsafe surface.
11. The adhesive should be applied in a moderately even coat.
12. Heat weld all Lonseal sheet vinyl flooring seams 24 hours after installation.



***Note:** For **HOT YOGA** installations please adhere to the following guidelines:

1. A 12” installation perimeter (against the wall) of #300 Epoxy adhesive is recommended with a field spread of #755 Premium Bond for BOTH the Lonsafe installation and the Lonseal sheet vinyl flooring product.
2. Seal the top perimeter of the installation (where the vinyl and wall meet) using Geocel 2300 clear caulking.
3. Air temperature should not exceed 105° F and substrate should not exceed 85° F.

Floating Floors

A floating system will perform and is maintained similarly to a fully adhered system. Floating floors tend to show indentations from furniture or displays more easily and heavy rolling loads can cause the system to buckle.

Specifier Note: The floating system is suitable for certain applications such as tradeshow floors, retail displays, kiosks, mobile command units, offices, etc. Additional uses include installations where excessive substrate moisture or existing floor coverings make typical remediation too costly or invasive.

If you plan to implement this type of system, you must request approval in writing from Lonseal Technical Support in order for warranty terms to apply. Additionally, specify that doorjambs be left high enough above the substrate to allow the floating system of Everlay and Lonseal sheet vinyl flooring to freely slide beneath for a more finished appearance.

Please note that, with the below exceptions, installation requirements, adhesive usage and application methods, as detailed elsewhere in this manual, must be followed.

Requirements of Substrates for Floating Floors

The flooring over which this system is installed must be free of contaminants and provide a sound and smooth foundation. Applications of this system over uneven substrates, ceramic tile, raised panel flooring systems, etc. may eventually telegraph irregularities to the surface.

Materials Needed for Floating Floors

Obtain the following materials from Lonseal:

Everlay Underlayment Sheet Vinyl: A PVC sheet reinforced with non-woven fiberglass with a smooth surface and lugs on the back. This is the underlayment to which the Lonseal sheet vinyl flooring is adhered. Dimensions: Rolls 6'-6" wide by 164' long.

Temporarily secure the edges of the installation at thresholds, reducers and where the system will not be mechanically bound to the floor.

Adhesives: Applied per the bucket label (Note for this application use a smaller trowel size: 1/32" x 1/16" x 1/32" U notch)

- Lonseal #755 Premium Bond should be applied to both the Everlay surface and backing of the Lonseal sheet vinyl flooring with a 3/8" nap roller. Allow to tack on both surfaces before setting the two sheets.
- Lonseal #300 Epoxy applied in a 3" (7.5 cm) band to permanently adhere the completed flooring system at all transition thresholds, reducers and where the system will not otherwise be mechanically bound to the floor. (except at walls)

Use Lonseal DFT under the seam of Lonseal sheet vinyl flooring to prevent adhesive contamination in the seam. Heat weld all seams.

Installation**Everlay**

- If possible, undercut doorjamb to fit the combined thickness of the Everlay and Lonseal sheet vinyl flooring (Approximately 3.5-4 mm).
- Make the substrate smooth enough to prevent unsightly telegraphing of cracks, uneven joints and holes.
- Thoroughly clean and vacuum the substrate concentrating on wall/floor junctions.
- Lie out and acclimate the Everlay sheets so that the seams run perpendicular to the finished Lonseal sheet vinyl flooring seams.
- With no adhesive underneath, install the Everlay to within ¼” (6mm) of walls and fixtures.
- Secure seams with 2” (50mm) wide cellophane tape centered on the seam and thoroughly rolled by hand.

Lonseal sheet vinyl flooring

- Lay out the Lonseal sheet vinyl flooring, mark seam location on the Everlay with a pencil and apply DFT centered on the lines and leave the liner paper on.
- Create an “anchor” sheet by folding (tubing the length of the seam) the Lonseal sheet vinyl flooring nearest the longest wall, open and apply #755 Premium Bond adhesive.
- When adhesive is almost completely clear, replace the sheet and roll with a standard 100 lb. resilient flooring roller.
- Tube the remaining sheets open at the seam and after applying adhesive remove the liner paper from the DFT. Allow the #755 Premium Bond to go almost clear, replace the vinyl and roll with a standard 100 lb. resilient flooring roller.

Adhesive Pointers

Because both surfaces are impermeable, allow #755 Premium Bond and #300 time to eliminate moisture (open time) because trapped vapors will cause bubbles. The color of #755 Premium Bond adhesive begins to change from milky to clear as it cures. About half the color should be visible in the adhesive before laying sheeting.

#300 Epoxy does not change color while curing, but still requires open time to prevent bubbling. However, do not let the epoxy form a skin before covering and, once the Lonseal sheet vinyl flooring is replaced on the adhesive, roll it at hourly intervals until bubbles stop forming and the floor is securely bonded.

Cut seams and roll sequentially into the DFT.

IMPORTANT! When making seams, take care not to cut through the Everlay. The best way is to partially cut through the bottom layer of Lonseal sheet vinyl flooring and complete cutting the vinyl with a hooked blade utility knife.

- Use standard heat welding equipment and matching Lonseal welding thread.

Maintenance

Maintain following Lonseal's Maintenance Guidelines as with any permanently-installed floor.

Custom Cutting

Configuring Lonseal sheet vinyl flooring into any number of designs is possible with Waterjet cutting technology. A listing of facilities is available through the Technical Department by email request at Technical@lonseal.com. Specifiers must work directly with the cutting facility to create and ship their designs.

Potential for Dimensional Change: Sheet vinyl is subject to dimensional change to a greater degree than vinyl tile. Lonseal accepts no responsibility for dimensional changes to sheet vinyl flooring products that are cut into shapes.

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After Installation: Maintenance Guidelines

Lonseal's Floorcare Maintenance Program has been designed to extend the aesthetics and performance of Lonseal's resilient vinyl surfacing products. As a part of this program, each of Lonseal's products has been engineered to excel at their specific application in combination with Lonseal sheet vinyl flooring products. It is encouraged that Specifiers' include Lonseal's Floorcare Products in all Lonseal specified projects to obtain optimum results.

Lonseal's maintenance products are available through our Customer Service Department at 800-832-7111. These instructions are for **machine** and **manual** maintenance methods.

- Install and maintain entry matting with a non-staining backing to reduce tracked-in dirt and contaminants.
- Begin maintenance 48 hours after installation.
- On low-speed rotary machine use contact pads for smooth surfaces or brush attachment for textured surfaces.

Application and Maintenance of Standard Acrylic Dressing/Finish

Initial Maintenance

1. Remove dry soils (labels, gum). Sweep or microfiber dust mop floor. Place "Wet Floor" signs in area.
 2. Dilute **Loncare** 2 oz. per gallon of cold tap water. Scrub with blue pad on auto scrubber or single disk machine.
 3. Pick up cleaning solution with scrubber or wet vac. Replace the solution when mop water becomes dirty.
 4. Using a clean microfiber mop pad, damp mop any residues with clean water. Allow floor to dry completely.
 5. Apply **Lonprime** in one thin coat using a clean microfiber mop pad. Application of **Lonprime** as a base seal coat increases the adhesion of the floor finish to the floor.
 6. Allow to dry completely before applying floor finish. Dry time is subject to temperature and humidity.
 7. Apply **Lonfinish** or **Lonsatin** in a thin coat using a clean microfiber mop pad.
 8. To apply a full even coat, outline the area to be finished. Fill in the outlined area using a figure eight (8) motion. Ensure perimeter and edges are completely coated.
 9. Apply a minimum of 2-4 coats. Allow 30-45 minutes between coats.
 - a. For highly embossed and *porous products, 4 coats of floor finish is highly recommended.
- * Loneco, Lonfloor Galvanized and Lonfloor Vista

Routine/Daily Maintenance

1. Remove gross soils (labels, gum). Sweep or microfiber dust mop the floor. Place "Wet Floor" signs in area.
2. Dilute **Loncare** 2 oz. per gallon of cold tap water. Replace solution when mop water becomes dirty.
3. Apply to finished floors using a clean microfiber mop pad or auto-scrubber. Allow floor to dry completely.
4. When dry, if needed, burnish with ultra high speed machine and blue ice pad to high gloss (those floors using **Lonfinish**). Never burnish with a soiled pad.

Periodic*Scrub and Recoat (as needed)*

1. Dilute **Loncare** 2 oz. per gallon of cold tap water. Scrub with blue pad on auto scrubber or single disk machine.
2. Pick up cleaning solution with scrubber or wet vac. Replace solution when mop water becomes dirty.
3. Using a clean microfiber mop pad, damp mop any residues with clean water. Allow floor to dry completely.
4. Apply **Lonfinish** or **Lonsatin** in a thin coat using a clean microfiber mop pad.
5. To apply a full even coat, outline the area to be finished. Fill in the outlined area using a figure eight (8) motion. Ensure perimeter and edges are completely coated.
6. Apply a minimum of 2-4 coats. Allow 30-45 minutes between coats.
 - a. For highly embossed and *porous products, 4 coats of floor finish is highly recommended.

* Loneco, Lonfloor Galvanized and Lonfloor Vista

Restorative*Strip and Finish (as needed)*

1. Sweep to remove gross soils. Divide work areas into small 5' X 20' areas.
2. Dilute 1 part **Lonstrip** with 5 parts water. Apply enough stripper to ensure complete wetting.
3. Allow to stand 5-10 minutes minimum. DO NOT ALLOW SOLUTION TO DRY. Re-wet as needed.
4. Scrub floor with auto-scrubber or floor machine using a brown stripping pad to break softened film. Flip pad and replace as needed.
5. Pick up solution with wet vac or auto-scrubber.
6. Damp mop floor with clean water to remove all residues.
7. Allow to dry before applying **Lonprime**.
8. Apply **Lonprime** in one thin coat using a clean microfiber mop pad. Application of **Lonprime** as a base seal coat increases the adhesion of the floor finish to the floor.
9. Allow to dry completely before applying floor finish. Dry time is subject to temperature and humidity.
10. Apply **Lonfinish** or **Lonsatin** in a thin coat using a clean microfiber mop pad.

11. To apply a full even coat, outline the area to be finished. Fill in the outlined area using a figure eight (8) motion. Ensure perimeter and edges are completely coated.
12. Apply a minimum of 2-4 coats. Allow 30-45 minutes between coats.
 - a. For highly embossed and *porous products, 4 coats of floor finish is highly recommended.
 - * Loneco, Lonfloor Galvanized and Lonfloor Vista

Long Term – Restoring Luster

METHOD 1

- Rejuvenate the finish, with two thin coats of **Lonfinish** or **Lonsatin**, applied as detailed under Scrub and Recoat (above). Stripping the finish/dressing is rarely needed if the floor is maintained and thin coats of dressing applied as needed to refurbish the floor appearance.

METHOD 2

- Once the surface is clean and completely dry, **DRY BUFF** with a ¹Contact Pad on a high speed machine or Autoscrubber (1500 rpm) to enhance the luster.

Loncare	Neutral pH Cleaner	2,000 s.f. coverage per gallon
Lonbuff	Spray Buff	4,500 s.f. coverage per gallon
Lonprime	Base Seal Coat	3,500 s.f. coverage per gallon
Lonfinish	Acrylic Glossy Finish	2,500 s.f. coverage per gallon
Lonsatin	Acrylic Matte Finish	2,500 s.f. coverage per gallon
Lonstrip	Non-Ammoniated Extra Heavy Duty Stripper	2,000 s.f. coverage per gallon

In the case Lonseal Flooring Maintenance Products are not accessible due to time constraints or emergency cases, other brand maintenance products of similar quality may be substituted. However, when substituting, always do test areas.

Lonseal, Inc. does not warrant performance of nor will be held responsible for problems arising from the use of any maintenance product by any manufacturer since all situations and application personnel are different. All questions should be directed to the Lonseal, Inc. Technical Department at 800-832-7111.

¹ Contact Pads can be used on embossed and smooth textures, providing the cleaning power of a red 3M type pad, thus outlasting conventional pads. Contact pad fibers are split laterally into five segments, which creates 15 contact points for every one fiber thus increasing contact with the flooring surface for greater efficiency with no abrasion to the surface. Contact pads can also be repeatedly machine washed thus increasing cost effectiveness.

Maintenance on Glossy Urethane Finished Surfaces

These instructions are for **machine** and **manual** maintenance methods

- Begin maintenance 48 hours after installation is complete.
- The floor should always be clean to minimize any slip hazard from build up of dust and tracked-in contaminants.
- When the floor is properly clean, you will notice increased traction.

Initial and Daily Maintenance

1. Install and maintain entry matting with a non-staining backing to reduce tracked-in dirt and contaminants.
2. Sweep with a soft bristle broom or microfiber dust mop the entire area to remove dust and debris.
3. Dilute **Loncare** 2oz. per gallon of cold tap water. Damp mop using a clean microfiber mop pad.
4. To remove scuff marks, buff the area with a low speed machine equipped with a clean contact pad until clean and dry.
5. Change contact pads when they get clogged.

Revitalize Gloss (As Needed)

The length of time required for interim maintenance or revitalizing varies and is dependent upon usage and traffic.

1. Sweep with a soft bristle broom or microfiber dust mop the entire area to remove dust and debris.
2. Spray a fine mist of **Lonbuff** over a small area to be cleaned (about 5 feet at a time).
3. Immediately **BUFF** sprayed area with a low speed machine equipped with a clean contact pad until clean and dry.
4. Change contact pads when they get clogged.
5. Once the surface is clean and completely dry, **DRY BUFF** with a clean contact pad on a low speed machine to enhance the luster.

Note: Do not use abrasive pads, brushes or cleaning agents.

Please contact Technical Support at 800-832-7111 for additional assistance.

Lonseal, Inc. does not warrant performance of nor will be held responsible for problems arising from the use of any maintenance product by any manufacturer since all situations and application personnel are different. All questions should be directed to the Lonseal, Inc. Technical Department at 800-832-7111.

Maintenance on Matte Urethane Finished Surfaces - TOPSEAL

These instructions are for **machine** and **manual** maintenance methods

- Begin maintenance 48 hours after installation is complete.
- The floor should always be clean to minimize any slip hazard from build up of dust and tracked-in contaminants.
- When the floor is properly clean, you will notice increased traction.

Note: Always use quality cleaning products.

Initial and Daily Maintenance

1. Install and maintain entry matting with a non-staining backing to reduce tracked-in dirt and contaminants.
1. Dust mop the entire area with a clean microfiber pad to remove dust and debris.
2. Dilute **Loncare** 2oz. per gallon of cold tap water. Damp mop using a clean microfiber mop pad.
3. To remove scuff marks, BUFF the area with a low speed machine equipped with a clean white pad and diluted **Loncare**.
4. Always use clean buffing pads and change pads as they get clogged.

Note: Do not use abrasive pads, brushes or cleaning agents.

Please contact Technical Support at 800-832-7111 for additional assistance.

Lonseal, Inc. does not warrant performance of nor will be held responsible for problems arising from the use of any maintenance product by any manufacturer since all situations and application personnel are different. All questions should be directed to the Lonseal, Inc. Technical Department at 800-832-7111.

Maintenance Problems & Solutions: Standard Acrylic Finish

PROBLEM	TYPICAL CAUSE(S)	RECOMMENDED SOLUTION
Black marks (i.e. scuffs, scratches)	Rubber shoe heels, hard plastic or rubber wheels/casters, painted items, contaminants on shoes	Remove thick residue with a dull putty knife. Gently rub mark residue with a white scouring pad moistened with diluted pH neutral cleaner.
Low or uneven surface gloss (fisheyes)	Incorrect ratio of pH neutral cleaner and water, dirty mop water or dirty equipment	Accurately mix cleaner per container label. <i>Change dirty mop water frequently</i> and clean dirty equipment.
	Insufficient finish/dressing, improper initial preparation, incorrect finish application	Thoroughly clean and re-coat. May require complete stripping old finish and re-coating with new.
Finish appears cloudy, is sticky, easily mars	Wrong type, or dirty, buffing pad or brush	Use only clean pads or brushes as indicated by cleaning product manufacturer.
	Use of phenolic type disinfectants in mop water	Switch to quaternary based disinfectant.
Finish is powdery, scaly	Use of high pH cleaners	Use only pH neutral cleaners and concentrates.
	Incompatible finish materials i.e. a harder dressing over a softer one	Strip old finish completely and apply new finish as directed herein.
Slippery floor	Dressing is too hard for type of use	Dressing in multi-use areas like gyms need greater flexibility. Strip old finish completely and apply a more suitable finish.
	Dressing applied before previous coat has dried	Strip old finish and reapply as directed herein allowing ample time for drying between coats.
Slippery floor	Poor preparation leaves surface of floor contaminated	Strip and rinse, then allow the floor to dry before applying any finish.
	Finish damaged by using wrong pads or brushes	Pads and brushes should be suited to the type of dressing and floor surface. Aggressive pads and brushes will accelerate wear to the dressing and vinyl. Strip old finish completely and apply new finish as directed herein
Slippery floor	Leaked or spilled water, beverage or condensation	Blot or pick up with a wet vacuum, rinse with clean water. Check for leak source. Maintain adequate walk-off mats.
	Contaminants (i.e. soap residue, grease, clean/shine overspray)	Use a higher pH cleaner to reduce and lift contaminant. Removal of the finish by complete stripping may be required for silicone based furniture polish etc.
Slippery floor	Accumulation of dust and dirt	Typical of gyms and multi-purpose rooms. Sweep and dust mop frequently. Use walk-off mats at all entrances.
		Continued next page...

Maintenance Problems & Solutions: Standard Acrylic Finish

Scuffs, scratches and gouges	Floor contaminated with dirt, debris	Provide and maintain walk-off mats. Sweep and dust mop and scrub floors as frequently as needed to prevent accumulation.
	Inappropriate type pads or brushes	Pads or brushes too coarse. Sweep and dust mop prior to machine cleaning or buffing.
	Dragging objects	Move furniture and objects on an appropriate type dolly, or slide them on a protective surface.
Dressing looks yellow	Dirty mop, dirty buffing pad or tracked-on contaminants	Completely strip and refinish the floor and maintain with clean equipment. Stop introduction of contaminants by means of adequate entry matting.
Brownish stain under mat, rubber wheels, tires	Anti-oxidants in rubber leach into the vinyl, causing permanent stains.	Ensure that mats are non-staining. Use acrylic spacers to keep rubber from contact with the vinyl.
Colored stains	Inks or dyes from bags, rags or rugs cause stains	Scrub immediately with a high pH cleaner or denatured alcohol. Don't use solvents. Stains may be permanent.

7

Disclaimers & Important Policy Notices

TO PRESERVE THE WARRANTY AND DELIVER THE BEST POSSIBLE INSTALLATION TO YOUR CUSTOMER, FOLLOW THE INSTRUCTIONS IN THIS MANUAL

Lonseal supplies flooring and surfacing products with the understanding that applicable building codes were investigated by the specifying agency prior to ordering.

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

Lonseal, Inc. does not warrant performance of nor will be held responsible for problems arising from the use of any maintenance product by any manufacturer since all situations and application personnel are different. Questions pertaining to special purpose uses should be directed to the Lonseal, Inc. Technical Department at 800-832-7111.

Installer Responsibility

For best results, trained installation professionals should follow the written directions provided in our installation manual and/or our adhesive containers.

Installation of any Lonseal flooring and related products constitutes acceptance of all material and site-related conditions by the installation contractor.

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

Disclaimers

All vinyl floor coverings can be marred when cigarettes are left to burn or are extinguished on them.

Lonseal is not liable for damage resulting from telegraphing of any flooring disfigurement or hazard created due to installations over cracks or expansion joints.

Lonseal will not consider a claim for material or sundries shipped, stored or installed under unfavorable conditions including, but not limited to: Damage resulting from careless handling, 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 emplaced.

Lonseal is not responsible for replacement of materials when the color selection, based on a random sample, fails to exactly match the material shipped.

Lonseal is not responsible when shading issues arise due to misapplication.

Lonseal does not guarantee short or long-term success of crack repairs.

Responsibility for the performance of any panel rests solely with the panel manufacturer and with the installer. Lonseal provides the following information about underlayment panels to ensure correct selection, conditioning, installation and preparation. Lonseal is not responsible for panel performance for any reason for the life of the installation.

Lonseal is not responsible for damage resulting from the use of inappropriate, improperly designed, or inadequate floor protection devices. Rolling-type casters on furniture/appliances/equipment may damage the flooring, any warranty as to their suitability rests with the furniture, appliance or equipment manufacturer.

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

Contacting Lonseal 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 contact Lonseal Technical Support:

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.

8

Safety Warnings

YOUR SAFETY AND THAT OF OTHERS AT THE JOB SITE IS CRITICAL. READ AND OBEY ALL HEALTH AND SAFETY WARNINGS ON MATERIAL SAFETY DATA SHEETS (MSDS) AND LABELS.

Chemical-Related Emergencies

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

Asbestos Removal

For complete and authoritative instruction (Work Practices) regarding removal of materials containing ASBESTOS contact:

- Resilient Floor Covering Institute (RFCI)
115 Broad Street, Suite 201
La Grange GA 30240

(706) 882-3790

Warning Regarding Complete Floor Covering Removal

When removing any type floor covering, ensure that: 1) all applicable local, state, and federal regulations are observed, 2) that those who undertake removal are familiar with the Resilient Floor Covering Institute Work Practices and 3) these personnel are properly trained and licensed as required.

- **Do not sand, dry scrape, bead blast, or mechanically pulverize existing resilient flooring, backing, and solvent-based cutback adhesive or lining felt. These products may contain asbestos fibers not easily identified.**
- **Do not use power devices that might create asbestos dust.**
- **Do not allow unprotected personnel near the jobsite.**

Inhaling asbestos dust may cause *asbestosis* or other serious bodily harm. Smoking greatly increases the risk of serious bodily harm when airborne asbestos particles are inhaled.

When removing vinyl composition tile over twenty years old, you may encounter solvent-based asphalt adhesives that aren't readily identifiable. If you cannot identify them, assume that they contain asbestos fiber. If you are unsure or unable to determine whether asbestos is present where you will be working, do not proceed without seeking qualified help.

Recommended Work Practices For Removal of Resilient Floor coverings written 3/15/2010.

Appendix I

Trowel Specification and Roller Spread Rate Table

#755 Premium Bond	V-notch trowel Porous	U-notch trowel Non-Porous	Nap roller	
	1/16" x 1/16" x 1/16"	1/32" x 1/16" x 1/32"	3/8"	
	*Approx. spread rate	170-210 sq.ft./gallon	185-245 sq.ft./gallon	180-200 sq.ft./gallon
	**Flash time	15-30 minutes	15-30 minutes	15-30 minutes
	**Working time	1 hour	1 hour	1 hour
#300 Epoxy	V-notch trowel Porous Interior	U-notch trowel Non-Porous Interior	Square-notch Exterior	
	1/16" x 1/16" x 1/16"	1/32" x 1/16" x 1/32"	1/16" x 1/16" x 1/16"	
	*Approx. spread rate	165 sq.ft./gallon	175 sq.ft./gallon	150 sq.ft./gallon
	**Flash time	15-25 minutes	15-20 minutes	15-25 minutes
	***Working time	15-30 minutes	15-25 minutes	up to 40 minutes
#400 Contact	Nap roller	Disposable paint brush	Compressed air gun	
	3/8"	Clean/New	-	
	*Approx. spread rate	266 sq.ft./gallon	235 sq.ft./gallon	363 sq.ft./gallon
	**Flash time	3- 15 minutes	3- 15 minutes	3- 15 minutes
	***Working time	0 minutes	0 minutes	0 minutes

*Approximate product coverage(s)

** FLASH TIME: waiting time required before installing flooring.

*** WORKING TIME: window of time for the adhesive to accept flooring.

Note: Flash time and working times may vary based on temperature, humidity, coating weight, substrate porosity, applicator and jobsite conditions.

Appendix II

Alternative Fastener Types Schedule

For a complete detailing of fastener requirements send for publication, National Evaluation Report 272 which is available free from ISANTA (International Staple, Nail and Tool Association) and the governing entities.

The adaptation below is based on information relevant to installation of underlayment flooring panels found in Table 45, Page 56 of NER 272 published by National Evaluation Service, Inc.

TABLE 45
WALL SHEATHING, PANEL SIDING AND FLOOR UNDERLAYMENT ATTACHED TO WOOD MEMBERS

Description of Attached Material	Attached Material Nominal Thickness (In Inches)	Spacing Specifications (In Inches) ⁴		Fastener Specifications ^{1,2}	
		Edges	Intermediate	Minimum Leg Length (Inches)	Fastener Style ³
Floor Underlayment	1/4	3	6-Grid	1-1/4	3d Ring Shank Nail
		2	5-Grid	7/8	18 Gage Staple 3/16" Crown Width
		2	4-Grid	1-1/4	0.080 Nail
	11/32	6	8-Grid	1-1/4	3d Ring Shank Nail
		4	6-Grid		16 Gage Staple 0.080 Nail
	15/32 - 19/32	6	8-Grid	1-1/4	3d Ring Shank Nail
		5	6-Grid		16 Gage Staple 0.097" Nail
	3/4	6	8-Grid	1-1/2	4d Ring Shank Nail
		5	6-Grid		16 Gage Staple 0.097" Nail

1. Except as noted above, all staples shall have a minimum crown width of 7/16".
2. Steel wire fasteners exposed to the weather in service shall be zinc coated by a hot-dip, mechanical deposition or electrodeposition galvanizing process.
3. 0.080 nails and No. 18 gage staples are not listed in Table Numbers 1 through 3 and are for nonstructural use only as tabulated above.
4. Fastening schedule only applies to buildings of conventional wood frame construction where wind or seismic analysis is not required by the applicable code. In areas where wind or seismic analysis is required, required fastening shall be determined by structural analysis.

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