

# LONSEAL

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## TECHNICAL MANUAL FOR INTERIOR FLOORING PRODUCTS

Last Revised 06/11/2010

# Lonseal Interior Products

## Table of Contents

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### 1. About this Manual

Purpose	6
Audience	6
Handling & Storage	6

### 2. About Lonseal Products

Technical Specifications	7
Product Description & Features	7
Design Applications	7
Coving	7
Composition & Construction	8
Thermal Properties	8
Quality Control	8
Lonseal Product Samples	8

### 3. Before Getting Started

Color Shading	9
Products Used in the Installation	9
Lonseal Products	10
Lonseal Adhesive No. 300 Epoxy	10-11
Lonseal Adhesive No. 400 Contact Adhesive	12
Lonseal Adhesive No. 555A Acrylic Adhesive	13
Lonseal Double Face Tape (DFT)	14
Lonsealer	15
Trowel Notch Table	16
Embossed Pattern	16
Discoloration (Staining)	16
Approved Type Smoothing and Filling Compounds	17

### 4. Getting Started

Site & Subfloor Conditions	18
Site Conditions	18
Old Substrates must meet "As New" Criteria	19
Minimum Smoothness (FF/FL)	19
Moisture and Alkalinity Testing	19-20
Permanent HVAC	20
Old Adhesive Residue	20
Expansion Joints & Control Joints	21
Performing a Bond Test	21
Supplying Mock-Ups	21
Substrates and Preparation	22
Lightweight Concrete: Qualifications and Preparation	22
Standard Concrete: Qualifications and Preparation for New or Existing	23-24
Underlayment Panels & Suspended Wood Systems	24-26
Underlayment Panels: Conditioning & Installing	26-27
Miscellaneous Substrates, Preparation and Installation	28
Pre-Existing Floor Coverings	28-30
Radiant Heated Flooring Systems	30

<b>5. Floor Installation Guidelines</b>	
Installing to the Substrate	31
Laying Out	31
Anchor the Installation	31
Final Steps	32
Seaming Guidelines	32
Tips for Improving the Appearance of the Installation	32
Heat Welded vs. Chemical Welded Seams	33
Suggested Selection Criteria for Heat Welded Seams	33
Visual Effects of Seaming	34
Pattern Matching	34
Description of Heat Weld Method	34
Trimming	35
Glazing	35
Heat Welding UV Cured Urethane Finished Surfaces	35
Glazing UV Cured Urethane Finished Surfaces	35
Heat welding tools for UV Cured Urethane Finished Surfaces	36
Description of Chemical (Cold) Welding Method	36
Making Low Visibility ("Invisible") Seams	36
Chemical Welding UV Cured Urethane Finished Surfaces	37
Installing on Stairs	37
Adhesive	37
Installing Under Hospital Beds	38
Adhesive	38
Primer	38
Installation	38
Installing on Alternative Substrates	39
Modular or Raised Panel Systems: As Tiles on Individual Modules	39
Modular or Raised Panel Systems: As Full Sheets	39
Installing Lonsafe Underlayment	40
Floating Floors	41
Requirements of Substrates for Floating Floors	41
Materials Needed for Floating Floors	41-42
Installation	42
Adhesive Pointers	43
Maintenance	43
Custom Cutting	43
<b>6. After Installation: Maintenance Guidelines</b>	
Application & Maintenance of Standard Acrylic Dressing/Finish	44
Lonseal's Maintenance Program	44
Initial Maintenance	44
Routine/Daily Maintenance	45
Periodic - Scrub and Recoat	45
Restorative - Strip and Finish	45
Long Term - Restoring Luster	46
Maintenance Products & Manufacturers' Information	46
Maintenance on Glossy UV Cured Urethane Finished Surfaces	47
Initial and Daily Maintenance	47
Revitalize Gloss	47
Maintenance on TOPSEAL Products	48
Initial and Daily Maintenance	48
Maintenance Problems & Solutions for Standard Acrylic Dressing/Finish	49-50
<b>7. Disclaimers &amp; Important Policy Notices</b>	
Installer Responsibility	51

Disclaimers	52
Contacting Lonseal Technical Support	53
<b>8. Safety Warnings</b>	
Warning Regarding Complete Floor Covering Removal	54
<b>Appendix</b>	
Alternative Fastener Types Schedule	55

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**FOR ORDERS**

Please fax your order to  
Customer Service at  
**888-LONSEAL** (888.566.7325).  
For general questions, please call  
800.832.7111.

**FOR SAMPLES**

Call 800.832.7111 or visit  
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# 1

## About This Manual

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### Purpose

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

### Audience

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

### Handling & Storage

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Proper storage is necessary to ensure the best performance and appearance from Lonseal sheeting 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.
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° - 75° F (18° - 23° C).
4. The installation contractor must check to make sure all materials and adhesives are correct for the job, and ensure that the pattern, color, style and lot numbers match those called for in the finish schedule as specified for that project.
5. DO NOT use marker upon 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.

# 2

## About Lonseal Products

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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

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Technical specifications are available via Lonseal's website ([www.lonseal.com](http://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

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#### 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.

#### Coving

All Lonseal resilient sheet products can be coved for those applications in which coving is required (healthcare applications are often coved since coving provides a high degree of sanitation). The vinyl can be installed up the walls to a height of 4 inches (10 cm), without complex pattern scribing.

Lonseal vinyl 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 rugged wear layer of polyvinyl chloride resin, plasticizers, fillers and pigments is formulated to provide maximum resistance to foot traffic and most industrial chemicals. (Note that an additional wear layer of clear urethane is standard on Lonseal UV finish lines.)
- Calendered construction allows maximum flexibility of layers of material that enhance acoustics, while reducing fatigue and impact injury. Some patterns have an additional layer of fiberglass mesh for maximum dimensional stability and support to the wear layer.
- The product's backing layer enhances adhesion.
- Some Lonseal products are continuously marked on the back approximately 12" (305 mm) 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.
  - 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**

Temperatures must not exceed 85° F (29.4° C) on installations over radiant heated floors.

**Quality Control**

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

# 3

## Before Getting Started

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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 warning (see Section 8 – Safety Warnings for important information).**

### Color Shading

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Because a certain degree of color variation can occur as a result of the manufacturing process, all rolls of Lonseal product must be installed sequentially by roll number and all cuts must be installed in the order of their removal from the roll. Install without reversing the sheets. Lonseal is not responsible when shading issues arise due to misapplication.

### Products Used in the Installation

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**NOTE: Use only Lonseal brand adhesives.**

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

Lonseal adhesives may be safely used:

- on above-grade, below-grade or on-grade concrete
- on floors with moisture barriers installed under the slab
- where the concrete is deemed to be substantially dry and not subject to water absorption.

**Recommended Surfaces.** Lonseal adhesives are used to adhere Lonseal resilient sheet vinyl to **floors, interior walls, and ceilings** made of the following materials:

- standard concrete
- approved plywood and composition type panels
- sanded metal
- ceramic/porcelain tile
- VCT
- fiberglass<sup>1</sup>
- terrazzo

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<sup>1</sup> Contact the Lonseal Technical Department for recommended procedures at 800-830-7111.

## Lonseal Products

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### Lonseal Adhesive No. 300 Epoxy

This two-component epoxy adhesive provides outstanding adhesion for high performance indoor-outdoor installation of Lonseal sheeting over approved underlayment surfaces.

Use this 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.
- Locations where Lonseal sheet vinyl is installed adjacent to another flooring type that cannot be heat or chemically welded to PVC sheeting and where there will be no transition covering.

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

#### 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 rolling load indentations from 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, 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 moisture vapor to off gas before covering with Lonseal sheet vinyl (critical on non-porous substrates).
- Not rolling the vinyl a sufficient number of times during the curing process.

**Effects of Temperature on Uncured Epoxy:** *Do not mix or apply No. 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.

### Lonseal Adhesive No. 300 Epoxy (cont.)

#### 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 work off. Do not allow any item onto the floor until the epoxy has cured, typically 6-12 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 No. 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.

#### Application of Lonseal Adhesive No. 300 Epoxy

No. 300 Epoxy adhesive consists of two parts labeled PART A and PART B that, when mixed, equal a gallon.

6. 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.
7. 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 ***Trowel Notch Table*** on page 17). Coverage will vary with sub floor porosity.
8. Allow open time before laying the vinyl sheet material into it.
  9. 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.
  10. 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.
  11. 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.

**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.

**Lonseal Adhesive  
No. 400**

Nitrile rubber-based, high-strength adhesive formulated for spray, roller or brush application. Fast drying, Lonseal No. 400 forms an instant bond. Use No. 400 to bond Lonseal vinyl to any approved substrate. When cured, Lonseal No. 400 is highly resistant to water, acids, alkalis, oil, gasoline and most solvents.

**Adhesive No. 400 is the only contact type adhesive recommended for use with Lonseal sheet vinyl.**

**Application**

Using a compressed air gun, disposable paint brush or non-shedding medium nap roller, apply a uniform coating to both substrate and backing layer of the sheet vinyl after they are thoroughly cleaned and free of oil, dirt or grease.

Metal and impervious surfaces must be abraded with #60 sandpaper or steel wool, then cleaned and primed with Acetone<sup>2</sup>.

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. When adhesive becomes slightly tacky to the touch, join the material to the substrate and roll or clamp 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 150-250 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.

**WARNING!** This Adhesive Contains Acetone: No. 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. (See ACETONE WARNING below).

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

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<sup>2</sup> **Adhesive No. 400 ACETONE WARNING: CAUTION! ACETONE IS FLAMMABLE! HANDLE WITH CARE! KEEP AWAY FROM HEAT, SPARKS AND FROM OPEN FLAME. EXTINGUISH ALL FLAMES AND PILOT LIGHTS AND TURN OFF ALL NON-EXPLOSION PROOF ELECTRONIC EQUIPMENT AND SOURCES OF IGNITION DURING USE.**

**Lonseal Adhesive  
No. 555a**

This adhesive is a premium quality, white, acrylic adhesive. Called “transitional” because it transitions from having outstanding green grab to firm curing with little residual grab, it is suitable for installing all Lonseal sheet vinyl products 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**”.

Recommended Surfaces: Suitable for any approved surface that is not exposed to flooding or extremes of temperature fluctuation.

Recommended Notch Size: Refer to the **Trowel Notch Table** (page 16) in this section. 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 vertical and overhead surfaces as described in Lonseal’s **Technical Manual for Interior Vertical Products**, available from [www.lonseal.com](http://www.lonseal.com)).

Installation Conditions: Using the permanent HVAC, the subfloor, 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. Apply 555a adhesive with a new trowel. Maintain proper notch depth throughout the installation.
2. As it cures, the adhesive color changes from all white to clear. To ensure that the adhesive will transfer to the sheeting when rolled, the best time to lay the sheeting into the adhesive is when at least half of the color remains in the adhesive. Typical open time at 70° F (21° C) up to 40 minutes. During the installation process, occasionally lift material and inspect for full transfer of adhesive to the sheet backing.
3. Immediately roll the material in both directions using a 75 or 100 lb. three-section roller.
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 12 months when stored in original, unopened container at room temperature in a dry heated area.

Clean Up: Remove excess adhesive immediately with soapy water. Clean dried adhesive from surface and tools with a non-flammable cleaner.

**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 the eyes.

Contents: 3 Gallons (11.35 Liters) or 1 Gallon (3.8 L) or Quart (.945)

**NOTE:** To learn how to apply to **interior walls and ceilings**, please refer to Lonseal’s, “**Technical Manual for Interior Vertical Products**”.

**Lonseal Double Face Tape (DFT)**

Lonseal DFT is an aggressive, dry adhesive film that provides a “clean zone” free of adhesive contamination. 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.
- For all chemically welded seams, apply DFT before the underlying adhesive has been troweled.

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 chalk line to mark the position of a seam as 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 and to avoid irritating paper cuts. 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 products, or fuses Lonseal sheeting 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 to Lonseal UV cured urethane products:** Lonsealer fuses only the PVC layers of all Lonseal *urethane coated* products. The cured Lonsealer residue usually rolls off the urethane surface, but may require using a spatula to ensure complete and timely removal. Additionally, applying Lonsealer using the methods described in the following section, **Low Visibility Seams** virtually ensures no residue on the surface.

**IMPORTANT NOTICES:**

- Simply coating the seam is not sufficient to prevent eventual gapping and seam failure. The needle must be fully inserted into the seam and sufficient Lonsealer applied or the seam can eventually fail.
- When seams are contaminated (with dirt, moisture or adhesive residue) chemical fusion of the two sheets is compromised with resulting loss of performance.
- Dirty seams cannot be cleaned when sealed. Particular care must be taken to handle the seam area of light colored material carefully and with clean hands.
- Use Lonseal DFT under all chemically welded seams (curved seams and insets excepted).
- Use at temperatures between 65°-85° F (18°-29° C)
- The edges of the sheeting must touch throughout the length of the seam for successful seaming to be possible.

Application: Shake tube well, insert needle fully into seam and draw evenly along the entire seam length. There remains some residue visible along seam. Do not wipe the residue off. Effects of the residue diminish rapidly leaving only a small trail of cured residue visible along the seam.

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.

## Trowel Notch Table

### INTERIOR and EXTERIOR TROWEL and ROLLER SPECIFICATIONS and SPREAD RATE

	"V" notch Interior Porous 1/16" x 1/16" x 1/16"	Fine notch Interior Non-Porous 1/16" x 1/32" x 1/32"	"Square" notch Exterior-All 1/16" x 1/16" x 1/16"
			
*Spread / gal.	180-215	200-260	160-180
**Minutes open time	15-25	10-15	15-25
**Minutes working time	15-25	15-25	15-25
Roller 	Approximately 200 sq. ft. per gallon (Vertical/Walls Only!)		

\* Actual job site coverage may vary according to substrate conditions.

\*\* OPEN TIME: Mandatory evaporation time.

\*\* WORKING TIME: Amount of time left to install after open time. Varies with fluctuations in temperature and humidity.

## Embossed Pattern

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. Back rolling the sheet with the longer run-off may compress it enough to match.

## Discoloration (Staining)

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

- To prevent premature aging, automotive tires and many rubber products contain antioxidants like butylated hydroxytoluene (BHT) among others. Products, usually tires, i.e. car, truck, bicycle, trailer, motorcycle, and rubber-backed mats, planters, furniture feet etc. containing BHT can permanently stain vinyl.
- 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 discoloration of the vinyl.

Lonseal will not replace flooring due to "contact" discoloration.

## Approved Type Smoothing and Filling Compound

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**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.
- Force drying which stops the hydration process needed to develop full cure strength.
- Priming the substrate, whether concrete or wood, makes applying properly mixed patch and smoothing products easy and they perform better. Check with 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, clean, solid substrate.

- Use primer as directed by the 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.

# 4

## Getting Started

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### Site & Subfloor Conditions

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

#### Site Conditions

1. The site should be dry and have not been flooded for 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 68° 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. .

2. Take precautions to ensure that the substrate is not contaminated (including sweeping with oil-based products). Other trades must remain out of the work area and off the floor until the installation contractor advises it is safe to enter or for 48 hours post installation.

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.

**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, according to ACI 302, are typically FF18/FL15. Prior to installing, the installation company must obtain a report from the project GC stating that the substrate conforms to ASTM E1155-96(2001).

**Moisture & Alkalinity Testing**

**Lonseal strongly recommends to the Flooring Contractor, that moisture and alkalinity testing be performed by an accredited engineering firm/laboratory or accredited persons sufficiently in advance of the installation date so that corrective measures can be performed.**

Prior to any installation of Lonseal sheeting over concrete regardless of age or elevation or floor location, testing for moisture vapor drive shall conform to the following required standard tests:

A) **ASTM F1869-03** (anhydrous calcium chloride), maximum slab moisture content not to exceed 5.0 lbs.

B) **ASTM F2170** (Internal Relative Humidity tests). Maximum slab moisture content not to exceed 75%.

C) Per **ASTM F710**, (Preparing Concrete Floors to Receive Resilient Flooring), maximum 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, Inc.

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 drive. Acid washing alone will not have long-term benefits.

**NOTE:** Portland-based terrazzo permits emission of moisture vapor from the slab and must be likewise tested.

**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 of location, always test slab for moisture and pH.

**Disclaimer:** Any recommendations and guarantees regarding the suitability and performance of these products or services belong to the material manufacturer or the installation contractor. Installation of Lonseal sheeting constitutes acceptance of the slab and acknowledgement by the installer that the slab/substrate meets all Lonseal requirements and recommendations for site conditions.

### **Permanent HVAC**

Using the permanent HVAC system, condition the subfloor, flooring material and adhesive to an average temperature of 72° F (22° C) for 48 hours prior to during installation and afterward.

### **Old Adhesive Residue**

Different kinds of verse adhesives can react adversely to each other resulting variously in adhesive re-emulsification and bond failure, as well as possible indentations and staining of the vinyl. Remove old adhesives until only a thin residue remains before proceeding with installation.

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

1. Bead blasting (shot-blasting) or grinding assures rapid and complete removal of surface contaminants.
2. Hand scraping shall leave not more than a stain of residue.
3. To stop plasticizer migration between the new adhesive and old embedded adhesive residue, apply encapsulating primer per manufacturer's instructions. Once encapsulant is dry, apply approved type patch and/or skimcoat as needed.

**Encapsulating Primer Note:** Always follow manufacturer recommendations regarding suitability, storage, and 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 & Control Joints

Expansion joints are designed to permit slab movement which cannot be stopped. It is advisable to “stop short” with the vinyl 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 vinyl.

From a design standpoint, a transitional threshold across an expansion joint would ruin the appearance of the floor. Attempts to permanently stop slab movement usually fail over time. Among others, a method to permit continuous application of vinyl sheeting over expansion joints requires that the original filler material be removed from the joint to a minimum depth of 2” (5 cm) and the resulting gap cleaned and filled with a mixture of Lonseal No. 300 2-part epoxy and sand. Once the epoxy/sand mix cures, it may be sanded and filled with approved cementitious filler.

Following the manufacturer’s directions, open, clean and fill control joints, saw, 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

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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, 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.

## Supplying Mock-Ups

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Prior to installing Lonseal flooring, provide a mock-up 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 (cold) seams.
2. Flash (integral) coving, including inside and outside corners complete with cove cap and stick.
3. Surface finish treatment, whether standard acrylic dressing or aftermarket urethane.
4. Game lines or insets (as applicable).

## Substrates and Preparation

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### Lightweight Concrete: Qualifications and Preparation

Lonseal does not recommend installing over lightweight concrete less than 1.5" (4cm) thick or with a density of less than 115 lb/ft.<sup>3</sup> (1841 kg/in<sup>3</sup>) with compressive strength below 3200 psi over concrete or less than 2000 psi over wood. Applications on lightweight concrete and commercial-grade pumped gypsum require prior approval from Lonseal Technical Support in order for warranty terms to apply.

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

**NOTE:** Lightweight insulating concrete is typically used for sound or thermal insulation, is not structural, has low compressive strength, and exhibits soft, weak surfaces. These substrates are not suitable for the installation of Lonseal resilient sheet vinyl, as they do not provide a solid, structural surface that can serve as a substrate. [Cellular lightweight, vermiculite, gypsum (below 3200 PSI), perlite and other lightweight fill materials are typically used in this category of insulating concrete]

Because drying times vary greatly, always test a slab to ensure it is dry and free of alkalinity, regardless of its age. For example: concrete on metal deck construction requires a much longer drying time than on grade slabs.

- Admixtures added to the mix to reduce moisture/pH emission in the cured slab can slow cure time in the hardened concrete.

**Standard Concrete:  
Qualifications &  
Preparation for New or  
Existing**

In general, new concrete slabs used as subfloors must conform to ACI 302.1R (Revision 96) and satisfy regulatory code requirements. Additionally, new concrete slabs used as subfloors shall meet the following minimum criteria:

- Be well drained and not subject to “hydrostatic” pressure from below or prone to saturation from seasonal rainfall, or runoff of rainwater from drains or due to watering of grass and plants.
- Require placement of a low permeance (0.01 perm) vapor retarder, per ASTM E-E 96 Method B, directly under the slab, between the slab and any sub-slab granular capillary break material.
- The general contractor shall provide and document verification that the slab is smooth and level per ACI 302 tolerances FF18/FL15 for all-purpose, commercial concrete slabs.
- Shall provide a minimum of 3500-psi compressive strength after 28 days, when tested in accordance with Test Method C-109 or Test Method C-472, which ever is appropriate.
- Water to cement ratio shall not be less than (0.40 to 0.45).
- Shall not be cured using concrete curing agents or surface hardeners. Curing compounds are bond breakers that will inhibit the ability of an underlayment or topping to bond to the concrete substrate. Regardless of the type of curing compound used, even dissipating curing compounds, it must be completely removed.
- Concrete slabs for heavy commercial use shall meet or exceed minimum standards as stipulated by applicable building codes.

Concrete slabs used as subfloor shall be of a good standard mix as recommended by the Portland Cement Association, using clean aggregates. A loose, sandy, or scaly surface or evidence of a white, powdery surface is not acceptable. Prior to priming and installation of Lonseal sheeting, prepare the slab in conformance with ASTM F 710-98. Concrete slabs shall be properly cured, permanently dry, clean, and smooth and structurally sound. Typically, a 4" thick slab requires an average of 30 days to cure sufficiently to test for the presence of moisture and pH.<sup>3</sup>

Thicker slabs require 28 additional days *PER* inch over 4 inches.

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<sup>3</sup> For details on testing the slab, see **Subfloor Condition, Moisture and Alkalinity Testing**  
Lonseal Technical Manual for Interior Flooring Products  
Revision Date: 6/11/2010

**Condition of Slab Prior to Installing:** Concrete floors must be dry, clean, smooth, level, structurally sound and free of dust, solvent, scaly paint, wax, oil, grease, asphalt, sealing compounds and other extraneous materials. Over-watered, frozen, or otherwise weak concrete must be removed mechanically to provide a sound base for patching compounds.

**NOTE:** Obtain specific recommendations of the specified patching/smoothing compound manufacturer.

**Preparing Concrete Substrates:** Never use sweeping compounds on areas where resilient flooring is to be installed. If the slab has a dense steel-troweled surface, it should be mechanically abraded to remove possible contaminants and to provide a surface optimized for adhesion.

**Old Slabs: Cutback and Other Type Adhesive Residues** (see **Section 4 - Getting Started, Old Adhesive Residue**).

**Cracks and Joints:** Crack Repair: Repair all cracks in new and old concrete. Large dormant cracks such as those typically found due to settlement 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 epoxy injection.

### Underlayment Panels & Suspended Wood Systems

**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.

#### PANEL SELECTION

**ASTM F1482–03:** Underlayment panel selection, conditioning, installation and preparation shall conform to ASTM F1482–03, *Standard Practice for Installation and Preparation of Panel Type Underlayments to Receive Resilient Flooring*.

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

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

**CAUTION:** Some panel products promise performance at a low price but give little, if any, warranty as to performance or replacement.

- About APA - The Engineered Wood Association: Plywood panels bearing the APA label are manufactured by member companies to consistently perform within established APA standards. Suitable underlayment panels bear the APA: The Engineered Wood Association stamp and shall be stamped Underlayment with "sanded face" or Underlayment A-C.

**About - Multiply Underlayment Panels:** Columbia Forest Products *Multiply* panels satisfy Lonseal requirements for underlayment panels. Obtain complete installation instructions from *Multiply*. Properly installed, these panels have a 10-year warranty and are widely available.

**Unsuitable Underlayment Panels:** The following supersedes panel recommendations in ASTM F 1482-03. Unacceptable substrate surfaces include, but are not limited to, luan, base grade particleboard, waferboard, wheatgrass and OSB (oriented strand board). Installations over unapproved panels void the warranty.

**NOTE:** Check with Lonseal Technical Support if you are considering specifying panel types not listed herein.

#### CONDITIONS TO AVOID – STRIPWOOD APPLICATIONS

**WARNING!** Do not apply underlayment panels to stripwood that is directly adhered to any concrete or gypsum subfloor.

**WARNING!** Installing Lonseal resilient sheet vinyl directly to stripwood floor systems, no matter how smooth they appear, can result in damage to the stripwood. Prior to applying underlayment panels, nail or screw loose boards to remove all squeaks.

**WARNING!** 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” (76 mm) wide require underlayment grade panels minimum 1/4” (6 mm) thick or thicker depending on service requirements.
- Stripwood and plank floors wider than 3” (76 mm) require underlayment grade 3/8” (9 mm) panels or greater depending on service requirements.

**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" (26mm) total thickness. Substrate panels shall be underlayment grade, APA stamped, sanded and filled face.
- B. Single-layer suspended subfloor systems shall be 3/4" (20mm), tongue and groove plywood panels properly acclimatized, glued and fastened to joists on 16" (40.5cm) centers. Single layer systems must be overlaid with minimum 1/4" (6mm) underlayment panels conforming to ASTM F1482-03, 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" (40.5cm) between centers, the underlayment panels must be gradually thicker to minimize deflection.

**PREPARATION OF SUSPENDED WOOD SYSTEMS**

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. Do not use liquid solvents, strippers, or cleaners to remove wood surface contamination. If contamination exists which cannot be effectively removed by sanding, encapsulate with approved underlayment panel or replace the affected area with new plywood and glue / fasten securely to joists.

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

**Underlayment Panels:  
Conditioning &  
Installing**

**NOTE:** Store and acclimate 1/4" (6 mm) underlayment panels on site prior to installation for at least 24 hours (longer for thicker panels). Follow panel manufacturer requirements for acclimatization, shipping and storage.

- Where required, install underlayment panels rated to handle heavy traffic and rolling loads.

**NOTE:** Installing Lonseal sheeting on underlayment panels that are fastened or adhered directly to concrete voids the Lonseal warranty.

**UNDERLAYMENT FASTENERS**

Use "deformed" fasteners like "annular grooved" (ring shank), "screw-shank" nails, or staples. Avoid resin coated nails and staples that can actually move within the sheath created by the resin resulting in nail pops and squeaks. In all cases, fastener length must not exceed the combined thickness of the underlayment and substrate.

- For staples, use the correct fastening schedule as stipulated in the Alternate 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.

**WARNING!** 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. Where the adhesive bond breaks under the panel, it makes a "popping" or "snapping" noise that requires replacing the panel and complete abatement of construction type adhesive.

To avoid popping and snapping of the underlayment panels when applying them to a subfloor that has residual adhesive, first cover the subfloor with plastic sheeting or newspapers.

#### PLACEMENT AND INSTALLATION OF UNDERLAYMENT PANELS

1. Place and fasten the first panel in corner of room allowing a minimum 1/4" (6 mm) for expansion at walls.
2. Begin at one end of the panel and apply fasteners in a random pattern at 4"-5" (100-150 mm) intervals over the face of the panel.
3. Apply a bead of *white carpenter's wood glue* along the exposed edge(s) of the panel.<sup>4</sup>
4. Lightly butt the next panel into place and completely fasten as with the first panel and continue in this manner until the underlayment panels are in place and completely fastened.
5. Stagger panels offsetting subfloor joints and subfloor panels by at least 6" (15 cm).
6. Fasten the edges of the panel at 3" (75 mm) intervals about 1/2" (13 mm) from edge.
7. Countersink fasteners below the plane of the surface and sand the joints.
8. Apply approved filing and smoothing compound as needed.

**NOTES:** \*MultiPly and other panel types. Install per manufactures instructions.

\* Thicker panels may be nailed at greater intervals not to exceed 8" (20cm).

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<sup>4</sup> Experience shows that the application of *White carpenters wood glue* along panel edges prevents moisture transmission through panel joints and reduces telegraphing potential by bonding the panels together and to the subfloor. Clean adhesive residue from finished joints with a damp cloth as work progresses.

### Miscellaneous Substrates, Preparation and Installation

#### MDF, Fiberglass & Metal

Prepare the substrate to ensure proper adhesive bond.

- Substrate must be sound, dry, and free from dust, dirt, wax, and loose paint, curing compounds, grease or foreign matter including rust or oxidation. Lightly abrade non-porous surfaces (not containing asbestos) with fine or medium grit sandpaper.
- 
- Refer to **Section 3 – Lonseal Products** to select the correct adhesive for the project. You should base your selection of adhesive on the desired bonding characteristics and application methods of the adhesive. Once selected, follow application guidelines for that adhesive.

#### Millwork & Fixtures

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

- Allow cut material 8 to 12 hours to stabilize before installing.
- To minimize the possibility of shrinkage, use only Lonseal No. 400 contact adhesive or Lonseal No. 300 two-part epoxy adhesive. (Refer **Section 3 – Lonseal Products** for working characteristics of these adhesives and select that which best suited the requirements of the application.)
- Seal seams as described in section, *Description of Chemical (Cold) Welding Method*. (Vertical seams require Lonsealer Type C).

### 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 or structural deficiencies prior as well.

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

**DEFINITION OF “AS NEW”**

The original substrate must be determined to be in “as new” condition as possible prior to installation of Lonseal sheet vinyl. “As new” substrates must first be tested for moisture and alkalinity as described in **Assessing Site and Subfloor Conditions** in this section and then properly prepared to receive Lonseal sheet vinyl and for a satisfactory installation to be possible.

**REQUIREMENTS OF PRE-EXISTING FLOORS AND FLOOR COVERINGS**

Regardless of its material composition (i.e., VCT, SVT, LVT, ceramic tile, terrazzo, fiberglass, epoxy painted, urethane coated, linoleum, etc.), the following details what must be done to prepare all (compatible) pre-existing floor coverings to receive Lonseal vinyl sheeting.

- Most importantly, the existing floor covering must be compatible with Lonseal adhesives and PVC sheet vinyl (non-compatible floors include, but are not limited to, rubber or asphalt surfaces.)
- The pre-existing floors must be in a climate-controlled environment.
- The installer must verify that the existing floor covering is a single layer only and that it is fully and securely bonded (not perimeter bonded) to an acceptable, “as new” original subfloor/substrate.
- The pre-existing floor covering must not be cushioned in any way.
- The installer must clean the surface free of dirt, contaminants, wax, grease, etc.
- The pre-existing floor covering must not exhibit any curling at seams (such as may be due to alkaline efflorescing) nor be subject to substrate moisture or hydrostatic pressure.

**PREPARING FOR PRE-EXISTING FLOOR COVERINGS****Fluid Applied Coatings: Epoxy, Urethane:**

- Ensure coatings are well bonded and mechanically remove loose, scaly areas. Abrade with #60 paper or screen and prime (optional) 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).

**NOTE:** Lonseal is not responsible for telegraphing of irregularities to the face of the vinyl or for de-bonding of the original flooring from the original substrate subsequent to installation of Lonseal resilient sheet vinyl over pre-existing floor covering.

1. **Non-compatible floors / surfaces:** Do not install Lonseal resilient flooring on asphalt, any bituminous or asphalt-saturated material, or floor coverings made of (or containing) rubber.

**Radiant Heated Flooring Systems****Supplemental Instructions**

1. Test slab for moisture and alkalinity as directed in the **Moisture and Alkalinity Testing** in this section.
2. The subfloor, 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 maximum temperature during installation.
3. For warranty terms to apply, use only Lonseal adhesives (555a or 300 epoxy), DFT and either chemically or heat weld the seams.

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

# 5

## Floor Installation Guidelines

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### Installing to the Substrate

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#### REMINDER

- Always allow material to acclimate for 6-8 hours while laying flat.
- Material will compress when back rolled (face in)
- Allow extra length. Do not pre-cut net as some shrinkage is possible.

#### Laying Out

**Do not reverse sheets.** All Lonseal resilient sheet products must be installed running in the same direction. Most of our products are equipped with direction indicators to insure proper installation. Make and install all cuts in consecutive order.

1. Lay out material with seams out of high-traffic patterns and in unobtrusive locations, and avoid placing seams at pivot points.  
  
Use full sheets to avoid end seams. When end seams occur, avoid “clustering” by staggering seams not less than 6’ from others.
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 may be wiser 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.

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

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*Without exception*, all seams require sealing by either chemical fusion (cold welding) with Lonsealer or heat welding (also called thread welding) with matching PVC welding thread. Chemically-fused seams must be tight and clean, heat welded seams must be neatly trimmed and well bonded to the vinyl on both sides of the seam. **There must be no gaps in chemical or thread-welded seams.**

Flawless seams and detail worklay are the hallmarks of an impressive installation.

### Tips for Improving the Appearance of the Installation

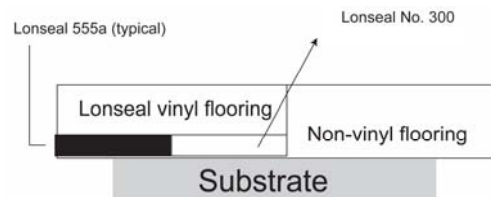
- Eliminate partial “boards” at side seams of Lonwood Dakota wood patterns by trimming the selvage in order to assure an aesthetically pleasing transition from sheet to sheet.
- Lonseal sheet flooring products are manufactured to rigorous industry tolerances and rarely experience noticeable fluctuation in height differences from sheet to sheet, (i.e., “lippage”).
- All seams have a level of visibility. Except in the case of UV treated products, heat welded seams usually have a shiny band on either side of the trimmed thread. Chemically welded seams typically leave a trace of residue on the seam. These are typical results of seaming and their effects diminish with routine maintenance and use.
- Heat welded seams on heavily-embossed patterns can only be trimmed even with the uppermost part of the embossed pattern.

**Note on Sport Flooring:** Sport flooring installations require all seams to be heat welded and do not require DFT under the seams. Refer to Lonseal’s “**Technical Manual for Sport Flooring.**”

### Seaming to other flooring types

Lonseal sheet vinyl can usually be chemically or heat welded to most other PVC floor coverings 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), apply a transition strip or apply a 3” band of Lonseal No. 300 epoxy along the other type of flooring.



**CAUTION:** Thread designed for seaming linoleum will not bond to, or be used on, Lonseal resilient PVC floors.

### 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 (cold) 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 whereas it would require the adhesive at least 8 hours to cure sufficiently and to not “boil” into a heat-welded seam otherwise. (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. The installer is responsible for applying the best method to the material considering the texture. Whatever method is used, the 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. Availability of matching thread
  - Heat welding thread, if 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 *Maintenance* in this section) minimizes or eliminates the appearance of the glaze.
  - On urethane coated products, both glossy and matte (TOPSEAL) a urethane nozzle (see *Section 3 - Heat-Weld Seam Tools available for purchase from Lonseal.*) prevents the factory-applied urethane 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.
  - On heavily embossed patterns, it is only possible to trim the thread even with the top of the embossing, or “pastille”. Thus, trapped soil along the seam requires added cleaning effort.

• **Note on Chemically Welded Seam Aesthetics:** Chemical (cold) welded seams acquire a residue of sealer that varies from 1/8” to 3/16” (2mm – 5mm) in width. It will eventually wear down, but will always be evident to some degree, even with application of dressing.

## Visual Effects of Seaming

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### Pattern Matching

Embossed patterns may not match across the seam from sheet to sheet. They will grow and shrink in relation to each sheet. Match pattern in center of seam. Let it run towards 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

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

Groove depth **never** to exceed 1/2 *thread* thickness.

- Use a straight edge and grooving tool 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 power tool or hand tool, maintain a consistent depth in the groove.
- When welding coved installations, use rigid cove stick and ensure that the material is installed tight because an unsupported weld is weak.
- Keep the groove area clean and dry. Practice grooving and welding on scrap material.
- Use only equipment specifically designed for heat welding resilient 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 (now properly heated) nozzle. Keep the gun 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**

- Allow the welding thread to cool before trimming.
- Trimming is done in two passes: 1) with a trim plate and a crescent (half moon) knife and 2) with the crescent (half moon) knife only.
- **EMBOSSSED NOTE:** On the trim pass, substitute the usual spatula for the Pastille trim tool. This tool has blunt edges 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 and is quite obvious to the eye.

**CAUTION: Do not use automatic welding machine on UV cured urethane products.**

**Glazing**

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 surface. Glazing will also correct color matching of thread to the flooring product. Unglazed thread can make the seams visibly dirty and may be an “off-color”.

**Heat Welding UV Cured Urethane Finished Surfaces**

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

A urethane nozzle (Lonseal part no. 65 or no. 66T) is required to heat weld seams on all urethane products.

**Glazing UV cured 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.

Use the urethane nozzle/urethane precision 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.

### Heat Welding Tools for UV Cured Urethane Finished Surfaces

#### **No. 65 – 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.

#### **No. 66T – Urethane Precision nozzle**

Hot air is delivered with precision into the groove thus eliminating unnecessary burning, scorching or glazing on top of the material. The urethane precision nozzle is specially designed for use on flooring materials with a urethane finish.

**Note:** The urethane precision nozzle must be used in combination with a roller guide (Lonseal part no. 67T).

#### **No. 67T – Roller Guide**

A self-guiding attachment made for heat welders. Designed for more consistent welds as well as increasing guidance of the welder in grooves.

## **Description of Chemical (Cold) Welding Method**

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Lonsealer is a fast flash solvent composed of PVC solids suspended in liquid THF (Tetrahydrofuran). This liquid melts adjacent sheets of vinyl causing them to bond together. Seams must be tight and free of contaminants for the system to work. DFT is also required, beneath every seam, to ensure adhesive residue does not interfere with the cold weld process.

***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 (“Invisible”) Seams**

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Apply masking tape to the edges of the vinyl prior to cutting the seams\*\*, remove the off-cut waste and apply Lonsealer to the seam over the remaining masking tape. Remove the masking tape before the Lonsealer dries being careful not to let any drip onto the surface below.

\*\*Alternatively, apply masking tape to the seam after it has been cut. Slice the masking tape and apply Lonsealer in the seam.

## Chemical Welding UV Cured Urethane Finished Surfaces

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Lonsealer will not fuse to the UV cured 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 PVC material below the UV cured surface.

## Installing on Stairs

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**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 No. 555a or Lonseal No. 400 Contact adhesive. Review adhesive characteristics to determine appropriate adhesive for the project. (See **Section 3 – Lonseal Products**) 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 with laminate roller.

1. If necessary, repair the stair structure so that it is solid, plumb and true.
2. Match pattern (if applicable) evenly from bottom to top of stairway.
3. 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.
4. For a snug 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 marring the face of the vinyl. Use warm air to make the vinyl supple for better fit at corners and edges. *Do not overheat the vinyl*.
5. 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. (Gradus)
6. Provide suitable finishing trim for the exposed edge of open stairways. Lonsealer Type C may be used to fuse intersecting pieces of vinyl sheeting.

## Installing Under Hospital Beds

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**NOTE:** When installing under hospital beds, the following guidelines should be followed to achieve satisfactory results.

### Adhesive

For standard patient rooms, use Lonseal's No. 555a acrylic adhesive due to its firm setting properties and ease of use. 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 555a has sufficient curing time otherwise displacement can occur. Uncured adhesive will "displace" when heavy loads, especially rolling loads, are placed too soon. See page 13 for additional installation methods using 555a.

**Note:** Properly applied substrate patch material and adhesive will not significantly contribute to indentation from hospital bed wheels.

### 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 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. Apply only enough adhesive to adhere the vinyl. Too much adhesive can cause indentation and will not recover with the sheet vinyl if compressed.
4. Prevent bubbles by allowing sufficient open time for adhesive to off-gas moisture and develop good green grab.

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

5. 555a is off white on application and begins to lose color as it dries. Install the vinyl when there remains about 2/3 to 1/2 color and the adhesive is tacky to touch, but not wet.
6. After laying the vinyl, roll thoroughly with a 75 or 100lb resilient floor roller to firmly bed the sheeting into the adhesive and promote full transfer for maximum bond.
7. Allow no foot traffic for a period of 24 hours and ensure no construction traffic. Do not place furnishings or fixtures or allow rolling loads of any sort for a minimum of 48 hours. Allow a minimum of 72 hours for adhesive to completely cure.

## Installing on Alternative Substrates

### Modular or Raised Panel Systems: As Tiles on Individual Modules

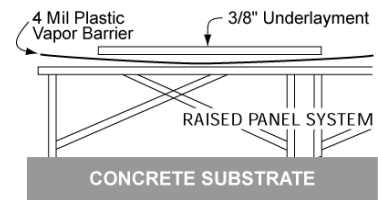
- Specify CNC or water jet method to cut Lonseal sheet vinyl to fit individual panel modules.
- Adhere with No. 300 epoxy using a fine notch trowel, allow sufficient open time (as instructed in this manual), and roll with a Laminate Roller (pictured at right).
- Secure edges to module until cured with 2" wide masking tape and stack face-to-face to eliminate bubble formation.



**Cutting Services Note:** Lonseal does not offer cutting services. Such services are provided by independent cutting firms. See **Custom Cutting** in this manual for more information.

### 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 .004" plastic membrane installed under the plywood for a vapor retarder 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).**

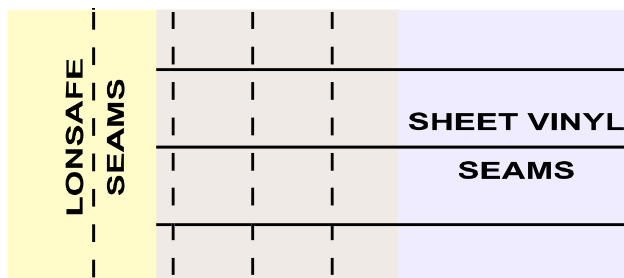
1. Maintain the site conditions using the permanent HVAC system. Installation temperature should be maintained at the floor level in the range of 65° - 85° F (18° – 29° C).
2. Prior to installation, a moisture vapor emission, RH and alkalinity test should be performed in accordance with the following:
  - ASTM F1869; maximum slab moisture content not to exceed 5.0 lbs
  - ASTM F2170; maximum RH within the slab not to exceed 75%
  - ASTM F710; maximum alkalinity shall not exceed pH 9

### Floor Preparation

1. Remove all contaminants and adhesive residues from the substrate.
2. Level substrate to within 3/16" in a ten foot span.
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 close to 2 feet.



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 a 1/16" square notched trowel.
6. Apply Lonseal's #555A 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 75-100lb 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, use a 3/8" nap roller to apply the #555A adhesive to both the backing of the material and the Lonsafe surface.
11. The adhesive should be applied in a thin and even coat.

**\*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 #555A 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. Temperature should not exceed 105°F.

## Floating Floors

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A floating system will perform and is maintained similarly to a fully adhered system. Floating floors provide additional “cushioning” underfoot, resulting in lower impact and sound transmission. However, 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. In such cases a fully adhered-to-the-substrate floor covering may not be desirable. Additional uses include installations where excessive substrate moisture or very old 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 doorjamb be left high enough above the subfloor to allow the floating system of Everlay and Lonseal sheeting to freely slide beneath for a more finished appearance.

Please note that, with the below exceptions, installation requirements, adhesives 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 is adhered. Dimensions: Rolls 6'-6" wide by 164' long.

**Bron Double Face Tape:** *Temporarily* secures the edges of the installation at thresholds, reducers and where the system will not be mechanically bound to the floor. This product is available in rolls 2" (5 cm) wide by 60' (18.28m) long,

**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 No. 555a: Acrylic adhesive applied full spread
- Lonseal No. 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)

**Lonseal DFT:** Use under the seam of Lonseal sheeting to prevent adhesive contamination in the seam.

**Lonsealer or welding thread:** Seam treatment.

**Lonseal Sheet Vinyl:** Install as specified.

**Optional Edge Trim:** Supplied by other vendors as needed.

## Installation

### Everlay

- If possible, undercut doorjamb to fit the combined thickness of the Everlay and Lonseal vinyl (Approximately 3.5-4 mm).
- Make the subfloor 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 crosswise to the finished Lonseal sheeting 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 Vinyl

- Lay out the Lonseal sheet vinyl, mark seam location on the Everlay with water-based ball point pen 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 nearest the longest wall open and apply No. 555a adhesive.
- When adhesive is almost completely clear, replace the sheet and roll with a standard 75-100 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 555a to go almost clear, replace the vinyl and roll with a standard 75-100 lb. resilient flooring roller.

**Adhesive Pointers**

Because both surfaces are impermeable, allow No. 555a and No. 300 time to eliminate moisture (open time) because trapped vapors will cause bubbles. The color of 555a adhesive begins to change from milky to clear as it cures. About half the color should be visible in the adhesive before laying sheeting.

No. 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 vinyl sheeting 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.

**CAUTION!** 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 and complete cutting the vinyl with a hooked blade utility knife.

- Seal seams with Lonsealer or use standard heat weld equipment and matching Lonseal welding thread.

**Maintenance**

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

## Custom Cutting

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Configuring Lonseal sheet vinyl into any number of designs is possible with Water-jet and Ultrasonic cutting technology. A listing of facilities cutting is available through the Technical Department by email request at [Technical@lonseal.com](mailto:Technical@lonseal.com). Specifiers must work directly with the cutting facility to create and ship their designs. The Lonseal Technical department is available to provide recommendations on installing complex floor 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 products that are cut into shapes.

# 6

## After Installation: Maintenance Guidelines

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### Application and Maintenance of Standard Acrylic Dressing/Finish

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

- Begin maintenance 48 hours after installation.

#### ***Lonseal's Maintenance Program***

Lonseal's Floorcare Maintenance Program has been designed to extend the aesthetics and performance of Lonseal's resilient vinyl surfacing products. Our line of high performance maintenance products includes: **Loncare**, **Lonbuff**, **Lonprime**, **Lonfinish**, **Lonsatin** and **Lonstrip**. As a part of this program, each of these products has been engineered to excel at their specific application in combination with Lonseal resilient vinyl surfacing 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.

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

#### ***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. 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 <sup>5</sup>Contact Pad on a high speed machine or Autoscrubber (1500 rpm) to enhance the luster.

**Maintenance Products and Manufacturer Info**

<b>Carroll</b> Distributor Alliance Group		Customer Service	USA	800-527-5722
<b>Carroll Company</b>	Loncare	Neutral pH Cleaner		2,000 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.*

<sup>5</sup> 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 UV Cured 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.

**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.
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 UV Cured Urethane Finished Surfaces - TOPSEAL**

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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.
2. Dust mop the entire area with a clean microfiber pad 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 white pad and diluted **Loncare**.
5. 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
<b>Black marks (i.e. scuffs, scratches)</b>	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.
<b>Low or uneven surface gloss (fisheyes)</b>	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.
	Wrong type, or dirty, buffing pad or brush	Use only clean pads or brushes as indicated by cleaning product manufacturer.
<b>Finish appears cloudy, is sticky, easily mars</b>	Use of phenolic type disinfectants in mop water	Switch to quaternary based disinfectant.
	Use of high pH cleaners	Use only pH neutral cleaners and concentrates.
<b>Finish is powdery, scaly</b>	Incompatible finish materials i.e. a harder dressing over a softer one	Strip old finish completely and apply new finish as directed herein.
	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.
	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
<b>Slippery floor</b>	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.
	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**

<b>Scuffs, scratches and gouges</b>	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.
<b>Dressing looks yellow</b>	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.
<b>Brownish stain under mat, rubber wheels, tires</b>	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.
<b>Colored stains</b>	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

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**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**

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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

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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.

## Contacting Lonseal Technical Support

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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](http://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

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**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)  
966 Hungerford Drive Suite 12-B  
Rockville, MD 20850

(301) 340-8580

### **Warning Regarding Complete Floor Covering Removal**

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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.

# Appendix

## 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) 708-482-8138 and the governing entities.

The adaptation below is based on information relevant to installation of underlayment flooring panels found in Table 38 on page 38 of NER 272 published by National Evaluation Service, Inc.

(Reproduction, in part of: TABLE 38

Wall Sheathing, Panel Siding and Floor Underlayment Attached To Wood Members

DESCRIPTION OF ATTACHED MATERIALS	DESCRIPTION OF MATERIAL NOMINAL THICKNESS (in inches)	SPACING SPECIFICATIONS (in inches) <sup>4</sup>		FASTENER SPECIFICATIONS <sup>1,2</sup>	
		Edges	Intermediate	Minimum Leg Length (in inches)	Fastener Style <sup>3</sup>
Floor Underlayment	11/32	6	8-Grid	1-1/4	3d Ring Shank Nail
					16 Gage Staple
		4	6-Grid		0.080 Nail
					3d Ring Shank Nail
	15/32-19/32	6	8-Grid	1-1/2	16 Gage Staple
		5	6-Grid		0.097 Nail
	3/4	6	8-Grid	1-1/2	4d Ring Shank Nail
		5	6-Grid		16 Gage Staple
				0.097 Nail	

<sup>1</sup> Except as noted above, all staples shall have a minimum crown width of 7/16 inch.

<sup>2</sup> Steel wire Fasteners exposed to the weather in service shall be zinc-coated by a hot dip, mechanical-deposition or electro-deposition galvanizing process.

<sup>3</sup> 0.080 nails and No. 18 gage staples are not listed in Tables 1-4 and are for nonstructural use only as tabulated above.

<sup>4</sup> Fastening schedule only applies to buildings of conventional wood frame construction where wind or seismic analysis is not required by the applicable code.

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 512 W. Burlington Avenue, Suite 203,  
 La Grange, Illinois 60525-2245  
 Phone: (708) 482-8138  
 Fax: (708) 482-8186