

nora[®] INSTALLATION GUIDE

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General Installation Guidelines

All nora® flooring is to be installed by nora® Approved Installers, or INSTALL (International Standards & Training Alliance) resilient certified for the specific requirements of the project. This nora® Installation Guide covers the typical projects and circumstances where nora rubber flooring is to be installed. If you need assistance or require a project specification, please contact the nora® Technical Department at 1-800-332-NORA. The procedures and recommendations described in this installation guide are developed to offer the best opportunity for a proper and successful nora flooring installation. Any deviation from these guidelines may result in an installation failure.

All appropriate Safety Data Sheets (SDS) and this installation guide must be read and fully understood prior to installing any nora product. For all nora® nTx installations, please refer to the nora® nTx Installation Guide. All of this information, including installation and maintenance videos, plus how to become a nora Approved Installer is available on www.nora.com/us.

All nora products are intended for appropriate indoor use only, in high stress commercial and industrial sectors, e.g., hospitals, schools, labs, rail, radiant heating and castor chair traffic, etc. nora's adhesives must only be used under nora flooring. The use of any other manufacturers adhesive is not permitted and will void the warranty.

Unless stated otherwise follow the specific requirements of *ASTM F710 Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring*. For copies of any of the ASTM standards, practices or test methods, please visit www.astm.org.

The prepared substrate must be smooth and ridge free. Use an appropriate patching compound or self-leveling underlayment following the manufacturers written usage instructions. Patching or underlayment compound must be moisture-, mildew-, and alkali-resistant, and, for commercial installations, must provide a minimum of 3000 psi compressive strength when tested in accordance with *ASTM C109/C109M Standard Test Method for Compressive Strength of Hydraulic Cement Mortars - Using 2-in. or 50mm Cube Specimens* or *ASTM C472 Standard Test Method for Physical Testing of Gypsum, Gypsum Plasters and Gypsum Concrete*, whichever is appropriate. Warranties should be obtained by the manufacturers of the products used. Any specific requirement for levelness must be agreed to by the owner, end-user, general contractor and flooring contractor prior to the flooring installation. Note: Tile "run off" may occur if the substrate is not flat.

Mat Bond tests are recommended as they can help to determine the compatibility of the nora flooring system to a variety of substrates and may provide an indication of the presence of excessive moisture or other contaminants.

Moisture testing as per ASTM F2170 is mandatory and must be performed regardless of grade level or whether the concrete is freshly poured or classified as an older slab.

A water droplet test for absorbency of the concrete or cementitious substrate is always recommended when using nora® 485 or 685 adhesives. It is the responsibility of the installing party to determine the suitability of the subfloor being covered.

Attention

Do not sand, dry sweep, dry scrape, drill, saw, shot-blast or mechanically chip or pulverize existing resilient flooring, backing, lining felt, asphalt "cutback" adhesive or other adhesive. These products may contain asbestos fibers and/or crystalline silica. Avoid creating dust. Inhalation of such dust is a cancer and respiratory tract hazard. Unless positively certain that the product is a non-asbestos containing material, you must presume it contains asbestos. Regulations may require that the material be tested to determine asbestos content. Various local, state and federal government agencies have regulations governing the removal of in-place asbestos-containing material. If you contemplate the removal of a resilient floor covering structure that contains (or is presumed to contain) asbestos, you must review and comply with all applicable local, state and federal regulations. The RFCI's (Resilient Floor Covering Institute) "Recommended Work

Practices for Removal of Resilient Floor Coverings” is a defined set of instructions that addresses the task of removing all resilient floor-covering structures, including adhesive and adhesive residues. For more information, contact RFCI directly at www.rfci.com or 706-882-3833.

Occupational Safety and Health Administration (OSHA) has amended its existing standards for occupational exposure to respirable crystalline silica. OSHA has determined that employees exposed to respirable crystalline silica at the previous permissible exposure limits, face a significant risk of material impairment to their health. For more information go to <https://www.osha.gov/silica/>

Conditioning

The flooring, adhesives, and accessories must be acclimated in the correct environmental conditions for at least 48 hours prior to use. Areas of the flooring subjected to direct sunlight, for example through doors or windows, must be covered using blinds, curtains, cardboard or similar materials for 24 hours before, during, and for a period of 72 hours after the installation to allow nora “wet” adhesives to cure.

The area to receive flooring must be fully enclosed, weather tight and climate controlled at the normal service ambient temperature and humidity (except walk-in freezers or similar). If this is not possible then the ambient temperature must remain steady ($\pm 10^{\circ}\text{F}$) and be between $68^{\circ}\text{F} \pm 5^{\circ}\text{F}$ and $50\% \pm 10\%$ ambient relative humidity (RH) for at least 48 hours prior, during and 72 hours after installation (do not use gas fueled blowers.) Avoid conditions where dew point allows for the condensing of moisture on concrete substrates. The substrate must be at least 5°F above dew point to be considered acceptable. Example: If the ambient conditions are 70°F and 65% RH, the dew point is 57°F and you must not proceed with the installation, unless the surface temperature is at a minimum of 62°F . Dew point calculation charts are available on the internet.

Moisture Testing

Test the slab with a testing apparatus that conforms to and follows the exact protocol of *ASTM F2170 – Standard Test Method for Determining Relative Humidity in Concrete Slabs Using in situ Probes*. If for any reason you are unable to drill into the concrete, please contact the nora Technical Department.

Adhesive Limits

Tested at the correct service temperature and ambient humidity, the maximum allowable internal slab relative humidity levels (with an effective vapor retarder as required) are as follows:

1. nora[®] 485, 685, 385, 585, and dryfix adhesives = 85% RH
2. nora[®] stepfix and profix tape adhesives = 75% RH

If the moisture test results exceed the maximum allowed then the installation must not proceed until either the moisture content drops to an acceptable level or an effective moisture mitigation system is used that conforms to *ASTM F3010 Standard Practice for Two-Component Resin Based Membrane Forming Moisture Mitigation Systems for use Under Resilient Floor Coverings*, and installed following that manufacturers written instructions.

Water Droplet Test

When using nora 485 or 685 adhesives it is mandatory that the substrate be absorptive as detailed within ASTM F710. To confirm this, the installer must perform a water droplet test in a sufficient number of places throughout the project. To perform the test, simply place a dime sized droplet of clean potable water using a clean straw or similar onto clean concrete (without any floor patching or leveling compounds). The water must absorb into the concrete within five minutes to be considered absorptive, or the substrate is considered non-absorptive.

Substrate absorptiveness directly influences not only the drying time of moisture from within a concrete subfloor but also the open and working time characteristics of the adhesive. Where the substrate is highly absorptive, the adhesive will dry more rapidly, as it will in areas subjected to air flow such as in the vicinity of open doors or windows. It is the installer's responsibility to recognize and understand the working characteristics of the adhesive in all areas of the project and to make any necessary adjustments in preparation or installation techniques that may be required to achieve a secure bond.

Mat Bond Test

Mat Bond tests are recommended as they can help to determine the compatibility of the flooring system to a variety of substrates and may provide an indication of the presence of moisture. It is the responsibility of the installing party to determine the suitability of the subfloor being covered and how many Mat Bond tests need to be performed.

The areas and products to be tested must be properly conditioned for 48 hours before and during the testing period. There are several factors that can influence the outcome of a bond test, therefore it is important to follow this protocol. The responsible party must ensure that the tests are conducted only at a time when subfloor and job site conditions comply with those requirements which are outlined in this installation guide and ASTM F710.

The correct adhesive selection will be determined based upon the usage and type of nora flooring along with the type of existing substrate conditions. If required, contact your nora® Sales Representative for adhesive recommendations. Place tests randomly and at appropriate locations such as near walls or in light traffic areas. It is recommended that each test plot should be 2 ft. x 2 ft.

Install the bond tests using the appropriate adhesive, trowel notch, open times, and rolling etc. Do not uplift to check for adhesive transfer after flooring placement. Use Duct tape or similar to seal the edges of the flooring test sample to the substrate on all sides. Protect the flooring from foot traffic for 12 hours and rolling traffic for the duration of the test which must be a minimum 3 days (72 hours).

To evaluate the nora 485, 685 and dryfix Mat Bond tests, begin at a corner and pull up the test sample in one piece if possible. The success or failure is determined by the test administrator's visual interpretation and the amount of physical effort required when removing the floor covering.

- nora 485 or 685 adhesive if wet or soft adhesive can indicate that the substrate is either still too wet or the surface of the concrete is non-absorptive. Typically the point of failure should occur cohesively; there should be approximately the same amount of adhesive on both the substrate and the back of the flooring. If all or most of the adhesive is on the material backing, there is very likely either insufficient mechanical preparation or a contaminant on the substrate or perhaps the substrate has too much moisture. If all or most of the adhesive remains on the substrate, it is likely that the adhesive dried too much before placement of the material, or insufficient rolling. If the failure occurs within or between other components of the flooring system, there may be a problem with those components, preparation or application method. If the flooring requires a great deal of effort to pull up, for example where it cannot be removed intact, the bond test can be considered successful, providing no sign of moisture is found.

- nora 385 and 585 adhesives, cut a two inch wide strip from the center of the test sample and slowly peel up from one end; the point of failure should be between the adhesive and either the substrate or the back of the flooring. Removal of the balance of the sample should be very difficult, and then it can be considered successful providing no sign of moisture is found.
- nora dryfix Mat Bond tests are not expected to have equivalent peel strength as the wet adhesives. The primary goal when evaluating this test is to ensure that the nora dryfix is compatible with an appropriately prepared substrate. A good secure bond with the nora dryfix still bonded to the back of the flooring and a small amount of adhesive residue transferred to the substrate is ideal. If the prepared substrate fails easily in any way then the preparation protocol and or products should be evaluated and adjusted prior to re-doing the Mat Bond testing. One option that is recommended if the substrate remains dusty after cleaning is to use a water-based Acrylic primer that is not film forming and diluted 1:1 with clean cold potable water.

Subfloor Preparation

CONCRETE SUBFLOORS

For new construction, the General Contractor must provide a structurally sound concrete subfloor that conforms to *ASTM C33/C33M Standard Specification for Concrete Aggregates*. Concrete subfloors must not be subject to shrinking, curling, cracking or moving in any way prior to the application of any nora products. nora systems, Inc. accepts no liability for a failure or complaint due to slab movement of any kind. nora products must not be installed over expansion joints; use an industry standard expansion joint assembly.

When concrete slabs have or are suspected of having ASR (Alkali Silica Reaction) present, do not proceed; contact the nora Technical Department. Do not use any nora product where hydrostatic pressure can occur.

All on and below-grade concrete subfloors require a confirmed permanently effective vapor retarder with a low permeance (≤ 0.1) having a minimum thickness of 10 mils, or meets the current requirements of *ASTM E1745 Standard Specification for Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs*. It must also be placed directly underneath the concrete, above the granular fill or use an effective moisture mitigation system that conforms to *ASTM F3010 Standard Practice for Two-Component Resin Based Membrane Forming Moisture Mitigation Systems for use Under Resilient Floor Coverings*.

All concrete subfloors must be absorptive (see water droplet test), permanently dry (see moisture testing), clean, smooth and structurally sound as per ASTM F710. In addition, concrete subfloors must be free of dust, solvents, paint, wax, varnish, oil, grease, asphalt, old adhesives and other extraneous materials that may interfere with the bond. Use only mechanical means like diamond grinding with a Diamabrush™ Concrete Prep Plus Tool (or similar), or shot blasting. When using mechanical abrasion equipment ensure that it is equipped with an effective dust shroud and vacuum with Hepa filter. Refer to the Warnings section of this installation guide for further instructions regarding the control of airborne particulates such as dust or other substances. Note: the use of a sweeping compound is acceptable as long as it is water based only.

When using a patching or leveling compound over non-absorptive substrates first check suitability with Mat Bond testing. To be considered absorptive (for nora 485 and 685 adhesives) they must be at least 1/8 inch thick and installed following the manufacturers written instructions. Note: when mechanical sanding of the compound is required certain compounds may become denser and the surface porosity may be diminished. A water droplet test is recommended to determine the state of porosity (see water droplet test).

Surface cracks, grooves, depressions, control joints or other non-moving joints, and other irregularities must be filled or smoothed with latex modified patching or underlayment compound for filling or smoothing, or both. Patching or underlayment compound must be moisture-, mildew-, and alkali-resistant, and, for commercial installations, must provide a minimum of 3000 psi compressive strength. Begin by mechanically removing all laitance, dirt, debris, and coatings from the fill area. Use a suitable dustless concrete saw with a diamond blade or similar to achieve this followed by vacuuming. Do not install over any moving cracks or joints. If the concrete moisture level is too high, do not fill these with any patching compound. Use only those products and methods as directed by the moisture membrane manufacturer.

All expansion joints and moving joints must not be covered with any nora product. Use a suitable industry standard expansion joint assembly system. For moving cracks please contact the nora Technical Department for recommendations

WOOD SUBFLOORS

All wood subfloors must be a total minimum thickness of 1-1/4 inch and overlaid with overlapping joints using APA (American Plywood Association) underlayment grade plywood, installed as per ASTM F1482 Standard Practice for Installation and Preparation of Panel Type Underlayments to Receive Resilient Flooring.

Wood substrates must not be in direct contact with concrete subfloors, even if built on sleepers. All suspended wood floors must have adequate under floor ventilation and a permanently effective vapor retarder or membrane placed directly on the ground beneath the air space. Do not install over any oriented strand board (OSB), particleboard, Masonite, lauan, fire retardant treated plywood, or any similar unstable substrates.

The plywood must be clean and free of any bond breaking contaminates, this may be achieved by sanding if required or replacing the plywood with new APA plywood. Any gaps at the seams must be filled and smoothed with suitable and flexible joint filler. Any ridges must be sanded smooth.

Do not install over any oriented strand board (OSB), particleboard, Masonite, lauan or any similar unstable or contaminated substrates.

GALVANIZED/STAINLESS STEEL AND ALUMINUM SUBFLOORS

Abrade the existing galvanized/stainless steel or aluminum by using mechanical systems – i.e. disk sander with 40-grit sandpaper. Clean the galvanized/stainless steel, or aluminum by sweeping and then wiping with 70% Isopropyl alcohol. Perform a Mat Bond test with the appropriate adhesive as described in this nora Installation Guide.

REGULAR STEEL SUBFLOORS

All rust must be removed by sand blasting or other mechanical methods. To prevent the steel from rusting again, a primer such as Sherwin-Williams Re-coatable Epoxy Primer (Re-coatable Epoxy Primer; Part G-B67R5, Part H-B67V5 Hardener) or similar must be applied to the steel subfloor. Contact the Sherwin-Williams Company at 216-566-2902 for complete SDS and product installation instructions. Use only in well ventilated areas. Perform a mat bond test with the appropriate adhesive as described in this nora Installation Guide.

OVER EXISTING FLOOR COVERINGS

nora flooring can be installed over existing smooth finished, non-cushioned backed and securely bonded floor coverings (e.g. VCT, natural rubber, linoleum, PVC.) The existing flooring must not have any voids that could telegraph through the nora flooring. nora flooring can also be installed over properly prepared existing terrazzo, ceramic and quarry tile floors.

Note: The responsibility for determining if the old resilient flooring is well-bonded to the subfloor and is not textured or embossed enough to show through the new installation rests with the owner, general contractor and flooring contractor. Installations over existing resilient flooring may be more susceptible to indentations.

To fill voids and/or surface irregularities, use a patching compound that is suitable for bonding to existing floor coverings. Sand the surface to a smooth finish as needed. A primer may be required so it is important to check with the patch manufacturer for specific mixing and installation instructions. Any product warranties or performance guarantees are the responsibility of the selected manufacturer.

Layout

The material layout should be decided by the architect, designer or end user; however, nora generally recommends that tiles are installed point to point (corner to corner). The tiles and sheet flooring have arrows on the backside and these should always be pointed in the same direction. The exceptions being norament® arago and noraplan® valua planks, which can be installed in multiple ways.

After the area is properly prepared, locate your center or start lines using the 3/4/5 method or a carpenter's square. Balance the layout and use a pencil to mark your starting lines.

nora® dryfix Tape

If used over existing flooring, nora systems, Inc. accepts no liability for any failure due to other manufacturers' flooring products or the possible breakdown of that flooring bond from the subfloor for any reason. Providing both the moisture test and Mat Bond test have acceptable results then the installation may continue. Note: do not install over any existing cushion backed resilient flooring.



Image 1

The nora dryfix tape must be installed prior to dry fitting the flooring materials. Carefully vacuum the installation area to remove all loose debris. Layout lines using a pencil prior to applying the nora dryfix tape. If using chalk, you must wipe the chalk off the surface of the nora dryfix tape before installing nora flooring.

Unroll the nora dryfix tape into position (image 1). Overlap all seams by at least 1/2 inch and press into place using a broom or similar to remove any air bubbles. Allow a minimum of 15 minutes before cutting seams. If the tape stretched during the installation process it will return to its original size.



Image 2



Image 3

Trace cut all seams without damaging the substrate, resulting in no overlaps or gaps, then remove the excess material (image 2). The use of a straight edge is recommended (image 3). If any trash or debris is trapped underneath the tape, remove it and replace that section of dryfix.

Dry-lay the flooring as detailed below, uplift half the area and vacuum the back of the flooring

along with the surface of the wax paper. Remove the protective wax paper, fold or roll the wax paper for ease of disposal, leaving approximately 4 inch and fold that under the flooring. Replace flooring onto the exposed tape and do not stand on it until you are sure of correct positioning, as it is still possible to reposition it. Use a suitable heavy roller to remove any air bubbles and ensure a good bond.

Weld all seams with either nora heat or cold weld as specified (prevent any traffic on the cold weld for 8 hours). This can be performed immediately. nora systems, Inc. cannot accept any liability for seams that open up or peak due to changes in ambient conditions if seams are not welded.

Installation

TILES

Dry-lay the flooring tiles without adhesive following the design layout. Do not layout more material than will be adhered that day. Begin installing the at center rows and following the start lines in both directions, including end cuts but without stress (pressure fitting). Remove and neatly stack (in order for replacement later), a workable section of the area, but not too large, thus avoiding late placement into the adhesive. Clean the substrate again prior to applying the appropriate adhesive.

SHEETS

Dry-lay the sheet flooring into the correct position while overlapping all seams by one inch, leaving the ends slightly long. Do not dry-lay more material than will be adhered that day. Make relief cuts as required to avoid tears at all corners.

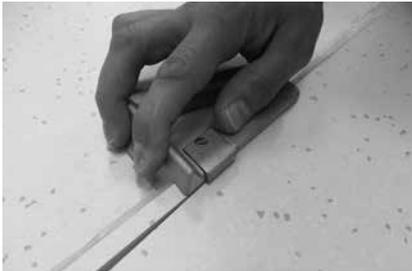


Image 1

It is recommended to remove the factory edge using a Crain 340 selvage trimmer or similar to trim off ~ 0.5 inch (image 1).

Using a nora knife or similar with a straight blade set at just under the thickness of the flooring, carefully trace cut the entire seam (images 2 and 3). A utility knife (used vertically) with the same type of straight blade is needed to finish the cut at each end of the seam. Finish cutting the seam using a utility knife with a hook blade to provide a slight undercut (image 4). Carefully remove the excess material. Finish dimension on the width should be 4 feet after seam cutting.



Image 2



Image 3

Note: Underscribe tools are not recommended for seam cutting.



Image 4

Continue this process one sheet at a time until the area is completed. Trim or "cut-in" to a snug fit all of the perimeter to complete the installation either now for small areas or later for large areas.

Pull back half the area or one end of the area but not too large, thus avoiding late placement into the adhesive. Clean the substrate and back of the flooring prior to applying the appropriate adhesive.

ESD Flooring (ed Products)

For ESD flooring installations, nora copper tape must be used with the proper conductive adhesive (nora 685 or 585). In rooms < 2,500 square feet in size, the copper strip (minimum 4 feet long) must be applied to the substrate and extended to a pre-determined grounding point (to be connected by a qualified electrician). In rooms > 2,500 square feet, additional grounding points must be pre-defined and also have the copper tape installed.

nora® 485 and 685 Adhesives

These are water-based acrylic adhesives which are formulated for the installation of specific nora rubber floor coverings (2 mm – 4 mm) on absorptive subfloors. nora 685 adhesive is a conductive version used for installing the nora ed range of products on absorptive subfloors.

Note: Not recommended for use in sterile areas (i.e. operating rooms, etc.)



Apply the adhesive using a 1/16 inch x 1/16 inch x 1/16 inch V-notched trowel, evenly without the formation of puddles or any voids. Do not apply fresh adhesive over drying adhesive as this will result in telegraphing of adhesive lines. Coverage is approximately 160 – 180 square feet per gallon for a CSP 1 (depending on the substrate). Replace worn trowels to ensure proper spread rate. Do not re-notch.

Once troweled properly, the adhesive must have sufficient open time; this will depend upon the ambient temperature and humidity, substrate absorptiveness, humidity and air flow. The acceptable condition of the adhesive is best described as follows: The adhesive ridges can be easily bent over with little or no transfer to your fingertips. When pressed hard with your fingertip, transfer must be achieved. Do not install if the adhesive becomes too dry and the ridges are not easily bent over, if it is then remove and replace it. Do not uplift to check for adhesive transfer after flooring placement. A Mat Bond test prior to beginning the installation is recommended to determine both the appropriate open and working time of the adhesive.

Carefully replace the flooring back into its proper position then slowly roll in both directions utilizing a 100-150 lb. three-section roller. Re-roll again in both directions after approximately 60 minutes, if required. Repeat the process for the second half of the area and then for all remaining areas.

Remove any fresh adhesive from the surface of the flooring with water and a clean cloth. Dried adhesive may be removed using 70% Isopropyl alcohol and a clean cloth. Do not wash or perform any maintenance of the floor for a minimum of 72 hours after the installation is completed to allow adhesive to cure. Refer to the appropriate SDS for any disposal.

nora® 385 and 585 Adhesives

These are two-component polyurethane (PU) adhesives that have been formulated for the installation of specific nora rubber flooring. nora 585 adhesive is a conductive version of the nora 385 adhesive, and is typically used for installing the norament ed range of products. When parts A and B are thoroughly mixed together, they form a reactive adhesive that cures to a tough, flexible film with a good resistance to surface moisture and many chemicals. Note: These adhesives are not for use with 2 mm noraplan products

Add all of part B to part A and mix until homogenous (without streaks), using a slow speed drill (<150 rpm), fitted with a suitable mixing spindle approximately 3 inches in diameter. Note: Do not partial mix units.



Apply the adhesive using a 1/32 inch x 1/16 inch x 1/32 inch U-notched trowel, evenly without the formation of puddles or any voids. Do not apply fresh adhesive over drying adhesive, as this will result in telegraphing of adhesive lines. Coverage is approximately 170 – 190 square feet per gallon for a CSP 1 (depending on the substrate). Replace worn trowels to ensure proper spread rate, do not re-notch.

Once troweled properly, the adhesive must have sufficient open time; this will depend upon the ambient temperature, humidity, and substrate conditions. Note: all slick or burnished concrete should be mechanically roughened to create a suitable profile. While it is possible to lay the flooring into the adhesive after 15 minutes (may be preferred for small areas), it is recommended to allow the adhesive to begin to tack up (sticky when touched lightly with your fingertip) as this will help prevent the flooring from sliding on the wet adhesive and the adhesive bleeding through the seams. Note: It is better to wait than spend the same amount of time cleaning up the adhesive.

Carefully replace the flooring back into its proper position and slowly roll in both directions utilizing a 100-150 lb. three-section roller. Re-roll again in both directions after approximately 60 minutes. If required, place weights on any lifting edges or corners to ensure proper bonding. Repeat the process for the second half of the area and then for all remaining areas.

Remove any fresh adhesive from the surface of the flooring with 70% Isopropyl alcohol or liquid soap and a clean cloth. Cured PU adhesive may not be removed without damaging the flooring. Do not wash or perform any maintenance of the floor for a minimum of 72 hours after the installation is completed to allow adhesive to cure.

Mix and allow the product to harden in open container outside. When fully cured and cooled then dispose of as construction waste, alternatively refer to the appropriate SDS.

Precaution

Prevent all traffic for a minimum of 12 hours and heavy traffic and rolling loads for 72 hours. If required, after 12 hours protect the flooring using plywood, Masonite or an appropriately thick enough product, ensuring first that the flooring surface is free of all debris. Lay the panels so that the edges form a butt joint and tape the joint to prevent both movement and debris entrapment underneath them.

Flash Coving (Boot Method)

At the intersection between the wall and subfloor, no gap should be so wide that the cove stick cannot be installed correctly. If it is, then it must be filled and smoothed using a suitable product before installation. Ensure that the wall is dry, smooth and clean. If dusty then prime using a suitable water based primer applied with a small roller or paint brush.

Install any required cove cap strip following the manufacturer's written instructions. Ensure that the opening is sufficient to accommodate the thickness of the flooring material.



Image 1

Install the appropriate size nora[®] profix tape (90 for 4 inch or 145 for 6 inch) to the wall keeping it close to the substrate (image 1).

Cut the nora[®] cove stick to size and miter all corners, then remove the bottom 1 inch of wax paper from the nora profix and adhere the nora cove stick to the wall (no need to adhere it to the subfloor).

Dry-lay slightly longer than required lengths of flooring as detailed within the nora installation guide for sheets making relief cuts to avoid tears at all external corners (image 2).

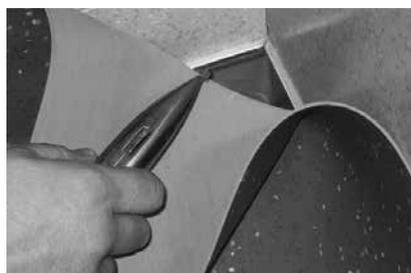


Image 2

Push the flooring into the internal corner as far as possible without damaging the flooring. Cut a straight line in the flooring, starting at the base of the nora cove stick up through to the top edge of the flooring at a ~ 45° angle. Cut all the external corners using the Boot Method (refer to the Flash Coving "BOOT" section of this guide). Do not trim the perimeter or internal corners until the field flooring is adhered.

EXTERNAL CORNERS

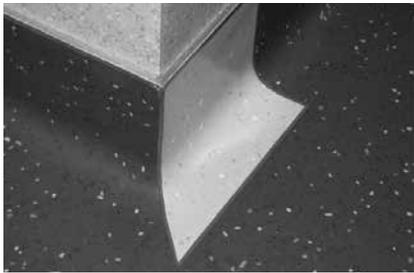


Image 3

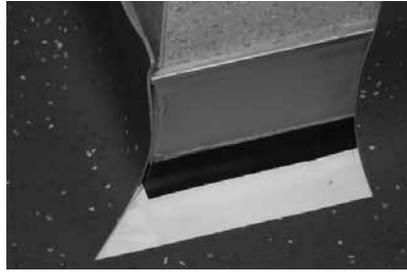


Image 4

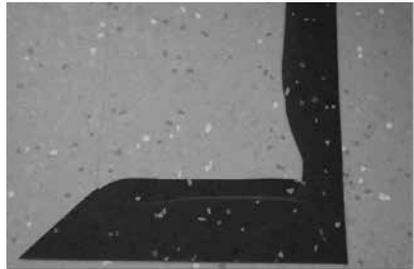


Image 5



Image 6

Using a pencil and small straight edge, mark out where the cuts are required for each boot. Begin at the outside corner of the wall and draw a line towards the toe of the boot (45°), then approximately 2 inch perpendicular to the wall and then complete the boot up the vertical. If tiles are being used, then it may be preferred to continue the perpendicular cut to the end of the tile (image 3). Using a small straight edge and a suitable utility knife accurately cut and remove the excess flooring (in one piece) from the external corner following your pencil marks. Keep the excess for use as a template (image 4).

Note: Butterfly corners are not acceptable with nora products.

Trace and cut the removed section onto a new piece of flooring. The front vertical needs to be cut large from the 45° at the base of the cove stick (to be trimmed after installation) (images 5 and 6).

INTERNAL CORNERS

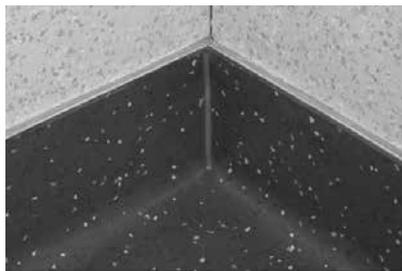


Image 7

Place one side into position and trim off the excess material, resulting in a straight cut down the center of the corner and through to the base of the nora cove stick. Repeat the process with the second side. A slight gap is acceptable as all internal seams are to be cold welded (image 7)

WALLS

Carefully fold back the flooring, a section at a time, while being careful not to crease or tear it. Remove the wax paper from the nora profix and, keeping the floor tight to the cove stick, push lightly into the tape. Trim the flooring to fit the cap strip and insert. When sure of correct positioning, press the flooring firmly into place.

BOOT

Carefully remove the wax paper from the nora profix and accurately place the "boot" (external corner) into the tape and press firmly into place. Trim the boot to fit the cap strip and insert. Trim the front seam (external) using a small straight edge, resulting in a straight 1/8 inch gap. Note: All external seams must be cold welded as detailed within this guide.

Note: A video of this process is available on www.nora.com/us

Sanitary Base

Perform testing and the proper preparation protocol (as described in the opening section of this installation guide), and follow the appropriate sections of the guide for installing flooring, substrate preparation and adhesive usage. nora® sanitary base should be used for the entire area (except at the doorway), or as specified.

At the intersection between the wall and subfloor any gap cannot be more than $\sim 1/2$ inch. If it is, then it must be filled and smoothed using a suitable product, before installation. Ensure that the wall is dry, smooth and clean. If dusty then prime using a water-based primer that is not film forming, diluted 1:1 with clean, cold potable water. Apply using a small roller or paint brush.



Image 1

Using nora profix 145 tape, leave the wax paper on the sides of the roll and place the roll on the cardboard disk (supplied). The disk will help keep the tape at the correct height when applying it to the wall. Install nora profix 145 tape directly to the wall ($\sim 1/8$ inch from the floor), pressing firmly into place (image 1). Then install nora profix 50 tape directly to the floor tight to the intersection between the wall and floor, pressing firmly into place. Note: If the walls are not straight it may be better to install the sanitary base first and then install the flooring up to it.

Install the nora flooring, ensuring that it is left large enough to cover the edge of the nora profix 50 tape following the appropriate installation section within this guide. Then when applying the correct adhesive, go right up to the nora profix 50, following the appropriate adhesive section within this guide.

Measure, mark, cut back and remove the flooring 2 inches from the wall where the sanitary base is to be installed using a straight edge with a sharp utility knife. Keep the line as straight as the wall will allow, a piece of waste nora sanitary base may be used to check suitability of the width prior to cutting.

Dry cut the nora sanitary base to size, miter the foot and ensure a tight snug fit at all seams unless welding is required or specified. When welding is required, leave an even gap between all sections of approximately $1/8$ inch and when ready, follow the appropriate section within this guide for cold welding. Remove the wax paper from the nora profix tape on the floor and press the sanitary base firmly into place, keeping it tight to the flooring. Remove the wax paper from nora profix tape on the wall and press firmly into place. Tap the sanitary base with a rubber mallet or roll with a rubber hand roller to ensure a good bond. Note: All external corners must be cold welded.

Wall Base

Perform testing and the proper preparation protocol (as described in the opening section of this installation guide), and follow the appropriate sections of the guide for installing flooring, substrate preparation and adhesive usage.

At the intersection between the wall and subfloor, any gap cannot be more than approximately $1/2$ inch. If it is then it must be filled and smoothed using a suitable product, before installation. Ensure that the wall is dry, smooth and clean.

APPLICATION

nora® wall base must be adhered using a suitable cove base adhesive and applied following the manufacturer's written instructions. After cutting to fit and preparing the corners (as below), adhere it to the wall, positioning it carefully using your chosen adhesive and press or roll (hand roller) to obtain a strong bond. Do not stretch the wall base during installation or it may shrink back later. To help avoid possible shrinkage, slightly compress the wall base during installation.

INTERNAL CORNERS

These can be cut and tightly butted or completed in one piece by heating with a heat weld gun and creasing. Hold it firm in the creased position and allow to cool, then cut and miter the toe of the base (in situ).

EXTERNAL CORNERS

These must be heated using a heat weld gun, held in the creased position, then allowed to cool. nora systems, Inc. does not recommend shaving the back as this will weaken the corners.

Stairs

GENERAL

Perform testing and the proper preparation protocol (as described in the opening section of this installation guide), and follow the appropriate sections of this guide for installing flooring, substrate preparation and adhesive usage.

norament[®] stairtreads are designed for straight stairs and cannot be modified on site to fit a step it was not intended or designed for (i.e. square nose design modified to fit an angled riser) or used on winding steps. norament stairtreads are designed for 80-90 degree stair profiles. In some cases the nosing shall be massaged inward toward the sanded side of the tread to ensure full contact of the nosing to the riser. It is not designed for the nosing to be adhered to the riser. To determine if the degree of the stair is suitable for the norament stairtreads, use a sample piece of stairtread and confirm the nosing can be fully compressed against the riser with no visible gaps between the nose of the stairtread and the nose of the stair step. The radius of the stair step nosing shall be no larger than the radius of the norament stairtread (1/2 inch radius). To fill the void, use nora[®] metal repair stair angle (Article 989) and/or nora[®] epoxy stair filler (coverage: 30 linear feet x 1/4 inch bead). nora[®] stair nosing and standard flooring may be used for those applications.

Note: The vertical part of nosing on the stairtread or nosing is not designed to be adhered. Avoid bending or flexing nora stairtreads, especially if they have "VI" (visually impaired) strips. If they are creased during transportation, contact nora Technical Department before proceeding with the installation.

With steps that are wider than the stairtreads (approximately 6 feet) it will be necessary to join sections together. nora systems, Inc. recommends staggered fitting (ashlar) of the cuts from one step to the next. Note: When ordering the stairtreads for this purpose, ensure that they are all ordered from the same batch, and when possible use the factory edge for joining.

CONCRETE STAIRS

All stairs must be permanently dry, clean, smooth and structurally sound, also prepared per ASTM F710. If any step is damaged, rounded, and uneven or out of level, then it must be properly repaired by an experienced underlayment contractor, following the directions of the manufacturer. The front edge of the step must be straight and match the shape of the stairtread or nosing profile. nora metal repair stair angles are available (if required) and must be mechanically fastened, using the fixings supplied. Then, using an appropriate patch or leveler, fully smooth the step to a suitable surface, including the nose. This area is subject to the most stress, once in service an unprepared step can compromise adhesion and result in damage to the stairtread.

WOODEN STAIRS

All stairs must be permanently dry, clean, smooth, level and structurally sound. Sanding is an option to make them smooth. All nails and screws must be countersunk and filled or removed. Loose boards must be screwed down or removed and replaced. All gaps and uneven or broken areas must be repaired or replaced. The front edge of the step must be straight and match the shape of the

stairtread or nosing profile.

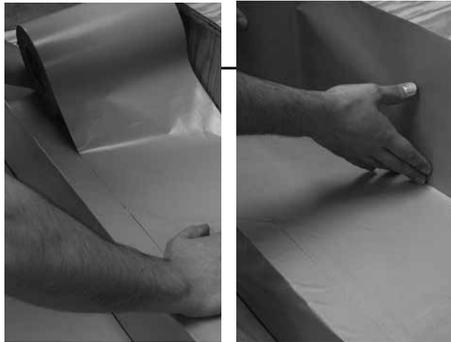


Image 1

Image 2

Stair Tread Installation

Apply nora® stepfix to the entire prepared staircase (images 1 and 2). The stepfix should be flush with the intersection between tread and riser for both applications of the tape, one on riser (fold over the nosing) and one on tread. If the stepfix overlaps on the tread, or you slightly crease it during installation, do not be concerned. Proceed and press firmly into place with your hand.

Installation of stair treads should begin with the bottom step. The riser portion of the top stair tread is cut off and trimmed to fit the bottom and sides of the bottom riser. The balance of the stair tread (nosing portion) will be required later for the top landing. Do not install the leftover combined tread and nosing portion on the landing. Fill any voids using nora epoxy stair filler as needed.

Remove the wax paper from the bottom riser and carefully press into position the pre-cut riser and trim the excess off flush with the top of the stair nosing.

Continue with the bottom step working upwards; cut each stairtread to fit the width of the step. The normal method is as follows. Each step should be measured across in at least three locations:

- Across the nosing.
- At the intersection between the tread and riser.
- At the top of the riser.

Add 1/16 inch to the measurements and transfer them to the back of the stairtread, trim to size and undercut both sides to ensure a snug fit. If required, uneven sides should be scribed in using a scribing bar or using a template. Remove the paper from the tread and place the pre-cut stairtread into position (keep the stairtread nosing tight to the step nosing) and press firmly. Fold the riser section of the stairtread back (onto the tread) and remove the paper from riser. Carefully roll or push the stairtread tight into the intersection between the tread and riser of the step, then correctly position the riser and press firmly. Trim the excess flush with the nosing of the



Image 3

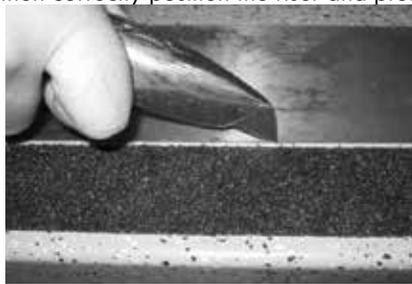


Image 4

step above, and repeat the process until all of the steps are completed.

For the top nosing: Between the nosing and tread part of the stairtread there is a gradual reduction of the material thickness. Take care to cut off the nosing (at the appropriate height) so the thickness matches that of the landing flooring (image 3).

Mark each end of the balance of the stairtread

and, using a straight edge and suitable utility knife, remove the nosing and discard the tread (image 4).

Cut the width of the top nosing to fit. It is the responsibility of the installing party to determine the suitability and porosity of the subfloor and the correct adhesive for this application.

- For nora 485 or 685 adhesive installations (absorptive substrate), apply the adhesive evenly without the formation of puddles or voids using a 1/16 inch V-notched trowel. Painters tape may help to hold the nosing in position until the adhesive is set for 72 hours. All traffic must be kept off for that period. Make sure that it is tight to the step nosing.

- For immediate trafficking, use a suitable contact adhesive applied to the top step and back of the top nosing, following the manufacturer's written instructions. Allow the appropriate open time and install the nosing. Make sure that it is tight to the step nosing.
- nora 385 adhesive may also be used; however, painters tape will be required to hold the nosing in position until the adhesive has fully cured for 72 hours. All traffic must be kept off for that period.

Do not use the nora stepfix to bond the top nosing unless the nosing is joined (cold welded) to the landing flooring. All traffic must be kept off until the cold weld is cured.

Note: The vertical part of nosing on the stairtread or nosing is not designed to be adhered. Avoid bending or flexing nora stairtreads, especially if they have "VI" (visually impaired) strips. If they are creased during transportation, contact nora Technical Department before proceeding with the installation.

Stair Nosing Installation

For the installation of nora stair nosing, starting at the bottom of the staircase, cut the nosing to the correct width to ensure a snug fit. Use an offcut of the nosing and mark an adhesive line on each step. Install the flooring on the bottom riser, using either the recommended adhesive (not PU adhesive) or a suitable contact adhesive following the adhesive manufacturer's SDS and written instructions. Allow the appropriate open time. Use the contact adhesive applied to both the nose of the step and the underside (tread part) of the rubber nosing. After the appropriate open time, install the rubber nosing, keeping it tight to the staircase nose, tap into place to ensure a good bond using a rubber mallet. Continue repeating this process up the staircase, installing treads and risers then rubber nosings until the staircase is complete.

Heat Welding

After installation with wet adhesives wait a minimum of 12 hours before heat welding. If nora dryfix tape or nora nTx flooring was used, welding can be performed immediately. Heat welding should not be used vertically or when welding to nora sanitary base. If required, these must be cold welded.

Groove the required seam with either a mechanical joint cutter or hand-grooving tool, ensure all grooves are clean. The depth of the groove must be controlled at approximately 2/3 the thickness of the flooring, or for acoustic products, 2/3 the thickness of the top layer. The width of the groove must be approximately 1/8 inch.

Preheat the welding gun to 662°F - 752°F (350°C - 400°C). It is recommended to practice welding on a piece of scrap flooring material first to determine the heat setting and speed, as different heat guns and cable length will affect the temperature. Note: If the weld rod comes out during trimming, then either you welded too fast or the gun is not hot enough.



Image 1

Cut a length of nora heat weld rod sufficient to weld the entire length of the seam plus approximately 6 inches extra. Proceed to weld the seam starting at the wall and apply slight pressure to the gun nozzle (nose) to force the melting rod into the groove (image 1). Properly applied, the heat weld rod will have a slightly flattened portion on either side. Allow the rod to cool to the touch and begin the trimming process to remove the excess weld.



Image 2

Make the first cut of the weld rod (image 2). Use a Mozart trimming knife with the 0.7 mm spacer claw. Allow the weld rod to cool to room temperature.

Next, using only the Mozart trimming knife (without the spacer claw), finish trimming the remainder of the weld. The finished weld should be smooth and on the same plane as the floor covering.

If for any reason you still have any excess weld rod left after the final trim, it is necessary to remove this using the melting technique. After heating up a non-sharpened metal putty knife, gently push the putty knife down the seam weld. Excess weld material will collect on the knife.

Cold Welding

NORAMENT® (LIQUID WAX METHOD)

After installation with wet adhesives wait a minimum of 8 hours before cold welding. If nora dryfix tape or nora nTx flooring was used, welding can be performed immediately. nora cold weld must be used on all vertical corners, flash coving and when required for sanitary base, or if specified.

To prevent bonding of the cold weld outside of the seam, using a clean cloth apply a thin even layer of nora® liquid wax to both sides of the seam (approximately 4 inches total), and allow to dry.

Groove the required seam with either a mechanical joint cutter or hand-grooving tool, ensure all grooves are clean. The depth of the groove must be controlled at approximately 2/3 the thickness of the flooring, or for acoustic flooring, 2/3 of the top layer, and the width of the groove must be approximately 1/8 inch.

For vertical seams, first apply the liquid wax to the entire seam area and allow it to dry. Using a small straight edge, trim or groove the seam or sanitary base back, approximately 1/8 inch.

The use of gloves is recommended when using nora cold weld. Cut off the tip of the cartridge at the first thread, screw on the nozzle and place the cold weld cartridge into a cartridge gun. Cut off the nozzle tip at a slight angle.



Image 1

Inject the nora cold weld into the groove without gaps until a small bulb develops above the seam (about size of heat weld rod) (image 1). At the end of the seam, release the gun to prevent leaks. Any nora cold weld tracked or spilled on the flooring must be removed immediately using 70% Isopropyl alcohol or liquid soap and a clean cloth, as cleaning at a later stage may not be possible.

Press the nora cold weld into the seam using a smoothing spatula, held nearly flat (~22° angle), resulting in a surface flush and on the same plane as the surface of the floor (image 2). Excess cold weld must be pressed away on each side of the seam. It is important to develop a slight gap between the excess weld and the weld within the seam for easy removal once cured.

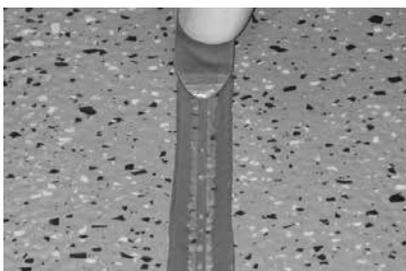


Image 2

For vertical corners, use a smoothing spatula to remove the excess cold weld and smooth the surface to approximately the required finish, then wait for approximately 10 minutes for the weld to skin over. Wet your fingertips using nora liquid wax, 70% Isopropyl alcohol or water and finish the weld by lightly smoothing it to a slightly rounded acceptable finish.

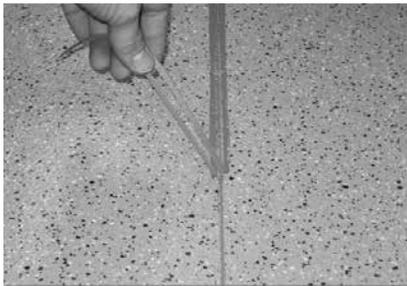


Image 3

The excess cold weld can be removed after approximately 3 – 8 hours, depending on its thickness, temperature and ambient humidity. This can be done by simply peeling it off with your fingertips (image 3). If it is still connected anywhere, then trim it off using a sharp skiving knife.

Prevent any traffic on the seams until the nora cold weld has cured for approximately 8 hours. Wet mop only after 8 hours, machine scrubbing of floor after 24 hours and, if required, buff floors after 72 hours.

NORAPLAN® (MASKING TAPE METHOD)

After installation with wet adhesives wait a minimum of 8 hours before cold welding. If nora dryfix tape or nora nTx flooring was used, welding can be performed immediately. nora cold weld must be used on all vertical corners, flash coving and when required for sanitary base, or if specified.

To prevent bonding of the nora cold weld outside of the required seam, use masking tape (not painters tape) to completely cover the seam that requires welding. Approximately center the tape with the seam. Use a hand roller to firmly press the tape down and ensure a good bond.

Groove the required seam with either a mechanical joint cutter or hand-grooving tool, ensure all grooves are clean. The depth of the groove must be controlled at approximately 2/3 the thickness of the flooring, or for acoustic flooring, 2/3 of the top layer, and the width of the groove must be approximately 1/8 inch.

For vertical seams, use a small straight edge to trim or groove the seam or sanitary base back, approximately 1/8 inch.

Carefully apply masking tape onto the surface of each side of the seam, keeping the edge of the tape flush with the edge of the flooring. Press or roll (hand roller) the tape and ensure a good bond.



Image 4

The use of gloves is recommended when using nora cold weld. Cut off the tip of the cartridge at the first thread, screw on the nozzle and place the cold weld cartridge into a cartridge gun. Cut off the nozzle tip at an angle.

Inject the nora cold weld into the groove without gaps until a small bulb develops above the seam (about size of heat weld rod) (image 4). At the end of the seam, release the gun to prevent leaks. Any nora cold weld tracked or spilled on the flooring must be removed immediately using 70% Isopropyl alcohol or liquid soap and a clean cloth, as cleaning at a later stage may not be possible.

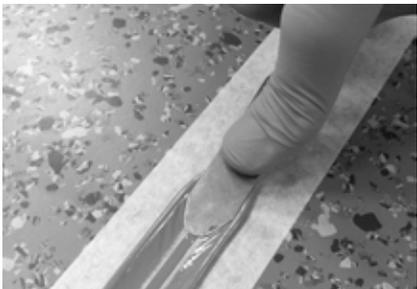


Image 5

Press the nora cold weld into the seam using a smoothing spatula, held nearly flat (~22° angle), resulting in a surface flush and on the same plane as the surface of the floor (image 5). Excess cold weld must be pressed away on each side of the seam. It is important to develop a slight gap between the excess weld and the weld within the seam for easy removal.

For vertical corners, use a smoothing spatula to remove the excess cold weld and smooth the surface to approximately the required finish, then wait for approximately 10 minutes for the weld to skin over. Wet your fingertips using nora liquid wax, 70% Isopropyl alcohol or water and finish the weld by lightly smoothing it to a slightly rounded acceptable finish.

The masking tape may be removed carefully now or after it has cured, this will be approximately 8 hours depending on thickness, temperature and ambient humidity. This can be done by simply peeling it off with your fingertips.

Prevent any traffic on the seams until the nora cold weld has cured for approximately 8 hours. Wet mop only after 8 hours, machine scrubbing of floor after 24 hours and, if required, buff floors after 72 hours.

Technical Data - nora® Adhesives

Technical Data	Wet Adhesives				Dry Adhesives		
	nora® 385	nora® 485	nora® 585	nora® 685	nora® dryfix (flooring)	nora® profix 50/90/145 (sanitary base)	nora® stepfix (stairtread)
Packaging/Material Size	2 gal unit in 3.5 gal pail or 1 gal unit in a carton	4 gallon pail	2 gal unit in 3.5 gal pail or 1 gal unit in carton	4 gallon pail	Brown box, white paper		
Composition	2-part polyurethane	Water-based acrylic	Conductive 2-part polyurethane	Conductive water-based acrylic	Paper, fabric, polyacrylate, double sided tape		
Shelf Life	12 months				Minimum 2 years		
Storage	Room temperature				Protect from sunlight, cool/dry space		
Freeze/Thaw	Stable per ASTM D7149 at 0°F (-18°C)				Stable per ASTM D7149 at 0°F (-18°C)		
Pot Life	15-20 minutes at 68°F	n/a	15-20 minutes at 68°F	n/a	n/a		
Open Time	Depends on site conditions				No limit, providing dust free		
Working Time	45-200 minutes	15-45 minutes	45-200 minutes	15-45 minutes	n/a		
Moisture Tolerance	Maximum 85% RH Following the protocol of ASTM F2170 using Wagner Rapid RH probes only				Maximum 85% RH	Maximum 75% RH Following the protocol of ASTM F2170 using Wagner Rapid RH probes only	
VOC Content	Product is in compliance with SCAQMD Rule 1168 Standard for Rubber Floor Adhesives, which has a VOC limit of 60 0 grams/liter				Product is in compliance with SCAQMD Rule 1168 Standard for Rubber Floor Adhesives, which has a VOC limit of 60 <0.5 grams/liter		
LEED Contribution	Contribute to LEED EQ Credit 4.1 - Low Emitting Materials, Adhesives & Sealants				Contribute to LEED EQ Credit 4.1 - Low Emitting Materials, Adhesives & Sealants		
Warranty	As detailed in the nora® limited warranty				As detailed in the nora® limited warranty		
Application	1/32x1/16x1/32" U-notched trowel (FFA)	1/16x1/16x1/16" V-notched trowel	1/32x1/16x1/32" U-notched trowel (FFA)	1/16x1/16x1/16" V-notched trowel	Utility knife and straight, sharp blade		
Coverage	~170-190 sqft/gal	~160-180 sqft/gal	~170-190 sqft/gal	~160-180 sqft/gal	215 sqft	Per roll size	Per roll size
Working Temperature	Per the flooring requirements				Per the flooring requirements		
Radiant Heating	Yes, contact the nora® Technical Department				Yes, contact the nora® Technical Department		
Castor Chairs	After 72 hours				Immediately	n/a	n/a
Hospital Beds	After 72 hours				Immediately	n/a	n/a
Foot Traffic	After 12 hours				Immediately	n/a	Immediately
Heavy Rolling Loads	After 72 hours				Immediately	n/a	n/a
Wet Cleaning	After 72 hours				Immediately		

Technical Data - nora® Installation Accessories

Technical Data	Products		
	nora® cold weld	nora® heat weld rod	nora® liquid wax
Packaging	White tube with application nozzle	Round welding rod on cardboard reel	White plastic bottle with white plastic lid
Container/Material Size	10 fl oz (300ml)	328 linear feet	16.91 oz
Composition	Silane modified polymers	EVA-copolymer with pigments	Water based wax emulsion
Color	As selected	As selected	Beige
Odor	Slight	None	Slight
Hardness	~75 Shore A	~93 Shore A	n/a
Shelf Life	Minimum 1 year	Minimum 5 years	Use within 12 months of opening
Storage	Protect from sunlight; store in cool and dry conditions	Storage temperature ~20°F (-6.67°C)	Cool, dry conditions
Freeze/Thaw	Stable per ASTM D7149	n/a	Stable per ASTM D7149
VOC Content	<12 grams/liter; product is in compliance with the SCAQMD Rule 1168 Standard for Architectural Sealants, which has a VOC limit of 250	None known	None known
LEED Contribution	Contributes to LEED EQ Credit 4.1 - Low Emitting Materials, Adhesives & Sealants	n/a	n/a
Warranty	As detailed in the nora® limited warranty		
Coverage	~50 - 60ft (15 - 18m)	~328 linear feet	~375 linear feet at 4" wide
Working Temperature	Per the flooring requirements	Pre-heat welding gun to 662°F - 752°F (350°C - 400°C)	Per the flooring requirements
Cure Time	8-12 hours	When cooled	~5-10 minutes
Foot Traffic	After curing, 8-12 hours	When cooled	8-12 hours
Heavy Rolling Loads	After 48 hours	When cooled	After 48 hours
Wet Cleaning	After 48 hours	When cooled	After 48 hours

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