



North American
ADHESIVES®

NA 1650

Uncoupling Membrane

Uncoupling Membrane for Tile Installations



PRODUCT DESCRIPTION

NA 1650 Uncoupling Membrane is a premium-performance, lightweight, waterproofing and vapor-pressure-equalizing underlayment membrane that provides crack suppression for use under ceramic tile and stone installations, for both residential and commercial applications. It is designed to perform over challenging substrates, such as young concrete and single-layer 3/4" (19 mm) plywood subfloors with joist spacing of up to 19.2" (49 cm) on center. The unique engineered tri-layered design of *NA 1650 Uncoupling Membrane* absorbs lateral stress from the substrate without transferring this force to the tile or stone, which maintains exceptional bonds.

FEATURES AND BENEFITS

- Prevents transmission of in-plane substrate cracks up to 1/8" (3 mm)
- Recommended for use with polymer-fortified mortars
- Approved for use over young (green) concrete and mortar beds
- Time-saving: Embed membrane and then install tile immediately
- Engineered cavity design allows easy single-pass filling of surface core with less mortar
- Uncoupling, waterproofing and water vapor membrane up to 25 lbs. (11.3 kg) MVER and 100% relative humidity
- Compression resistance to support rolling loads
- Approved for radiant-heating applications
- Reduced "roll memory" and unique tri-layer construction keep membrane flat.
- Lightweight for easy handling and fast installation
- Easy to cut with standard utility knife
- Chalk and laser lines easily visible on surface
- Mesh-fabric top layer makes it easy to fill cavities with mortar.

INDUSTRY STANDARDS AND APPROVALS

- ASTM C627 (Robinson): Extra Heavy Rating. See the "Product Performance Properties" chart below.
- ANSI: Exceeds A118.10 (Waterproofing Membrane for Thin-Set Ceramic Tile)
- ANSI: A118.12, Section 5.1.3 – Achieves bond strength of 50 psi (0.34 MPa) or greater in 7 days per test method
- ANSI: A118.12, Section 5.2.3 – Passes. Point load resistance after 28-day cure.

USES

- Residential (homes, apartments and condominiums) and commercial (office buildings, restaurants, galleries and malls) interior floors
- Use for renovating older floors to address existing in-plane cracks in the subfloor.
- Use to isolate stresses beneath the flooring associated with expansion and contraction of substrate materials.
- Use to protect lateral stresses in industry-approved plywood or oriented strand board (OSB) floors from transferring to the finished tile floor.
- Offers an installation solution when the construction timeline requires installing tile over green or young concrete slabs before the full 28-day cure

SUBSTRATE REQUIREMENTS

- All suitable substrates should be structurally sound, stable, dry, clean and free of any substance or condition that may reduce or prevent proper adhesion.
- Do not use chemical means (acid etching or stripping) to prepare approved substrates. Use mechanical methods only.
- The substrate and ambient temperature must be between 40°F and 95°F (4°C and 35°C) for protection after installation.

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- Mechanically clean and prepare concrete substrates by diamond-cup grinding or other engineer-approved methods to obtain the minimum International Concrete Repair Institute (ICRI) concrete surface profile (CSP) of #1. When concrete requires more mechanical preparation than CSP 1, the final surface must be made smooth by applying *NA 600 Multi Patch™*. See the Technical Data Sheet (TDS) for more information.

See North American Adhesives' (NAA's) "Surface Preparation for Tile and Stone Installations" document in the Document Library section at www.na-adhesives.com.

Regular and young (green) concrete

- All concrete substrates must be structurally sound, stable, dry, clean, and free of any substance or condition that may reduce or prevent proper adhesion. Concrete must be cured sufficiently to support tile installation traffic as determined by the design professional, construction manager or general contractor. The surface should be free of voids, sharp protrusions, loose aggregate, cement laitance, concrete sealers and curing compounds.

Exterior-grade plywood and OSB

- Maximum allowable deflection for floor systems and substrates: Floor systems, whether wood-framed or concrete, over which the tile will be installed using the appropriate Tile Council of North America (TCNA) method, according to the Floor Tiling Installation Guide, must conform with the International Residential Code (IRC) for residential applications, the International Building Code (IBC) for commercial applications, or applicable building codes.

For ceramic tile installations, the maximum allowable floor member live load and concentrated load deflection for framed floor systems must not exceed $L/360$, where "L" is the clear span length of the supporting member per applicable building code. For natural-stone tile installations, maximum allowable floor member live load and concentrated load deflection for wood-framed floor systems shall not exceed $L/720$, where "L" is the clear span length of the supporting member, per applicable building code.

For other specialty flooring products, including marble and slate, refer to the manufacturer's recommendations for the finish flooring. Enhanced structural performance may be required for ceramic and natural-stone floor products. See the TCNA Handbook for Ceramic Tile Installation.

1. Verify that the deflection under all live, dead and impact loads of interior plywood or OSB APA Sturd-I-Floor Exposure 1 floors complies with industry standards for ceramic tile or stone installations per ANSI A108.01, Section 2.3; TCNA's "Maximum Allowable Deflection for Floor Systems and Substrates" under Substrate Requirements; or TTMAC's installation notes for the specifier/section deflection.

2. Minimum construction for interior ceramic or porcelain tiled floors is as follows:

- For single-layer plywood or OSB subfloor with joist spacing of 16" (41 cm) o.c. – use tongue-and-groove plywood or OSB of 5/8" (16 mm) nominal thickness with a 1/8" (3 mm) gap required between sheets.
- For single-layer plywood or OSB subfloor with joist spacing of 19.2" (49 cm) o.c. – tongue-and-groove plywood or OSB of 3/4" (19 mm) nominal thickness with a 1/8" (3 mm) gap required between sheets.
- For double-layer plywood or OSB subfloor with joist spacing of 24" (61 cm) o.c. – use two layers of plywood or OSB consisting of a tongue-and-groove subfloor with a nominal thickness of 3/4" (19 mm) with a 1/8" (3 mm) gap required between sheets, and an underlayment with a nominal thickness of 3/8" (10 mm).*

* *The first subfloor layer should be 3/4" (19 mm) thick plywood or OSB, either plain with all sheet edges blocked or tongue-and-groove, over bridged joists spaced a maximum of 24" (61 cm) o.c. The second subfloor layer (underlayment) should be 3/8" (10 mm) thick, plugged-faced exterior plywood or OSB.*

3. For interior natural-stone tiled floors, the minimum subfloor construction requirement is double-layered, regardless of joist spacing. The maximum joist spacing is 24" (61 cm) o.c. The double-layer wood floor should consist of a tongue-and-groove subfloor with a nominal thickness of 3/4" (19 mm), and an underlayment with a nominal thickness of 3/8" (10 mm).
4. Use a NAA polymer-fortified mortar meeting ANSI A118.11 or ANSI A118.15 standard or classified as ISO 13007 C2E or better for installing *NA 1650 Uncoupling Membrane* in the applicable interior installation.

Lightweight concrete

- Refer to NAA's "Gypsum-based floors and walls: Which NAA products can be applied?" technical bulletin in the Document Library section at www.na-adhesives.com.

SUITABLE SUBSTRATES

- Concrete
- Cement mortar beds, self-leveling underlayment and leveling coats
- Young concrete
- Industry-approved exterior-grade plywood and APA Sturd-I-Floor, Exposure 1 OSB (interior, dry areas only)
- Approved backer units – see manufacturer's installation guidelines
- Cement terrazzo (properly prepared interior only)

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- Existing ceramic tile or stone (properly prepared interior only)
- Radiant-heat systems
- Existing, properly prepared vinyl flooring – vinyl composition tile (VCT), non-cushioned paper-backed/felt-backed sheet vinyl, luxury vinyl tile/plank (LVT/LVP)
- Epoxy terrazzo (with appropriate bond testing – interior only)
- Gypsum underlayment or lightweight concrete*

* Follow gypsum or lightweight concrete manufacturer's recommendation regarding priming and/or special surface preparation before installing underlayment membrane. Reference NAA's "Gypsum-based floors and walls: Which NAA products can be applied?" technical bulletin in the Document Library section at www.na-adhesives.com.

Consult Technical Services for installation recommendations regarding substrates and conditions not listed.

LIMITATIONS

- Do not use over cracks or control joints subject to out-of-plane movement, or subject to in-plane movement greater than 1/8" (3 mm). See the "Expansion Joints" section.
- Do not use over substrates containing asbestos, plank wood flooring, presswood, particleboard, pressure- or oil-treated plywood, Lauan plywood, Masonite, self-stick tile, metal or fiberglass surfaces, epoxy floors or dimensionally unstable materials.
- Do not use when hydrostatic pressure exists.
- Do not use on vertical surfaces; as a roof deck membrane or wear surface; or for submerged applications.
- When using *NA 1650 Uncoupling Membrane* over gypsum-based floor patching or leveling compounds, reference NAA's "Gypsum-based floors and walls: Which NAA products can be applied?" technical bulletin in the Document Library section at www.na-adhesives.com.
- Do not use premixed products such as mastic to set tile over *NA 1650 Uncoupling Membrane*.
- Ceramic, porcelain or glass tile or stone set over *NA 1650 Uncoupling Membrane* must be 2" x 2" (5 x 5 cm) or larger.
- Installations requiring seam tape to waterproof must be properly sloped to facilitate drainage and prevent standing water.
- Tile must be suitable for floor installations and have a minimum thickness of 7/32" (5.5 mm).

- When used over young (green) concrete, the concrete must have cured for at least 7 days and be suitable to support tile installation traffic as determined by the project design professional, construction manager or general contractor.
- If the floor becomes wet during construction, it should be allowed to dry before application of finish flooring, including underlayment, hardwood flooring, ceramic tile, etc. After it is dry, the floor should be checked for flatness, especially at joints.

Note: On occasion, dimensionally weak natural stone tile that normally would not be categorized as moisture-sensitive (such as travertine, limestone, marble and agglomerates) can exhibit doming, cupping or curling when large- and-heavy-tile mortars (previously called "medium-bed" mortars) are used over impervious sheet membranes such as *NA 1650 Uncoupling Membrane* underlayment membrane. For this reason, areas requiring more than 3/8" (10 mm) buildup require the use of a self-leveling underlayment or cured mud-bed application before installation of *NA 1650 Uncoupling Membrane*. When installing natural stone, always do a mockup area of the proposed installation and allow materials to reach a full cure to ensure the desired effect. For details on these methods or materials, contact Technical Services before installation or design.

APPLICATION

Applying the underlayment membrane

1. Inspect the subfloor before installing *NA 1650 Uncoupling Membrane* underlayment membrane to ensure that the substrate is acceptable for tile or stone installation.
2. Always pre-cut and dry-fit *NA 1650 Uncoupling Membrane* in place.
3. Mix a suitable NAA mortar for the substrate to a consistency on the high end of the recommended water range. The mortar should be able to hold a notched ridge while allowing for wetting out the fleece layer backing of *NA 1650 Uncoupling Membrane*.
4. With pressure, apply a coat by using the trowel's flat side to key mortar into the substrate.
5. Apply additional mortar, combing it in a single direction using a 1/4" x 3/16" (6 x 4.5 mm) V-notched trowel. Coverage may vary as a result of mortar consistency, trowel angle, floor flatness, substrate absorption, etc. If full coverage is not achieved, it may be necessary to use a 1/4" x 1/4" (6 x 6 x 6 mm) square-notched trowel.
6. Spread only as much mortar that can be covered with *NA 1650 Uncoupling Membrane* before the mortar skins over. Open times vary with jobsite conditions and mortar choice.

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7. Embed *NA 1650 Uncoupling Membrane* into the mortar, with the fabric side down. Using a rubber or wooden float, hand roller or preferably steel roller (not exceeding 75 lbs. or 34.0 kg), apply pressure to ensure proper embedding of the membrane. Areas of the membrane properly embedded into the mortar will appear darker.
8. Ensure that all edges or ends of each roll abut the edges or ends of other rolls without leaving gaps. To ensure a flat surface, do not overlap edges or ends from one roll onto another. Leave about 1/4" (6 mm) between the membrane and the edge of walls, columns, etc., for movement.
9. Lift the membrane occasionally to verify coverage. Proper installation results in full contact between the fleece layer backing and the tile-setting mortar.

Waterproofing floors

After *NA 1650 Uncoupling Membrane* is embedded on the floor as directed, *NA 1660 Sealing Tape* can be used to waterproof the membrane seams with a NAA mortar that meets the ANSI A118.4, ANSI A118.11 or ANSI A118.15 standard, or is classified as ISO 13007 C2E or better.

1. Using a 1/4" x 3/16" (6 x 4.5 mm) V-notched trowel, key in the mortar to the adjoining seams with the trowel's flat side, being sure to fill in any holes or voids.
2. Apply mortar on top of the seams with the trowel's notched side. Center *NA 1660 Sealing Tape* over the seam with at least 2" (5 cm) on each side of the seam and apply *NA 1660 Sealing Tape*. Work the sealing tape into the thin-set with a grout float or the trowel's flat side while the thin-set is still workable.
3. To waterproof around the walls of the installation area, take a pre-measured length of *NA 1660 Sealing Tape* and fold it in half along its length. One side of the fold will be adhered to the floor and the other side will be adhered up the wall. To accomplish this, follow the installation methods detailed in steps 1 and 2.

4. Next, embed *NA 1660 Sealing Tape* into the mortar with a grout float or the trowel's flat side, taking care not to puncture the membrane.

Note: Flood testing is recommended before tile application.

TILE INSTALLATION

Ceramic, porcelain and stone tile

1. In accordance with the TCNA Handbook for Ceramic Tile Installation and with porcelain tile manufacturers, use a NAA polymer-fortified mortar suitable for the tile being installed. The mortar should meet the ANSI A118.4, ANSI A118.11 or ANSI A118.15 standard, or be classified as ISO 13007 C2E or better. The engineered design of *NA 1650 Uncoupling Membrane* manages moisture dissipation to control drying of the mortar between the tile and the membrane.
2. For fast-track installations, use *NA 3240 Multi Flex™ Rapid*.
3. First skim the surfaces of *NA 1650 Uncoupling Membrane* using the flat side of the trowel, ensuring that the cavities and mesh fabric are completely filled.
4. Immediately apply additional mortar and comb over the membrane using the recommended notched trowel (and directional troweling method) suitable for the size and type of tile being installed.



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5. Install tile in accordance with industry guidelines, checking frequently for adequate mortar coverage. Interior tile or stone installations can take place immediately after the *NA 1650 Uncoupling Membrane* installation.



6. Grouting may be done once the mortar has cured enough to allow light traffic, which will depend upon the mortar used, tile size, tile type and jobsite conditions.

Moisture-sensitive stone tile

1. Prefill the cavities in *NA 1650 Uncoupling Membrane* with an approved NAA polymer-fortified mortar.
2. Allow the mortar to cure overnight.

EXPANSION JOINTS

- Honor expansion joints through *NA 1650 Uncoupling Membrane*, tiles and grout per industry standards.
- When necessary, cut tiles along both edges of the expansion joints. Do not allow tiles and mortar to overlap the expansion joints.
- Provide for movement as required by TCNA Method EJ171 or TTMAC Specification Guide 09 30 00, Detail 301MJ.

GROUTING

Select an appropriate NAA cement, ready-to-use or epoxy grout. Allow for longer drying time before grouting when installing large-format tiles (that is, tiles greater than 15" or 38 cm on one or more sides).

PROTECTION

- Provide for dry, heated storage on site and deliver materials at least 24 hours before tilework begins.
- Do not store *NA 1650 Uncoupling Membrane* in direct sunlight.

- Do not leave *NA 1650 Uncoupling Membrane* exposed for more than 72 hours; rather, protect it from other trades if tile will not be set immediately. If left exposed, *NA 1650 Uncoupling Membrane* should be covered with a recommended NAA thin-set mortar, troweled smooth.
- Protect *NA 1650 Uncoupling Membrane* from spills, contamination and damage before and during tilework to ensure a positive bond with the mortar.

Product Characteristics	
at 73°F (23°C) and 50% relative humidity	
Type of material	Polypropylene (PP) for all components (textured foil, backing fleece and mesh)
Shelf life	2 years when stored in a dry area in original shipping container
Chemical resistance	High
Material thickness	1/64" (0.5 mm), nominal
Membrane height	1/8" (3 mm), nominal
Storage and performance temperature range	-40°F to 176°F (-40°C to 80°C)
Compressive strength	About 0,37 N/mm ²
Permeance	< 0.07

ASTM C627 Service Rating (Robinson)	
Floor System	Actual Rating
16" (41 cm) o.c., wood substrate	Extra heavy
19.2" (49 cm) o.c., wood substrate	Extra heavy
24" (61 cm) o.c., wood substrate	Heavy
Concrete slab	Extra heavy

Approximate Coverage	
Roll Size	Roll Coverage
39.4" x 98.4' (1 m x 30 m)	323 sq. ft. (30 m ²)



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Refer to the Safety Data Sheet for specific data related to health and safety as well as product handling.
For the most current product data and warranty information, visit www.na-adhesives.com.

For information on sustainability and transparency, as well as product certification programs,
contact Technical Services at 1-800-637-7753.

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LEGAL NOTICE

The contents of this Technical Data Sheet ("TDS") may be copied into another project-related document, but the resulting document shall not supplement or replace requirements per the TDS in effect at the time of the NAA product installation. For the most up-to-date TDS and warranty information, visit our Website at www.na-adhesives.com. **ANY ALTERATIONS TO THE WORDING OR REQUIREMENTS CONTAINED IN OR DERIVED FROM THIS TDS SHALL VOID ALL RELATED NAA WARRANTIES.**

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