

# NA 410



**North American**  
**ADHESIVES®**

## Reduced-Preparation Self-Leveling Underlayment



GOOD

BETTER

BEST

### PRODUCT DESCRIPTION

A high-strength, self-leveling cement-based underlayment and repair mix for interior concrete and engineer-approved floors. *NA 410* typically requires only a clean, soundly bonded substrate before application. *NA 410* provides low installation costs and fast turnaround on jobsites.

- For leveling, smoothing and repairing interior floors
- Allows flooring installations as early as 12 hours

Note: Provide for and do not bridge expansion and control joints where specified, including the perimeter of the room, columns, supports and equipment pedestals. Do not mix with other self-leveling underlayments.

### USES

*NA 410* is well-suited for leveling, smoothing and repairing interior floors before the installation of floor coverings. Ceramic tile and natural stone can be installed 12 hours after application. Suitable floor coverings – such as carpet, vinyl sheet goods, vinyl tile, vinyl composition tile (VCT), homogenous PVC, rubber and engineered wood plank – can be installed 36 to 48 hours after application, depending on the thickness of the application. Do not use *NA 410* for “reduced-preparation” applications under surfaces subject to dynamic loading.

### SUITABLE SUBSTRATES (Properly prepared)

- Properly prepared, sound, dimensionally stable, fully cured concrete that is at least 28 days old and free from hydrostatic pressure
- When *NA 410* is used over a properly primed sound and stable substrate, surface profiling is not required.
- *NA 410* can be installed over well-bonded coatings, adhesives and glues compatible with *NA 300*, such as cutback, carpet glue and VCT. Excluded are finished surfaces that will be subject to dynamic loading (such as pallet jacks), forklifts or rubber-wheeled traffic; surfaces subject to dynamic loading require a surface profile.
- When using *NA 410* to install over substrates other than clean sound concrete, the installer warrants that the materials being bonded to will be solid, stable and well-bonded, capable of passing 75 psi (0,52 MPa) tensile pull tests throughout the installation according to ISO 13007 Sections 3 and 4 (Direct Tensile Pull Tests). All substrate materials must be compatible with NAA primers. Contaminated surfaces or weak substrates (not conforming to at least 75 psi [0,52 MPa] direct tensile bond) must be removed by shotblasting, scarification or other industry-approved means before *NA 410* is applied.
- *NA 410* can be used over ceramic tile, VCT, cement terrazzo and small amounts of old cutback adhesive residue. Surfaces must be properly prepared, bonded, free of dirt and dust, and primed.
- Engineer-approved plywood subfloors may be resurfaced with *NA 410*. Subfloors must be properly prepared, bonded, and free from dirt and dust (see Item 11 under “Surface Preparation” section for details).
- *NA 410* is compatible with a wide variety of floor-covering adhesives, epoxy adhesives, polyurethane adhesives, and tile and stone installation mortars. Consult the floor-covering or coating manufacturer’s recommendations regarding the maximum allowable moisture vapor emission rate (MVER) and

### TECHNICAL QUICK REFERENCE

Product characteristics at 73°F (23°C) and 50% relative humidity

#### NA 410 (before mixing)

Physical state	Powder
Color	Gray
Shelf life	6 months in original bag, in dry, heated and covered place
Flammability	Flame spread: 0 Fuel contribution: 0 Smoke development: 0

#### NA 410 (mixed)

Mixing ratio	5 to 5.25 U.S. qts. (4,73 to 4,97 L) of water per 50 lbs. (22,7 kg) of powder
Density	About 128 lbs. per cu. ft. (2,1 kg per L)
pH	11
Application temperature range	50°F to 95°F (10°C to 35°C)
Pot life	60 minutes
Flowing time	10 minutes
Final set	4.5 hours
Time required before installation of tile or stone	Typically 12 to 24 hours depending on temperature and humidity
Time required before installation of impervious floor covering	Typically 36 to 48 hours depending on temperature and humidity

Other data relating to *NA 410* – material and hardening conditions at 73°F (23°C) and 50% relative humidity without curing

Compressive strength (ASTM C 109 [CAN/CSA-A5])	
1 day	> 1,800 psi (12,4 MPa)
7 days	> 3,200 psi (22,1 MPa)
28 days	> 4,000 psi (27,6 MPa)
Flexural strength (ASTM C348)	
1 day	> 500 psi (3,45 MPa)
7 days	> 850 psi (5,86 MPa)
28 days	> 1,050 psi (7,24 MPa)
Pull-out strength (Direct Tensile Bond test – rupture in concrete substrate) (CAN/CSA-A23.2-6B)	
3 days	> 260 psi (1,79 MPa)
7 days	> 300 psi (2,07 MPa)
28 days	> 350 psi (2,41 MPa)
Packaging	Bag: 50 lbs. (22,7 kg)

### RECOMMENDED THICKNESSES AND APPROXIMATE COVERAGES\* per 50 lbs. (22,7 kg)

1/8" (3 mm)	48 sq. ft. (4,46 m <sup>2</sup> )
1/4" (6 mm)	24 sq. ft. (2,23 m <sup>2</sup> )
1/2" (12 mm)	12 sq. ft. (1,11 m <sup>2</sup> )
1" (2,5 cm)	6 sq. ft. (0,56 m <sup>2</sup> )

\* Coverages shown are for estimating purposes only. Actual job-site coverages may vary according to substrate conditions, type of equipment, thickness applied and applications methods used.

### HEALTH AND SAFETY

Consult the Material Safety Data Sheet (MSDS) for safe-handling instructions.

# NA 410

retained moisture content in the substrate. For substrates with an MVER exceeding 5 lbs. per 1,000 sq. ft. (2,27 kg per 92,9 m<sup>2</sup>) per 24 hours, using a calcium chloride test (reference ASTM F1869), install a suitable moisture-reduction barrier.

Note: The maximum allowable MVER is always determined by the complete system installed, including primers, underlayments/toppings, floor coverings and sealers. The wide variety of substrate conditions, floor coverings and adhesives available requires careful analysis of the intended final floor use, as well as compliance with each manufacturer's recommendations for MVER, retained moisture content and adhesive selections.

- Do not install *NA 410* over particleboard, chipboard, hardboard (Masonite), Luan panels, metal, asbestos, gypsum-based patching materials or any other nondimensionally stable materials.
- *NA 410* can be installed over steel decking when properly primed with a 100%-solids epoxy primer.

To ensure installation success, test a small area for compatibility, bond strength and performance. Contact NAA's Technical Services Department for installation recommendations regarding substrates and conditions not listed.

## TECHNICAL NOTES

- Fluid once mixed, *NA 410* can easily be installed from 1/8" to 1" (3 mm to 2,5 cm) in a single lift. *NA 410* is ready to accept installation of ceramic tile and natural stone after 12 to 24 hours. After 36 to 48 hours, it can accept installation of such floor coverings as carpet, vinyl sheet goods, vinyl tile, VCT, homogenous PVC, rubber and engineered wood plank.
- *NA 410* has a compressive strength greater than 1,800 psi (12,4 MPa) after 1 day, 3,200 psi (22,1 MPa) after 7 days and greater than 3,800 psi (26,2 MPa) after 28 days.
- *NA 410* is compatible with a wide variety of floor-covering adhesives, epoxy adhesives, polyurethane adhesives, and tile and stone installation mortars.
- *NA 410* also can provide an ideal level substrate for cement and epoxy terrazzo flooring systems.
- Before application of *NA 410*, always properly prepare the surface and prime with NAA's *NA 200* or *NA 300*. See respective Technical Data Sheets (TDSs) for details.
- *NA 410* should be used for interior applications only.
- *NA 410* should only be used between 50°F and 95°F (10°C and 35°C). In cooler conditions, use indirect auxiliary heaters to maintain ambient and substrate temperatures within the required range. For temperatures above 85°F (29°C), follow ACI hot-weather application guidelines to ensure a successful installation.
- Provide for expansion and control joints where specified, including the perimeter of the room, columns, supports and equipment pedestals. Do not bridge expansion and control joints. Ensure that such joints are honored completely through *NA 410* and the primer. The minimum recommended width for expansion and control joint cuts in *NA 410* is 1/4" (6 mm). Where control or expansion joints do not exist in the substrate, provide for them in the system per industry standards.
- Do not mix *NA 410* with any other self-leveling underlayment.
- Radiant-heating applications require a concrete surface profile (CSP) of #3 or greater as categorized by the International Concrete Repair Institute (ICRI), as well as an appropriate NAA primer. Because not all radiant-heat systems are alike, consult the radiant-heating supplier along with all industry standards to ensure a successful installation.

## SURFACE PREPARATION

- 1 All substrates must be structurally sound, stable and solid. Substrates must be free of deflection beyond L/360 (or L/720 for stone applications), taking into consideration both live and dead loads. Reference the ASTM C627 standard dealing with deflection.
- 2 Thoroughly clean and remove from the surface any substance that could interfere with the bond of the installation material, including dirt, tar, wax, oil, grease, latex compounds, sealers, curing compounds, form release agents, laitance, loose toppings and any other material that could prevent the proper

bonding of *NA 410* to the substrate. Well-bonded adhesive residue that has been well-scraped can be covered with *NA 410*, in conjunction with the appropriate primer.

3. Concrete surfaces that are sound, stable and uncontaminated may be bonded to without mechanical profile, shotblasting, sandblasting, water-jetting, scarifying, diamond-grinding or other methods.

Note: *NA 410* may not be installed over low-psi (low-MPa) concretes, or concrete surfaces that are weak or degraded near the surface. In most cases, weak upper layers of concrete must be removed by mechanical method to produce sound and solid conditions, and then the resulting substrate must be properly primed.

4. After cleaning and mechanically profiling the substrate, test for MVER using a calcium chloride test (reference ASTM F1869). *NA 410* is an underlayment for use with other finished floor systems (such as resilient, VCT and ceramic). Always follow the manufacturers' recommendations regarding the maximum allowable moisture content and MVER before installation. See the "Suitable Substrates" section in this TDS for details regarding MVER conditions and treatments.
5. Concrete substrate and ambient room temperatures must be between 50°F and 95°F (10°C and 35°C) before application. Temperatures must be maintained within this range for at least 72 hours after the installation of *NA 410*.
6. Fill in deep areas, holes or cracks with appropriate concrete restoration materials especially when installing on a second-story floor or above where fluid material could leak to a floor below.
7. Always prime the prepared surface with a primer before applying *NA 410*.
8. Do not apply primer over standing water.
9. Apply *NA 410* only when the selected primer is in its recommended state as defined in that primer's TDS.
10. Some mechanically prepared substrates may be more porous than others. This may require a specific application of the primer.
11. *NA 410* can be used over engineer-approved plywood or oriented strand board (OSB) subfloors in accordance with the Tile Council of North America's F185-05 specification. Subfloors must be properly prepared, bonded, and free from dirt and dust.  
  
When applying NAA underlayments to plywood flooring, mechanically fasten a diamond mesh on top of the primed surface (meeting the requirements of ASTM C847) before application of *NA 410*. Differential movement within plywood substrate may lead to hairline cracks at plywood joints.
12. Moisture vapor transmission exceeding 5 lbs. per 1,000 sq. ft. (2,27 kg per 92,9 m<sup>2</sup>) per 24 hours must first be treated by installing a suitable moisture-reduction barrier. Apply a small test area to ensure compatibility with the moisture-reduction barrier before general installation of *NA 410*.  
  
If a primer is required with the suitable moisture-reduction barrier, use *NA 300*. Use an appropriate test area to confirm the compatibility of *NA 300* with the moisture barrier.
13. To install *NA 410* over properly prepared ceramic tile, VCT, cement terrazzo or small amounts of old cutback adhesive residue, the surface must be properly prepared, bonded, free of dirt and dust, and primed.
14. To install *NA 410* over properly prepared steel decking or metal, the surface must minimally meet L/360 deflection requirements for tile and L/720 deflection requirements for stone, taking into consideration both live and dead loads (per ASTM C627). Prime the properly prepared surface with a 100%-solids epoxy primer using a sand broadcast method. Follow epoxy primer's manufacturer's recommendations.

## MIXING

1. General mixing

Into a clean mixing container, pour the required amount of cool, clean potable water. If available water is not cool, chill water to 70°F (21°C). Add *NA 410* powder while slowly stirring. Mix water and *NA 410* powder to a mixing ratio of 5 to 5.25 U.S. qts. (4,73 to 4,97 L) water per 50-lb. (22,7-kg) bag of *NA 410*. The mixing ratio must remain consistent. Do not overwater material.

## 2. Barrel mixing

Using the mixing ratio in Item 1 of the "Mixing" section, mix using a high-speed mixer (at about 850 to 1,200 rpm) with an "egg-beater" mixing paddle. Mix to a homogenous, lump-free consistency (for about 90 to 120 seconds). Do not overmix. Overmixing or moving the mixer up and down during the mixing process could trap air, which could shorten the pot life or cause pinholing during application and curing.

## 3. Pump mixing

NA 410 can be mechanically mixed, using the mixing ratio in Item 1 of the "Mixing" section, with a continuous mixer and pump (with at least 100 ft. [30,5 m] of hose) or with a batch mixer and pump (with at least 70 ft. [21,3 m] of hose). Mixer and pump must be in good working condition. Periodic cleaning of pumping equipment is required per the manufacturer's instructions. Be sure to pressure-test the rotor and stator for proper mixing. Use a mesh screen "sock" at the end of the hose to catch any foreign material that could enter the hopper of the mixer. Apply to a small test area before general application to ensure a successful installation.

## APPLICATION

1. Before installation, close all doors and windows to prevent drafts. Protect areas from direct sunlight.
  2. Make sure the concrete substrate and ambient room temperatures are between 50°F and 95°F (10°C and 35°C) before application. Temperatures must be maintained within this range for at least 72 hours after the installation of NA 410. In cooler conditions, use indirect auxiliary heaters to maintain the ambient and substrate temperatures within the required range. For temperatures above 85°F (29°C), follow ACI hot-weather application guidelines to ensure a successful installation.
  3. Application of NA 410 over large areas can be made easier and more efficient by using conventional piston, rotor-stator or underlayment-type pumps.
  4. For best results, work as a team to provide a continuous flow of wet material to avoid trapping air or creating a cold joint.
  5. Set the width of the pour at a distance that is ideal for maintaining a wet edge throughout placement. Quickly pour or pump NA 410 onto the properly prepared and primed surface in a ribbon pattern. If a wet edge cannot be maintained, reduce the width of the pour.
  6. NA 410 has an approximate flow time of 10 minutes at 73°F (23°C), is self-leveling and can be applied from 1/8" to 1" (3 mm to 2,5 cm) in a single application. Temperature and humidity affect the working time, flowability and setting time. Apply enough material to adequately cover all high spots.
  7. Immediately after placing the NA 410, spread the material with a gauge rake. After achieving the desired depth, smooth the surface with a smoother to obtain an even surface. Do not overwork the material, which could trap air.
  8. NA 410 hardens and is ready to accept installation of ceramic tile and natural stone in 12 to 24 hours. Suitable floor coverings – such as carpet, vinyl sheet goods, vinyl tile, VCT, homogenous PVC, rubber and engineered wood plank – can be installed 36 to 48 hours after application. Protect the surface from contaminants until the final flooring installation is complete. Applications of greater depths (more than 1" [2,5 cm] – see Item 9) and in cooler temperatures may require extra curing time before the installation of covering surfaces.
  9. NA 410 may be extended with 1/4" to 3/8" (6 to 10 mm) of clean, saturated surface-dry (SSD) aggregate on the primed surface at no more than half of the total pour depth. Pour NA 410 over placed aggregate and rake aggressively to ensure full contact and bond with substrate. Immediately pour 1/4" (6 mm) of NA 410 over the raked aggregate to provide a smooth, level surface. Alternately, one may add aggregate (up to 30% by weight, 15 lbs. or 6,80 kg) directly to the NA 410 when mixing; in this case, add the aggregate after reaching a homogenous mix of NA 410 and water.
- Note: Use only clean, nonreactive aggregates.

## EXPANSION AND CONTROL JOINTS

1. Provide for expansion and control joints where specified, including the perimeter of the room, columns, supports and equipment pedestals. If control and expansion joints do not exist in the substrate, provide for them in the system.
2. Do not bridge the substrate's expansion and control joints. Ensure that such joints are honored completely through NA 410 and the primer.
3. Cut joints in NA 410 at least 1/4" (6 mm) wide as soon as the product has reached a final set and can be walked on.

## CURING

1. NA 410 is self-curing; do not use a damp-curing method, or curing and sealing compounds.
2. Protect NA 410 from excessive heat or draft conditions during curing. Turn off all forced ventilation and radiant-heating systems. (Some radiant-heating systems should not be tuned on until 7 to 14 days after installation; check with heat manufacturer.) Protect for up to 24 hours after completion.
3. Avoid walking on the installed surface for at least 6 hours after installation, depending on temperature and humidity conditions.
4. Protect installation from traffic, dirt and dust from other trades until NA 410 has completely cured and the final flooring has been installed.

## CLEANUP

Wash hands and tools with water promptly before material hardens. Cured material must be mechanically removed.

## IMPORTANT NOTICE

Before using, user shall determine the suitability of the product for its intended use and user alone assumes all risks and liability whatsoever in connection therewith. **ANY CLAIM SHALL BE DEEMED WAIVED UNLESS MADE IN WRITING TO US WITHIN FIFTEEN (15) DAYS FROM DATE IT WAS, OR REASONABLY SHOULD HAVE BEEN, DISCOVERED.**

For the most current product data, visit [www.na-adhesives.com](http://www.na-adhesives.com).



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