



NEXGEN Building Products

MAXTERRA®

MgO Fire- And Water-Resistant
Underlayment

NEXGEN

www.nexgenbp.com

Tomorrow's Building Solutions, Today.

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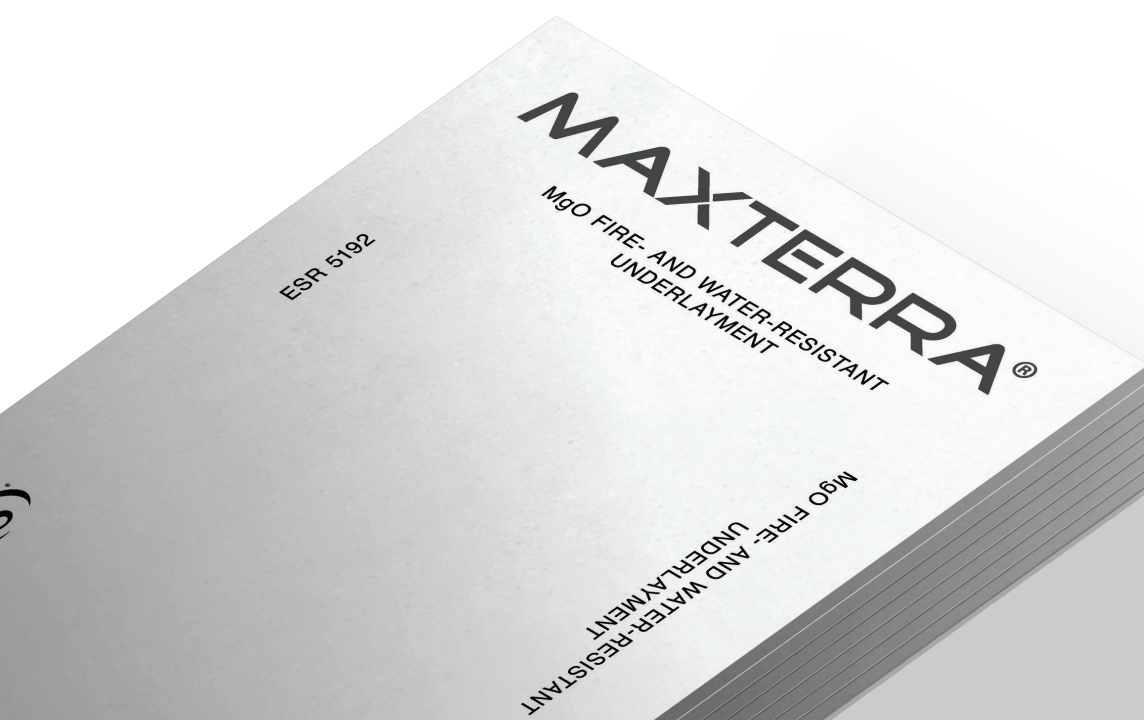
Introduction

Welcome to MAXTERRA® MgO Fire- and Water-Resistant Underlayment, our premier solution for advanced flooring systems. At NEXGEN, we champion "a safer, stronger, healthier way to build." This guide is designed to provide step-by-step instructions to ensure proper installation, optimal performance, and long-lasting durability for your project.

This guide addresses various project conditions and emphasizes adherence to the highest standards set by NEXGEN Building Products, LLC, as well as local building codes, and guidelines from architects, engineers, and other authorities having jurisdiction. Proper installation requires compliance with the most stringent requirements specified by these sources.

Please thoroughly review this guide and ensure compliance with all installation instructions, including fastening and waterproofing techniques, to maximize the performance and lifespan of your installation.

For additional guidance, please contact NEXGEN Building Products. Invest in MAXTERRA® for quality and success—Tomorrow's Building Solutions, Today.



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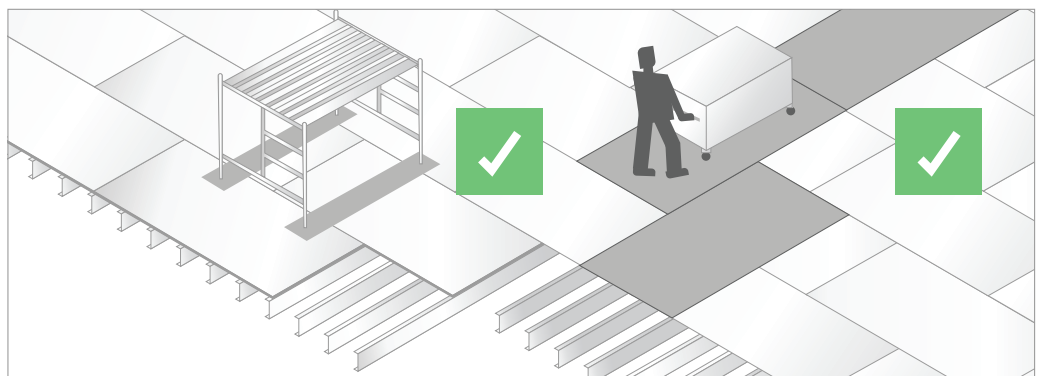
1. General

1.1 Description

One of the keys to good performance in floors is the right combination of subfloor, underlayment and finish flooring. **MAXTERRA® MgO Fire- and Water-Resistant Underlayment** panels provide a smooth base for carpet, tile, or sheet flooring, and other types of finish flooring

NEXGEN MAXTERRA® MgO is a best-in-class, innovative, and versatile mineral-based building material that utilizes magnesium oxysulfate (MOS) cement technology. It is a superior alternative to conventional underlayment boards by offering unmatched fire resistance, water resistance, and mold and mildew resistance without the use of harsh chemicals.

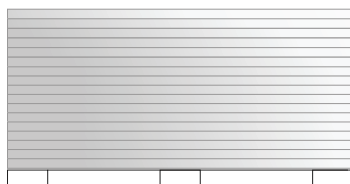
- A. **MAXTERRA® MgO Fire- and Water-Resistant Underlayment** high-density magnesium oxide panels can be used as a replacement for traditional Portland Cement Boards.
- B. **NEXGEN MAXTERRA® Underlayment** can be attached directly to the structural subfloor using corrosion-resistant nails, screws, or staples.
- C. **MAXTERRA® Underlayment** must be installed in accordance with instructions contained in this Installation Manual. For use as underlayment, the structure must be designed for a maximum allowable assembly deflection of $L/360$ for the applicable design loads.
- D. When fastening bottom plates of walls bearing on top of the **MAXTERRA® MgO Underlayment**, attach using fasteners that are inherently resistant to corrosion or coated for corrosion resistance (performance equal to or better than Class D, ASTM A153 Hot-Dipped Galvanized Stainless Steel, or ASTM B117 1000+ hr salt-spray rated).
- E. When **MAXTERRA® Underlayment** has been installed, NEXGEN recommends laying a temporary sheet of MAXTERRA® Underlayment, plywood or OSB over the underlayment in all high traffic areas and in areas where point loads such as ladders and drywall carts will be present to protect the underlayment surface during construction.



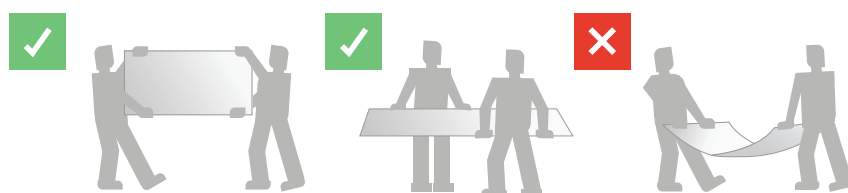
- F. Vapor barriers, if required in the project design or by the finish flooring manufacturer, must be installed, as applicable.
- G. For optimum performance, **MAXTERRA® Underlayment** panels must be installed in accordance with this installation manual and the applicable fire-resistant rated design assembly. In the event of conflicting instructions, the most stringent requirements must be used.
- H. Sustainability Characteristics:
 - 1. **NEXGEN MAXTERRA® MgO** is free from VOCs, quartz silica, and Red List chemicals.
 - 2. The formulation is sulfate-based, which distinguishes it from traditional chloride-based MgO products by addressing corrosion issues and

1.2 Storage and Handling

- A. Store **MAXTERRA®** products in a cool, dry location (indoors or in a covered location when possible). Product should be stored off the ground, on a clean and level surface, horizontal and fully supported (panels should be placed on dunnage, pallets, or risers; at least 4-6 inches above ground level). Until they are ready to be used, the product should remain covered with the original plastic wrap (if the wrap is damaged, it should be resealed with a waterproof tarp or plastic sheeting), with proper ventilation provided to avoid trapping any environmental moisture. Consider additional protection during extended adverse weather conditions.
- B. Avoid keeping panels/pallets in freezing temperatures. Freezing may result in panels sticking together. If panels become frozen, allow them to thaw naturally; bring panels/pallets to a location where the temperature is above 32°F (0°C) to allow the ice to melt naturally. **Salt or de-icing agents should not be used at any time;** sand may be used for ice build-up. Covering the panels/pallets with tarps or similar coverings is an effective way to prevent panels from freezing together. To remove accumulated snow, use a plastic edged shovel to prevent panel damage.
- C. Ensure forklifts or other equipment used to move the pallet or load are capable of lifting and moving the pallet or load safely. If it is necessary to lift pallets from the long end, make sure the forks are long enough to safely balance the weight of the lift. It is recommended to limit stacking of pallets to 2 high on job sites and not more than 12 feet high in warehouses so long as the pallets are not damaged.



- D. Proper design and material staging are required to avoid unforeseen loading of subflooring during construction. The design professional is responsible for structural support of special loads that may occur during construction or staging.
- E. Make sure to use two people when handling individual MAXTERRA® Underayment panels.
- F. Hold the panels along the long length with hands spaced apart to avoid excessive bending.



1.3 Project Site Conditions

- A. Underayment should be installed only on a dry subfloor. Moisture may accumulate when the subfloor is exposed to weather during construction and can cause excessive expansion of the subfloor panels if the subfloor is not allowed to dry adequately. A damp subfloor can also contribute to nail pops and squeaks.
- B. 1/2 in. (12 mm) and 5/8 in. (16 mm) panels may be installed immediately after installation of the structural subfloor and may be exposed to weather for up to 200 days.
- C. For 1/4 in. (6mm) and 3/8 in. (9 mm) panels, follow traditional building practices so that scheduling allows the subfloor to dry out and become conditioned in an enclosed, conditioned environment prior to installation of the underayment and floor covering.

NOTE: Before installing, allow 1/4 in. (6mm) or 3/8 in. (9mm) underayment panels to acclimatize by standing them on edge and separating them to permit air circulation for several days in the rooms where they will be installed.

1.4 Safety

- A. Follow all standard industrial safety and hygiene practices during the installation. Wear appropriate personal protective gear. Read SDS and installation information before beginning specification and installation.

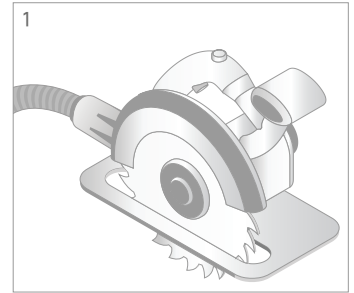
1.5 Warranty

- A. Manufacturer's Warranty: Provide the manufacturer's standard limited warranty in effect at the date of purchase for a period of ten (10) years.

2. Preparation

2.1 Materials and Tools Needed

- A. Safety glasses
- B. Gloves
- C. Respiratory protection (mask)
- D. Utility knife or backer board scoring knife ([scoring knife is recommended for 1/2" (12 mm) or 5/8" (16 mm) thick panels])
- E. Fasteners (nails, screws, or staples)
- F. Hammer or nail gun
- G. Electric drill
- H. Jigsaw
- I. Circular saw equipped with a **dust-collection device** - a fiber cement blade is recommended.¹



2.2 Subfloor

- A. With a panel thickness of 1/4 in. (6 mm), 3/8 in. (9 mm), 1/2 in. (12 mm), or 5/8 in. (16 mm):
 - 1. The subfloor should be an APA span-rated wood structural panel (plywood or OSB), or MAXTERRA™ Non-Combustible Single Layer Structural Floor Panels (ICC-ES ESR-5194). Subflooring shall be adequately designed to support the required design loads for the project joist spacing. The **MAXTERRA® Underlayment** must not be considered in designing the load carrying capacity of the floor assembly.
 - 2. **MAXTERRA® Underlayment panels** must be fully supported by the structural panel subflooring below.
 - 3. Clear the subfloor of dust, debris, and standing water.
 - 4. When subfloor panels are dry, visually check the subfloor end and edge joints for flatness or variations in subfloor panel thicknesses that will transmit through to the underlayment. This will be extremely visible with strong side lighting from windows, doors, and interior lighting.
 - 5. If necessary, to correct surface imperfections with wood subfloor panels, sand the subfloor problem areas with a commercial floor sander or use a compatible leveling compound.
 - 6. If necessary, to correct surface imperfections with MgO or cement-based subfloor panels, use an elastomeric compound explicitly designed for concrete and masonry substrates. Follow the manufacturer's instructions for achieving optimal gap filling and leveling applications.

7. Repair any structural buckling by adding blocking under the subfloor. Fasten the subfloor to the blocking to flatten the subfloor panels.
8. Check the subfloor for squeaks and refasten as necessary before installing the underlayment.
9. Do not install **MAXTERRA® Underlayment** panels over the top of any designed expansion joints/gaps in the structural panel subfloor. Integrity of any designed expansion joints/gaps must be maintained through **MAXTERRA® Underlayment**.
10. Inspect the area. Make sure all subfloor fasteners are at or below the surface, repair any large gaps with leveling compound.

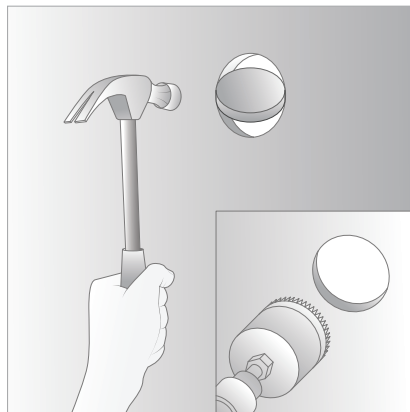
2.3 Walls Installed Atop 1/2 in. (12mm) or 5/8 in. (16mm) MAXTERRA® Underlayment

For design purposes, **MAXTERRA® Underlayment** provides an allowable bearing stress ($F_c \perp$) greater than or equal to the allowable bearing stress of wood structural panels (OSB or plywood) of the same thickness.

- A. Bottom plates of walls bearing on top of MAXTERRA® underlayment must be attached to the framing with corrosion resistant fasteners (performance equal to or better than Class D, ASTM A153 Hot-Dipped Galvanized Stainless Steel, or ASTM B117 1000+ hr salt-spray rated). The fastening methods described below may be used, but alternative attachment methods may also be designed by a licensed engineer or design professional. The bottom plates for shear walls must be constructed in accordance with the requirements of the engineer-of-record as outlined in the approved project drawings and specifications.
- B. For 1/2 in. (12mm) thickness:
 - For wall panels in non-braced (non-shear) applications, the bottom plates must be nailed with minimum 2-16d common nails [3.5 in. x 0.162 in. dia. (89 mm x 4.1 mm dia.) spaced at 16 in. o.c. (406 mm).
 - For wall panels in braced (shear) applications, the bottom plates must be nailed with minimum 2-16d common nails 3.5 in. x 0.162 in. dia. (89 mm x 4.1 mm dia.) spaced 8 in. o.c. (203 mm).
- C. For 5/8 in. (16mm) thickness:
 - The bottom plate attachment must be designed by a licensed design professional.
 - MAXTERRA® underlayment provides an allowable bearing stress ($F_c \perp$) greater than or equal to the allowable bearing stress of wood structural panels (OSB or plywood) of the same thickness.

2.4 Cutting

- A. Underlayment panels can be cut to size with a utility knife and a straight edge or a power saw.
1. Line up the intended cut with the straight edge.
 2. Score the panel face with the utility knife, pressing hard enough to cut through the glass fiber reinforcing mesh.
 3. Once it has been scored, snap the panel on the score line.
 4. For a clean edge, line up the straight edge on the back side with the snapped panel and cut through the mesh.
 5. Use a rasp to smooth out any rough spots along the edges.
 6. For large projects where a large number of cuts will be made, a power saw equipped with a dust-collection device is recommended. Always wear a NIOSH/MSH-approved mask and eye protection when cutting panels.
 7. Use a low RPM portable saw equipped with a carbide tipped blade intended for use with cement fiber panels.
- B. Cutouts for pipes and fixtures:
1. Use a utility knife to cut through the mesh on both sides of the panel then use a hammer to punch out the desired hole from the back side of the panel, OR
 2. Use an electric drill with a hole-saw bit, OR
 3. Use a jigsaw.



WARNING: If using an electric drill or jigsaw, wear appropriate breathing protection to avoid inhaling the panel dust. See SDS for more information.

3. Tips and Tricks

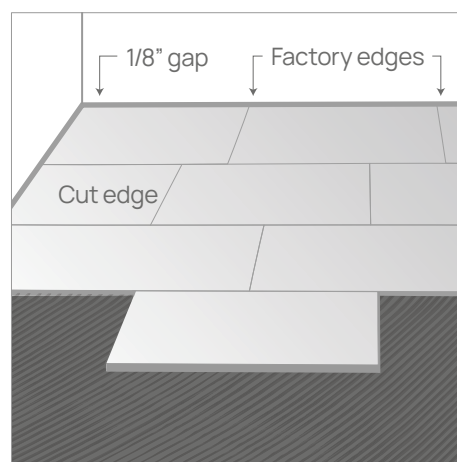
3.1 Things to keep in mind when installing MAXTERRA®

- A. MAXTERRA® Underlayment is used across many different floor projects because it is compatible with many different floor covering solutions. These include laminate, vinyl and wood.
- B. Installing MAXTERRA® Underlayment in a renovation requires the removal of the existing surface material (flooring) before installing underlayment.
- C. Always use corrosion-resistant fasteners (Hot-Dipped Galvanized, Stainless Steel, or ASTM B117 1000+ hr salt-spray rated).
- D. To help prevent damage to the surface of the panels, keep the work area clean of loose debris that can gouge the panel surface, such as loose screws, nails, or other similar materials.

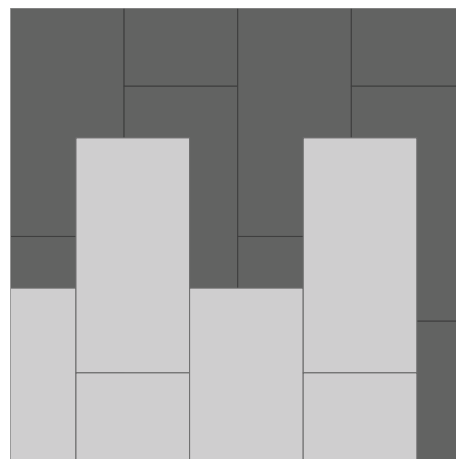
4. Installation

4.1 Plan The Placement

- A. Board joints must be in moderate contact, in a staggered brick pattern.



- B. MAXTERRA® MgO Fire- and Water-Resistant Underlayment panel edges must be staggered from subfloor joints by at least 6 inches.



- C. Four corners of the underlayment sheets must not meet at one point.
- D. Joints in the panels must be provided where existing structural joints (such as building control joints) occur and where changes in direction occur, such as in L-shaped rooms.
- E. Underlayment edges must be kept 1/8 in. (3.2 mm) away from rigid structures such as walls and cabinet bases and cut edges of underlayment must be toward the outside (toward the wall / cabinet base / other ridged structure), as applicable.
- F. Installation over a dry subfloor is essential.
- G. Plan the placement of the underlayment sheets.
1. Lay the sheets so the joints in the underlayment do not line up with the joints in the subfloor. The underlayment should completely cover the subfloor joints. Stagger the board placements a bit like bricks.

- H. Do a dry run and lay out the underlayment to fully cover the area.
- I. If needed, cut the underlayment to fit in small spaces or around obstructions. Score the board with a utility knife, then cut it using a jigsaw with a carbide blade.
- J. Snap a grid to the subfloor or underlayment using a chalk line to mark your underlayment placement.

4.2 Apply Adhesive

NOTE: It is EXTREMELY important to complete the application of the adhesive and installation of the underlayment panels in a timely manner to prevent premature curing of the adhesive before the assembly is completed.

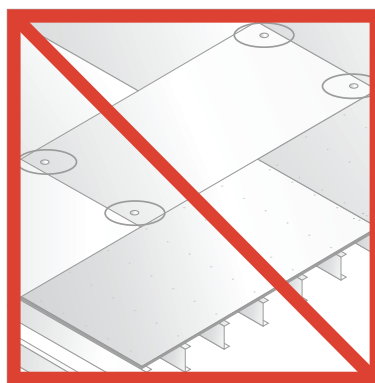
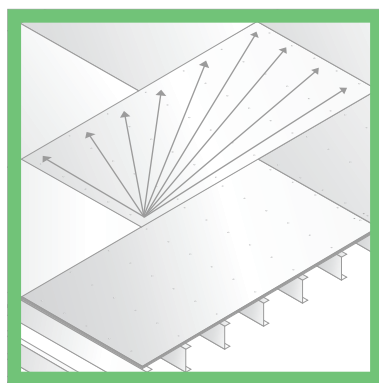
- A. Select a compatible adhesive suited for underlayment applications. Solvent or polyurethane-based construction adhesives compliant with APA AFG-01 or ASTM D3498 are recommended.
- B. The adhesive should be applied directly to the subfloor at the location of the underlayment edges and on a maximum 24 in. (610 mm) grid pattern in the field. It is recommended to only apply enough adhesive to install a single underlayment panel at a time to ensure that the adhesive is in a workable state prior to "skinning" over.
- C. The adhesive must be applied in accordance with the adhesive manufacturer's instructions. In general, a 1/4 in. to 3/8 in. (6.4 mm to 9.5 mm) bead size is recommended, but the manufacturer's guidelines should be followed if they differ from this recommendation.
- D. Once the underlayment panel has been installed with the adhesive, it must be fastened in accordance with the fastening table.

4.3 Lay The Underlayment Panels

- A. While the adhesive is still wet, place a sheet of underlayment onto it and immediately fasten to the subfloor.
- B. Repeat this process, applying adhesive and laying the underlayment one sheet at a time.
- C. Leave a 1/8-in. gap between the underlayment and walls or any other intersections with vertical structures such as cabinets or columns.
- D. Underlayment joints must be in moderate contact, in a staggered brick-like pattern.

4.4 Secure The Underlayment Panels

- A. The size and type of fasteners must comply with jurisdictional requirements.
 - 1. Fasteners should be selected and placed in accordance with the fastening schedule table.
- B. The fasteners should be attached while the adhesive is still wet.
- C. Stand on the panel to make sure it is in direct contact with the subfloor.
- D. Begin installing fasteners at an edge next to an adjacent panel and move toward the opposite edge, making sure the panel lies flat.



CAUTION: Do not overdrive or underdrive fasteners. Overdriving can result in: "telegraphing" fastener or panel joint location through resilient tile or sheet flooring, or floor squeaks due to movement between underlayment and subfloor panels. Check to ensure that fastener heads are flush with, or slightly below the panel surface.

- E. Position the fasteners at least 1/2 in. (13 mm), but no more than 2 in. (51 mm), from the edge of the sheet.
- F. Drive the fasteners so that the heads are slightly below the surface of the underlayment panel.

Fastening Schedule

Panel Thickness	Fastener Type ^{1,2}	Perimeter Spacing ³	Field Spacing
1/4 in. (6mm)	1/4 in crown chisel point staple. ⁴	2 inches O.C.	4 inches O.C.
3/8 in. (9mm)	3d (.083 in. dia.) x 1-1/4 in. ring shank nails.		
1/2 in. (12mm)	0.113 in. dia. x 1-1/2 in. to 2 in. ring shank nails.	6 inches O.C.	12 inches O.C.
5/8 in. (16mm)	#8 x 1-1/2 in. to 2 in. wafer-head screws.		

For SI: 1 inch = 25.4 mm

- ¹ Fasteners must be corrosion resistant (electrogalvanized, hot-dipped galvanized, or stainless).
- ² Fasteners must be set flush or just below panel surface.
- ³ Fasteners must be placed a minimum of 1/2-inch (13 mm) from edges and 2 inches (51 mm) from corners.
- ⁴ Staple length must be selected such that it embeds at least 85% of the thickness of the subfloor but does not protrude from the bottom of the subfloor panel.
- For example: 1" (25 mm) length staples should be used with 1/4-inch (6 mm) thick underlayment and 3/4-inch (19 mm) thick subfloor; 7/8" (22 mm) length staples should be used with 1/4-inch (6 mm) thick underlayment and 5/8-inch (16 mm) thick subfloor.

5. Finish Floor Coverings

5.1 Surface Preparation

NOTE: Before installing the finish flooring, fill any edge gaps, splits, or minor damaged areas in the underlayment with an elastomeric compound explicitly designed for concrete and masonry substrates. Follow the manufacturer's instructions for achieving optimal gap filling and applications. (This step may not be necessary under some carpet and structural flooring products. Check the manufacturer's recommendation.) Lightly sand any surface roughness, particularly around fasteners. Refer to finish flooring manufacturer's tolerances and guidelines to ensure applicable requirements have been met prior to proceeding with installation.

Remove all dust, dirt and debris from the **MAXTERRA®** underlayment surface. Make sure panel surface is clean and free from water, oil, grease and other contaminants.

- A. Ensure that fasteners used to install **MAXTERRA®** panels sit flush or just below the panel surface.
- B. Identify and repair any imperfections in the surface of the panels and repair any damage in accordance with these instructions.
 - 1. As with any surface to receive floor finishes, **MAXTERRA®** panels should be flat and free from excessive high and low areas.
 - 2. Floor flatness requirements may vary depending on type of floor covering. Follow all finish flooring manufacturer requirements.
- C. HVAC system should be running at end-use conditions for a minimum of 48-hours prior to finish floor installation.

5.2 Floor Coverings

- A. Carpet and pad can be installed over **MAXTERRA®** panels using adhesive tack strips. Use hotmelt glue adhesive to secure strips to the surface of **MAXTERRA®** panels.
- B. For commercial carpet tile, or other adhered carpets, follow all flooring manufacturer's requirements for adhesives, primers and substrates. For best results, the use of a primer is recommended.

5.3 Tile

- A. For tile installations, see the **MAXTERRA® Backer Board** installations instructions.

5.4 Natural Hardwood Flooring

- A. For the installation of natural hardwood flooring on MAXTERRA®™ Underlayment panels, full-coverage adhesive is mandatory, as mechanical fasteners alone are insufficient. The flooring manufacturer's guidelines for adhesive type and application rates must be followed.

5.5 Vinyl

- A. Vinyl products such as luxury vinyl plank (LVP), and luxury vinyl tile (LVT) may be installed as floated or adhered systems over MAXTERRA® underlayment in accordance with manufacturer's requirements.
- B. Vinyl sheet products and vinyl composition tile (VCT) may be installed in fully adhered applications.
- C. For adhered vinyl floor finishes, ensure substrate compatibility with finished flooring manufacturer and follow all installation requirements. For best results, it is recommended to patch and feather all seams and apply primer to the area to receive the floor covering for optimal results.

6. Fire-Resistant and Sound-Rated Assemblies

6.1 Fire-Resistant Assemblies

- A. MAXTERRA® underlayment has been evaluated in specific fire-resistance rated designs in accordance with ASTM E119/ANSI UL 263 and can be used in specific fire-resistant-rated assemblies; see www.nexgenbp.com/resources and for more information.
- B. Follow all local building code requirements for fire-resistance rated construction.

6.2 Sound-Rated Assemblies

- A. MAXTERRA® underlayment has been evaluated in specific acoustically rated designs in accordance with ASTM E90 / ASTM E492 and can be used in specific sound attenuation assemblies; see www.nexgenbp.com/resources and ICC-ES ESR-1645 for more information.

NEXGEN

www.nexgenbp.com

Technical Support

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NOTICE

The product must be stored and handled according to NEXGEN's instructions at all times between purchase and installation and must be installed according to NEXGEN's printed installation instructions and all applicable building codes adopted by federal, state or local governments or government agencies. NEXGEN's Limited Warranty does not cover damage, claims, or defects resulting from or in any way attributable to the improper use, storage, shipping, handling or installation of the product.

For all terms and conditions see www.nexgenbp.com/resources