

**NU-AGE™**  
HEATING SYSTEMS

**AFM-WM**  
SPEC DATA

### 1. PRODUCT NAME

Nu-Age Anti-Fracture Waterproofing Membrane (AFM-WM)  
Nu-Age Anti-Fracture Membrane (AFM)

#### Primers and Accessories

- 6000 Interior Primer
- 80 Exterior Primer
- AFM-500 Detail Tape
- 160-Mastic

### 2. MANUFACTURER

NanoTube Solutions, LLC  
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### 3. PRODUCT DESCRIPTION

#### Basic Use

AFM is a 40mil (1mm) thick reinforced peel-and-stick sheet membrane specifically designed for use under ceramic tile, porcelain and natural stone as a stress relieving material in conjunction with thin-set methods. The membrane has the flexibility and strength to withstand structural movement and natural concrete shrinkage cracks up to 1/4" (6.4mm) without transferring the stress load to the finished tile topping.

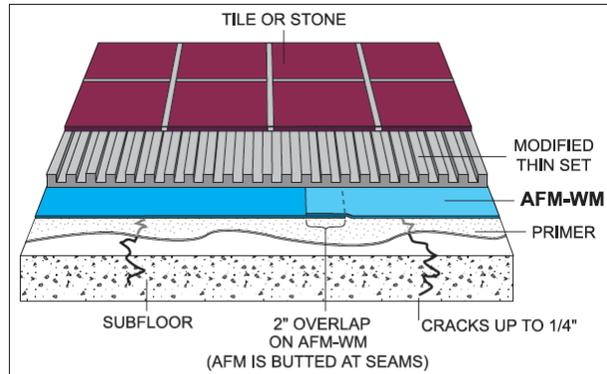
AFM can keep unsightly reflective cracks from surfacing in expensive tile floor finishes by expanding and contracting with shrinkage cracks. Areas of application include: concrete slabs, plywood, pre-cast floor panels, gypcrete, OSB, radiant heated floors, ceramic tile, terrazzo, marble, slate, stone, leveling and patching compounds, radon conditions, backer board, existing VAT and VCT and vinyl floors. AFM can be used in airports, shopping malls, office buildings, restaurants, department stores, commercial buildings, apartments, condominiums, residential homes, convention centers, entry-ways, breezeways or anywhere subfloor cracking in floors can cause problems with the performance of tile floors.

AFM-WM is a waterproofing membrane specifically designed for use under ceramic tile, porcelain and natural stone as a waterproofing, stress relieving, sound control and radon barrier in conjunction with thin-set methods.

AFM-WM features all the benefits of AFM. It also includes a 2" (51mm) overlap strip, which provides an adhesive-to-adhesive cohesive bond between subsequent sheets of membrane. Once the cohesive bond occurs, AFM-WM turns into a monolithic or single-ply membrane across the entire surface being water-proofed.

AFM-WM is suitable for all applications where AFM is recommended, in addition to showers. It can be installed on all substrates cited for AFM.

Both AFM and AFM-WM can be used for interior and exterior applications.



Membrane over cracked substrate protects tile installations.

#### AFM Packaging

Localized Crack Isolation: 12" x 25' and 12" x 75' rolls  
(305mm x 7.6m and 305mm x 23m rolls)

Full Floor Coverage: 36" x 75' rolls  
(914mm x 23m rolls)

Crack Protection Kit: 12" x 25' rolls  
(305mm x 7.6m rolls) plus primer

Crack Suppression Kit: 12" x 75' rolls  
(305mm x 23m rolls) plus primer

Crack Prevention Kit: 30" x 50' rolls  
(762mm x 15.2m rolls) plus primer

#### AFM-WM Packaging

Full Floor Coverage: 36" x 75' rolls  
(914mm x 23m rolls)

Additional Packaging: See Tables 2, 3, 4.

#### Composition and Materials

AFM consists of a tough fabric reinforcement laminated to an aggressive adhesive membrane. The membrane is tacky on the bottom, providing for superior adhesion to concrete, steel and wood substrates. The top fabric makes an excellent bonding surface for latex modified thin-set mortars or thin-set tile adhesives.

AFM can be used as a full floor covering beneath thin tile setting systems and is thin enough to be utilized in localized movement or cracking areas without causing bumps in thin-set tile finishes. The AFM system contains no VOCs and is environmentally safe, which allows its use in confined areas. The aggressive rubberized adhesive retains its flexibility throughout the life span of the floor and will not dry out or decay with time.

AFM-WM shares AFM's composition properties, and it has a 2" (51mm) overlap guide, which provides an adhesive-to-adhesive cohesive bond on the side laps.

### Accessory Materials

6000-Primer: High tack water based primer is ideal for use on indoor applications available as a concentrate, this primer can be mixed at the jobsite with clean water or used in its full concentrate form, depending on the condition and porosity of the substrate. It is used in its concentrate form when used in vertical application.

80-Primer: High tack exterior grade solvent based primer. A VOC compliant formula is available upon request.

160-Mastic: Sealant is used with AFM-WM for waterproof detailing around edges, drains, posts, protrusions, etc.

AFM-500 Detail Tape is a 20mil (0.51mm) unreinforced conformable tape used prior to installing AFM-WM for detailing inside corners, drains, posts, protrusions or any area where membrane adherence may be difficult.

### Limitations

AFM is not intended for use as a water-proofing membrane when installed with butt joint seams typically used for Anti Fracture Membrane installation. For water-proofing applications requiring multiple sheets of membrane, use AFM-WM with the factory overlap edge for ease of providing waterproof seams. Follow Nu-Age Heating details for sealing corners, edges, splices and seams as needed.

*Note:* AFM is a water-proofing membrane and can be used as a single sheet on seamless applications or on larger installations if details are followed for sealing corners, edges, splices and seams. The following limitations apply to both AFM and AFM-WM: Do not install over wet primer.

Not recommended for use on concrete floors where hydrostatic head pressure exists or moisture vapor transmission in excess of 3-4 lbs is present. Not recommended for use where horizontal floor movement is greater than 1/4" (6.4mm). Existing cracks larger than 3/16" (4.8mm) should be prepared with proper backing material prior to installation. Not recommended to cover joints or cracks larger than 3/8" (9.5mm)

Not recommended for use where vertical floor movement is present. For installations over plywood subfloors, please refer to TCA Method F147. For expansion joints, reference TCA Method EJ171. Do not apply over marine-grade plywood or other substrates containing solvent based waterproofing preservatives that could chemically react with the membrane.

Do not use solvent based sealants or sealers where contact with membrane may occur. When installing natural stone over AFM or AFM-WM (or any other impervious membrane), it is important to maintain a thin-set thickness of 3/8" (9.5 mm) or less after the tile is embedded, even if the mortar manufacturer allows for thicker installations. Thicker mortar beds can potentially provide sufficient moisture to cause some natural stones to warp or crown. Not recommended for vertical applications exceeding 8' (2.4m) height. For vertical exterior applications, contact NanoTube Solutions to confirm design includes adequate mechanical fastening and movement joints for application.

**TABLE 1** Typical Physical Properties (AFM / AFM-WM)

Thickness	40 mil (1mm)
Color	black adhesive bottom
Elongation	500 min (rubberized adhesive)
Application Temperature	45° to 120°F (7° to 49°C)
Service Temperature	-20° to 180°F (-29° to 82°C)
Transmission Class	STC 55
Impact Insulation	IIC 67
Robinson Floor Test	extra heavy duty traffic

**TABLE 2** Packaging Information (AFM)

12" x 25'	9 rolls/case	18 cases/pallet
12" x 75'	3 rolls/case	30 cases/pallet
36" x 75'	1 roll/case	30 cases/pallet

**TABLE 3** Packaging Information (AFM-WM / AFM-500)

AFM-WM	36" x 75'	1 roll/case	30 cases/pallet
AFM-500	6" x 50'	8 rolls/case	30 cases/pallet
AFM-500	12" x 50'	4 rolls/case	30 cases/pallet

**TABLE 3** Packaging Information (Accessories)

6000 Interior	16oz bottle	9/case
6000 Interior	1 gallon can	4/case
80 Exterior	1 gallon can	4/case
80 Exterior	5 gallon pail	1/case
160 Mastic	10.5oz tube	36/case
160 Mastic	1 gallon can	4/case

## 4. TECHNICAL DATA

### Applicable Standards

*ASTM C482* Standard Test Method for Bond Strength of Ceramic Tile to Portland Cement

*ASTM C627* Standard Test Method for Evaluating Ceramic Floor Tile Installation Systems Using the Robinson Type Floor Tester

*ASTM D412* Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers Tension

*ASTM E90* Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements

*ASTM E492* Standard Test Method for Laboratory Measurement of Impact Sound Transmission Through Floor-Ceiling Assemblies Using the Tapping Machine American National Standards Institute

*ANSI 118.10* Waterproof Membranes for Thin-set Tile and Stone

*TCA Method F147*

*TCA Method EJ171*

*Tile Council of North America (TCNA) - Handbook for Ceramic Tile Installation*

### Approvals

Consult manufacturer for current information on approvals by code bodies and other industry entities.

## 5. INSTALLATION

### Storage and Handling

Store all materials in a dry space at temperatures between 50° and 90°F (10° and 32°C). Do not store in direct sunlight. Do not remove from box until ready to use.

### Preparation

Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact. Store materials protected from exposure to harmful environmental conditions and at temperature and humidity conditions recommended by the manufacturer. Verify that site conditions are acceptable for installation. Do not proceed with installation until unacceptable conditions are corrected. The surface to receive AFM and AFM-WM must be clean, dry and free of any foreign matter that may adversely affect the membrane's adhesion.

### Application

#### Priming - Interior Applications

Begin the priming process by mixing water based primer concentrate with clean tap water in a separate container (see below for Exterior Applications). 6000 concentrate is mixed at a ratio of 1 part concentrate to 2 parts water for horizontal applications.

On vertical, porous or weathered surfaces, the concentrate should be used full strength. Be sure to thoroughly mix the primer. Should the primer be left to sit for any extended period of time, thoroughly re-mix before use. Only mix enough primer that can be used in half a day. Begin priming by brushing or rolling the 6000 water based primer onto the surface at a rate of 500-600 ft<sup>2</sup>/gal (12.5-15 m<sup>2</sup>/L).

Coverage may vary depending upon the porosity of the surface being covered. The primer must be allowed to dry fully before the AFM or AFM-WM is installed. When fully cured, the primer will feel tacky to the touch but will not come off the surface.

#### Priming - Exterior Applications

Prior to installing AFM-WM, apply 80 Primer onto the surface with a brush or roller at an application rate of 150 - 200 ft<sup>2</sup>/gal (3.6 - 5 m<sup>2</sup>/L) and allow to dry. Coverage may vary depend-ing on the porosity of the surface.

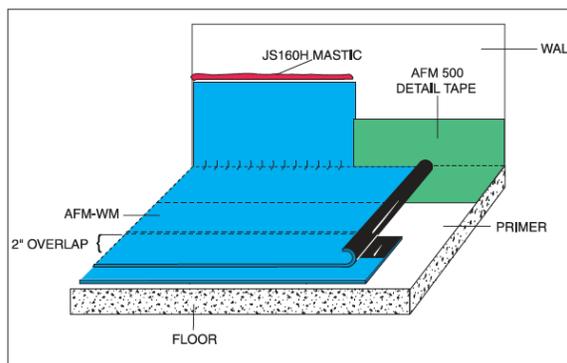
*Note:* A VOC compliant version of 80 Primer is available upon request.

*Note:* 6000 Primer can be used full strength for exterior applications. Techniques for AFM, There are 3 installation techniques: crack isolation, full floor coverage and vertical application.

*Note:* There will be an immediate and aggressive bond of membrane to primed subfloor. Realignment of the membrane can be difficult once adherence to the subfloor begins.

1. Crack must be covered a minimum of 6" (152 mm) in any direction.
2. Membrane must be a minimum of 1½ times the width of the tile.
3. Where any portion of a tile spans a crack, the tile must rest completely on membrane.

*Note:* If membrane width does not meet the above criteria, turn the membrane 90 degrees and apply in proper lengths perpendicular to the crack.



AFM-WM waterproofing membrane detailing

Use multiple strips in a butt joint fashion to cover the length of the crack. To apply membrane, carefully remove the first few inches of the paper release backing. Align 6" (152mm) above the beginning of the crack and press into place. Continue removing the release paper, exposing the adhesive bottom, while smoothing the membrane onto the primed surface. Continue to smooth the membrane as it comes into contact with the primer, which is essential to gain maximum adhesion, as well as to minimize trapping air beneath the membrane. Repeat process as necessary.

#### Full Floor Coverage

Prime area as described above and allow to dry. Roll out the AFM membrane (do not remove the release paper at this point) and cut to the appropriate length. Pull one half of the membrane on top of the other half. Lightly score the paper at the halfway point. Do not cut through the adhesive. Begin pulling the release paper off the upper section and apply the exposed adhesive bottom to the primed surface, smoothing the membrane as the adhesive comes into contact with the surface. Once completed, pull the other half of the AFM membrane on top of the applied AFM membrane. Pull the remaining release paper off the membrane while smoothing the AFM into place. Pre-cut a new sheet of AFM and align the new membrane sheet next to the installed AFM membrane sheet as described above. Should air become trapped beneath the membrane, puncture it with a sharp instrument and press the sheet flat. For maximum performance, ensure that 100% of the surface is in contact with the primed substrate.

#### Vertical Application

Prime the surface with 6000 Primer in its concentrated form as described above (do not dilute). Apply the membrane as previously described, starting the membrane application at the top of the vertical surface. For vertical exterior applications, see Limitations section.

### Techniques for AFM-WM

#### Step 1 - Detailing With AFM 500

Detail Tape areas around pipes, conduits or any protrusions through the subfloor should be primed and taped with a 6" (152mm) piece of AFM 500 Detail Tape. Force and form the Detail Tape to fit tightly to the protrusion and the subfloor. At drain openings, apply a light coat of primer and allow it to fully cure. Cover drain at least 6" (152 mm) past all perimeters with AFM 500 Detail Tape. Remove the release paper, apply the membrane over the drain hole, cut an X in the center of the hole and form the

Detail Tape into the drain. Be sure the membrane has 100% contact with the primed drain surface. Remove the top release film. Double ply with a full sheet of AFM-WM over the Detail Tape, then cut and form it around or into the protrusion or drain. Apply a troweled bead of 160-Mastic at the membrane terminations. Secure the drain clamping ring tightly over the AFM-WM membrane. Floor to Wall Transitions and Inside Corners After priming the floor and wall, apply a 6" (152mm) strip of AFM 500 Detail Tape tightly at all floor-to-wall transitions and into the corners. Remove the release paper and install the Detail Tape 3" (76mm) on the floor and 3" (76mm) up the wall. Press the Detail Tape tightly into the corner and be sure to keep any voids from occurring behind the Detail Tape. Remove the release film from the face of the Detail Tape and install AFM-WM (see instructions below) up the wall extending 3" (76mm) past the Detail Tape. Place a 1" (25.4mm) troweled bead of 160-Mastic at all AFM-WM terminations. On inside corner seams at the vertical-to-horizontal transitions, apply a troweled bead of 160-Mastic to the overlap. Trowel the mastic 3" (76 mm) up and 3" (76 mm) out from the transition on the seam. It must cure for a minimum of 24 hours prior to flood testing.

#### *Step 2 - Applying AFM-WM*

Always apply AFM-WM with the strip overlap as the leading edge for the proper seam. Roll out the AFM-WM membrane (do not remove the release paper at this point), and cut to the appropriate length. Pull one half of the membrane on top of the other half. Lightly score the paper at the halfway point. Do not cut through the adhesive. Begin pulling the release paper off the upper section and apply the exposed adhesive bottom to the primed surface. Smooth out the membrane as the adhesive comes into contact with the surface. This is essential to minimize air beneath the membrane. Once completed, pull the other half of the AFM-WM membrane on top of the applied AFM-WM membrane. Pull the remaining release paper off the membrane while smoothing the AFM-WM into place. Pre-cut a new sheet of AFM-WM and align the new membrane 2" (51mm) over the overlap guide on the installed AFM-WM membrane. Remove the overlap release film from the installed AFM-WM membrane 2" (51mm) past the overlap guide. Continue to install the the new membrane sheet as described above. Firmly roll the 2 membrane sheets together, forming a cohesive bond at the overlap. For maximum performance, 100% surface contact to the primed substrate must be achieved.

*Note:* Should air get trapped beneath the membrane, puncture it with a sharp instrument and press the sheet flat. Repair any punctures per guidelines cited in Repairs section.

#### *Step 3 - Applying 160-Mastic*

Use a troweled bead of 160-Mastic on all termination edges, bent seams, end laps, overlaps and detail cuts the same day of application.

#### *End Laps and Corners*

End laps and corner overlaps must be a minimum of 6" (152mm). Place two 1" (25.4mm) troweled beads of 160-Mastic 1" (25.4mm) apart beneath all overlaps and firmly roll the seam. Trowel a 1" (25.4mm) bead of 160-Mastic onto the edge of the overlap, extending 1/2" (12.7mm) on both layers of AFM-WM. Apply a 1" (25.4mm) troweled bead of 160-Mastic 6" (152mm) in both directions to all overlaps and "T" joints. Mastic must cure a minimum of 24 hours prior to flood testing.

#### *Repairs*

Carefully inspect the applied membrane before covering to ensure that it is free of large blisters, fish-mouths or any damage. If the membrane is damaged and requires repair, clean the affected area and lightly prime at least 6" (152 mm) beyond the area damaged and allow to dry. Cut an AFM-WM membrane patch. Cover the re-primed area, press on the patch and roll firmly. Apply a troweled bead of 160-Mastic on all edges of the patch. The patch must overlap the damaged area at least 6" (152mm) on all sides.

#### **Flood Testing**

Nu-Age Heating System warranty cannot be enforced without documentation of a successful leak-free flood test, which must be submitted within 30 days after testing. The applicator and general contractor must sign the successful flood testing document. The mastic must cure at least 24 hours prior to flood testing (48 hours prior to flood testing on all planter boxes). Perform a flood test with a minimum of 2" (51 mm) and a maximum of 4" (102 mm) of water for 24 hours. Plug all drains and position barriers to contain the water. Repair any leaks prior to covering the membrane. Upon completion of repairs, refold the affected area to ensure that repaired leaks are sound.

#### **Curing**

There is no curing time for the membrane. After membrane is adhered, ceramic, porcelain or stone tiles can be installed with a latex-modified thin-set mortar meeting the ANSI 118.6 standard. Follow mortar manufacturer's recommendations for trowel size and open time. For natural stone installations, see Limitations section. Note - For AFM-WM applications, 160-Mastic must be allowed to cure for 24 hours prior to tile installation.

#### **6. AVAILABILITY**

AFM and AFM-WM are available through Nu-Age Heat distributors. For detailed information or to find a local representative or distributor, contact NanoTube Solutions.

#### **7. COST**

AFM and AFM-WM are competitively priced. Contact a local representative or the Corporate Office for information.

#### **8. WARRANTY**

Nu-Age AFM is warranted to be free of defects in manufacture for a period of 5 years. NanoTube Solutions assumes no warranty as to the installation of its products. Should a Nu-Age Heating product prove defective during the term of this guarantee, NanoTube Solutions will pay for replacement of the portion of the installation that involves the defective product. This payment will include finish materials, labor and installation, provided the cost per square foot to NanoTube Solutions does not exceed the original cost of installation per square foot.

#### **9. MAINTENANCE**

None, if installed in accordance with manufacturer's recommendations.

#### **10. TECHNICAL SERVICES**

Complete technical assistance and information are available from Nu-Age Heat field representatives and distributors or by contacting the manufacturer.

#### **11. FILING SYSTEMS**

Additional product information is available from the manufacturer.