

SECTION 093000 - SHEET MEMBRANE WATERPROOFING AND CRACK ISOLATION

PART 1 - GENERAL

This specification includes the sheet membrane used as waterproofing, vapor retarder, and crack isolation in conjunction with tile and dimension stone installations. The content of this section should be combined with the specification for the tile and stone finishes including the setting materials required to complete the sheet membrane installation.

1.1 SUMMARY

Typical Floors and Walls: **Dal-Seal TS** sheet membrane may be installed for waterproofing and crack isolation on floor and wall substrates for tile and dimension stone installation.

Steam Room Walls and Ceilings: Dal-Seal TS may be installed as a bonded water/vapor barrier on walls and ceilings.

Acceptable Floor Substrates: Concrete and cured mortar bed, plywood, backer board.

Acceptable Wall Substrates: Concrete, masonry, backer board, mortar.

Acceptable Backer Boards: Cementitious backer board, glass mat water-resistant gypsum backer board, fiber-cement backer board, fiber-reinforced water-resistant gypsum backer board, and cementitious coated extruded foam backer board in accordance with TCNA Handbook. Note: Some backer boards are not suitable for steam rooms. Consult manufacturer's specifications.

A. Section Includes:

1. Sheet membrane waterproofing for **[tile] [and] [dimension stone]** installations.

The next three paragraphs describe Dal-Seal TS used as waterproofing for floors and walls in showers, tub surrounds, and other wet areas.

- a. Sheet membrane bonded to tile substrate with NobleBond EXT or latex Portland cement mortar, thin-set mortar for shower floors **[and walls]**.
 - b. Sheet membrane bonded to tile substrate with NobleBond EXT or latex Portland cement mortar, thin-set mortar for walls at tub surrounds.
 - c. Sheet membrane loose-laid under thickset tile substrate for shower floors.
2. Sheet membrane waterproofing and water vapor retarder for **[tile] [and] [dimension stone]** installations.

The next paragraph describes Dal-Seal TS used as waterproofing and vapor retarder for steam room floors, walls, and ceilings.

- a. Sheet membrane bonded to tile substrate with latex Portland cement mortar for steam room floors [**and walls**].
3. Sheet membrane crack isolation for [**tile**] [**and**] [**dimension stone**] installations.

The next two paragraphs describe Dal-Seal TS used as crack isolation for floors. Select the required installation method.

- a. Sheet membrane bonded to tile substrate with latex Portland cement mortar for floors.
- b. Sheet membrane bonded to tile substrate with adhesive for floors.

1.2 REFERENCES

- A. ANSI A108.13 - Installation of Load Bearing, Bonded, Waterproof Membranes for Thin-Set Ceramic Tile and Dimension Stone.
- B. ANSI A108.17 - Installation of Crack Isolation Membranes.
- C. ANSI A118.10 - American National Standard Specifications for Load Bearing, Bonded, Waterproof Membranes for Thin-Set Ceramic Tile and Dimension Stone Installation.
- D. ANSI A118.12 - American National Standard Specifications for Crack Isolation Membranes for Thin-Set Ceramic Tile and Dimension Stone Installation.
- E. ASTM E96/E96M - Standard Test Methods for Water Vapor Transmission of Materials.
- F. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.
- G. ASTM F2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes.
- H. TCNA Handbook - TCNA Handbook for Ceramic, Glass, and Stone Tile Installation.

1.3 ACTION SUBMITTALS

- A. Product Data: For each specified product.
- B. LEED Submittals:

Include the next paragraph for LEED NC, LEED CS, and LEED for Schools.

1. Certificates for Credit MR 5: For regional materials indicating location of manufacturer and point of extraction, harvest, or recovery. Include distance to Project, cost, and fraction by weight for regional components.

Include the next paragraph for LEED CI, only.

2. Certificates for Credit MR 5: For regionally manufactured [**and regionally extracted and manufactured**] materials indicating location of manufacturer [**and point of extraction, harvest, or recovery**]. Include distance to Project, cost, [**and fraction by weight**] for regional components.

Include the next paragraph for LEED NC, LEED CI, and LEED CS.

3. Data for Credit IEQ 4.1: For [**adhesives**] [**and**] [**sealants**], statement of VOC content.

C. Shop Drawings:

1. Include details of sheet membrane waterproofing installation with flashings and terminations.

1.4 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.

PART 2 - PRODUCTS

2.1 SHEET MEMBRANE [**WATERPROOFING**] [**AND**] [**CRACK ISOLATION**]

Dal-Seal TS is rated "Extra Heavy Duty" when tested with ceramic tile to ASTM C627, Standard Test Method for Evaluating Ceramic Floor Tile Installation Systems Using the Robinson-Type Floor Tester.

- A. Sheet Membrane: ANSI A118.10; composite sheet membrane made from an alloy of non-plasticized Chlorinated Polyethylene (CPE) with non-woven fiber laminated to both sides.

1. Basis of Design Manufacturer: Noble Company.
2. Basis of Design Product: Dal-Seal TS.

- B. Performance:



Include water vapor permeance for steam room applications. ASTM E96/E96M, Procedure E uses the desiccant method at high temperature 100 deg F (37.8 deg C).

1. Water Vapor Permeance: ASTM E96/E96M, Procedure E; maximum 0.15 perms (28.6 ng/Pa•s•m²).

Include crack isolation for flooring applications. Available ratings are Standard performance and High performance based on crack bridging capability.

2. Crack Isolation: "High performance" rating when tested to the "System Crack Resistance" portion of ANSI A118.12.

2.2 ACCESSORIES

A. Bonding Mortar:

1. Latex-Portland Cement Mortar (Thin Set): ANSI A118.4.

B. Bonding Adhesive: Type recommended by sheet membrane manufacturer to suit application **[with VOC less than LEED allowable limits]**.

Include NobleBond EXT for interior and exterior locations used in horizontal and vertical applications excluding steam room.

1. Basis of Design Product: NobleBond EXT.

Include Dal-Bond 21 for interior locations used in horizontal applications, only.

2. Basis of Design Product: Dal-Bond 21.

C. Mortar Bed:

1. Portland Cement Mortar (Thickset): ANSI A108.02.

D. Seam Sealant: Type recommended by sheet membrane manufacturer **[with VOC less than LEED allowable limits]**.

For projects required to meet LEED VOC limits, include Dal-Sealant 150, only.

1. Basis of Design Product: Dal-Sealant 150.

2. Basis of Design Product: NobleWeld 100.

E. Perimeter Sealant: Type recommended by sheet membrane manufacturer **[with VOC less than LEED allowable limits]**.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine **[tile]** **[and]** **[stone]** substrates, including **[walls,]** **[floors,]** **[ceilings,]** **[and]** **[framing]** for unacceptable conditions affecting sheet membrane installation.
- B. Examine roughing-in for plumbing piping to verify actual locations of piping connections before sheet membrane installation.
- C. Correct unacceptable conditions before installing sheet membrane.

3.2 PREPARATION

Floor slab moisture content may be measured by moisture emission test or by relative humidity test, or both.

- A. Examine, prepare, and test concrete floors for finish flooring installation in accordance with ASTM F710. Perform one **[moisture emission test in accordance with ASTM F1869]** **[relative humidity test in accordance with ASTM F2170]** and one alkalinity test for every 2,000 sf (*185 sq m*). Obtain instructions for corrective measures from flooring and adhesive manufacturers when test results are not within specified limits.

Use more restrictive substrate tolerances when installing large format tile. Verify acceptable limits with tile manufacturer.

1. Surface Tolerance: Maximum variation from plane of 3/16 inch (*4.5 mm*) in 10 feet (*3000 mm*).
 - a. Floor systems over which tile will be installed shall be in conformance with **[IRC]** **[IBC]** **[applicable building codes]**.

Include moisture emission rate or relative humidity requirements, or both. When using NobleBond EXT use the following requirements. Coordinate with tests specified above.

2. Moisture Emission Rate: Maximum 4 lb. per 1000 sq ft (*1.4 kg 100 sq m*) per 24 hours when tested using calcium chloride moisture test kit for 72 hours.
 3. Relative Humidity: Maximum 85 percent.
 4. Alkalinity Range: pH of 7.0 to 9.0.
- B. When tested moisture emission rate exceeds specified maximum, consult membrane manufacturer, thin-set manufacturer, and tile manufacturer for acceptable mitigation methods and materials.

3.3 INSTALLATION - SHEET MEMBRANE WATERPROOFING **[AND VAPOR RETARDER]**

Include this article when sheet membrane is installed on solid substrates including floors and tile backer boards. Include option above only when sheet membrane is installed in steam rooms.

- A. Comply with ANSI A108.13, TCNA Handbook, and the manufacturer's instructions for installation of sheet membrane waterproofing.

Include the next paragraph for thin-set floor and wall applications.

- B. Bonded Installation for Thin-Set Applications:
1. Apply bonding **[mortar]** **[adhesive]** for full coverage of substrate.

2. Install sheet membrane and fully embed into bonding material.
 - a. A carpet type roller may be used to embed sheet membrane on horizontal surfaces.
 - b. Hand roller or flat side of trowel can be used to embed sheet membrane on vertical surfaces.

Include the next paragraph for mortar bed floor applications only.

- C. Loose Laid Installation for Mortar Bed Applications:
 1. Loose lay sheet membrane on floor substrate.
- D. If membrane is not wide enough, seam by overlapping sheets minimum 2 inches (50 mm), shingle fashion in direction of water drainage. Seal joints watertight.
- E. Turn sheet membrane installed on floors up vertical surfaces minimum 2 inches (50 mm) higher than flood plane and bond to substrate.
 1. Shower Walls: When sheet membrane is turned up and terminated behind backer board, extend minimum 3 inches (75 mm) above finished dam or high point and fasten to substrate with no penetrations less than 2 inches (50 mm) above finished dam.
- F. Extend sheet membrane over floor drains. Cut drain opening in sheet membrane and seal to drain body. Secure membrane with floor drain clamping ring.
- G. Seal sheet membrane watertight to items penetrating sheet membrane.

3.4 INSTALLATION - SHEET MEMBRANE WATERPROOFING AND VAPOR RETARDER

Include this article when sheet membrane is installed on framing before installation of solid substrates for use at steam room walls and ceilings only.

- A. Comply with TCNA Handbook and the manufacturer's instructions for installation of sheet membrane waterproofing.
- B. Apply continuous bead of seam sealant to framing flanges.
- C. Overlap sheets minimum 2 inches (50 mm) shingle fashion in direction of water drainage. Seal joints watertight.
- D. Seal sheet membrane watertight to items penetrating sheet membrane.
- E. Install sheet membrane over framing and mechanically fasten to retain sheet membrane in place.
- F. Install tile backer board and mechanically fasten to framing.

- G. Seal fastener penetrations.

3.5 INSTALLATION - SHEET MEMBRANE CRACK ISOLATION

Show locations of sealant (soft) joints on Drawings to place the joints in the vicinity of the slab-on-grade control joints.

- A. Comply with ANSI A108.17, TCNA Handbook, and the manufacturer's instructions for installation of sheet membrane waterproofing.
- B. Apply bonding [**mortar**] [**adhesive**] for full coverage of substrate.
- C. Install sheet membrane and fully embed into bonding material.

3.6 FIELD QUALITY CONTROL

Include this article for flood testing floor waterproofing installations only.

- A. Upon completion of sheet membrane waterproofing installation, plug drains, dam perimeter of waterproofing, and fill with water minimum 2 inches (50 mm) deep and maintain for 24 hours.
 - 1. Inspect waterproofing for leaks.
 - 2. Repair leaks and re-test until watertight.
- B. Prepare test and inspection reports. Indicate corrective measures required to make installation watertight.

3.7 PROTECTION

- A. Protect sheet membrane from pedestrian and vehicular traffic and prolonged exposure to sunlight.
- B. Keep sheet membrane clean until [**tile**] [**and**] [**stone**] finishes are installed.

END OF SECTION 093000



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