

ShowerPerfect™ / 4 to 1™ Installation System

Shower installation system designed for either
Mapelastic™ AquaDefense or
Mapelastic WSM waterproofing membrane



INSTALLATION GUIDE IGT0514

As tile formats continue to grow, the trend is to carry this continuous-plane look into the shower compartment (see Figure 1). The *ShowerPerfect / 4 to 1* Installation System is designed specifically for installers who prefer the traditional mortar-bed slope-to-drain method (via MAPEI's *4 to 1* Mud Bed Mix), while still using the *ShowerPerfect* linear drain assembly.

The *ShowerPerfect / 4 to 1* Installation System can be used with either of MAPEI's waterproofing membranes – *Mapelastic WSM* sheet membrane or *Mapelastic AquaDefense* liquid membrane – before placement of tile, stone or glass tile. Follow all applicable industry standards and guidelines for mortar-bed installations within shower receptors, see “Applicable Industry Codes, Standards and Guidelines” section below.



Figure 1: *ShowerPerfect* linear drain

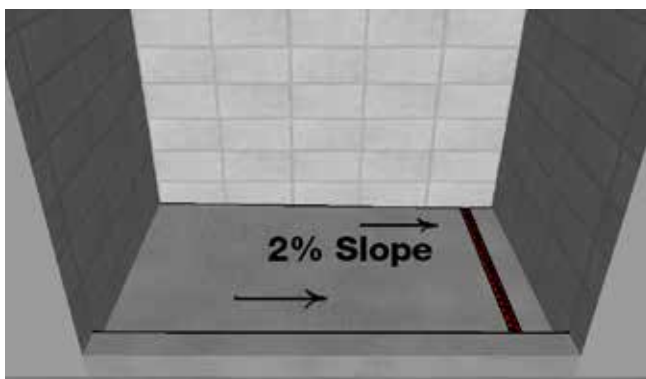


Figure 2: The mortar bed must maintain a 2% slope to drain.

FEATURES AND BENEFITS

- Field-installed slope to drain using MAPEI's *4 to 1* Mud Bed Mix and *ShowerPerfect* linear drain assembly
- Designed to accommodate large-format ceramic (standard or thin-body), glass or stone tile
- Multiple shower strainer designs, including field-matched tile-in strainer
- Patented drain assembly made of durable PVC
- Option 1: *Mapelastic WSM* waterproofing sheet membrane is sandwiched between the PVC body, *ShowerPerfect* Hybrid Sealant and the stainless-steel frame.
- Option 2: *Mapelastic AquaDefense* waterproofing liquid membrane is sandwiched between the PVC body and the stainless-steel frame.
- Simple installation steps:
 1. Mortar Bed Installation:
 - Method 1: Linear drain assembly using *ShowerPerfect* Drain Body Floor Supports. The mud-bed mix is packed in and around drain assembly, and screed is pulled from drain assembly to the opposing shower wall.
 - Method 2: *ShowerPerfect* Drain Support Frame with a factory pre-slope of 2% set with *Ultraflex™ RS* using a 1/4" x 3/8" x 1/4" (6 x 10 x 6 mm) square-notched trowel is installed onto the substrate and adhered with the appropriate fasteners. The mortar-bed screed is pulled from the edge of the drain support frame to the opposing shower wall.
 2. Curb Installation:
 - Build a curb using a mortar bed method per industry standards, or use the premade *ShowerPerfect* Curb.
Note: All horizontal surfaces (such as shower seats, sills and curbs) must slope toward the drain or toward another surface that is sloped toward the drain. Where waterproofing is present, it must also be sloped toward the drain.
 3. Attach the waste pipe by either gluing the drain waste outlet to the 2" (5 cm) PVC drain waste line using a hub-to-hub coupling or attaching the no-hub coupling to the 2" (5 cm) PVC drain waste line and waste outlet.
 4. *ShowerPerfect* Drain Extenders allow the linear drain to be custom-fit from wall to wall, up to 32" (81 cm).

WHERE TO USE

- Standard showers with interior dimensions from 26" x 32" to 36" x 61" (66 x 81 cm to 91 x 155 cm)
- Tub-to-shower conversions
- Commercial (e.g., hotels, hospitality facilities, institutions and dormitories)
- Light commercial and residential (e.g., office buildings, condominium residences and single-family homes)

ACCEPTABLE SUBSTRATES

- Concrete slabs
- Cement backer units (CBUs)
- Exterior-grade plywood

INSTALLATION OF DRAIN SYSTEM (mud bed without *ShowerPerfect* Drain Support Frame)*

1. The substrate must be structurally sound and capable of supporting the entire tile and mud bed assembly. The substrate is to be fully cured and free of soap scum, dust, dirt, oil, wax, sealers, paint, coatings, and any other substances that could reduce or inhibit proper adhesion and system performance.
2. The shower installation should meet all state, federal, local, provincial and applicable building code requirements. (Refer to the "Applicable Industry Codes, Standards and Guidelines" section below.)
3. Install backer board on the walls and secure to the studs per the manufacturer's instructions. The backer board will sit behind the Drain Support Frame when used and behind the floated mud bed. Tape all joints and prep the backer board for waterproofing, in accordance with the backer board manufacturer's instructions.
4. Recommended location, size and length of the Linear Drain Body in relation to the 2" (5 cm) waste pipe line (or "stub-out") (see Figure 4):
 - Place the hub-to-hub coupling on top of the ID PVC waste pipe line.
 - Establish the Linear Drain Body position 3" to 6" (7,5 to 15 cm) away from the closest parallel wall and center it along the length of the wall.
 - Mark off the drain pipe line to a length just below the top of the subfloor.

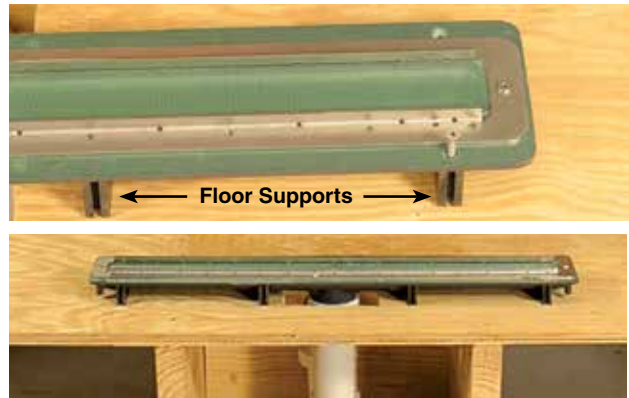


Figure 3: Drain assembly with *ShowerPerfect* drain body floor supports – assembled view

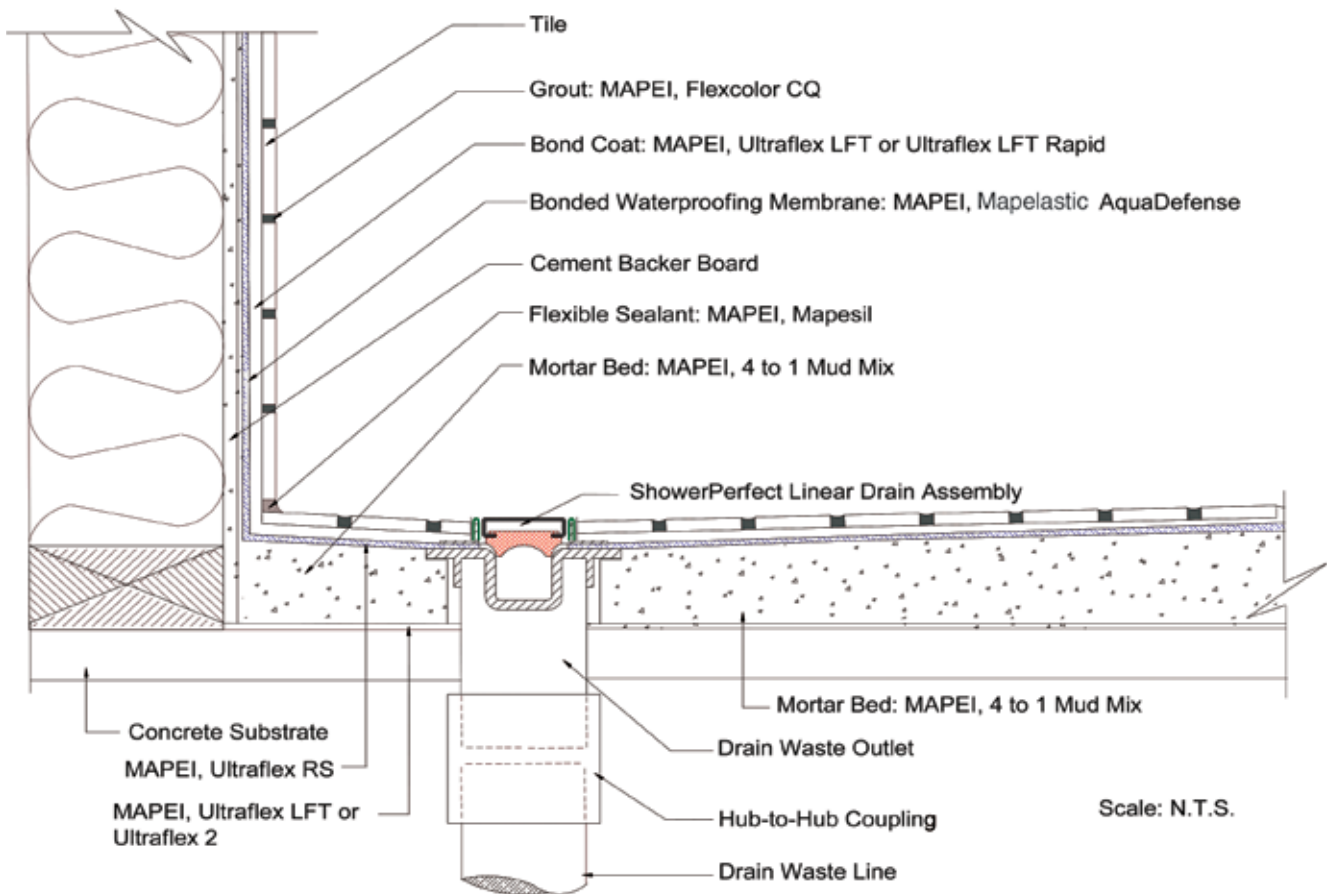


Figure 4: Drain orientation – set 3" to 6" (7,5 to 15 cm) from wall.
Mapelastic AquaDefense waterproofing liquid membrane system

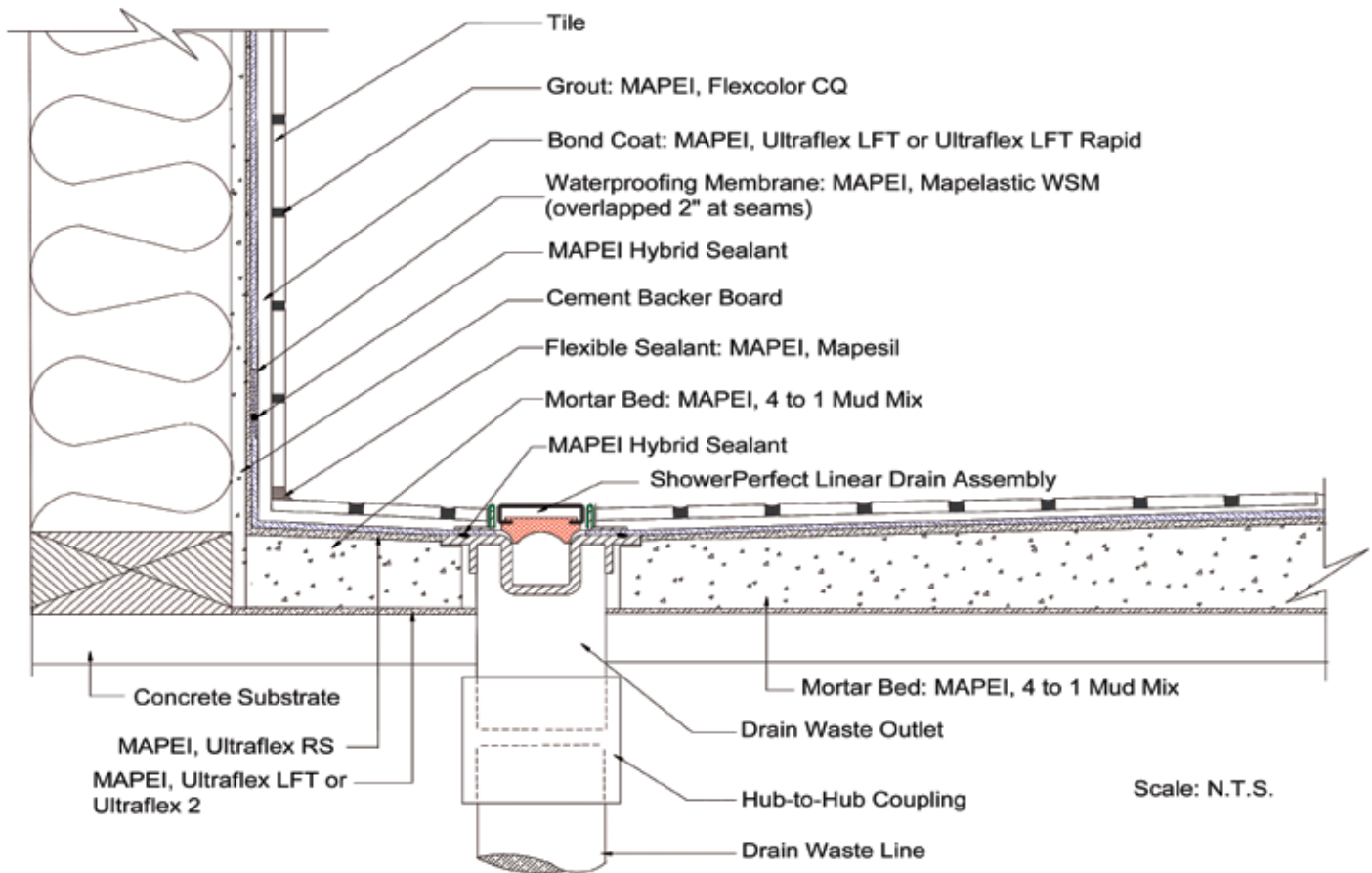


Figure 4a: Drain orientation – set 3" to 6" (7,5 to 15 cm) from wall.
 Mapelastic WSM waterproofing sheet membrane system

5. Cut to size and dry-fit all of the components.
 - Measure and attach the four Drain Body Floor Supports into the substrate and parallel to the wall.
 - The Linear Drain Body must be aligned over the drain waste outlet in the subfloor, about 3" to 6" (7,5 to 15 cm) from the wall. Use the appropriate fasteners for plywood or concrete substrates.
 - Ensure that all four of the brackets are level with one another and that the drain body is parallel with the closest wall.
 - Next, align the Linear Drain Body with the waste line's "stub-out" in the floor.
 - It is important, before making your final cut to the drain waste line, to ensure that the waste line is below the Linear Drain Body. Then take your final measurement.
 - To determine the final measurement before cutting the drain line's "stub-out," measure from the top of the Linear Drain Body to the top of the drain waste outlet pipe. This final measurement should be 2-3/8" (6 cm) overall (see Figure 5).
 - When installing the no-hub coupling (see Step 9, Option 2), elongate the hole on one side of the substrate to accommodate tightening of the worm gear screw.
 - Note: The installer can choose to use the Drain Support Frame with a factory pre-slope of 2% in place of the Linear Drain Body with the Drain Body Floor Supports. Use the Drain Support Frame as a guide when pulling a screed for your ShowerPerfect System. Because grooves on the Drain Support Frame are at the same elevation, the Linear Drain Body can be set in place with either method.



Figure 5: Measure from the top of the Linear Drain Body to the top of the drain waste outlet pipe.

- Option 1*: Use standard plumbing practices to clean, prime and glue the PVC drain waste outlet to the 2" (5 cm) PVC drain waste line using the hub-to-hub coupling.

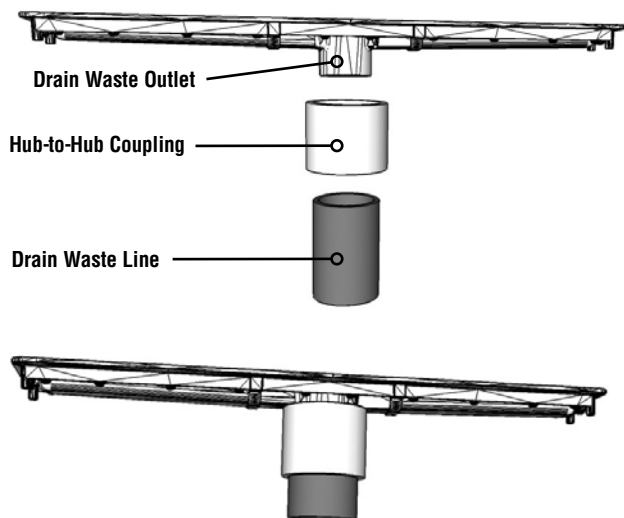


Figure 6: Clean, prime and glue the drain to the 2" (5 cm) waste line (see Figure 4) – exploded view and assembled view

Option 2*: Attach the no-hub coupling to any code-appropriate 2" (5 cm) drain waste line (PVC, copper, cast iron, etc.) and the 2" (5 cm) PVC drain waste outlet. In order to access and tighten both the worm gear screws on the bottom and top:

- First, attach the no-hub coupling to the drain waste line and tighten the bottom worm gear screw.
- Then, attach the drain waste outlet to the no-hub coupling and tighten the top worm gear screw.

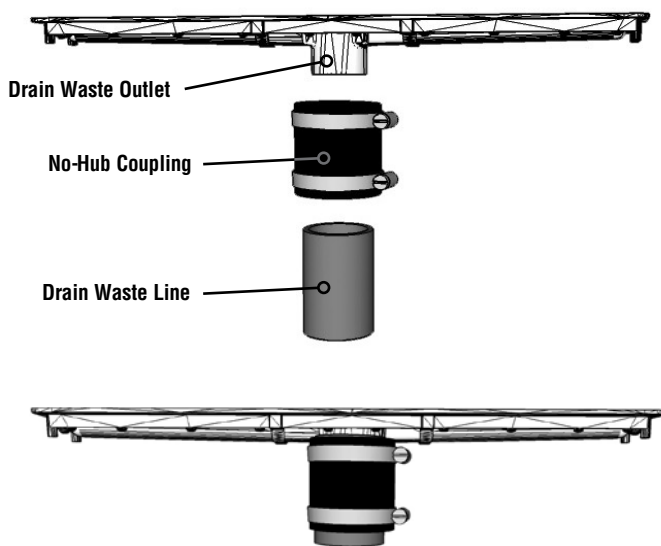


Figure 7: Attach the drain, no-hub coupling and 2" (5 cm) waste line (see Figure 4) – exploded view and assembled view

* Note: Plumbing components must be purchased separately and are not included in drain assembly kit.

- Now that you have set, leveled and secured the Linear Drain Body to the Drain Body Floor Supports, substrate and drain waste outlet, you are ready to install the mortar bed and curb.
- In order to improve the bond of the mortar bed to the substrate, it is important to first apply either a slurry bond coat or a latex bond coat to the substrate.
 - This wet bond coat can be achieved by using one of MAPEI's polymer-modified thin-set mortars mixed with water. Apply the thin-set mortar to the substrate using a 1/4" x 1/4" x 1/4" (6 x 6 x 6 mm) square-notched trowel, and then knock down the ridges with the flat side of the trowel.

- While the polymer-modified mortar is still wet, begin applying MAPEI's 4 to 1 Mud Bed Mix to a thin-set mortar such as *Ultraflex 2*, *Ultraflex 3* or *Ultraflex LFT*.
 - Starting with the Linear Drain Body, pack the mortar mix firmly into all of the voids, in and around the drain, until the mortar bed reaches the upper edge of the Linear Drain Body perimeter.
 - On the far shower wall, opposite from the drain, make a mark on the wall indicating the maximum height of the mortar bed. This industry standard measurement is calculated on a 2% slope to drain. Plumbing code requires a minimum slope of 1/4" per foot (6 mm per 0,30 m).
 - Next, starting at the Linear Drain Body, begin pulling the screed lengthwise to the mark on the shower wall.
- With the appropriate screws, secure the drain body to the substrate (plywood or concrete) through the holes in the drain body. To secure the drain body in place, use #8" x 2" (20 x 5 cm) wood screws for plywood and 3/16" x 2-1/4" (4,5 mm x 5,7 cm) Tapcon flat Phillips head fasteners for concrete.
- Cut the green masking tape along the inside of the metal frame.
 - Make sure that the cut is clean and goes all the way through to allow for a clean separation of the tape.
 - Remove the screws holding the metal frame to the Linear Drain Body and completely remove the whole metal frame.
 - The green masking tape will still be on at this point. Peel off the green masking tape from the outer perimeter of the Linear Drain Body.
 - When using *Mapelastic AquaDefense* to waterproof, abrade the exposed Linear Drain Body with sandpaper, clean away the debris and thoroughly dry the surface.

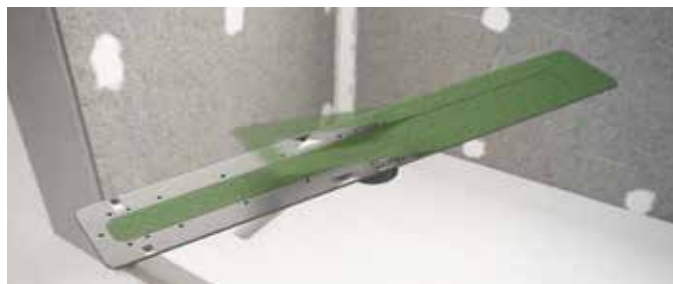


Figure 8: Peel off the green masking tape from the outer perimeter of the Linear Drain Body.

WATERPROOFING OPTIONS**

** Before applying either of the waterproofing methods below, ensure that the mortar bed has dried sufficiently per acceptable industry standards.

- Waterproofing Option 1: *Mapelastic WSM* comes in a 39" x 30' (99 cm x 9,14 m) sheet membrane roll that allows waterproofing of the floors and walls of a standard-size shower compartment with 26" x 32" to 36" x 61" (66 x 81 cm to 91 x 155 cm) interior dimensions.
- Measure and field-cut the *Mapelastic WSM* to the specific size of the shower compartment, remembering to leave room for 2" (5 cm) overlaps wherever membrane pieces meet.



Figure 9: Apply a single bead of *ShowerPerfect Hybrid Sealant* to the perimeter of the Linear Drain Body.

- Now *Ultraflex RS* can be trowel-applied to the floor, including about 4" to 6" (10 to 15 cm) up the wall. Use a 3/16" x 5/32" (4,5 x 4 mm) sawtooth V-notch trowel.
- Apply a single bead of *ShowerPerfect Hybrid Sealant* 3/16" to 1/4" (4,5 to 6 mm) around the entire perimeter of the Linear Drain Body.

12d. Next, set the membrane into the mortar and cover it up the wall. Position the membrane over the Linear Drain Body and feel with your fingers for the “locator pins” (see Figure 10) that will be sticking up from the Linear Drain Body. Press the fabric down over the locator pins until these protrude through the fabric to create a continuous layer of waterproofing. Using both a grout float and a vinyl floor roller (see Figure 11), remove any creases or bubbles in the membrane to ensure bond between the mortar and sloped mortar bed.



Figure 10: Position *Mapelastic WSM* over locator pins of the Linear Drain Body.



Figure 11: Use a vinyl floor roller to remove any creases or bubbles in *Mapelastic WSM*.

- 12e. Next, reinstall the metal frame to the Linear Drain Body using the screws that were previously removed.
- 12f. Now, trowel and place the pre-cut wall membrane into the mortar. Make sure to leave a 6" (15 cm) overlap on the floor membrane covered up the wall and a 2" (5 cm) overlap at any wall seams.
- 12g. Finally, with all the sheet membranes set in place, apply *ShowerPerfect Hybrid Sealant* to the back of the pre-formed corners, U-shaped curb cover and under the 2" (5 cm) overlap on the wall coving. Also ensure that all wall seams with a 2" (5 cm) overlap have been treated with the sealant.



Figure 12: Adhere the pre-formed corners, U-shaped curb cover and 2" (5 cm) overlaps using *ShowerPerfect Hybrid Sealant*

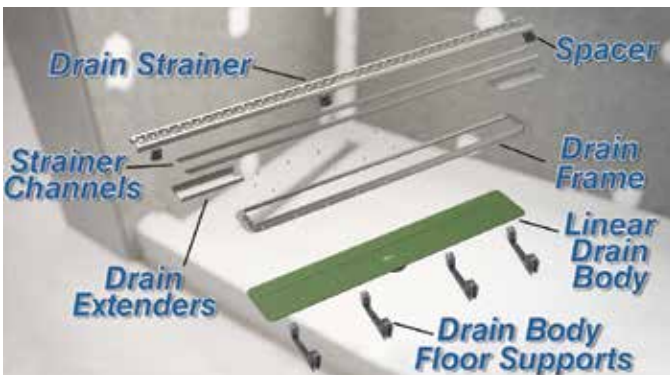


Figure 13: Drain assembly with *ShowerPerfect Drain Body Floor Supports* – exploded view

13. Waterproofing Option 2: Apply *Mapelastic AquaDefense* to the entire system, including the mortar bed, walls and Linear Drain Body. For compliance with IAPMO, use MAPEI's *Reinforcing Fabric* on all shower-pan seams and at all shower transitions from floor to wall; and on inside corners, outside corners and U-shaped curb cover. (Inside corners and U-shaped curb cover are purchased separately.)
- 13a. When *Reinforcing Fabric* is positioned well over the Linear Drain Body, feel with your fingers for sharp “locator pins” sticking up about 3/16" (4,5 mm) from the body of the drain. Press the fabric down over the locator pins until these protrude through the fabric to create a continuous layer of waterproofing.



Figure 14: Position *Reinforcing Fabric* over locator pins of the Linear Drain Body.

13b. Apply additional coat(s) of *Mapelastic AquaDefense* to ensure that no surface (pan, wall, drain or fabric) is left exposed. *Mapelastic AquaDefense* should be applied to provide a continuous homogenous layer of waterproofing to the installation.

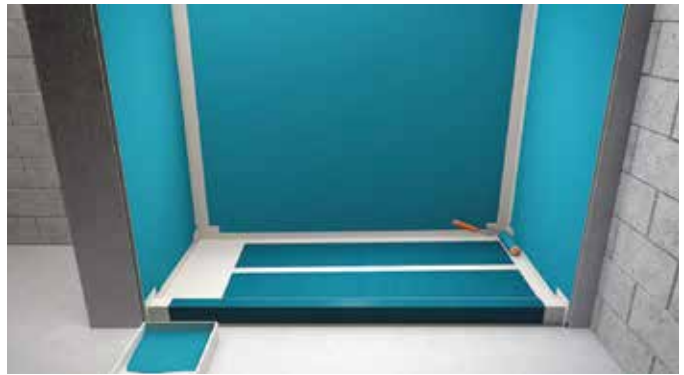


Figure 15: Application of *Reinforcing Fabric* and *ShowerPerfect LM Inside Corners* with MAPEI's *Mapelastic AquaDefense*

14. Position the holes in the drain frame over the corresponding locator pins; this ensures the correct location of the frame, so that the holes in the frame align with the holes in the Linear Drain Body.
15. Secure the end screws down first on each side; then, secure the rest of them in any order. The torque should be set to 12 ft.-lbs. for all of the frame screws.
16. Cut again along the inside of the drain frame through the reinforcement fabric. Repeat the cut if necessary to make sure that the fabric is completely cut through for easy removal.
- Note: Do not remove the cut fabric or leftover green masking tape from around the perimeter until the tile installation is complete. This will protect the drain from any foreign debris.
17. To enhance the benefits of the linear drain, extenders are included in the kit to accommodate a wall-to-wall shower installation:
- **Step 1:** Measure and mark the trough extensions to fit the installation.
 - **Step 2:** Measure from the end screws to the wall or curb and deduct 3/8" (10 mm) – or as much as needed – to accommodate for the thickness of the wall tile and thin-set combined.
 - **Step 3:** Cut the trough extensions as marked.
 - **Step 4:** Loosen the two end screws on each end enough to be able to slide the trough extensions under the screw heads.
 - **Step 5:** Measure and cut the strainer channels as needed on both sides to fit the drain frame and extensions.
 - **Step 6:** Slide each strainer channel over the vertical portion of the drain frame and vertical parts of the trough extensions.

- **Step 7:** Retighten both screws to 12 ft.-lbs. of torque.
- **Step 8:** Install ceramic, stone or glass tile over the floors and walls.
- **Step 9:** After tile installation, cut the tile-in drain strainer to size in order to accommodate the notches on the frame.
Note: The tile-in drain strainer kit includes pre-cut tape, which performs as waterproofing, to adhere to the inside of the strainer channel. The tile is then set with mortar over the tape in the channel.
- **Step 10:** Slide spacers into the drain cover and place in the trough. Spacers provide 1/8" (3 mm) of incremental adjustment.

18. If state, federal, local or provincial codes require flood testing, perform testing per ASTM D5957 and IAPMO guidelines before commencing with tilework. For *Mapelastix AquaDefense*, ensure that it is allowed to cure for at least 12 hours at 73°F (23°C) and 50% relative humidity before flood testing.

APPLICABLE INDUSTRY CODES, STANDARDS AND GUIDELINES

Note 1

– International Plumbing Code (IPC) 2012

SECTION 417 Showers

417.4 Shower compartments

Showers compartments shall be not less than 900 square inches (0.58 m²) in interior cross-sectional area. Shower compartments shall be not less than 30 inches (762 mm) in least dimension as measured from the finished interior dimension of the compartment, exclusive of fixture valves, showerheads, soap dishes, and safety grab bars or rails. Except as required in Section 404, the minimum required area and dimension shall be measured from the finished interior dimension at a height equal to the top of the threshold and at a point tangent to its centerline and shall be continued to a height not less than 70 inches (1778 mm) above the shower drain outlet.

Exception: Shower compartments having not less than 25 inches (635 mm) in minimum dimension measured from the finished interior dimension of the compartment, provided that the shower compartment has not less than of 1,300 square inches (.838 m²) of cross-sectional area.

Note 2

– International Residential Code (IRC) 2012

SECTION P2709 Shower Receptors

P2709.1 Construction

Where a shower receptor has a finished curb threshold, it shall be not less than 1 inch (25 mm) below the sides and back of the receptor. The curb shall be not less than 2 inches (51 mm) and not more than 9 inches (229 mm) deep when measured from the top of the curb to the top of the drain. The finished floor shall slope uniformly toward the drain not less than 1/4 unit vertical in 12 units horizontal (2-percent slope) nor more than 1/2 unit vertical per 12 units horizontal (4-percent slope) and floor drains shall be flanged to provide a water-tight joint in the floor.

P2709.2 Lining required

The adjoining walls and floor framing enclosing on-site built-up shower receptors shall be lined with one of the following materials:

1. Sheet lead;
2. Sheet copper;
3. Plastic liner material that complies with ASTM D4068 or ASTM D4551;
4. Hot mopping in accordance with Section P2709.2.3; or
5. Sheet-applied load-bearing, bonded waterproof membranes that comply with ANSI A118.10. The lining material shall extend not less than 2 inches (51 mm) beyond or around the rough jambs and not less than 2 inches (51 mm) above finished thresholds. Sheet-applied load-bearing, bonded waterproof membranes shall be applied in accordance with the manufacturer's instructions.

P2709.2.4 Liquid-type, trowel-applied, load-bearing, bonded waterproof materials
Liquid-type, trowel applied, load-bearing, bonded waterproof materials shall meet the requirements of ANSI A118.10 and shall be applied in accordance with the manufacturer's instructions.

P2709.4 Receptor drains

An approved flanged drain shall be installed with shower sub pans or linings. The flange shall be placed flush with the subbase and be equipped with a clamping ring or other device to make a water-tight connection between the lining and the drain. The flange shall have weep holes into the drain.

Note 3

– International Residential Code (IRC) 2012

SECTION R702

R702.4.2 Fiber-cement, fiber-mat reinforced cement backer units, glass mat gypsum backers and fiber-reinforced gypsum backers

Fiber-cement, fiber-mat reinforced cementitious backer units, glass mat gypsum backers or fiber-reinforced gypsum backers in compliance with ASTM C1288, C1325, C1178 or C1278, respectively, and installed in accordance with manufacturers' recommendations shall be used as backers for wall tile in tub and shower areas and wall panels in shower areas.

Note 4

Mapelastix WSM

- Exceeds ANSI A118.10 for waterproofing
- IAPMO-listed
- Exceeds ANSI A118.12 for crack isolation

Mapelastix AquaDefense

- Exceeds ANSI A118.10 for waterproofing
- IAPMO-listed
- *Mapelastix AquaDefense* ICC-ES-Evaluation Report-(International Construction Codes) 3474_2013
- Meets "Shower-pan waterproofing membrane" building code requirements for Los Angeles, California Tile Council of North America (TCNA) Environmental Classifications RES 1-6 or COM 1-6; consult the most current TCNA Handbook to determine the appropriate Environmental Classifications for either an interior or exterior wall tile installation.
- Exceeds ANSI A118.12 for crack isolation

Ultraflex RS

- Meets or exceeds ANSI A118.4 and A118.11
- Classified as ISO 13007 C2FS1P1

Note 5

When setting thin-body (3 to 6 mm) large-format tile in a shower, refer to both the thin-tile manufacturer and the MAPEI Reference Guides noted below before beginning the installation on walls and floors.

1. "Thin-Body Porcelain Tile Reference Guide for Interior Floors – 4,5 to 6 mm in Thickness" (RGT0112)
2. "Thin-Body Porcelain Tile Reference Guide for Interior and Exterior Walls, Ceilings and Soffits – 3 to 6 mm in Tile Thickness" (RGT0113)

Note 6

Use any appropriate MAPEI mortar, grout and sealant for the installation of glass tile, ceramic tile, porcelain tile or stone in shower stalls. Consult MAPEI's most current TDSs and Safety Data Sheets at www.mapei.com.

Follow all applicable industry standards, codes and guidelines:

- American National Standards Institute (ANSI)
- International Organization for Standardization (ISO)
- TCNA
- Terrazzo, Tile and Marble Association of Canada (TTMAC)
- Marble Institute of America (MIA)
- International Construction Codes (ICC)
- International Building Codes (IBC)
- IRC
- IPC
- American Standards and Test Methods (ASTM International)

MEMBRANE SEAMS AND CORNERS

Note 7

ShowerPerfect Hybrid Sealant – Use to adhere all pre-formed corners, U-shaped curb covers and seams to *Mapelastic WSM*.

MOVEMENT JOINTS

Note 8

Field movement joints are required within tile installations. Expansion, construction and contraction joints should be carried through the tile without exception. Refer to the most current TCNA Handbook, Detail EJ171; or the TTMAC Tile Installation Manual, Detail 301MJ.




MAPEI's *Mapesil*™ 100%-silicone sealant

- Meets ASTM C920; Type S; Grade NS; Class 25; Use NT, M, G, A and O
- Meets the requirements of TCNA Handbook Detail EJ171
- Conforms to ASTM C794 Adhesion Properties
- Interior/exterior residential and commercial installations from Res1 to Res6 and Com1 to Com6 per TCNA Environmental Classifications.

ShowerPerfect components to order/purchase separately	
	<i>ShowerPerfect</i> LM Inside Corners
	<i>ShowerPerfect</i> LM U-Shaped Curb Cover
	<i>Reinforcing Fabric</i>
	<i>Mapelastic AquaDefense</i>
	<i>ShowerPerfect</i> Drain Support Frame 32" x 12" (81 x 30 cm)
	<i>ShowerPerfect</i> Curb
	<i>Mapelastic WSM</i> 39" x 30' (99 cm x 9,14 m)
	<i>ShowerPerfect</i> Shower Curb Lag Screws
	<i>ShowerPerfect</i> SM Inside Corners
	<i>ShowerPerfect</i> SM U-Shaped Curb Cover
	<i>ShowerPerfect</i> Drain Strainer <ul style="list-style-type: none"> • Brushed stainless steel • Polished stainless steel • Oil-rubbed bronze • Tile-in drain
	<i>ShowerPerfect</i> Linear Drain Assembly Kit

	<i>ShowerPerfect</i> Drain Extenders*
	<i>ShowerPerfect</i> Drain Body Floor Supports*
	<i>ShowerPerfect</i> Strainer Channels*
	<i>ShowerPerfect</i> Stainless-Steel Base Screws*
	<i>ShowerPerfect</i> Strainer Tools*
	<i>ShowerPerfect</i> Strainer Spacers*
	<i>Ultraflex RS</i> pan mortar

* Included in Linear Drain Assembly Kit

Preferred additional MAPEI products for shower tile installation	
	<i>Ultraflex</i> ™ LFT™ or <i>Ultraflex LFT Rapid</i> mortar bond coat
	<i>MAPEI Flexcolor</i> ™ CQ grout
	<i>Mapesil</i> 100%-silicone sealant

For glass tile or moisture-sensitive stone installations, contact MAPEI's Technical Services Department for product recommendations.

Required items not sold by MAPEI
Drain assembly 8" x 2" (20 x 5 cm) wood screws for plywood substrate
Drain assembly 3/16" x 2-1/4" (4,5 mm x 5,7 cm) Tapcon flat Phillips head fastener for concrete substrate
No-hub coupling
Hub-to-hub coupling



MKT: 14-0312 PR: 7021
© 2014 MAPEI Corporation.
All Rights Reserved. Printed in the USA.

MAPEI Headquarters of the Americas
1144 East Newport Center Drive
Deerfield Beach, Florida 33442
Phone: 1-888-US-MAPEI
(1-888-876-2734)

Technical Services
1-800-992-6273 (U.S. and Puerto Rico)
1-800-361-9309 (Canada)

Customer Service
1-800-42-MAPEI (1-800-426-2734)

Services in Mexico
0-1-800-MX-MAPEI (0-1-800-696-2734)

Document Number: IGT0514
Edition Date: July 3, 2014