

# PERMABASE® BRAND CEMENT BOARD

## MANUFACTURER

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## DESCRIPTION

PermaBase® BRAND Cement Board is a rigid substrate made of Portland cement, aggregate and glass mesh that provides an exceptionally hard, durable surface that is able to withstand prolonged exposure to moisture.

### BASIC USES

PermaBase is ideally suited as an underlayment or backing surface for tub and shower surrounds, countertops, flooring and a variety of other interior and exterior applications.

### ADVANTAGES

- Reinforced edge with EdgeTech technology allows for closer fastener application of nails or screws at the edge without crumbling or spinout.
- IRC and IBC Compliant – Meets ASTM C 1325.
- PermaBase is approved as a substrate for direct applied finishes, tile, stone and thin-brick in exterior applications, as outlined in ICC-ES Evaluation Report ESR-1510.
- PermaBase is suitable for use in combustible and non-combustible construction under the IBC and IRC, as outlined in ICC-ES Evaluation Report ESR-1510.
- Resists the growth of mold per ASTM D 3273 with a score of 10, the best possible score.

- Can be cut utilizing a standard utility knife and straightedge. With PermaBase's unique core composition, little or no additional labor is needed to clean the edge after a cut.
- PermaBase is impact resistant, extremely durable and dimensionally stable. It has excellent overall flexural, compressive and tensile strength characteristics.
- PermaBase is highly moisture resistant, and will not rot, disintegrate or swell when exposed to water.
- 1/2" PermaBase may be used in 1 hour and 2 hour rated assemblies and is UL Classified.
- PermaBase has a smoother finish than other brands and has no open edges, which reduces hand chafing.
- Lowest water absorption of any cement board per ASTM C 473.
- Suitable for both interior and exterior applications.

### GREENGUARD CERTIFIED

PermaBase Cement Board is GREENGUARD Children & Schools<sup>SM</sup> Certified for indoor air quality.



### MOLD AND MILDEW RESISTANCE

PermaBase was designed to provide extra protection against mold and mildew. When tested by an independent laboratory, PermaBase received the highest possible ratings on ASTM G 21 and D 3273. The use of PermaBase in actual installations may not produce the same results as were achieved in controlled laboratory conditions. No material can be considered "mold proof," nor is it certain that any material will resist mold or mildew indefinitely. When used in conjunction with good design, handling and construction practices, PermaBase can provide increased mold resistance. As with any building material, avoiding water exposure during handling, storage and installation, and after installation is complete, is the best way to avoid the formation of mold or mildew.

### LIMITATIONS

- Joints should be treated with alkali resistant fiberglass mesh tape set in a latex-Portland cement mortar.

- Conventional paper drywall tape, joint compound and drywall nails or screws should not be used.
- Maximum wall framing spacing should not exceed 16" o.c. and must be designed to limit deflection to L/360 under all live and dead loads.
- Steel framing must be 20 ga. (galvanized) or heavier-16" o.c.
- 1/4" PermaBase should not be used on walls or ceilings.
- PermaBase is not a water barrier. Consult local building code for moisture barrier requirements.
- Not recommended for use with vinyl flooring.
- For exterior and interior finishes applied direct to PermaBase, reinforcing mesh must be embedded in basecoat. Consult finish manufacturer for additional requirements.
- PermaBase should not be exposed to temperatures over 220°F (105°C).

*(Continued next page)*

Job Name \_\_\_\_\_

Contractor \_\_\_\_\_ Date \_\_\_\_\_

### Submittal Approvals: (Stamps or Signatures)

## ACCESSORIES

**Joint reinforcement:** PermaBase mesh tape must be used on all edges and cuts made to size. Use 2" wide polymer-coated (alkali resistant) mesh tape for interior applications and 4" wide polymer-coated (alkali resistant) mesh tape for exterior applications.

**Bonding materials:** Treat joint and set facing material, preferably with latex-Portland cement mortar or with dry-set (thin-set) mortar. All mortars should comply with ANSI A118.1 or A118.4 standards. Type I organic adhesive meeting ANSI A-136.1 may be utilized for interior use only.

**Fasteners:** Galvanized roofing nails, 1-1/2" long with hot dipped galvanized coating, for use with wood framing. Nails should meet Federal Specification #FF-N105B/ type 2 style 20.

PermaBase corrosion resistant screws or equivalent, 1-1/4" or 1-5/8" long, for use with wood framing. Type S-12 screws or equivalent, 1-1/4" or 1-5/8" long, for use with 20 ga. or heavier steel framing.

## COMPOSITION

**Cementitious Backer Unit (CBU):** PermaBase is a nailable, screwable backerboard or underlayment panel which is composed of Portland cement, aggregates and reinforcements that has a significant ability to remain unaffected by prolonged exposure to moisture. PermaBase complies with ASTM C 1325 and ANSI A118.9.

SIZES & PACKAGING	
Size: Thickness, Width & Length	# of Pcs. Per Unit
<b>PermaBase Cement Board</b>	
1/2" x 32" x 5' (12.7 mm x 813 mm x 1524 mm)	50
1/2" x 36" x 4' (12.7 mm x 914 mm x 1219 mm)	50*
1/2" x 36" x 5' (12.7 mm x 914 mm x 1524 mm)	50
1/2" x 36" x 6' (12.7 mm x 914 mm x 1829 mm)	50*
1/2" x 36" x 8' (12.7 mm x 914 mm x 2438 mm)	30
1/2" x 48" x 8' (12.7 mm x 1219 mm x 2438 mm)	30
5/8" x 36" x 5' (15.9 mm x 914 mm x 1524 mm)	35
5/8" x 48" x 8' (15.9 mm x 1219 mm x 2438 mm)	24
3/8" x 48" x 8' (9.5 mm x 1219 mm x 2438 mm)	40*
3/8" x 36" x 5' (9.5 mm x 914 mm x 1524 mm)	50*
3/4" x 48" x 8' (19.0 mm x 1219 mm x 2438 mm)	20*
1" x 32" x 8' (25.4 mm x 813 mm x 2438 mm)	20*
<b>PermaBase Underlayment</b>	
1/4" x 48" x 4' (7.9 mm x 1219 mm x 1219 mm)	50
1/4" x 36" x 5' (7.9 mm x 914 mm x 1524 mm)	50
*Special order	

PHYSICAL PROPERTIES		
Property	Test Method	1/2" PermaBase
Water Absorption % by Weight/24 Hours	ASTM C 473	<8
Flexural Strength (psi)	ASTM C 947	750
Fastener Holding (Wet and Dry, lbs.)	ASTM D 1037 (0.400" head diameter)	90
Weight (psf)	ASTM C 473	3
Freeze/Thaw (cycles) per ANSI A118.9	ASTM C 666 Procedure B	100
Flame Spread/Smoke Developed	ASTM E 84	0/0
Compressive Strength (psi) (Indentation)	ASTM D 2394	2250
Wind Load (psf, studs 16" o.c.)	ASTM E 330	40
Thermal "R"/k Value	Property of Material	0.2/2.7
Bending Radius (ft.)	Property of Material	5
Standard Method for evaluating ceramic floor installation system	ASTM C 627	Light Commercial
Falling Ball Impact (12" drop)	ASTM D 1037	pass
Shear Bond Strength 7 days (psi)	Dry-Set Portland Cement Mortar	ANSI A118.1 204
	Latex-Portland Cement Mortar	ANSI A118.4 241
	Organic Adhesives Type 1	ANSI A136.1 159
Linear Variation (Due to change in moisture content)	ASTM D 1037	0.05%
Fungus Resistance	ASTM G 21	(No growth)
Mold Growth on Surface	ASTM D 3273	10

## TECHNICAL DATA

### FIRE RESISTANCE RATINGS

**One-hour rating:** The one-hour wall assembly consists of 3-5/8" steel studs, 16" o.c., one layer of 1/2" PermaBase attached horizontally or vertically with 1-1/4" long cement board screws, 8" o.c. in the field and perimeter on one side and one layer of 5/8" Fire-Shield® BRAND Gypsum Board attached vertically, on opposite side, with joints staggered to those of opposite side, with 1-1/4" long drywall screws 8" o.c. in the field and perimeter side, with 3" thick mineral fiber insulation batts in the stud cavities. UL #V452 and ITS/WHI Report No. J99-4001.

**Two-hour fire rating:** The two-hour wall assembly consists of 3-5/8" steel studs 16" o.c., on one side, base layer of 1/2" Fire-Shield C or 5/8" Fire-Shield Gypsum Board attached vertically with 1" drywall screws 24" o.c. in the field and perimeter and face layer of 1/2" PermaBase attached vertically with 1-5/8" cement board screws, 8" o.c. in the field and perimeter. Two layers of 1/2" Fire-Shield C or 5/8" Fire-Shield Gypsum Board applied vertically to opposite side, base layer attached with 1" drywall screws 24" o.c. in the field and perimeter and face layer attached with 1-5/8" drywall screws 12" o.c. in the field and perimeter, with 3" thick mineral fiber insulation batts in the stud cavities. All joints staggered between face and base layer. UL #V452 and ITS/WHI Report No. J98-32931.

(Tests were conducted pursuant to ASTM E 119, as a non load-bearing wall, fire rated both sides under the supervision of Underwriters Laboratories and Intertek Testing Services NA, Inc., respectively.)

Additional Assemblies are available.

## RECOMMENDATIONS

### INTERIOR APPLICATIONS

**General:** All framing should comply with local building code requirements and be designed to provide support with a maximum allowable deflection of L/360 under all intended loads. Framing members should be spaced a maximum of 16" o.c.

**Note:** Cut or score PermaBase on printed side of panel. Install tile and tile setting materials in accordance with current ANSI specifications and Tile Council of North America (TCNA) guidelines.

**Control joints:** For interior installations, allow maximum of 30 lineal feet between control joints. A control joint must be installed, but is not limited to the following locations: where expansion joints occur in the framing or building (discontinue all cross furring members located behind joint); when boards abut dissimilar materials; where framing material changes; at changes of building shape or structural system; at each story separation. Place control joints at corners of window and door openings, or follow specifications of architect. Control joint cavity shall not be filled with coating or other materials.

### Walls & Ceilings

**Wall framing:** Edges of PermaBase parallel to framing should be continuously supported. Provide additional blocking when necessary to permit proper PermaBase attachment.

Do not install PermaBase directly over protrusions from stud plane such as heavy brackets or fastener heads. Studs above a shower floor should be either notched or furred to accommodate the thickness of the waterproof membrane or pan. The surround opening for a tub or precast shower receptor should not be more than 1/4" larger than unit to be installed.

**Ceiling framing:** The deflection of the complete ceiling assembly due to dead load (including insulation, PermaBase, bonding material and facing material) should not exceed L/360. The dead load

applied to the ceiling frame should not exceed 10 psf. Ceiling joist or furring channel should not exceed 16" o.c. (Edges of PermaBase parallel to framing should be continuously supported.) Provide additional blocking when necessary to permit proper PermaBase attachment.

### PermaBase Cement Board:

Apply PermaBase with ends and edges closely butted, but not forced, together. Stagger end joints in successive courses. Drive fasteners into field of cement board first, working toward ends and edges. Space fasteners maximum 8" o.c. for walls, 6" o.c. for ceilings with perimeter fasteners at least 3/8" and less than 5/8" from ends and edges. Ensure PermaBase is tight to framing.

**Joint reinforcement:** Trowel bonding material to completely fill the tapered recessed board joints and gaps between each panel. On non-tapered joints, apply a 6" wide, approx. 1/16" thick, coat of bonding material over entire joint. For all joints, immediately embed 2" alkali-resistant fiberglass mesh tape fully into applied bonding material and allow to cure. Same bonding material should be applied to corners, control joints, trims or other accessories. Feather bonding material over fasteners to fully conceal.

### Floors & Counters

**Subfloor or Base:** For flooring applications with 16" o.c. floor joists, 5/8" tongue and groove exterior grade plywood or 3/4" tongue and groove exterior grade OSB may be used. For 19.2" o.c. and 24" o.c. floor joists, 3/4" tongue and groove exterior grade plywood or OSB must be used. Tile size for floors with 24" o.c. floor joists must be 12" x 12" or larger. The joists and subfloor assembly must meet L/360, as well as the appropriate code tables, for live and dead loads.

**Underlayment:** Using a 1/4" square-notched trowel, apply a setting bed of Latex-Portland Cement mortar or Thin-Set mortar to the subfloor or counter base. Immediately laminate PermaBase to subfloor or base leaving a 1/8"

space between boards at all joints and corners. Leave a 1/4" gap along walls. Stagger joints so they do not line up with underlying substrate joints. Fasten PermaBase every 8" o.c. throughout board field and around all edges while setting bed mortar is still workable. Around perimeter of each board, locate fasteners 2" from the corners and not less than 3/8" from the edges. Fill all joints solid with bonding material. On non-tapered joints such as butt ends, apply a 6" wide, 1/16" thick coat over the entire joint. For all joints, embed fiberglass mesh tape fully into applied bonding material; ensure that tape is centered over joint. Apply bonding material over fasteners to fully conceal. Remove all excess bonding material and allow to cure.

### EXTERIOR APPLICATIONS

**General:** All framing should comply with local building code requirements and be designed to provide support with a maximum allowable deflection of L/360 under all intended live (including wind) and dead loads.

**Note:** Cut or score PermaBase on printed side of panel. Install tile and tile setting materials in accordance with current ANSI specifications and Tile Council of North America (TCNA) guidelines.

**Control Joints:** For exterior installations, allow a maximum of 16 lineal feet between control joints. (For exterior tile applications, control joints should be spaced a maximum of every 12'.) A control joint must be installed, but is not limited to the following locations: where expansion joints occur in the framing or building (discontinue all cross furring members located behind joint); when boards abut dissimilar materials; where framing material changes; at changes of building shape or structural system; at each story separation. Place control joints at corners of window and door openings, or follow specifications of architect. Control joint cavity shall not be filled with coating or other materials.

### Decks

**Subfloor:** Plywood should be securely glued and fastened to floor joists spaced a maximum of 16" o.c. Subfloor should be sloped at a minimum pitch of 1/4" per foot. The floor surface should be true to plane within 1/8" in 10'.

**Underlayment:** Using a 1/4" square-notched trowel, apply a setting bed of Latex-Portland Cement mortar to the subfloor. Immediately laminate PermaBase to subfloor leaving a 1/8" space between boards at all joints and corners. Leave a 1/4" gap along walls. Stagger joints so they do not line up with underlying substrate joints. Fasten PermaBase every 8" o.c. throughout board field and around all edges while setting bed mortar is still workable. Around perimeter of each board, locate fasteners 2" from the corners and not less than 3/8" from the edges. Fill all joints solid with bonding material. On non-tapered joints such as butt ends, apply a 6" wide, 1/16" thick coat over the entire joint. For all joints, embed alkali-resistant fiberglass mesh tape fully into applied bonding material; ensure that tape is centered over joint. Apply bonding material over fasteners to fully conceal. Remove all excess bonding material and allow to cure.

**Waterproof membrane:** Trowel apply waterproof membrane to the entire surface of the PermaBase, following membrane manufacturer's installation instructions in detail.

### Walls & Ceilings

**Wall framing:** Studs should be spaced a maximum of 16" o.c. Edges/ends of PermaBase parallel to framing should be continuously supported. Provide additional blocking when necessary to permit proper PermaBase attachment. Do not install PermaBase directly over protrusions from stud plane such as heavy brackets or fastener heads.

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**Weather barrier:** While PermaBase is unaffected by moisture, a water barrier must be installed to protect the cavity. It should be installed according to the manufacturer's specifications.

**Ceiling framing:** The deflection of the complete ceiling assembly due to dead load (including insulation, PermaBase, bonding material and facing material) should not exceed L/360. The dead load applied to the ceiling frame should not exceed 10 psf. Ceiling joist or furring channel should not exceed 16" o.c. (Edges of PermaBase parallel to framing should be continuously supported.) Provide additional blocking when necessary to permit proper PermaBase attachment.

**PermaBase Cement Board:** Apply PermaBase with ends and edges closely butted, but not forced, together. Stagger end joints in successive courses. Drive fasteners into field of cement board first, working toward ends and edges. Space fasteners maximum 8" o.c. for walls, 6" o.c. for ceilings with perimeter fasteners at least 3/8" and less than 5/8" from ends and edges. Ensure PermaBase is tight to framing.

**Joint reinforcement:** Trowel bonding material to completely fill the tapered recessed board joints and gaps between each panel. On non-tapered joints, apply a 6" wide, approx. 1/16" thick coat of bonding material over entire joint. For all joints, immediately embed 4" alkali-resistant fiberglass mesh tape fully into applied bonding material and allow to cure. Same bonding material should be applied to corners, control joints, trims or other accessories. Feather bonding material over fasteners to fully conceal.

**FIRE-RATED ASSEMBLIES**

**UL LISTED PERMABASE CEMENT BOARD PARTITIONS – STEEL FRAMING**

Fire Rating	UL Design No.	Description
1 hr.	V452	1/2" PermaBase applied vertically or horizontally to one side of 3-5/8" steel studs 16" o.c. 5/8" Fire-Shield Gypsum Board applied vertically to opposite side. 3" mineral wool insulation in stud cavities.
1 hr.	V438	1/2" PermaBase applied vertically or horizontally over 5/8" Fire-Shield Gypsum Board applied vertically to each side of 3-5/8" steel studs 16" o.c. PermaBase secured to studs with cement board screws of adequate length to penetrate studs 3/8" spaced 8" o.c.
1 hr.	U420	1/2" PermaBase applied vertically or horizontally over 5/8" Fire-Shield Gypsum Board applied vertically to each side double row of 1-5/8" steel studs 16" o.c. spaced 6" apart. PermaBase secured to studs with cement board screws of adequate length to penetrate studs 3/8" spaced 8" o.c.
1 hr. Load Bearing	U425	1/2" PermaBase applied vertically or horizontally over 5/8" Fire-Shield Gypsum Board applied vertically to each side of 3-1/2", 20 gauge steel studs 16" o.c. PermaBase secured to studs with cement board screws of adequate length to penetrate studs 3/8" spaced 8" o.c.
2 hr.	V452	1/2" PermaBase applied vertically over 1/2" Fire-Shield C Gypsum Board, applied vertically to one side of 3-5/8" steel studs 16" o.c. 2 layers 1/2" Fire-Shield C Gypsum Board applied vertically to opposite side. 3" mineral wool insulation in stud cavities.
2 hr.	V438	1/2" PermaBase applied vertically or horizontally over two layers 5/8" Fire-Shield Gypsum Board applied vertically to each side of 2-1/2" steel studs 16" o.c. PermaBase secured to studs with cement board screws of adequate length to penetrate studs 3/8" spaced 8" o.c.
2 hr.	U420	1/2" PermaBase applied vertically or horizontally over two layers 5/8" Fire-Shield Gypsum Board applied vertically to each side double row of 1-5/8" steel studs 16" o.c. spaced 6" apart. PermaBase secured to studs with cement board screws of adequate length to penetrate studs 3/8" spaced 8" o.c.
2 hr. Load Bearing	U425	1/2" PermaBase applied vertically or horizontally over two layers 5/8" Fire-Shield Gypsum Board applied vertically to each side of 3-1/2", 20 gauge steel studs 16" o.c. PermaBase secured to studs with cement board screws of adequate length to penetrate studs 3/8" spaced 8" o.c.
3 hr.	V438	1/2" PermaBase applied vertically or horizontally over three layers 5/8" Fire-Shield Gypsum Board applied vertically to each side of 2-1/2" steel studs 16" o.c. PermaBase secured to studs with cement board screws of adequate length to penetrate studs 3/8" spaced 8" o.c.

**UL LISTED PERMABASE CEMENT BOARD PARTITIONS – WOOD FRAMING**

Fire Rating	UL Design No.	Description
1 hr.	U392	1/2" PermaBase applied vertically or horizontally to one side of 2x4 wood studs 16" o.c. with 1-1/4" cement board screws spaced 8" o.c. Ceramic tile installed over PermaBase. 5/8" Fire-Shield Gypsum Board applied vertically or horizontally to opposite side with 6d nails spaced 7" o.c. 3-1/2" mineral wool insulation in stud cavities.
1 hr.	U392	1/2" PermaBase applied vertically or horizontally to each side of 2x4 wood studs 16" o.c. with 1-1/4" cement board screws spaced 8" o.c. Ceramic tile installed over PermaBase. 3-1/2" mineral wool insulation in stud cavities.
2 hr.	U301	1/2" PermaBase applied vertically over two layers 5/8" Fire-Shield Gypsum Board, applied either horizontally or vertically to each side of 2x4 wood studs 16" o.c. PermaBase secured to studs with cement board screws of adequate length to penetrate studs 3/4" spaced 8" o.c.
2 hr.	U371	1/2" PermaBase applied vertically over either two layers 5/8" Gypsum Board, applied either horizontally or vertically to the interior side of 2x4 wood studs 16" o.c., or over 5/8" Gypsum Sheathing applied to exterior side with Portland cement stucco, brick veneer, thin brick finishes. PermaBase secured to studs with cement board screws of adequate length to penetrate studs 3/4" spaced 8" o.c.

