

TI-ProBoard

A Structural Ribbed Self-Supporting Board for Exterior Decks, Balconies, and Thin Concrete Finishes

The single-component structural board that replaces deck boards and plywood, so porcelain tile and thin decorative concrete can go directly to the joists on decks, balconies, and exterior floors.

AT A GLANCE

PANEL	THICKNESS	SPAN	RATING
12 in. x 8 ft or 12 ft	3/8 in. to top of rib	Up to 24 in. o.c.	Extra Heavy / Commercial

FinPan, Inc.
Hamilton, Ohio · October 2026

For architects, specifiers, and tile contractors. Install to the current TI-ProBoard instructions.

1. Purpose and Scope

This paper describes TI-ProBoard, the pultruded fiberglass composite panel we manufacture in Hamilton, Ohio, and the system we developed so porcelain tile and thin decorative concrete can be installed on exterior decks, balconies, and other outdoor floors without a wood skin under the finish. TI-ProBoard is recognized in the Tile Council of North America (TCNA) Handbook as a Structural Ribbed Self-Supporting Board (SRSB).

We wrote it for architects, structural consultants, and tile contractors specifying outdoor living space: decks, balconies, rooftop terraces, exterior floors, outdoor kitchens, and three-season rooms. The performance figures are from our technical data sheet and from independent tests we commissioned. We do not perform project design-load calculations. A design professional must confirm that the framing can carry the finished assembly.

2. Why Exterior Tile Assemblies Fail

Outdoor living space has moved from a seasonal amenity to a programmed room. Owners expect the same porcelain or decorative concrete used indoors to continue onto the deck or balcony without a step. The conventional way to get there stacks materials that do not move together: pressure-treated or composite deck boards, sometimes a plywood skin, a cementitious backer, a mortar bed, and tile.

Cement backer board itself is largely indifferent to moisture. The failures we have seen on exterior decks are driven by the wood beneath it. Deck boards and plywood swell, shrink, cup, and, where drainage is incomplete, rot. Each seasonal cycle opens grout joints, shears bond, and telegraphs movement into the tile. Salt, freeze-thaw, and incidental water over occupied space below make the problem structural as well as cosmetic. More than 30 million decks are already in place in the United States, and a large share of them are past a normal service life.

A durable exterior tile deck has to do four things at once: span the joists without a wood skin, stay dimensionally stable when wet and frozen, give mortar a mechanical key, and keep the finished surface low enough that the interior floor can meet the exterior floor without a ramp.

3. Product Description

3.1 Composition and geometry

We manufacture TI-ProBoard by pultrusion. Continuous fiber reinforcement is drawn through a resin bath and a heated die, producing a constant cross-section with the fiber oriented along the panel. The board is fiber-reinforced composite polymer with an integral fiberglass backing and 3/8-inch dovetail ribs. Edges are tongue-and-groove so adjacent panels interlock.

Panels are 12 inches wide by 8 feet (96 inches) or 12 feet (144 inches) long, 3/8 inch thick measured to the top of the ribs. A 4-by-4-foot grill-area protection insert is also available. Bare board weight is 1.3 lb/sq ft. A completed tile assembly is approximately 11 to 12 lb/sq ft.

The dovetail is the structural point of the product. Once the ribs are packed with a medium-bed mortar meeting ANSI A108.1B and screeded flush with the rib tops, the mortar is mechanically locked into the panel. The filled board, not the bare pultrusion, is what we tested. Flexural testing to ASTM D790 produced an ultimate load of 2,600 lb/sq ft with mortar in place.

Attribute	Value
Manufacturer	FinPan, Inc., Hamilton, Ohio
Process	Pultruded fiberglass / fiber-reinforced composite
Profile	Tongue-and-groove edges; 3/8 in. dovetail ribs
Panel size	12 in. × 8 ft and 12 in. × 12 ft
Thickness	3/8 in. to the top of the ribs
Bare weight	1.3 lb/sq ft
Installed weight	Approx. 11–12 lb/sq ft, tiled
Joist span, tile	Up to 24 in. on center, perpendicular to joists
Joist span, 1 in. concrete	16 in. on center
Slope	1/4 in. per foot away from the structure
Fastener	TI-ProScrews only (1-1/2 in. coated pan head); 2 per sq ft
Warranty	10 years against defects

Table 1. TI-ProBoard product data.

3.2 What the panel replaces

On a new or remodeled deck, TI-ProBoard is screwed directly to the joists. It is not an underlayment over plywood or deck boards. Any existing wood skin is removed down to the joists. The panel is the deck. That is why we describe it as a single-component system for exterior tile: one structural board between the joist and the mortar, rather than a multi-layer stack.

Because the board is only 3/8 inch to the rib top, the interior-to-exterior transition can be kept nearly flush once mortar and a typical porcelain tile are added. The same low profile is what lets a tiled balcony meet an interior floor without a curb or a ramp.

4. Performance

4.1 Robinson floor testing

ASTM C627, the Robinson-type floor test, cycles a loaded wheeled carriage over a completed tile assembly and rates the system — not a single product — as Residential, Light, Moderate, Heavy, or Extra Heavy under the TCNA performance-level guide. Our data sheet records four campaigns:

Year	Assembly / condition	Reported rating
2005	ASTM C627, 12 × 12 in. porcelain	Extra Heavy (TCNA)
2007	ASTM C627, 12 × 12 in. porcelain	Extra Heavy (TCNA)
2009	ASTM C627, 12 × 12 in. tile	Heavy (Laticrete)
2012	14 ft suspended ASTM C627	Commercial (TTMAC)

Table 2. Robinson-type results. Ratings describe the tested assembly, including mortar and tile.

Extra Heavy is the top TCNA service class and is the rating we cite for the conventional Robinson test. The 14-foot suspended test, which better represents a deck, was rated Commercial under TTMAC criteria. The 2009 result, reported by Laticrete as Heavy, is a separate campaign and should be read on its own.

4.2 Fire, freeze–thaw, and weathering

Surface-burning characteristics were measured under UL 723 / ASTM E84 (reported as UL E84-07, 2008). Calculated flame spread and the flame-spread index were both 0; calculated smoke developed and the smoke-developed index were both 0. The panel does not provide a food source for mold.

Freeze–thaw exposure is the other governing exterior test. Twenty samples passed ASTM C1026 with no deformation. A 300-cycle ASTM C67-08 freeze–thaw series passed with no changes or deformation. The board does not swell, warp, or degrade under weather exposure the way a wood substrate does. Each panel is a fiberglass section and is itself waterproof. Joints and fasteners are not. Where water must be kept out of the space below the deck, waterproofing is a separate membrane.

Test	Result
ASTM C627 Robinson, 2005 and 2007	Extra Heavy, 12 × 12 in. porcelain
ASTM C627, 14 ft suspended, 2012	Commercial (TTMAC)
ASTM D790 flexural, with mortar	Ultimate load 2,600 lb/sq ft
UL E84-07 surface burning	Flame spread 0; smoke developed 0
ASTM C1026 freeze–thaw	20 samples, no deformation
ASTM C67-08 freeze–thaw	300 cycles, no change or deformation

Table 3. Laboratory results from our technical data sheet.

4.3 Handbook recognition

TI-ProBoard is recognized in the TCNA Handbook as a Structural Ribbed Self-Supporting Board. Handbook methods do not name proprietary products; SRSB is the generic designation under which the system was accepted after we submitted our test record. Specifiers should confirm the current Handbook method number and any limitations in the edition they are designing to. Expansion joints follow TCNA method EJ171. The board itself is not cut to create the joint.

5. Applications

TI-ProBoard is intended for decks, balconies, rooftop terraces, exterior floors, outdoor kitchens, and three-season rooms — anywhere a tile or thin concrete finish has to live outside and the structure under it cannot be wood. Two assemblies cover that work.

5.1 Exterior tile decks and balconies

This is the primary use. Panels run perpendicular to joists spaced up to 24 inches on center, on framing sloped 1/4 inch per foot away from the building. End joints are staggered and land on a joist or on added blocking; no end is left unsupported, and no panel segment should be shorter than three joist spans. After the ribs are filled and the mortar has cured (commonly 24 hours, following the mortar manufacturer), an exterior-rated porcelain — minimum 12 inches, fully vitrified — is set in a modified thin-set meeting ANSI A118.4 or better. We require at least 98 percent thin-set coverage and back-buttering. Grout must carry an exterior rating. Finished-surface friction should be a coefficient of 0.6 or above; the current TCNA dynamic coefficient of 0.43 also applies.

Where the deck or balcony is over living space, or where a dry storage area is intended below, a waterproofing membrane is part of the assembly. Our details distinguish a waterproof system over living space from a waterproof system used to keep storage below dry. The panel joints are not a waterproofing layer.

5.2 Thin decorative and stamped concrete

We have approved decorative and stamped concrete on TI-ProBoard decks and balconies under three conditions: joists at 16 inches on center (tighter than the 24-inch tile span), 3,000 psi concrete, and a total pour thickness of 1 inch. This is a distinct assembly from the tile system and should not be mixed with the 24-inch span used for porcelain. For rib fill alone, a 60-pound bag of concrete mix covers about 14 square feet of board. A 4-by-4-foot insert is available where a grill needs a protected zone in the field of the deck.

DESIGN NOTE — CONCRETE VERSUS TILE

Do not carry the 24-inch tile span into a concrete-topped deck. The approved concrete condition is 16 inches on center, 3,000 psi, and 1 inch total thickness. Call us before specifying a stamped finish if the framing does not already meet that spacing.

6. Design and Installation

6.1 Framing

Joists must be sound, spaced no more than 24 inches on center for tile (16 inches for the 1-inch concrete pour), and sloped 1/4 inch per foot. Plane tolerance is 1/4 inch in 10 feet and 1/16 inch in 1 foot. On a remodel, decking is stripped, joists and posts are inspected, and slope is corrected — one method we recommend is to sister a 2×6 to each existing joist and fasten the panels to the new top edge. The assembled framing should meet a maximum deflection of $L/720$, the customary limit for ceramic tile. That check belongs to the design professional. Point loads from planters, hot tubs, and outdoor kitchens need their own review.

6.2 Fastening and layout

Only TI-ProScrews are warranted. They are 1-1/2-inch coated pan-head fasteners, used at two per square foot, driven through the fiberglass into the joist and later capped by mortar. We require our fastener because of the combination of fiberglass, pressure-treated lumber, and a cementitious cap. The first course is set straight to a chalk line, grooved edge outward. Courses interlock. End joints are staggered so a seam does not run continuously along one joist. Unsupported ends get blocking. A wet saw is recommended; dry cutting raises glass-fiber dust.

6.3 Mortar, membrane, tile

Ribs are packed with medium-bed mortar meeting ANSI A108.1B and screeded to the top of the rib. Tile follows after the mortar manufacturer's cure, typically about 24 hours, in latex-modified thin-set meeting ANSI A118.4 or better. Notch guidance is a $1/4 \times 3/8 \times 1/4$ inch trowel for 12- and 13-inch tile, and a $3/8 \times 3/8 \times 3/8$ inch trowel for 16- and 18-inch tile. Exterior work wants fully vitrified porcelain suited to the climate zone. Expansion joints are mandatory under EJ171 and are formed in the finish, not by cutting the board. Perimeter treatment uses TI-ProEdging pressed into the thin-set, with a 1/4-inch gap caulked to match the grout. Posts and rails that can move get a 1/2-inch gap, covered with trim.

6.4 Handling

Tongues and grooves are the interlock; damaged edges should not be forced. Boards stored outdoors for more than about two months need a UV cover. An installed board does not need routine maintenance. Our 10-year warranty covers defects in the panel. Workmanship, framing, and waterproofing remain outside that warranty.

7. Comparison with a Conventional Stack

Issue	Deck board + cement backer	TI-ProBoard
Structural base	Wood decking or plywood, then backer	Pultruded board on the joists
Moisture movement	Wood swells, cups, and can rot	Composite; will not swell
Freeze–thaw	Dependent on the wood and the stack	C1026 and 300-cycle C67 passed
Build-up	Often 1-1/2 in. or more before tile	3/8 in. board plus mortar and tile
Flame spread	Varies with the wood deck	E84 flame spread index 0
Single trade layer	Multiple substrates	One structural panel, then finish
Handbook class	Conventional backer methods	SRSB in the TCNA Handbook

Table 4. Functional comparison. Conventional assemblies can be detailed successfully; the difference is the number of movement-sensitive layers under the tile.

8. Guide Specification Notes

The following is language a specifier can adapt inside Division 07 or 09, coordinated with structural notes and the waterproofing section.

Structural tile substrate. Provide a pultruded fiberglass structural ribbed self-supporting board, 12 inches wide by 8 or 12 feet, 3/8 inch to the top of dovetail ribs, tongue-and-groove edges, TI-ProBoard as manufactured by FinPan, Inc. Install perpendicular to joists spaced at not more than 24 inches on center for tile, or 16 inches on center where a 1-inch, 3,000 psi decorative concrete finish is specified. Slope framing 1/4 inch per foot away from the structure. Do not install over plywood or deck boards.

Fasteners. 1-1/2-inch coated pan-head TI-ProScrews, two per square foot, at each joist. Stagger end joints. Support every panel end.

Fill and finish. Pack ribs with mortar meeting ANSI A108.1B, screeded flush. Where the deck or balcony is over occupied space or dry storage, provide a waterproofing membrane in accordance with the membrane manufacturer and TCNA wet-area practice. Set exterior porcelain in ANSI A118.4 or better modified thin-set at not less than 98 percent contact. Provide EJ171 movement joints without cutting the structural board. Grout rated for exterior exposure.

9. Limitations

TI-ProBoard is a substrate, not a finished walking surface and not a waterproofing membrane. Joints leak until they are detailed. The 24-inch span is a tile condition; concrete finishes use 16 inches. The Robinson ratings describe tested assemblies with a stated tile and mortar, not every tile size or every bedding thickness. We do not take responsibility for project load calculations, joist adequacy, rail loads, or guard design. Storage beyond about two months in sun requires cover. Cutting produces glass fiber; a wet saw is the recommended method. Hot tubs, outdoor kitchens, and planters need an engineered check even when the tile span is satisfied.

10. Conclusion

Exterior tile fails most often because the structure under it moves. TI-ProBoard removes that wood layer. A pultruded, dovetailed panel, fastened to sloped joists and locked to a mortar fill, gives porcelain a stable base at a thickness that can meet an interior floor. It does so with Extra Heavy and suspended Commercial floor ratings, zero flame-spread and smoke indices, and freeze–thaw results that wood decking cannot match. On 16-inch joists, the same panel carries a

1-inch decorative concrete pour.

Used inside those limits — correct span, TI-ProScrews, rib fill, a membrane where water must be kept out of the space below, and movement joints in the finish — it is the way we bring tile and thin concrete onto a deck or balcony without inheriting the movement of the wood.

References

- FinPan, Inc. TI-ProBoard Technical Data Sheet.
- FinPan, Inc. TI-ProBoard: The Deck Tiling Solution, including the decorative-concrete approval (16 in. o.c., 3,000 psi, 1 in. total pour).
- FinPan, Inc. TI-ProBoard installation instructions and product data.
- Tile Council of North America, Handbook for Ceramic, Glass, and Stone Tile Installation, SRSB designation and method EJ171.
- ASTM C627 (Robinson-type floor test), ASTM C1026, ASTM C67, ASTM D790, and ASTM E84 / UL 723.

FinPan, Inc. · 3255 Symmes Road, Hamilton, Ohio 45015 · Orders 800-833-6444 · 800-544-7398 · 513-870-9200 · finpan.com. October 2026. This paper describes the TI-ProBoard system for exterior decks, balconies, and related outdoor floors. It is not a substitute for the current installation instructions or for a project-specific structural design.