

Georgia-Pacific **Answers** Questions about
DensShield® Tile Backer



 Georgia-Pacific
DensShield®
Tile Backer



GP Georgia-Pacific
DensShield[®]
Tile Backer

Product Description

DensShield[®] Tile Backer was designed for use as a substrate for tile walls, ceilings, countertops and commercial and residential floor applications in high moisture areas. The special moisture-resistant, treated core **[A]**—covered front and back by fiberglass mats **[B]**—is 30% lighter than the leading cement board brands (based on 1/2" comparison.) The unique construction (an outer grey heat-cured copolymer moisture-resistant coating **[C]** over fiberglass mats over a patented, moisture-resistant, treated core) makes it a preferred product for any application in high moisture areas.

Applications

- Bathrooms (shower and tub walls, floors and ceilings)
- Kitchens (back splash, walls, countertops and floors)
- Residential and light commercial floors
- Non-tiled walls and ceilings in indoor swimming pool enclosures
- Residential steam rooms (call 1-800-225-6119 for application instructions)

Sizes

- 1/2" DensShield Tile Backer is available in 4' x 5', 32" x 5' and 4' x 8' panels for walls, floors and ceilings.
- 5/8" DensShield Tile Backer is available in 4' x 8' panels for fire-rated assemblies.
- 1/4" high-density DensShield underlayment is available in 4' x 4' panels for countertops and floors.

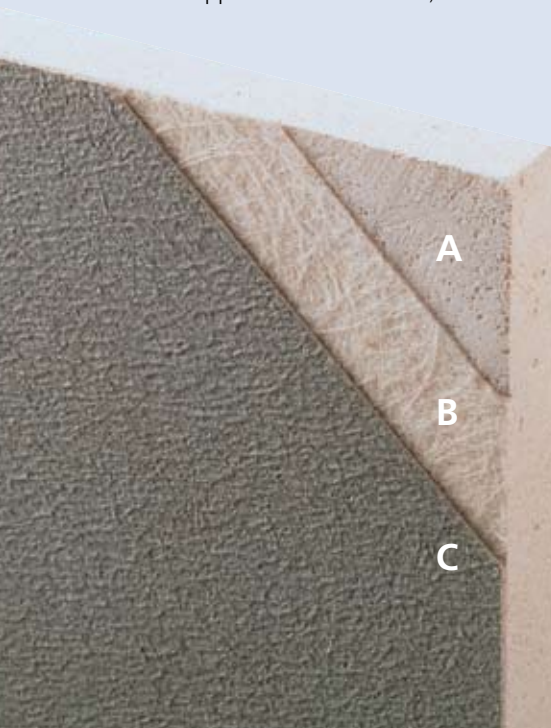
Standards and Code Compliance

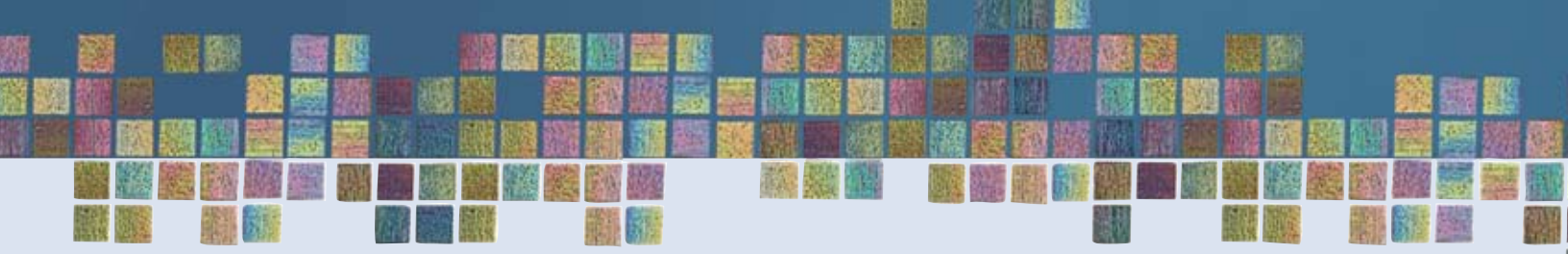
DensShield Tile Backer in 1/4", 1/2" and 5/8" thicknesses meets ASTM C 1178 as a fiberglass mat gypsum substrate for use as tile backer and has the following code evaluations:

- ICC-ES Legacy Report NER 572
- New York City MEA 65-88-M
- IRC and IBC code compliant

For More Information

For complete technical information, independent test data, application instructions, warranty and specifications, call the Georgia-Pacific Technical Hotline, **1-800-225-6119**. Or visit our Web site at www.densshield.com.



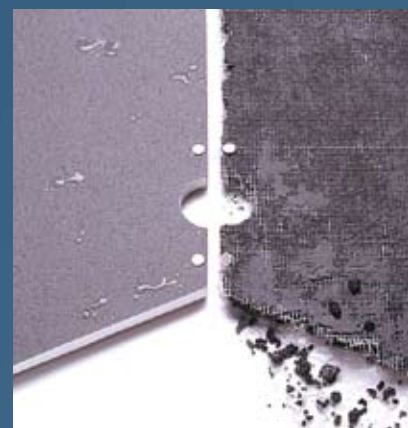


DensShield® FEATURES	DensShield® ADVANTAGES	DensShield® BENEFITS
Protects Tile Installation		
<ul style="list-style-type: none"> • Unique grey built-in acrylic coating. • Moisture-resistant treated core. • The only 5/8" Type X premium performance tile substrate that achieves one- and two-hour fire ratings. • Mold-resistant. 	<ul style="list-style-type: none"> • Protects tile installation and stops moisture migration into wall cavity. • Outperforms cement backers by stopping moisture at the surface. • Virtually no wicking compared to other backer boards. 	<ul style="list-style-type: none"> • Ideal for floors, showers, kitchens, countertops and other wet, high-humidity areas. • Fewer callbacks.
Easy To Install		
<ul style="list-style-type: none"> • Scores and snaps easily with a standard utility knife. • Light weight; 30% lighter than the leading cement board brands (1/2" comparison.) • Easy-to-handle sizes. 	<ul style="list-style-type: none"> • Non-abrasive to fixtures in tub and shower installations. • Can fasten close to edge for easy application over plywood flooring and wall framing. 	<ul style="list-style-type: none"> • Lower installed cost. (NAHB study showed DensShield® Tile Backer 46% faster to install than cement board.)
Strong and Durable		
<ul style="list-style-type: none"> • Flexural strength is approximately the same in both directions. 	<ul style="list-style-type: none"> • Wall and ceiling applications can be either parallel or perpendicular to the supporting member. 	<ul style="list-style-type: none"> • Fewer panel joints.
Lifetime Limited Warranty		
<p>When used in residential tile installations.*</p> <ul style="list-style-type: none"> • Backed by Georgia-Pacific, a worldwide leader in building products manufacturing. • 20-Year limited warranty for commercial installations.* 		<ul style="list-style-type: none"> • Peace of mind for contractor and home owner.

*See warranties for complete terms, conditions and limitations. For a copy of the warranty or for technical details, call 1-800-225-6119.



DensShield® Tile Backer outperforms cement board and is easier to install.



What is DensShield® Tile Backer?

DensShield® Tile Backer is our revolutionary substrate for installing tile in interior areas that are susceptible to moisture. DensShield panels are used for interior tile installations on ceilings, walls, floors and countertops. In industry-approved tests, DensShield has achieved a residential and light commercial rating for floors.

A quality tile installation requires a sound substrate that is unaffected by moisture. When tile is installed on plywood or paper-faced gypsum board, moisture can cause deterioration of the substrate, resulting in a tile failure. Plywood is a poor substrate for direct tile installations because moisture can cause it to warp and buckle, resulting in delamination or separation of the tile and mortar from the board.

Paper-faced gypsum board is adversely affected by moisture. When moisture migrates into the core, it wicks or moves up the board causing the paper to separate from the core and the tile to fall off. Conversely, DensShield panels provide a sound substrate for tile and offer outstanding protection from moisture. Its light weight makes it easy and simple to install. In addition, DensShield doesn't wick moisture.

Cement backers such as Durock®, HardiBacker® and Wonderboard® also provide a sound substrate for tile installation and have long been a favorite of tile contractors. Cement backers, however, are hard to install because they are heavy and difficult to score, cut and fasten without special, expensive tools. DensShield actually outperforms cement backers in moisture protection. Although cement backers are unaffected by moisture, they allow the passage of moisture through to the wall cavity if no additional moisture barrier is used. With DensShield Tile Backer, no additional moisture barrier is required or recommended. It's also lighter and much faster to install.

For these reasons, DensShield panels are truly the ultimate tile backer product. DensShield Tile Backer costs slightly more than greenboard but the high cost of redoing a tile job due to moisture damage makes it a bargain. It is priced about the same as cement backers.

On the market since 1987, DensShield Tile Backer has proven to be a viable and formidable competitor to cement backers because of these unique design characteristics:

1. GREY, HEAT-CURED ACRYLIC SURFACE COATING:

The grey coating on the tile application side of DensShield Tile Backer is a multi-coat, heat-cured, copolymer acrylic that provides a moisture barrier that stops water and retards moisture at the surface. This coating also serves as an ideal bondable surface for a variety of tile setting mortars and mastics. Because of this coating, no additional moisture barrier is required or recommended to protect the wall cavity.

2. FIBERGLASS MATS ON BOTH SIDES OF THE PANEL:

To add strength and rigidity, the core has fiberglass mats on both sides of the panel that are impregnated into the panel in the manufacturing process. This construction, combined with the tile-side acrylic coating, eliminates the possibility of delamination associated with paper-faced gypsum board. The added strength also means that DensShield Tile Backer can be fastened either vertically or horizontally to the supporting framing members, which can result in fewer joints.

3. PROPRIETARY MOISTURE-RESISTANT TREATED CORE:

The high-performance, moisture-resistant core of DensShield Tile Backer is specially treated to add further moisture protection. The specially engineered core doesn't allow DensShield panels to wick moisture like competing products.

DensShield® Tile Backer Application Chart

Size	Applications	Advantages
1/2" x 4' x 5'	walls, floors, ceilings, countertops	Allows contractors to install DensShield® Tile Backer in larger bath and garden tub surrounds with fewer joints and less waste.
1/2" x 32" x 5'		Works well for smaller tub surrounds, reducing joints and waste. Weighs only 27 lbs. per panel as compared to 45 lbs. per panel for the leading 3' x 5' cement board panel. Designed to align with standard construction framing of 16" o.c.
1/2" x 4' x 8'		Panel of choice for large residential and commercial applications. Large size reduces waste and number of joints that require treatment. Designed to align with standard construction framing of 16" o.c.
1/4" x 4' x 4'	floors, countertops	Perfect as underlayment for floors and countertops. The 1/4" thickness keeps the floor profile low while still providing ultimate performance—the 4' x 4' panel makes it easy to offset panel joints.
5/8" x 4' x 8'	walls, floors, ceilings, countertops	For fire-rated assemblies. Can be used anywhere Type X board is generically specified. Ideal for commercial and multi-family construction. Aligns perfectly with other 5/8" gypsum boards in fire-rated assemblies. No shimming necessary when moving from tiled to non-tiled areas.

Testing and Code Recognition

Floor Testing— Robinson Floor Test/ASTM C 627

An independent testing agency conducted the Robinson Floor Test (ASTM C 627) on DensShield® Tile Backer by constructing assemblies and subjecting them to increasing tests of weight and durability. Ultimately, DensShield panels were able to withstand pressure equivalent to three stacked refrigerators without damage.

Adhesion Bond Testing

CTC-Geotek conducted bond-adhesion tests comparing adhesion capabilities of DensShield Tile Backer and cement backers using most all major manufacturers' setting materials. The tests concluded that bonds with DensShield are as good as, if not better than, bonds with cement backers.

Moisture-Wick Testing

DensShield Tile Backer and the leading brands of cement board were subjected to wicking tests according to the Ceramic Tile Institute test procedures CTI-T83. The tests showed that within a 24-hour period, cement board will wick at least 3" up the board while DensShield will wick less than one-third of 1" (.31") during that same period.

Shower Test

DensShield Tile Backer passed a remarkable test observed by an independent testing firm. DensShield was subjected to a shower of water at 110°F, 15 minutes per hour for 24 hours, five days per week for a one-year period. The shower installation had no grout between wall and ceiling tiles installed over DensShield panels. No deterioration occurred. A similar test was conducted using cement board at CTC-Geotek. DensShield Tile Backer outperformed cement board during the severe test application. Test results are available upon request.

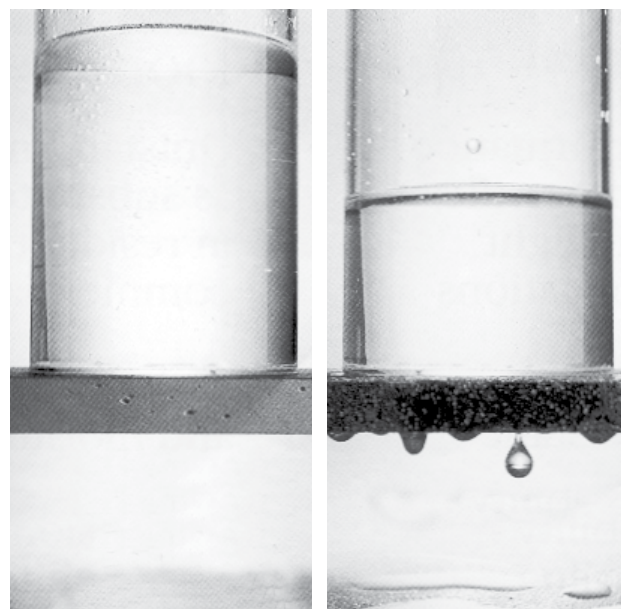
The DensShield panel test compares to 28 years of showers without deterioration. Although cementitious backer boards would not likely deteriorate under the same conditions, the possibility exists for deterioration of framing members and wall cavity components due to moisture infiltration if a moisture barrier isn't positioned behind the cementitious backer unit.

Percolation Test

The International Conference of Building Officials—Evaluation Service (ICBO-ES) prescribes a percolation test to measure how much water will pass through a panel within 48 hours. The test determines if an additional water barrier should be installed. The test consists of a 2" diameter tube, 48" long, bonded to test samples with silicone sealant. The tube is filled with water and after the allotted time, the remaining water is measured (minus evaporation).

When DensShield Tile Backer was tested using the ICBO-ES percolation test, only 1/8" of water passed through DensShield

while 19"+ of water passed through one cementitious tile substrate sample and 43"+ of water passed through another sample of cement board. The test shows that DensShield Tile Backer stops water at the surface, while cement boards allow water to pass through their porous construction.



DensShield® Tile Backer stops moisture at the surface to protect tile installations and wall cavity.

Portland cement board allows moisture to pass through to the wall cavity.

Mold Resistance Test

Tests conducted by SGS U.S. Testing Company Inc., an independent testing service based in Tulsa, Okla., have indicated that DensShield Tile Backer effectively resists mold growth. When tested, as manufactured, in accordance with ASTM D 3273, DensShield scores a 10, the highest level of performance for mold resistance under the ASTM D 3273 test method.*

DensShield Tile Backer is the first and only tile backer listed as a GREENGUARD microbial resistant product by a leading third-party organization, GREENGUARD Environmental Institute. This listing means DensShield Tile Backer, which features fiberglass mats instead of paper facings used on the surface of traditional tile backers, resist mold growth. The microbial resistant test is based on ASTM Standard D 6329-98, a testing standard set by ASTM International, which develops testing guidelines and procedures for building materials, products, systems and services.

*The score of 10, in the ASTM D 3273 test, indicates no mold growth in a 4-week controlled laboratory test. The mold resistance of any building product when used in actual job site conditions may not produce the same results as were achieved in the controlled, laboratory setting. No material can be considered mold proof. When properly used with good design, handling and construction practices, Dens™ Brand gypsum products provide increased mold resistance compared to standard paper-faced wallboard products.

GENERAL INSTALLATION QUESTIONS

1 Is the acrylic coated side of DensShield® Tile Backer installed face out?

Yes. The DensShield® Tile Backer panel should be positioned next to framing with the acrylic coated (grey) side facing away from studs. Apply mortar or mastic and tile to the acrylic coated (grey) side of DensShield panels. The built-in acrylic coating stops moisture penetration at the surface.

2 How do I score and cut DensShield Tile Backer?

DensShield panels score and snap cleanly with a standard utility knife. DensShield Tile Backer may be cut by scoring and snapping or by sawing, working from the grey facing side of the panel.

3 Can I install DensShield Tile Backer either parallel or perpendicular to the wall framing?

Yes. The flexural strength of DensShield panels is approximately the same in both directions. This allows wall and ceiling application either parallel or perpendicular to the supporting members and results in fewer panel joints.

4 Can DensShield Tile Backer be used in non-tile wet area applications?

Yes. In many applications, DensShield Tile Backer is used for its moisture barrier and moisture-resistant qualities for non-tiled walls and ceilings. There are several methods for finishing the panel depending on the environment. The environments of non-wet, high humidity and wet areas are described in the DensShield technical brochure (GP Item #532182). Each environment has its own finishing recommendation. A finishing method must never be used in a more severe environment than described.

5 Will the surface coating and mat separate or delaminate from the core?

No. The proprietary copolymer surface coating is heat cured, will not liquefy and is bonded to the fiberglass mat and the proprietary core. The fiberglass mats are mechanically attached by being embedded into the core during manufacture of the board.

6 What does it mean when Georgia-Pacific says DensShield panels have high resistance to wicking?

Like fuel travels up a wick of an oil lamp, the same occurs when other tile backer boards are exposed to water. When water wicks or travels up the board, it may not harm the board itself. But when it infiltrates the wall cavity, moisture can cause many problems including, but not limited to, dry rot, rusting fasteners, color change of tiles and wet insulation. Type 1 mastic loses its bond during prolonged wetting. When insulation becomes wet, it loses its effectiveness. This does not mean, however, that DensShield Tile Backer can be permanently immersed in water.

7 Does the Tile Council of North America (TCNA) recognize DensShield Tile Backer?

Yes. DensShield Tile Backer is found in 15 assemblies in the TCNA handbook for floors, walls, ceiling, tubs and showers and meets ASTM C 1178. GP has long been a supporter of the TCNA and is active in other industry associations.

8 What does the Lifetime Limited Warranty on DensShield Tile Backer really mean?

Georgia-Pacific is so confident about the performance of DensShield Tile Backer that the company backs it with a Lifetime Limited Warranty when used in residential tile installations and a 20-year limited warranty when used in commercial applications. For warranty details, visit our Web site at www.densshield.com.

9 Can I use DensShield® Tile Backer in fire-rated wall assemblies?

Yes. 5/8" DensShield® Fireguard® Type X Tile Backer can be substituted in any generic assemblies using a 5/8" Type X gypsum board. This permits the use of numerous 1-hour and 2-hour assemblies for both wood and metal frame construction. Transition to regular 5/8" Type X board is also minimized.

10 Do DensShield panels meet 2006 IRC and IBC codes for wet areas?

Yes. DensShield Tile Backer is manufactured to ASTM C 1178 and is listed as one of the three products acceptable as a backer board in wet areas.

FASTENING

11 What is the correct wall and ceiling framing requirements for DensShield Tile Backer?

Maximum wall framing spacing for 1/2" DensShield panels is 16" o.c. without blocking or 24" o.c. with blocking. Maximum wall framing spacing with 5/8" DensShield is 24" o.c. with or without blocking. For ceilings, framing should be spaced no greater than 12" o.c. for 1/2" DensShield or 16" o.c. for 5/8" thickness. Panels should be applied perpendicular to framing.

12 How is DensShield Tile Backer fastened in place?

No special or unique fasteners are required to fasten DensShield panels in place. For wood studs: galvanized roofing nails, rust-resistant drywall screws or bugle head deck screws. Fasteners should be long enough to penetrate at least 3/4" into the wood framing members. For metal framing: a variety of rust-resistant screws can be used.

13 What is the fastener spacing?

For walls and ceilings in either wood or metal framing, fasteners are to be spaced no more than 6" o.c. along framing members. For floor applications, fasteners should be spaced no more than 8" o.c. in both directions. Staples can be used on 1/4" products and spaced every 2" on edge and 4" in field.

14 Should the fasteners be countersunk?

No. Fasteners should be flush with the coated surface and are not to be countersunk.

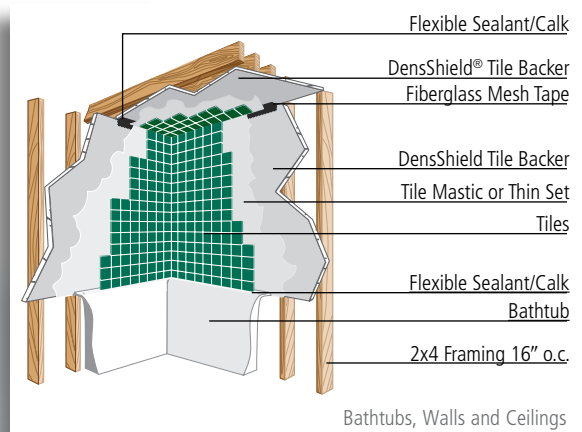
15 How do you repair damage to the surface coating of DensShield panels or areas where fasteners are countersunk?

Minor damage to the surface can easily be repaired by covering the indented or blemished area with standard tile setting material.

TAPING AND BEDDING

16 Should I tape the joints? If so, what kind of tape should I use with DensShield Tile Backer?

Yes. In all corners, bed self adhesive 2" wide 10x10 fiberglass mesh tape in a bead of flexible sealant. This is the same type of tape used for taping cement board joints. Then, embed the tape with the same material used to set tiles. Do not use all-purpose or setting type drywall compounds. Pull tile setting materials tightly over the joint to reduce crown in the joint area.



MOISTURE PROTECTION

17 I have been told by professional installers that DensShield[®] Tile Backer can provide a true moisture-resistant envelope by using flexible sealant/caulk in corners where adjacent DensShield panels come together. Is this true?

Yes. By caulking the intersecting corners of DensShield panels and around a tub base or shower pan with flexible sealant/caulk, a moisture-resistant envelope is established. The sealant/caulk should be applied to the DensShield corners PRIOR to taping the joints. This “caulk” joint should be as small as possible and should not spread over the face of DensShield panels because not all setting materials will adhere to a flexible sealant.

18 Must an additional moisture barrier be supplied and installed when using DensShield panels?

No. The grey face (tile side) of DensShield Tile Backer has a heat cured acrylic coating which is a built-in moisture barrier and vapor retarder so that no additional moisture barrier is required. In fact, an additional moisture barrier to the back side of DensShield is NOT recommended. Once tile is installed over DensShield panels, the assembly is a vapor barrier with a perm rating of less than one (1).

TILING

19 Are special tile setting materials needed to work with DensShield panels?

No. DensShield Tile Backer requires the same type of setting materials as any other backer board. No special mastics or thin-sets are required. To set tile, use Type 1 ceramic tile mastic, dry-set or latex portland cement mortar, or other products recommended by the mastic or mortar manufacturer. Follow the tile setting manufacturer’s instructions for applying tile setting material. Dry-set or thin-set latex-modified mortars are most commonly used with DensShield Tile Backer and cement backers. Use only latex-modified mortars in floor applications.

20 How well do different setting materials bond with the grey DensShield panel coating?

DensShield Tile Backer performs equal to or better than cement boards and fiber cement backers with all popular setting materials.

DensShield[®] Tile Backer is ideal for bathrooms, showers, floors, kitchens and other wet, high humidity areas.



21 Is there a limit on tile sizes and thicknesses for walls and ceilings?

Today's tile comes in a variety of sizes, shapes and weights and most are appropriate over DensShield® Tile Backer for walls, ceilings, floors and countertops. For specific questions, contact the GP Technical Hotline at 1-800-225-6119.

22 Can damaged tile easily be replaced when DensShield® Tile Backer is used as the tile backer?

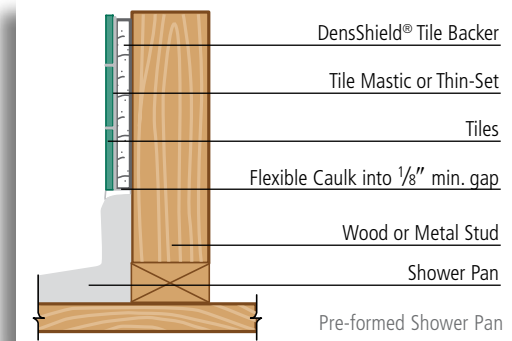
Yes. Here are some general guidelines and procedures:

Large Areas

1. Remove affected tile area and surrounding tiles from stud to stud. This includes removing the DensShield panels.
2. Fasten additional studs known as "scabs" to the sides of the original studs for support of the new DensShield panels.
3. Caulk the edges of the new DensShield panels with a flexible sealant/caulk so the joint is waterproof.
4. After caulk has cured, install new tiles and grout.

Small Areas

1. Remove grout from around the affected area.
2. Carefully score through just the acrylic finish around the affected area.
3. Remove the tile, including the acrylic DensShield finish, exposing the silicone-treated core.
4. Use a penetrating sealer/primer such as shellac primer or solvent-based primer to seal the exposed core.
5. Install tile with either a mastic or modified thin-set.
6. Re-grout the area.

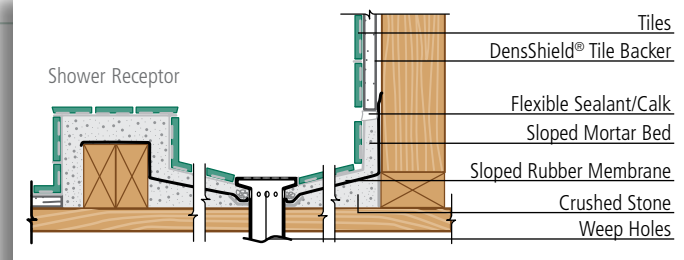


SHOWERS

23 How do you finish DensShield panels around the shower pan?

The shower pan or rubber membrane must be adequately sloped to the open drain or weep hole detail to permit proper water drainage. Caulk the space between the mortar bed and DensShield edge with flexible caulk.

- Showers with curbs— apply waterproof membrane up the walls a minimum of 2" and a maximum of 4" above curb.
- Showers without curbs— apply waterproof membrane up the walls a minimum of 6" and a maximum of 8".



DensShield panels should not be used in shower curbs. DensShield Tile Backer can be installed in the shower pan if part of an approved system.

DensShield®

Tile Backer

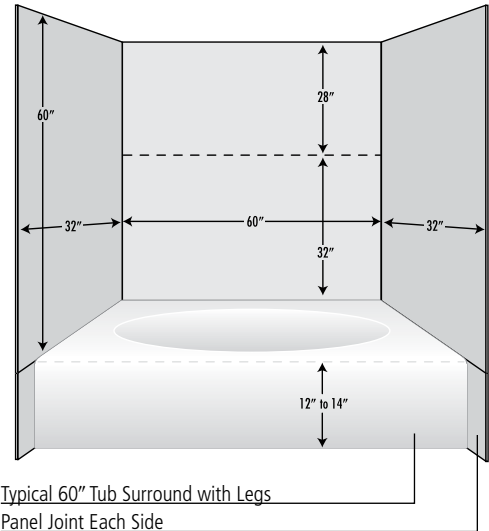
24 How can DensShield® Tile Backer reduce waste?

32" x 5' DensShield® Tile Backer saves you time and money. There will be only 1½ square feet of waste with DensShield for a standard 60" tub surround and 4" x 60" waste used to cut 2" x 12" or 2" x 14" legs for typical tub surround.

25 In a shower pan application, can DensShield Tile Backer penetrate the mortar bed?

Yes, DensShield Tile Backer can penetrate the mortar bed if a one coat float tile assembly is utilized. DensShield can be installed as a baseboard for a traditional reinforced floated wall tile system that has been attached to the framing members. The DensShield may be hung either parallel (horizontal) or perpendicular (vertical) to the framing for wall applications. Please refer to DensShield Product Bulletin #531719, "How to Create a One Coat Float Assembly with DensShield Tile Backer" for specific details and installation instructions.

If the one coat float method is not utilized, then the Tile Council of North America (TCNA)—Handbook for Ceramic Tile Installation 2008—does not recommend penetrating the mortar bed with DensShield Tile Backer or any other tile backer board in wet areas. Add a bead of flexible sealant between the DensShield panels and the shower pan (see diagram below). Do not use DensShield as a shower floor base or for curbs.



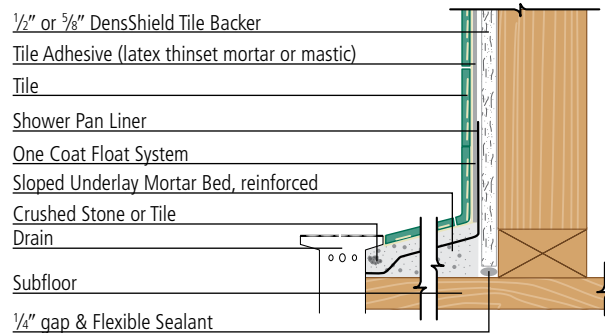
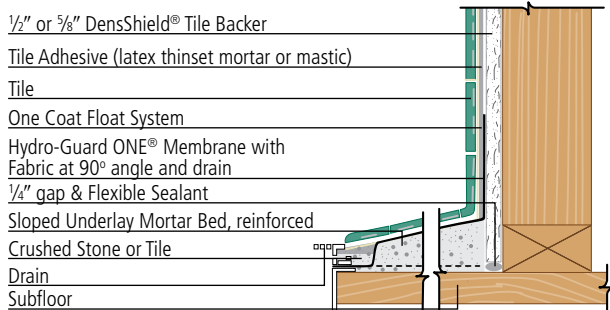
Typical 60" Tub Surround with Legs
Panel Joint Each Side

26 Can DensShield panels be used in a one-coat method wall tile system?

Yes, DensShield Tile Backer can be installed as a baseboard for a traditional reinforced floated wall tile system attached to the framing. DensShield may be hung either vertically or horizontally for wall applications.

- Grey coated side should always face out, away from the studs.
- Framing should be spaced no greater than 16" o.c.
- Attach DensShield spacing fasteners 6" o.c. along studs for wood or metal framing.
- For tub and pre-formed shower pans, leave a 1/8" to 1/4" gap above the lip; fill with flexible sealant.
- For shower pan receptors with membranes, the lath membrane shall be installed in a weather board fashion over the pan membrane.
- Attach membrane and lath per lath and membrane manufacturers' guidelines. Apply mortar bed per TCNA assembly W231. Membrane (ANSI A-2.1.8) shall be installed such that water is continually sloped toward the drain.

One-Coat Float System



27 Can DensShield® Tile Backer be used in floor applications?

Yes. Both ¼" and ½" DensShield® Tile Backer can be used in floor applications. Both of these thicknesses passed the Robinson Floor Test, the industry standard floor test for light commercial ratings. The Robinson Floor Test (ASTM C 627) is designed to determine how a tile assembly holds up under extreme wear and weight conditions. DensShield achieves the same light commercial rating as cement and fiber cement backers.

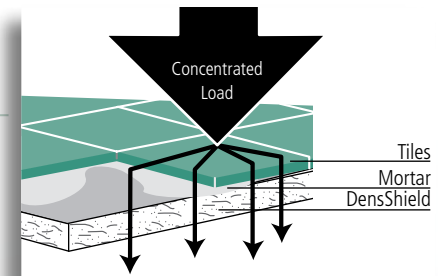
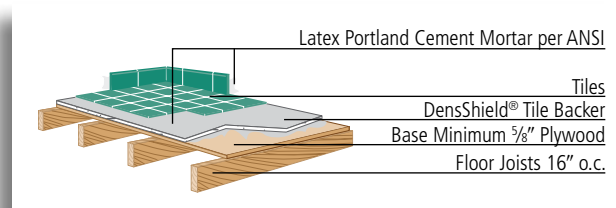
28 DensShield seems softer than cement boards. Does it have the same floor ratings?

DensShield Tile Backer is rated for residential and light commercial floors. ¼" DensShield panels have a compressive strength of 1500 lbs. per square inch (psi). ½" DensShield has a compressive strength of between 450 and 600 lbs. per square inch. That means that it would take a load of 450 to 600 lbs. per each square inch to start to crush ½" DensShield. When a load is applied to the floor tile, the tile distributes the load over its entire area. For example, a floor grade tile of 2" x 2" is 4 square inches. Using the conservative number of 450 lbs. of compressive strength per square inch for ½" DensShield panels times 4 square inches, it would take a total load on each 2" x 2" tile of over 1800 lbs. to overcome the compressive strength of ½" DensShield. An 8" x 8" tile would require a load on that tile of over 28,000 lbs. to overcome the compressive strength of ½" DensShield. (8" x 8" = 64 square inches x 450 lbs. per square inch = 28,800 lbs.) (¼" DensShield, 8" x 8" x 1,500 psi = 96,000 lbs.)

29 Is DensShield® Tile Backer installed any differently than other tile backers in flooring applications?

No. DensShield in either the ¼" or ½" thickness is installed the same way, following the guidelines below:

- Laminate DensShield panels, grey coated side up, to ⅝" minimum APA exterior grade plywood subfloor or ¾" OSB using a latex portland cement mortar (complying with ANSI A118.4) liberally applied with a ¼" square notched trowel. This is the same recommendation as Tile Council of North America (TCNA).
- Embed DensShield into mortar while still pliant (do not exceed open time). Stagger DensShield joints from subfloor joints; fasten with 1¼" galvanized roofing nails or corrosion-resistant screws. Avoid driving fasteners into the joists to avoid nail pops. Space fasteners no greater than 8" o.c. in both directions. Drive fasteners flush with the surface—do not countersink. Apply 2" x 10" glass mesh tape over joints and embed with latex portland cement mortar.
- Staples: (¼" DensShield only) ¼" or larger crown corrosive resistant chisel-point staples equal to approximately the total thickness of underlayment and subfloor. Staples shall be placed 2" o.c. around the perimeter and 4" o.c. in the field insuring that the staples are between ⅜" and ½" from ends and edges.
- Apply flooring grade ceramic tile with latex portland cement mortar (ANSI A118.4). Tile must be a minimum size of 2" x 2" or larger. Full thickness thresholds should be used, butted against the edge of DensShield panels and flush with the tile surface.
- Use latex portland cement floor grout (ANSI A118.6).
- PRIOR to tile installation, all backer boards need to be protected from very heavy loads and construction traffic such as moving appliances. Protection such as plywood should be laid down in these areas.



The drawing above depicts how a load is distributed over the surface of a tile and carried by DensShield Tile Backer. With a minimum tile size of 2" x 2", a load of over 1800 lbs. is needed to overcome the compressive strength of DensShield and floor assembly.



30 Can DensShield® Tile Backer be used in residential steam rooms?

Yes. But follow the specific installation recommendations below:

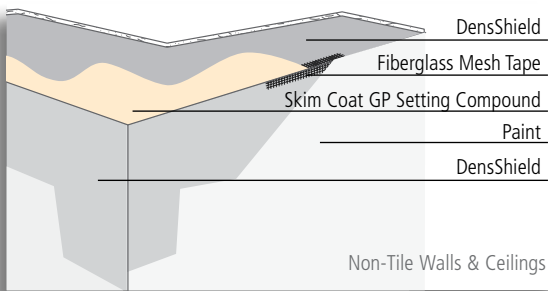
1. Do not install a vapor barrier behind DensShield® Tile Backer.
2. Apply DensShield to all wall and ceiling surfaces that will constitute the steam room using corrosion-resistant fasteners 6" o.c. along all framing members. All parts of the steam room shall be tiled.
Caution: Exposing materials such as wallpaper, joint compound, drywall or untiled DensShield panels may result in unsatisfactory performance of these materials.
3. Tape all corners and joints with a self-adhering fiberglass mesh tape and embed with a latex modified thin set mortar. Spot fasteners that were incidentally countersunk and other surface deformations.
4. Roller apply a liquid waterproofing material such as Laticrete 9235 or equal directly over the entire DensShield surface covering all fasteners, corners and joints. As an alternative to taping corners and joints in step 3, corners and joints may be finished with a liquid membrane manufacturer's taping procedures for vertical surface. See manufacturer's directions.
5. Seal around all penetrations and where DensShield meets dissimilar materials with a flexible silicone sealant.
6. Apply tile with a latex modified thin-set mortar per manufacturer's recommendations.
7. Use flexible silicone caulk as grout in all corners.
8. Use unfaced fiberglass insulation in wall cavity to retard heat. If using kraft-faced insulation, cut 4" slits in kraft paper every 3" in both directions.

LIMITATION: Residential applications only. No larger than 48 square feet.

Operation and Maintenance—The steam generation unit should be timer-controlled to avoid incidental lengthy exposure. Maintenance of grout and caulking of corners due to movement should be performed when required.

31 I want to use DensShield panels in non-wet areas to achieve a smooth finish for paint or wallcovering. How do I cover the rough surface of DensShield Tile Backer?

Apply Georgia-Pacific setting compound or equivalent and prime before the application of wallpaper or finish coat.



Compare DensShield® Tile Backer to Competing Tile Backer Substrates

Features/Benefits	DensShield® Tile Backer	Leading Cement Backer	Leading Fiber Cement Backer	Leading Fiber Gypsum Panel
Suitable for wet areas (meets 2006 IRC and IBC codes)	YES	YES	YES	YES
Protects wall cavity from moisture intrusion without additional vapor barrier	YES	NO	NO	NO
Built-in surface moisture barrier	YES	NO	NO	NO
Superior fire resistance	YES	NO	NO	NO
Lighter weight (depending on panel thickness)	YES	NO	NO	NO
Non-abrasive to tubs, shower pans and other fixtures	YES	NO	YES	YES
Easy to fasten	YES	NO	NO	NO
Cuts easily, cleanly with standard utility knife	YES	NO	NO	NO
Accepts mortars/mastic for tile installation	YES	YES	YES	YES
Available in 32" x 5', 4' x 5' and 4' x 8' panels	YES	NO	NO	YES

32 Greenboard: What makes DensShield® Tile Backer different from greenboard (paper-faced moisture-resistant gypsum board)?

DensShield® Tile Backer is an entirely different product than greenboard. The core of greenboard wicks water, while the paper facings can delaminate when exposed to moisture, causing tile failure. Greenboard is not recommended for use in extreme high moisture (wet) areas and therefore does not meet the 2006 IRC section R702.4.2 for backer boards for wall tile in tub and shower areas. DensShield has a heat-cured acrylic coating over fiberglass mats and a proprietary, treated moisture-resistant core. DensShield offers a proven tile backer design that is compliant with the more stringent 2006 IRC and IBC code.

33 Plywood: Why shouldn't plywood be used as a direct substrate for tile?

Plywood has many wonderful uses when used with resilient floor coverings but is not a trouble-free substrate for direct application of ceramic tile. Very simply, wood cures over a long period of time and is not stable. Moisture can cause plywood to move, warp and buckle. Since tiles and cement mortars used in tile installation are not elastic but are rigid, any movement or buckling of the plywood will cause grout failure, tile cracks or the tile to pop off of the substrate.

34 Fiber Cement and Cement Backers: What makes DensShield Tile Backer better than cement backers?

DensShield has a considerable weight advantage over cement backers. DensShield panels are 30% lighter than the leading cement board brands (1/2" comparison). Overall, that makes DensShield Tile Backer easier to handle on the job site and faster to install. In fact, a study conducted by the National Association of Home Builders (NAHB) Research Institute showed that DensShield Tile Backer is 46 percent faster to install than cement board. DensShield is much easier to install and doesn't require a secondary moisture barrier like cement backers.

Additionally, DensShield is highly resistant to wicking and protects the wall cavity from moisture without an additional vapor barrier. DensShield panels accept mortars or mastic for tile installation. It also has a Lifetime Limited Warranty when used in residential tile installations. Most important, while providing superior moisture protection, DensShield is much easier to score, cut and fasten than cement board.



Fiber Cement

- Weighs about 80 lbs. per 1/2" x 4' x 8' panel
- Requires a membrane behind it when used in wet areas according to the *Handbook for Ceramic Tile* from the Tile Council of North America
- Cut with a carbide tip scoring tool, circular saw or mechanical shears
- Needs special screws



Cement Backer

- Leading cement board weighs 96 lbs. (3 lbs./sq. ft. = 3 x 32 = 96) *source: USG Durock
- Requires a membrane behind it when used in wet areas according to the *Handbook for Ceramic Tile* from the Tile Council of North America
- Is more difficult to cut and fasten than DensShield Tile Backer



DensShield® Tile Backer

- Weighs only 64 lbs. per 1/2" x 4' x 8' panel
- Has built-in moisture barrier to protect tile installation
- Cuts easily with standard utility knife
- No special fasteners required



Cutting is a snap!
 Simply score and
 snap two sides with
 a single blade.
 And the cut edge
 will always be clean.

35 Why does Georgia-Pacific say DensShield® Tile Backer saves labor time by almost 50% versus cement board?

- Cutting.** With DensShield® Tile Backer, cutting is as simple as score and snap. The only tool needed is a standard utility knife and the cut edge will always be clean. With heavy cement board, cutting and scoring is difficult. With DensShield panels, cutouts for water supply piping, shower heads, etc., are easily and accurately cut, giving a less expensive and better, cleaner overall tile backer installation than can be achieved with cement backers.
- Fastening.** DensShield can be fastened close to its edge without edge breakout.

- Unique Sizes, Less Waste.** DensShield Tile Backer is available in ½" thick 4' x 5', 32" x 5' and 4' x 8' lengths. These sizes blend with conventional 16" o.c. or 24" o.c. wall frame spacing. It is also available in ⅝" thick 4' x 8' panels. In a shower stall, 4' x 8' panels provide full coverage with little or no waste. ⅝" DensShield® Fireguard® Type X requires no furring or aligning of the framing to match ⅝" gypsum board.
- No Moisture Barrier to Install.** With DensShield panels, there is no extra expense or labor to add a waterproof membrane against the framing. Additional vapor barriers behind DensShield are not required or recommended. Cement backers are highly porous, which means a secondary barrier is needed and required by TCNA in wet areas to protect the wall cavity.
- One Person to Install.** DensShield is so lightweight and easy to handle that a single installer can carry and easily install it, even in difficult applications. The result, of course, is lower installation cost.

36 Cement board maximum wall stud spacing is 16" o.c. Can I use DensShield Tile Backer 24" o.c. for wall framing?

With ½" DensShield, framing may be spaced up to 24" o.c. with proper blocking or backing located approximately 1" above the top of the tub or receptor and at horizontal joints where tile is to be installed. Using ½" 4' x 5' or ½" 4' x 8' DensShield blends with 24" o.c. wall framing and reduces the number of seams in the wet area. ⅝" DensShield may be used 24" o.c. without back blocking.

37 When I use cement board to keep the stud cavity dry, a moisture barrier membrane should be placed over the studs. Do DensShield panels require the same?

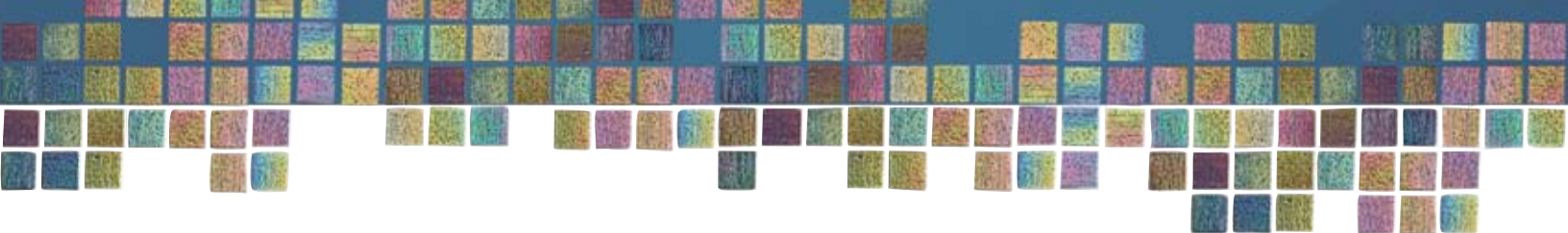
No. DensShield Tile Backer requires no additional moisture barriers. DensShield repels surface water and has a built-in moisture barrier. Cement backer products are unaffected by moisture but are highly porous. TCNA requires use of a secondary barrier behind cement and fiber cement backers in wet areas. Without the additional step of adding a moisture barrier (extra labor and material) to cement backers, moisture and mold damage can occur to the wall cavity.

38 How does the DensShield Tile Backer warranty compare to competitive cement and fiber cement boards?

DensShield® Tile Backer	Lifetime Limited Warranty when used in residential tile installations and a 20-year limited warranty when used in commercial applications.
Durock®	30 years
HardiBacker®	20 years
PermaBase®	30 years

39 Cement backers can be used on exteriors. Is DensShield Tile Backer recommended for exterior use?

DensShield is not for exterior use.



40 Cement board can be immersed in water for extended periods of time with no effect. What would happen if DensShield® Tile Backer was placed in a pail of water for, say, six months?

Other tile backer manufacturers use the water immersion demonstration to show that their product won't warp or buckle and that it will remain stable even when immersed in water for long periods of time. The purpose of such a demonstration is to promote the fact that tile won't fall off of cement backers as a result of moisture damaging the substrate. This demonstration is truly a gimmick and bears no relevance to a real tile installation.

Tile is never installed in interior building areas that are permanently under water. In fact, cement board has a liability in its design in that it allows water to freely pass through it, wetting the plywood in floor applications or framing members in unprotected wall cavities. If a secondary moisture barrier isn't installed, moisture can and will damage the stud cavity.

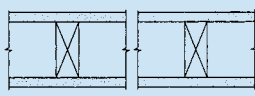
DensShield® Tile Backer isn't designed or intended to be permanently immersed in water. The fact is that the built-in acrylic coating on DensShield Tile Backer stops moisture at the surface, preventing tile failures and damage to the wall cavity. Regardless of the water immersion demonstrations of other boards, DensShield is a vastly superior tile backer for the application of installing tile in interiors of buildings.

41 Is DensShield Tile Backer recommended as a fireplace heat shield?

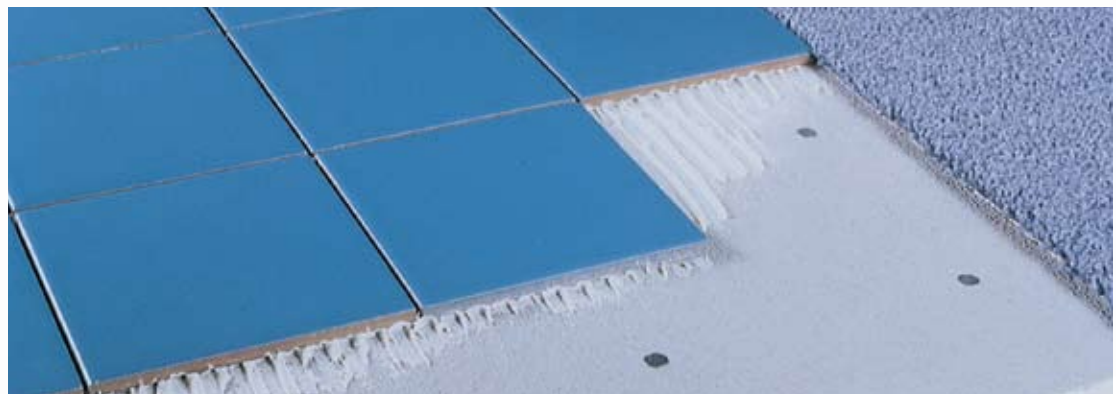
No. DensShield is not designed to be used as a heat shield or radiant barrier.

42 What advantages does 5/8" DensShield® FireGurad® Type X have in a fire-rating application?

DensShield Tile Backer provides significant advantages to specifiers, installers and owners. Neither insulation nor tile is required for fire rating. Conversely, cement backer requires a minimum 20-gauge steel stud and mineral wool in the cavity. The result is higher costs to achieve the same rating.

GA FILE NO. WP 3615	PROPRIETARY*	1 HOUR FIRE	30 TO 34 STC SOUND
Glass Mat Gypsum Board, Wood Studs			
<p>One layer 5/8" proprietary Type X glass mat water-resistant gypsum backing board applied parallel or at right angles to 2 x 4 wood studs 16" o.c. phosphate coated nails, 1 1/2" long, 1/4" diameter cupped heads, 8" o.c.</p> <p>Joints staggered 16" on opposite sides and covered with 10 x 10 mesh glass tape and tile adhesive. (LOAD-BEARING)</p>			
GP Gypsum	PROPRIETARY GYPSUM BOARD	<p>Thickness: 4 3/4"</p> <p>Approx. Weight: 7 psf</p> <p>Fire Test: WHI-495-0853, 5-14-87; WHI-495-0854, 5-15-87</p> <p>Sound Test: See WP 3605 (OR 64-8, 2-4-64)</p>	

With 1/4" DensShield panels, tile floors can be kept level with those in adjoining rooms, creating a better overall appearance and helping prevent problems like those often associated with door clearance; ideal for retrofit and floor cabinets.





SALES INFORMATION AND ORDER PLACEMENT

U.S.A. Midwest: **1-800-876-4746**
West: **1-800-824-7503**
South: **1-800-327-2344**
Northeast: **1-800-947-4497**

CANADA Canada Toll Free: **1-800-387-6823**
Quebec Toll Free: **1-800-361-0486**

TECHNICAL INFORMATION
Georgia-Pacific Gypsum Technical Hotline
U.S.A. and Canada: **1-800-225-6119**
www.gpgypsum.com



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LIMITATION OF REMEDIES AND DAMAGES

Unless otherwise stated in

our written warranty for these products, our sole liability for any product claim shall be limited to reimbursement of the cost of repair or replacement of the affected product, up to a maximum amount of two times the original purchase price for the affected product. We shall not be responsible under any circumstances for lost profits, damage to a structure or its contents, or indirect, incidental, special or consequential damages. Claims shall be deemed waived if they are not submitted to us in writing within ten (10) days after discovery of a product defect/circumstance giving rise to a claim.

CAUTION: For product fire, safety and use information, go to gp.com/safetyinfo.

HANDLING AND USE

CAUTION: This product contains fiberglass facings which may cause skin irritation. Dust and fibers produced during the handling and installation of the product may cause skin, eye and respiratory tract irritation. Avoid breathing dust and minimize contact with skin and eyes. Wear long sleeve shirts, long pants

and eye protection. Always maintain adequate ventilation. Use a dust mask or NIOSH/MSHA approved respirator as appropriate in dusty or poorly ventilated areas. For additional product fire, safety and use information to www.gp.com/safetyinfo or call 1-800-225-6119.

FIRE SAFETY CAUTION

Passing a fire test in a controlled laboratory setting and/or certifying or labeling a product as having a one-hour, two-hour, or any other fire resistance or protection rating and, therefore, as acceptable for use in certain fire rated assemblies/systems, does not mean that either a particular assembly/system incorporating the product, or any given piece of the product itself, will necessarily provide one-hour fire resistance, two-hour fire resistance or protection in an actual fire. In the event of an actual fire, you should immediately take any and all actions necessary for your safety and the safety of others without regard for any fire rating of any product or assembly/system.

Some of our products have been certified by Scientific Certification Systems (SCS). SCS is an internationally recognized third-party evaluation, testing and certification organization. Its program spans a wide cross-section of the economy, including manufacturing and retailing, consumer products, the energy industry, and the home improvement and construction sectors. For details on specific Georgia-Pacific Gypsum products and plants, please contact our Technical Hotline at 800-225-6119.