

GP G-P Gypsum
a Georgia-Pacific company

DensArmor® Plus

Paperless Interior Panels



G-P Gypsum — Your Complete Resource for Innovative Gypsum Products

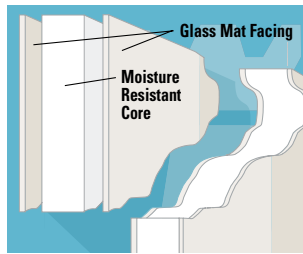
Product Overview

Areas of Use

Interiors of exterior walls, where moisture intrusion is most likely.

Pre-rock areas, where the windows, doors or roof have not been installed making moisture intrusion inevitable.

Areas likely to be exposed to moisture, where paper-faced green board may have been specified in the past.



For years, DensGlass Gold®, an exterior sheathing with glass mat facings, has been proven tough in commercial construction – under the most challenging of elements. Now the same powerful protection is working on the inside – all with the next-generation DensArmor® Plus paperless interior glass mat gypsum panels.

DensArmor Plus panels feature a glass mat surface on both the front and the back for the best in interior protection from moisture currently available. The moisture-resistant glass mats make DensArmor Plus panels the ideal replacement for paper-faced greenboard. A revolutionary departure from traditional wallboard, the face of DensArmor Plus panels finishes like paper-faced wallboard and offers superior performance in resisting mold.

Integrating DensArmor Plus panels into your specifications is part of an overall building solution that addresses the mold issue and reduces the time and expense of replacing alternative products if they become wet.

When tested, as manufactured, in accordance with ASTM D 3273, DensArmor Plus interior panels scored a 10, the highest level of performance for mold resistance under the ASTM D 3273 test method. 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, DensGuard® products provide increased mold resistance compared to standard paper faced wallboard.

Feature:	Benefit:
Coated glass mats on face and back	Protection – moisture and mold resistance Convenience – the glass mat surface finishes like regular gypsum wallboard
Paperless technology	Protection – high moisture and mold resistance
Moisture-resistant core	Durability – three months of coverage against in-place exposure damage*
Tapered edge	Convenience – ease of treating joints

*Do not subject DensArmor Plus panels to ponding or standing water.

Physical Properties

Properties	1/2" DensArmor® Plus Panels	5/8" DensArmor® Plus Fireguard Panels
Thickness, nominal	1/2" (12.7mm) ± 1/64" (0.4mm)	5/8" (15.9mm) ± 1/64" (0.4mm)
Width, standard	4' (1220mm) ± 3/32" (2.4mm)	4' (1220mm) ± 3/32" (2.4mm)
Length, standard	8' (2440mm) to 12' (3760mm) ± 1/4" (6.4mm)	8' (2440mm) to 12' (3760mm) ± 1/4" (6.4mm)
Weight, lbs./M sq. ft., nominal	1900	2500
Edges	Tapered	Tapered
Surfacing	Coated glass mat on face, back, long edges	Coated glass mat on face, back, long edges
Flexural strength, parallel, lbs.	80	100
Flexural strength, perpendicular	100	140
R Value ¹	.56	.67
Nail pull resistance minimum, lbs.	80	90
Hardness, lbs. force core, edges and ends	>15	>15
Water absorption (% of weight)	<5%	<5%
Surface burning characteristics (per ASTM E 84 or CAN/ULC-S102 and CAN ULC-S114):		
Flame spread/smoke developed	10/0	10/0
Bending Radius	8'	12'

¹Tested in accordance with ASTM C 518.

NOTE: Specified minimum values are as in applicable sections of ASTM C 1396, ASTM C 630 and ASTM C 1177.

Abuse Resistance Properties	5/8" DensArmor® Plus Fireguard Panels	5/8" Type X Wallboard
Indentation ASTM D 5420	.162"	.218"
Impact ASTM E 695	123 ft. lb.	106 ft. lb.

Note: Values based on tests of products stocked in the Atlanta, GA area; average values may vary.

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Application and Finishing

Application

1. DensArmor® Plus panels shall be installed in accordance with ASTM C840 "Standard Specifications for Application and Finishing of Gypsum Board."
2. For fire rated installations, the installation and details must be in conformity with those assemblies published in the Gypsum Association Fire Resistance Design Manual GA-600, UL/ULC Fire Resistance Directory or Intertek Testing Services/ Warnock Hersey Listing Book.
3. Nails shall be spaced a maximum of 7"(177.8 mm) on center on ceilings, and a maximum of 8"(203.2 mm) on center on walls.
4. Nails shall be driven with the heads slightly below the surface of the gypsum board, avoiding damage to the face and core of the board, such as breaking the glass mat or fracturing the core.
5. Screws shall be spaced not more than 12"(304.8 mm) on center along the framing members for ceilings and 16"(406.4 mm) on center for walls where the framing members are 16" on center. Screws shall be spaced not more than 12" on center along the framing members for ceilings and walls where framing members are 24"(609.6 mm) on center.
6. When using a combination of fasteners consisting of nails along the perimeter and screws in the field of the gypsum board, the spacing between a nail and an adjacent screw shall be not more than the spacing specified for screws.
7. Screws shall be driven to provide screw head penetration just below the gypsum board surface without breaking the glass mat surface of the gypsum board or stripping the framing member around the screw shank.
8. Where DensArmor Plus panels or exterior gypsum soffit board is used for ceilings of carports, open walkways, porches and soffits or eaves that are horizontal or inclined downward away from the building, the DensArmor Plus panels shall be either 1/2" or 5/8" (12.7 or 15.9 mm) in thickness. Framing shall be not more than 16" (406 mm) on center for 1/2" (12.7 mm) thick DensArmor Plus panels and not more than 24" (610 mm) on center for 5/8" (15.9 mm) thick DensArmor Plus panels. The DensArmor Plus panels shall be installed perpendicularly in accordance with the specifications above except as herein modified.
9. Suitable fascia and moulding shall be provided around the perimeter to protect the DensArmor Plus panels from direct exposure to water. Unless protected by metal or other water stops, the edges of the gypsum panel shall be placed not less than 1/2" (12.7 mm) away from abutting vertical surfaces. Do not allow water to pond on DensArmor Plus panels.
10. Where DensArmor Plus panels are to receive adhesively applied tile, the panel shall be permitted to be used on ceilings where ceiling framing is spaced not more than 12" o.c. (304.8 mm) for 1/2" (12.7 mm) thick gypsum panels and not more than 16" o.c. (406 mm) for 5/8" (15.9 mm) thick gypsum panels. (editor's note: this is to conform with IBC section 2509.3 and GA-216-2004 section 15.3.2)
11. All materials shall be kept dry prior to installation. Where DensArmor Plus panels are stored outside, it shall be off the ground, properly supported on a level platform and fully protected from the weather or direct sunlight exposure. Adequate ventilation shall be provided to prevent condensation. Gypsum panels shall be neatly stacked flat, not on their ends or edges, to prevent toppling, sagging or damage to the ends, edges, or surfaces.

Joint Treatment

Fiberglass Tape – To further reduce the risk of mold growth on the face of DensArmor Plus Interior Panels, fiberglass joint tape is recommended. The fiberglass tape should be bedded with a setting-type joint compound. After the DensArmor Plus Interior Panel joints have been taped and bedded with fiberglass tape and setting compound, subsequent joint treatment coats may be regular joint compound.

Paper Tape – Paper wallboard tape can also be used with DensArmor Plus panels. Traditional joint treatment methods are used to bed and finish coat the joint with regular and sanded to a smooth finish.

Installation and Decoration

DensArmor Plus panels can be finished in the same manner as regular gypsum wallboard and should be installed according to the Gypsum Association Publication GA-216 "Recommended Specifications for the Application and Finishing of Gypsum Board" and ASTM C 840 "Standard Specification for Application and Finishing of Gypsum Board for Non-Fire Rated Construction."

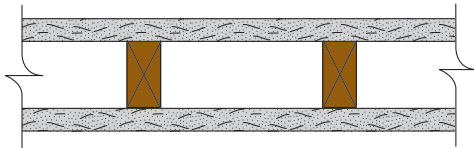
DensArmor Plus panels are designed to accept most types of paints, textures and wall covering materials. Because of the enhanced moisture and mold resistant properties of DensArmor Plus panels, drying times for both joint compound and wall coverings may vary. Always follow paint or wall covering manufacturer's installation instructions when applying either of these finishes. G-P Gypsum strongly recommends priming the surface of DensArmor Plus panels with a quality high solids primer/sealer before applying a final decorative material. Priming will equalize the suction variations between the joint compounds and the glass mat surfaces. If glossy paints are used in such areas as kitchens or bathrooms, skim coat joint compound over the entire surface of DensArmor Plus panels to reduce highlighting or joint photographing. This method is also recommended in areas with severe natural or artificial side lighting.

Fire and Sound Rated Assemblies

DensArmor® Plus panels are offered in 1/2" Fireguard C and 5/8" Fireguard X core types for use in fire-rated assemblies. These panels can be used in any G-P Gypsum or non-proprietary assembly where Type C/Type X gypsum board is required.

1-Hour Fire Rating

Test Reference: UL U305, ULC W301



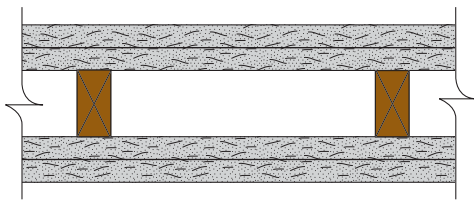
30-34 STC Sound Trans.

Test Reference: OR 64-8
Partition Thickness: 4-7/8"
Weight per Sq. Ft.: 7.0

5/8" DensArmor Plus Fireguard Interior gypsum board applied parallel or at right angles to each side of 2 x 4 wood studs 16" o.c. with 1-7/8" 6d coated nails spaced 7" o.c. Joints staggered. (UL U309, studs 24" o.c.)

2-Hour Fire Rating

Test Reference: UL U301



40-44 STC Sound Trans.

Test Reference: NGC-2363
Partition Thickness: 6-1/8"
Weight per Sq. Ft.: 12.0

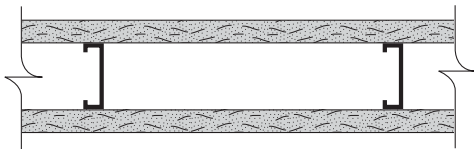
Sound Tested with studs 16" o.c. and with nails for base layer spaced 6" o.c.

Base Layer: 5/8" DensArmor Plus Fireguard Interior gypsum board applied vertically or at right angles to each side of 2 x 4 wood studs 24" o.c. with 1-7/8" 6d coated nails 24" o.c.

Face Layer: 5/8" DensArmor Plus Fireguard Interior gypsum board applied vertically or at right angles to studs over base layer with 2-3/8" 8d coated nails 8" o.c. Stagger joints 24" o.c. each layer and side.

1-Hour Fire Rating

Test Reference: UL U465, ULC W415



45-49 STC Sound Trans.

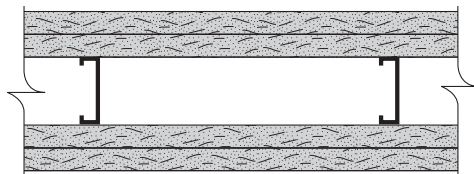
Test Reference: RAL TL99-103
Partition Thickness: 4-7/8"
Weight per Sq. Ft.: 6.0

Sound Tested with 2-1/2" glass fiber insulation, friction fit in cavity

5/8" DensArmor Plus Fireguard Interior gypsum board applied vertically to each side of 3-5/8" steel studs 24" o.c. with 1" Type S drywall screws 8" o.c. at edges and 12" o.c. at intermediate studs.

2-Hour Fire Rating

Test Reference: UL U411



50-54 STC Sound Trans.

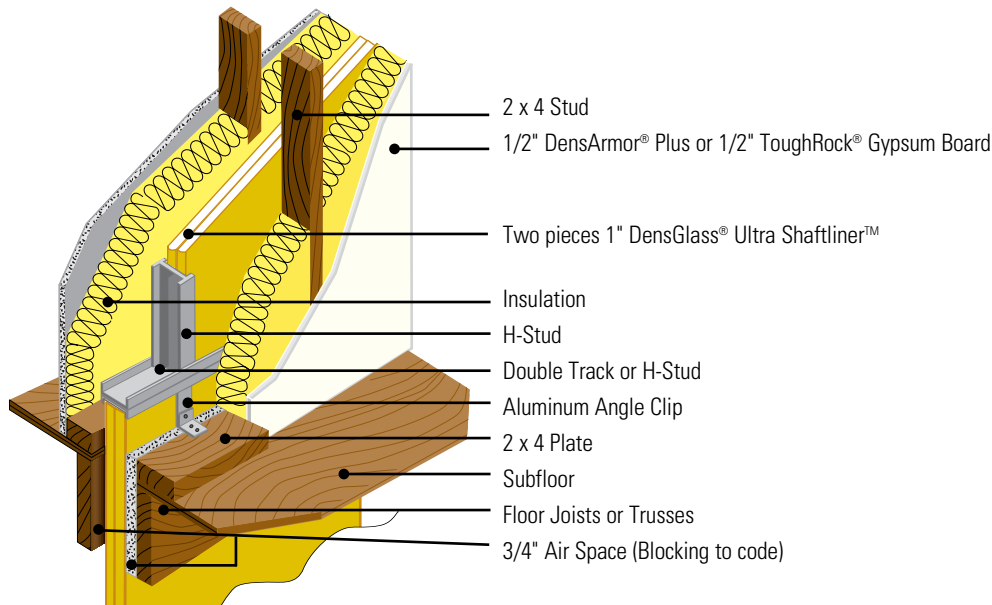
Test Reference: WHI 218-1
Partition Thickness: 5"
Weight per Sq. Ft.: 12

Sound Tested with 2-1/2" glass fiber insulation

Base Layer: 5/8" DensArmor Plus Fireguard Interior gypsum board applied parallel to each side of 2-1/2" steel studs 24" o.c. with 1-1/4" Type S screws 16" o.c.

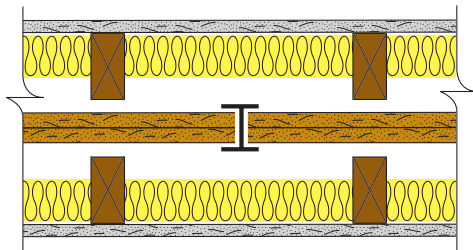
Face Layer: 5/8" DensArmor Plus Fireguard Interior gypsum board applied parallel to each side with drywall adhesive or secured with 1-5/8" Type S screws 12" o.c. at top and bottom track, 16" o.c. at edge joints only. Stagger joints 24" each layer and side.

Area Separation Wall Section Detail (ICC ES ER-2541)



Area Separation 2-Hour Fire Rating

Test Reference: UL DESIGN U373, WHI 120-04



60-64 STC Sound Trans.

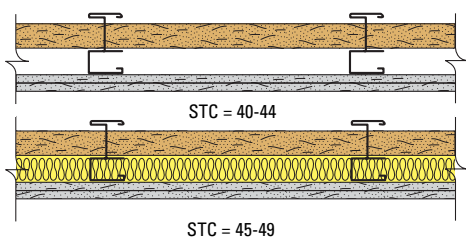
Test Reference: RAL TL89-383

Sound Tested with 2" x 4" stud wall with 1/2" DensArmor Plus or ToughRock gypsum board each side of assembly and 3-1/2" glass fiber in stud space both sides.

Two layers 1" DensGlass Ultra Shaftliner inserted in H-Studs 24" o.c. Min. 3/4" air space on both sides must be maintained between liner panels and adjacent framing. Apply 1/2" DensArmor Plus gypsum board to framing.

Shaftwall/Stairwell Design Summary Vertical (ICC ES ER-2541)

Series 620 2-Hour Fire Rating



40, 47 STC Sound Trans.

Test Reference: GA File No. WP 7096, WHI Design, GP/WA 120-01

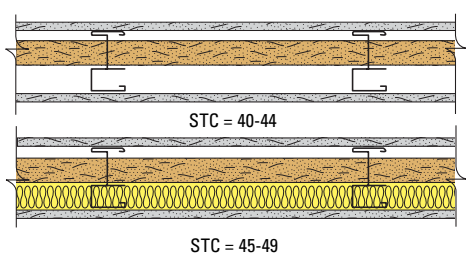
Approx. Weight: 9 psf

Glass fiber sound insulation thickness is 1", 2-1/2" and 3-1/2" for C-T studs of 2-1/2", 4" and 6" respectively. Finished one side.

Components: 1" DensGlass Ultra shaftliner, C-T studs and two layers of 1/2" DensArmor Plus Fireguard C or 5/8" DensArmor Plus Fireguard X gypsum board installed horizontally or vertically. Edges and ends offset 24" o.c.

C-T Stud	2-1/2"	4"	6"
Wall Thickness	3-1/2"	5"	7"

Series 621 2-Hour Fire Rating



42, 47 STC Sound Trans.

Test Reference: WHI Design, GP/WA 120-02

Approx. Weight: 9 psf

Glass fiber sound insulation thickness is 1", 2-1/2" and 3-1/2" for C-T studs of 2-1/2", 4" and 6" respectively. Finished both sides with 1/2" DensArmor Plus Fireguard C or 5/8" DensArmor Plus Fireguard X gypsum board installed horizontally or vertically. Edges and ends offset 24" o.c.

C-T Stud	2-1/2"	4"	6"
Wall Thickness	3-1/2"	5"	7"

Maximum Framing Spacing for Single-Ply Construction¹

Single-Ply Gypsum Board Thickness, in. (mm)	Application ²	Maximum Framing Members on Centers Spacing, in. (mm)
<i>Ceilings:</i>		
Non-Tile Applications		
1/2" (12.7)	parallel	16 (406.4)
5/8" (15.9)	parallel	16 (406.4)
1/2" (12.7)	perpendicular ¹	24 (609.6)
5/8" (15.9)	perpendicular	24 (609.6)
Tile Applications		
1/2" (12.7)	perpendicular	12 (305)
5/8" (15.9)	perpendicular	16 (406.4)
<i>Sidewalls:</i>		
1/2" (12.7)	perpendicular	24 (609.6)
or		
5/8" (15.9)	perpendicular	24 (609.6)

¹ Gypsum board ceilings to receive hand or spray-applied water-based texture material shall be applied perpendicular to framing to boards not less than 1/2" (12.7 mm) thick for 16" (406 mm) on center framing and not less than 5/8" (15.9 mm) thick for 24" (610 mm) on center framing.

² Nails for gypsum board applied over existing surfaces shall have a flat head and diamond point, and shall penetrate not less than 7/8" (22.2 mm), nor more than 1-1/4" (31.8 mm) into the framing member.

Limited Warranty

DensArmor® Plus Interior Panels are based on proven and patented paperless Dens Technology™, which has a lengthy history of performance. Based on that track record, G-P Gypsum Corporation backs the performance of DensArmor Plus with the following limited warranty:*

- Three months of coverage against in-place exposure damage (delamination, deterioration and decay)
- A three-year warranty against manufacturing defects.

*For complete warranty details, visit www.gpgypsum.com or call 1-800-225-6119.

CAUTION: THIS PRODUCT CONTAINS CONTINUOUS FILAMENT FIBERGLASS

Fiber released during normal handling of this product can cause skin, eye and respiratory irritation. Avoid breathing dust and contact with skin and eyes. Follow these standard work practices:

- Wear long-sleeved, loose-fitting clothing, gloves and eye protection.
- Use a dust mask, such as a 3M Model 95N or equivalent.
- Wash exposed areas with soap and warm water after handling.
- Wash work clothes separately from other clothing; rinse washer thoroughly. Operations that generate high airborne fiber concentrations (over 10 fibers/cc) require additional respiratory protection.

Architectural Specifications

Part 1 – General

1.1 Manufacturers

A. Manufacturers: Subject to compliance with requirements, provide products by the following:

1. Gypsum Board and Related Products:
 - a. G-P Gypsum Corp.

Part 2 – Products

2.1 Interior Gypsum Wallboard

A. Panel Size: Provide in maximum lengths and widths available that will minimize joints in each area and correspond with support system indicated.

B. Glass Mat, Moisture-Resistant Interior Wall Panel: Coated glass mat-faced, moisture-resistant, treated core gypsum wallboard. Physical properties conforming to the applicable sections of ASTM C 1177 and ASTM C 630.

1. Available Product: Subject to compliance with requirements, products that may be incorporated into the work include, but are not limited to, DensArmor Plus Interior Panels manufactured by G-P Gypsum Corp.
2. Product: Subject to compliance with requirements, provide DensArmor Plus Interior Panels manufactured by G-P Gypsum Corp.
3. Core: As indicated. [1/2" (12.7 mm), regular and Type C] [5/8" (15.9 mm), Type X].
4. Long Edges: Tapered

Part 3 – Execution

3.1 Finishing Gypsum Board Assemblies

A. Glass Mat Gypsum Interior Wall Panel: Finish according to manufacturer's written instructions for use in interior applications.

DensGlass Gold® Exterior Sheathing is a patented, unique paperless sheathing panel engineered with a moisture-resistant treated core surfaced with glass mat facings and a gold-colored, bond-enhancing primer coating. DensGlass Gold sheathing was created to withstand normal weather and moisture exposure for up to 6 months. DensGlass Gold sheathing can be used in exterior insulated finish systems. DensGlass Gold sheathing resists the growth of mold when tested, as manufactured, per ASTM D 3273.

DensShield® Tile Backer is a patented, premium performance tile substrate. Its unique properties have provided a wealth of labor saving benefits while offering ultimate moisture protection for professional tile installations on interior floors, walls, ceilings and countertops. Its heat-cured gray acrylic coating serves as a built-in vapor barrier that protects both the tile installation and the wall cavity behind it.

DensDeck® Roof Board is a patented, nonstructural, glass-mat faced noncombustible, water-resistant treated gypsum core panel. It is approved by all leading roofing systems manufacturers for use in commercial roof assemblies and has received the highest performance rating for fire, wind uplift, strength and moisture resistance.

DensDeck Prime® Roof Board is a premium roof board that combines all the features of standard DensDeck roof board with an enhanced surface treatment. The nonstructural roof board is engineered with a proprietary, non-asphaltic coating to enhance bonding in commercial single-ply and built-up roofing systems.

DensGlass® Ultra Shaftliner™ features a patented, coated glass mat. Independent tests confirm that DensGlass Ultra Shaftliner, with its patented glass mat design, resists the growth of mold when tested, as manufactured, per ASTM D 3273.

DensDeck DuraGuard™ Roof Board has all the properties of DensDeck roof board. It has a low perm, integrated, durable coating that enhances bond strength of the membrane system without requiring field priming. Features a moisture-resistant, treated core and a coated glass mat on back side.

DensGlass Silver™ Residential Sheathing was designed with innovative Dens Technology™ and incorporates the proven glass mat DensGuard® Technology. A moisture-resistant core meets requirements of ASTM C 1177 and applicable sections of ASTM C 79.

DensArmor® Plus Wallboard Panel is an interior panel with a moisture-resistant, noncombustible gypsum core using coated glass mat facings on both front and back of the board. The glass mat facing finishes like paper faced wallboard. DensArmor Plus wallboard resists the growth of mold when tested, as manufactured, per ASTM D 3273 providing unparalleled protection from problems caused by moisture intrusion.

Updates and Current Information: www.gpgypsum.com

Sales Information and Order Placement:

USA

Midwest: 1.800.876.4746

South: 1.800.327.2344

Northeast: 1.800.947.4497

West: 1.800.824.7503

CANADA 1.800.387.6823

Quebec: 1.800.361.0486

Technical Hotline:

1-800-225-6119 (M-F, 8-6et)

Literature Requests:

1-800-BUILD GP

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