GP Georgia-Pacific

Dens**Armor Plus**®

SPECIFICATION GUIDE

ENHANCED DRYWALL SOLUTIONS

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Who is Georgia-Pacific?

Georgia-Pacific is part of Koch Industries with a diverse set of businesses and industries across the world. Koch Industries, based in Wichita, Kansas, is the second largest private company in America, employing 130,000 people in 70+ countries.

From the time we were founded in 1927, Georgia-Pacific has never stopped growing. We started in a single building in Augusta, Georgia, and now have more than 300 Georgia-Pacific locations around the world. Through all the ups and downs of the past century, we have kept one eye on tomorrow, watching for opportunities to grow with customers and expand into new industries and markets.

Georgia-Pacific manufactures products with divisions such as:

- Consumer Products – Tissue, Towel, Napkin, Professional Cleansers etc.;

- Packaging – Linerboard, Packaging, Cellulose, Kraft Paper etc.;

- Building Products – Gypsum, Wood, Chemicals etc.

Gypsum Construction Products

Georgia-Pacific is a leading manufacturer of innovative solutions which have long been recognized for contributing to the sustainability of commercial and residential buildings. Our pioneering and state-of-the-art fiberglass mat technology has inspired the construction industry to build with products that help manage moisture damage during and after construction.

With a history of innovation dating back 30+ years with the introduction of DensGlass® Sheathing, the first Dens® Solutions product that set the foundation for innovation in fiberglass mat gypsum products for decades to come. It was the first fiberglass mat gypsum sheathing in the industry, and it remains the number one architecturally specified sheathing, in the US, today.[1]

Available worldwide, Dens® Solutions are industry trusted, high-performing fiberglass mat gypsum panels. DensGlass® Sheathing, DensElement® Barrier System, DensShield® Tile Backer, DensGlass® Shaftliner and DensArmor Plus® Interior Panels carry the mark of the valued heritage in our Gold colour, as a visible standard-bearer of Georgia-Pacific's position as the first manufacturer to create a fiberglass mat board and as a relentless innovator of strength and moisture resistant products for over 30 years.

DensDeck® Roof Boards

Including a high-performance roof board in your roofing system is essential to the protection of the building and the valuable contents inside. With its combination of fire resistance, strength and dimensional stability, industry professionals count on DensDeck® Roof Boards to enhance the performance of their roofing systems. And in keeping with the tradition of market-driven innovation DensDeck® Prime Roof Board now includes EONIC™ Technology, an enhancement that has doubled its resistance to moisture, making it the only roof board with manufacturing specifications that include 5% total water absorption resistance by weight and 1 gram surface water absorption performance on both sides of the board.[2]

DensGlass® Sheathing

Widely recognized by the Gold colour, DensGlass® fiberglass mat gypsum sheathing has an exemplary track record that spans more than 30 years. It is a preferred substrate under brick, stone, stucco, siding and ETICS/EIFS due to its ability to protect a structure against incidental moisture during and after construction. DensGlass® Sheathing adds performance and durability to a wide range of fire-rated and non-fire-rated building assemblies.

DensArmor Plus® Interior Panels

DensArmor Plus® Interior Panels, which feature fiberglass mats instead of the paper facings used on the surface of traditional gypsum board products, resist mold growth. They're ideal for areas prone to high humidity such as basements and residential bathrooms, and are ideal for commercial installations. They are designed for direct attachment with screws or nails to wood and metal framing or existing surfaces. They may be used as a covering material for flat or curved structures.
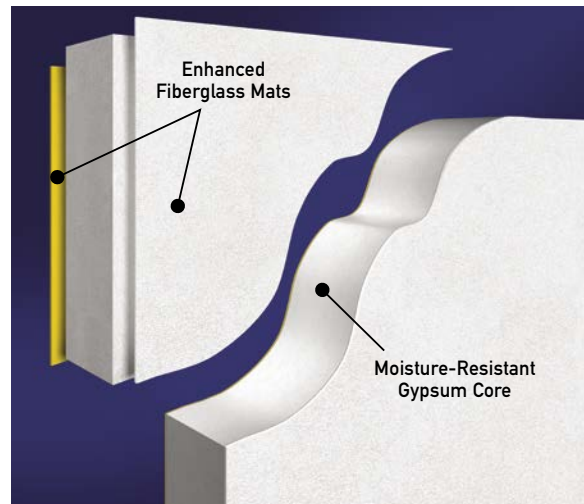
[1] Based upon survey of CMD Group project specifications from 01/01/17 – 12/31/17.

[2] Based on published manufacturing specifications as of December 1, 2017.

Enhanced Drywall with DensArmor Plus® Interior Panels

DensArmor Plus® Interior Panels have fiberglass mats for superior mold and moisture resistance compared to paper-faced drywall.

- Fiberglass mats, instead of paper facings, eliminate a potential food source for mold growth and may reduce remediation and scheduling delays associated with paper-faced drywall.

- Used before a construction is weather-tight, DensArmor Plus® Interior Panels stand up to ambient moisture and incidental wettings during and after construction.

- Backed with a limited warranty against delamination and deterioration for up to 12 months of exposure, during construction, to normal weather conditions. For complete warranty details, visit www.buildgp.com/warranties.

DensArmor Plus® Interior Panels. ©2021 Georgia-Pacific Gypsum LLC.

Mold Resistance

DensArmor Plus® Interior Panels, which feature fiberglass mats instead of the paper facings used on the surface of traditional gypsum board products, resist mold growth.

When tested, as manufactured, in accordance with ASTM D3273, DensArmor Plus® Interior Panels have scored a 10, the highest level of performance for mold resistance under the ASTM D3273 test method, a testing method set by ASTM International, which develops testing guidelines and procedures for building materials, products, systems and services. The score of 10, in the ASTM D3273 test, indicates no mold growth in a 4-week controlled laboratory test. In addition, the mold resistance of DensArmor Plus® Interior Panels have been validated by UL Environment and listed in its Sustainable Product Guide utilizing microbial resistant testing based on ASTM Standard D6329-98.

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, DensArmor Plus® Interior Panels provide increased mold resistance compared to standard paper-faced gypsum products. For additional information, go to www.buildgp.com/safetyinfo.
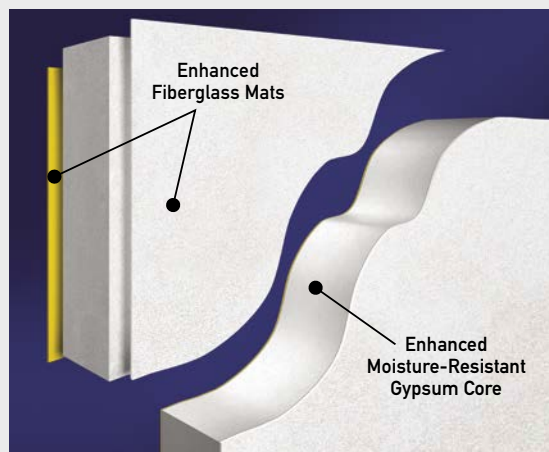
Low VOC Emissions

DensArmor Plus® Interior Panels are the first gypsum panels to be certified by UL Environment, an independent safety science company, as GREENGUARD and GREENGUARD Gold for low VOC emissions and are included in UL Environment's Sustainable Product Guide.

GREENGUARD
PRODUCT CERTIFIED FOR
LOW CHEMICAL EMISSIONS
UL.COM/GG
UL 2818
GOLD

Also available as

DensArmor Plus® Abuse-Resistant Interior Panel

DensArmor Plus® Abuse-Resistant Interior Panels.
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Abuse-Resistant Panels

- Withstands scuffs, surface indentation and abrasion

- Intended for use in high traffic areas, such as:
    - Stairwells in public buildings,
    - Healthcare facilities,
    - Shopping centers,
    - Schools, and
    - Common areas in multi-family housing

ASTM C754 Height Information

Table 1

| Stud depth (mm) | Min. Base Steel Thickness Steel Studs (mm) | Maximum Stud Height (mm) L/240 @ 5 psf (240 Pa) | | |
| | | Industry Designator | Framing Spaced 610 mm o.c. | Framing Spaced 406 mm o.c. | Framing Spaced 305 mm o.c. |

Stud depth (mm)	Min. Base Steel Thickness Steel Studs (mm)	Industry Designator	Framing Spaced 610 mm o.c.	Framing Spaced 406 mm o.c.	Framing Spaced 305 mm o.c.
41.3 (1 5/8")	0.455	162S125-18	2670	3070	3380
	0.750	162S125-30	2840	3280	3610
	63.5	250S125-18	3430	3910	4320
63.5 (2 1/2")	0.750	250S125-30	3840	4180	4820
	0.836	250S125-33	3800	4340	4780
	88.9	350S125-18	3180	4520	4980
88.9 (3 1/2")	0.750	350S125-30	4320	4950	5460
	0.836	350S125-33	4420	5050	5560
	92.1	362S125-18	4010	4620	5080
92.1 (3 5/8")	0.750	362S125-30	4420	5050	5560
	0.836	362S125-33	4650	5310	5840
101.6 (4")	0.455	400S125-18	4170	4850	5330
	0.750	400S125-30	4700	5390	5920
	0.836	400S125-33	4850	5560	6120
139.7 (5")	0.455	550S125-18	4720	5790	6680
	0.750	550S125-30	6150	6930	7570
152.4 (6")	0.455	600S125-18	4980	6380	6930
	0.750	600S125-30	6550	7490	8250
	0.836	600S125-33	6780	7770	8560

Notes:

- The Industry Designator code is a new industry-wide product identification, created by the Steel Stud Manufacturers Association; (U.S.) the number identifies the member depth, style, flange width and material thickness in mils.

- This limiting heights data is from ASTM C754. GPG presents this information only as a reference and will not be responsible for the performance of walls based on this table. Consult current information from ASTM C754 and SSMA (Steel Stud Manufacturers Association), and the stud manufacturers for limiting heights characteristics of their specific products.

- Limiting heights apply to walls constructed with minimum 15.9 mm thickness of Type X gypsum board and with a minimum of one full height layer on both sides of the stud framing.

- Limiting heights are based on tests conducted with gypsum board attached with screws spaced 300 mm o.c. to framing members.

- For fire rated constructions a minimum steel thickness of 25 MSG galv steel is required.

- When designing framework a deflection head may be required. For additional support please make contact using the information on the rear cover.

Performance benefits offered by DensArmor Plus® / DensArmor Plus® Abuse-Resistant Panels

High Impact Resistance

Fire Resistance

Moisture Resistance

Mold Resistance

Nail Pull Resistance

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

GP **Georgia-Pacific**
Gypsum

Partition Design Performance

Fire Resistance

Sound Dampening

Table 2a

Reference	SW1	SW2
Section		
Boarding to each side of framing	Single 15.9 mm DensArmor Plus® Fireguard® Panels	Single 15.9 mm DensArmor Plus® Fireguard® Panels
Framing (web mm)[1]	92	92
Insulation (mm)[2]	–	25
Acoustic (Rw dB)[3]	42	46
UL Design Number	U465	U465
Fire Performance (mins)[4]	60	60
Thickness (mm)	124	124

Table 2b

Reference	DW1	DW2	CW1	CW2
Section				
Boarding to each side of framing	Double 15.9 mm DensArmor Plus® Fireguard® Panels	Double 15.9 mm DensArmor Plus® Fireguard® Panels	Double 15.9 mm DensArmor Plus® Fireguard® Panels	Double 15.9 mm DensArmor Plus® Fireguard® Panels
Framing (web mm)[1]	70	70	2 x 42	2 x 42
Insulation (mm)[2]	–	50	25	50
Acoustic (Rw dB)[3]	52	56	64	65
UL Design Number	V487	V487	U420	U420
Fire Performance (mins)[4]	120	120	120	120
Thickness (mm)	133	133	200	200

[1] Framing size minimum to fulfil stated fire performance, but stud size specification and section to match partition height chart as table 1.

[2] Glasswool, minimum density 10 kg/m³.

[3] Rw dB value as calculated by Insul software, accurate to ±3 dB. This information is based on a steel thickness of 0.55 mm and is presented for illustration and intended solely for use by professionals for planning purposes. GP Gypsum disclaims any responsibility or liability for the use of this information and for the architecture, design, engineering or workmanship of any project, assembly or system, including, without limitations, its actual Rw dB rating.

[4] Certified Assemblies by UL, approved by UAE Civil Defence.

DensArmor Plus® Interior Panels – Physical Properties

Property	15.9 mm DensArmor Plus® Fireguard®	15.9 mm DensArmor Plus® Fireguard® Abuse-Resistant
Thickness, nominal[4] (mm)	15.9	15.9
Width, standard[4] (mm)	1219 ± 2.4 mm	1219 ± 2.4 mm
Length, standard[4] (mm)	2438 ± 6.4 mm	2438 ± 6.4 mm
Weight[1] nominal (kg/m²)	12.2	13.7
Permeance[7] (ng/Pa.s.m²)	570	570
Linear expansion with moisture change (mm/mm/%RH)[8]	6.25×10^{-6}	6.25×10^{-6}
Coefficient of thermal expansion (mm/mm/°C)[9]	15.3×10^{-6}	15.3×10^{-6}
Flexural strength, parallel[3, 4] (N)	444	444
Flexural strength, perpendicular[3, 4] (N)	622	622
R Value[2] (m².K/W)	0.118	0.118
Combustibility[6]	Non-combustible	Non-combustible
Nail pull resistance, min.[3, 4] (N)	400	400
Hardness core, edges and ends[3, 4] (N)	67	67
Water absorption (% of weight)[3, 4]	<5	<5
Surface water absorption[3, 4] (g)	<1.6	<1.6
Surface burning characteristics (per ASTM E84 or CAN/ULC-S102): flame spread/smoke developed	0/0	0/0
Humidified deflection[3, 4] (mm)	3	3
Bending Radius[5] (mm)	2438	

[1] Represents approximate weight for design and shipping purposes. Actual weight may vary based on manufacturing location and other factors.

[2] Tested in accordance with ASTM C518.

[3] Tested in accordance with ASTM C473.

[4] Specified values per ASTM C1658.

[5] Double fasteners on ends as needed.

[6] As defined and tested in accordance with ASTM E136 or CAN/ULC S114.

[7] Tested in accordance with ASTM E96 (dry cup method).

[8] As stated by Gypsum Association GA-235.

[9] Tested in accordance with ASTM E228-85.
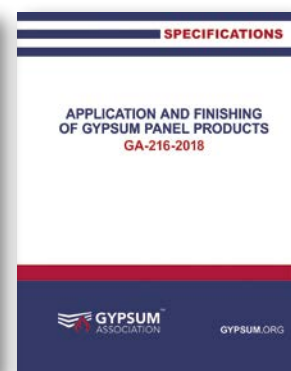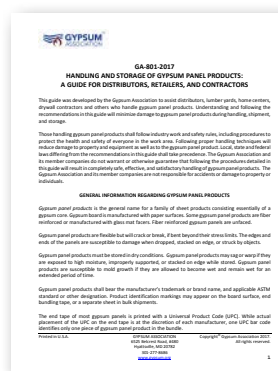
Quality Assurance

Georgia-Pacific's Dens® products have been approved by various certification programs including FM Approvals, Intertek and Underwriter's Laboratories (UL). They meet the requirements of Harmonized Technical Specifications EN 13501, EN 15283, ASTM C1177 and C1658 Standard Specification for Glass Mat Gypsum panels as tested to ASTM C473. They are manufactured under a unique Quality Management System (QMS) meeting several third-party certification and product listing program requirements, such as ICC-ES, FM Approvals, Intertek, UL/ULC as well as the CE Mark program. Our products are subject to their follow-up surveillance programs.

The Quality Management System is continually reviewed and improved as needed from both internal and external requirements mandate. The QMS exceeds the general structure and guidelines of an ISO management system. It includes a rigorous Management of Change (MOC) process thereby ensuring a consistent product.

Installation

Refer to Handling Gypsum Panel Products, GA-801, for proper storage and handling requirements. Reference: Application and Finishing of Gypsum Panel Products, GA-216, Gypsum Association.

Recommendations and limitations for use

The following recommendations and limitations together with the installation, handling, storage and other guidelines contained in this guide are important to ensure the proper use and benefits of DensArmor Plus® Interior Panels. Failure to strictly adhere to such recommendations and limitations may void the limited warranty provided by Georgia-Pacific Gypsum for such product.

For additional warranty details, please go to www.buildgp.com/warranties.

- DensArmor Plus® Interior Panels are resistant to normal weather conditions but are not intended for immersion in water. Cascading roof/floor water should be directed away from the panels.

- The use of forced air heaters creates volumes of water vapor, which, when not properly vented, can condense on building materials. The use of these heaters and any resulting damage is not the responsibility of Georgia-Pacific Gypsum. Consult heater manufacturer for proper use and ventilation. Avoid any condition that will create moisture in the air and condensation on the interior walls during periods when the exterior temperature is lower than the interior temperature.

- When using DensArmor Plus® panels in a horizontal position, such as a ceiling, they should not be installed before the building is weather-tight if water can pond or settle on the panels.

- DensArmor Plus® panels are not intended for roof applications. For roof applications consult our DensDeck® Roof Board brochure.

- DensArmor Plus® Interior Panels are not intended for exterior sheathing applications. For sheathing applications consult our DensGlass® Sheathing or DensElement® Barrier System brochure.

- Georgia-Pacific Gypsum does not warrant and is not responsible or liable for the performance of any coating, finishing, covering or other materials applied over DensArmor Plus® panels or any systems utilizing DensArmor Plus® panels. The suitability and compatibility of any system is the responsibility of the system manufacturer or design authority.

- For all installations, design details such as fasteners, sealants and control joints per system specifications must be properly installed. Openings and penetrations must be properly sealed. Failure to do so will void the warranty.

- Do not finish the panels until building has been properly closed in.

- Do not use DensArmor Plus® panels as a base for nailing and mechanical fastening.

Delivery, Handling and Storage

All materials shall be delivered in original bundles bearing the brand name, if any; applicable standard designation; and name of the manufacturer or supplier for whom the product is manufactured. Any plastic packaging used to wrap gypsum panel products for shipment is intended to provide temporary protection from moisture exposure during transit only and is not intended to provide protection during storage after delivery. Such plastic packaging shall be removed immediately upon receipt of the shipment.

WARNING: Failure to remove protective plastic shipping covers can result in condensation which can lead to damage, including mold.

- All materials should be kept dry.

- Gypsum panel products shall be neatly stacked flat with care taken to prevent sagging or damage to edges, ends and surfaces.

- Gypsum panel products and accessories shall be properly supported on risers on a level platform, and fully protected from weather, direct sunlight exposure, and condensation.

- Gypsum panel products shall be stacked flat rather than on edge or end.

WARNING: Gypsum panel products stacked on edge or end can be unstable and present a serious hazard in the workplace should they accidentally topple.

Refer to Handling Gypsum Panel Products, GA-801, for proper storage and handling requirements. Reference: Application and Finishing of Gypsum Panel Products, GA-216, Gypsum Association.

Georgia-Pacific Gypsum

GP Gypsum LLC
133 Peachtree Street, N.E. | Atlanta, Georgia 30303

CAUTION: For fire, safety and use information go to www.BuildGP.com/Safetyinfo.
WARRANTY: For current limited warranty for DensArmor Plus®, visit https://buildgp.com/international/

TRADEMARKS
Unless otherwise noted, all trademarks are owned by or licensed to Georgia-Pacific Gypsum LLC.

WARRANTIES, REMEDIES AND TERMS OF SALE
For current warranty information, please go to www.buildgp.com/warranties and select the applicable product. All sales by Georgia-Pacific are subject to our Terms of Sale available at www.buildgp.com/tc.

UPDATES AND CURRENT INFORMATION
The information in this document may change without notice. Visit our website at https://buildgp.com/gypsum/ for updates and current information.

CAUTION: For product fire, safety and use information, go to buildgp.com/safetyinfo or email: GPGypsumME@GAPAC.com

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.

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 any other specified 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.