



Georgia-Pacific
Gypsum

Building Reputations Together™

By John Hurst
Georgia-Pacific Gypsum

Enhance Construction Planning and Scheduling with DensArmor Plus® Interior Panels and DensGlass® Shaftliner

Resistance to moisture damage and mold growth can speed up construction and help reduce risk.

One of the riskier balancing acts in commercial construction involves installation of standard paper faced drywall, weather, schedules—and money. Hang traditional paper-faced drywall before dry-in and you incur an immediate risk of water damage to the board and a potential mold problem. Wait too long to install board, and you stretch construction schedules, invite labor-cost overruns, and delay project completion. The heart of the dilemma is the moisture sensitivity of traditional paper faced drywall which deteriorates when it gets wet. A moist paper-facing, along with the starches commonly used to adhere paper facing to gypsum boards, can combine in wet conditions to create a potential food source for mold growth.

One part of a solution to this problem is to use gypsum boards that resist moisture damage, like Georgia-Pacific Gypsum's DensArmor Plus® Interior Panels and DensGlass® Shaftliner.

Architects and manufacturers want paper-faced drywall to stay dry

For years, manufacturers have clearly stated that standard paper-faced drywall is designed to be hung in dry conditions. That's why architects on commercial construction projects routinely specify that paper-faced drywall must not be installed prior to a building being enclosed or "dried in."

Now, the fiberglass mat, moisture-resistant features of DensArmor Plus panels and DensGlass Shaftliner panels allow builders to install gypsum assemblies when it is not feasible to wait until cladding is completed. These next-generation products offer weather exposure limited warranties against damage from exposure to normal weather conditions or humidity if they are stored and installed according to Georgia-Pacific Gypsum's instructions. Weather exposure limited warranties cover DensArmor Plus panels and DensGlass Shaftliner for up to 12 months from installation.

Good building practice dictates that moisture sensitive paper-faced boards should not be installed until they can be adequately protected, because they cannot be exposed to even limited moisture. But sometimes conditions, schedules or climatic conditions require hanging gypsum board assemblies in less than ideal conditions. DensArmor Plus



interior panels and DensGlass Shaftliner panels help limit this potentially costly gamble. These products resist damage from humidity and normal weather exposure such as blowing rain because they have fiberglass mats front and back, rather than paper facings. Using moisture-resistant, fiberglass mat gypsum products can improve scheduling accuracy, support shorter construction schedules—and reduce the risk of costly remediation or rip out.

Compressing construction schedules can reduce costs

Commercial construction scheduling is a complicated art. Project managers use complex Critical Path Method (CPM) scheduling methods to sequence critical construction tasks. Computer programs assist contractors with critical predecessor-successor activity sequences and help to determine the total time required for project completion. Anything that shortens the critical path by even a single day may reduce equipment and labor costs, and may make a difference in meeting a deadline.

In the traditional scheduling exercise, managers often allow contingency time for weather delays. When moisture-resistant Dens® Brand products allow gypsum assemblies such as elevator shaftwall assemblies to be hung earlier, when there may still be limited moisture exposure, schedules can shrink. Accelerating building schedules with fiberglass mat gypsum products such as DensArmor Plus panels should always be done in conjunction with good building practices that limit moisture intrusion. The installer also must consider the moisture resistance of other building components and decorative finishes.

continues on reverse

TECHTALK

Technical Insight from the Gypsum Experts

Enhance Construction Planning and Scheduling with DensArmor Plus® Interior Panels and DensGlass® Shaftliner

In many commercial projects, moisture-resistant fiberglass mat panels are now being hung prior to the completion of exterior cladding, as seen in a major hospital project—the Medical University of South Carolina’s (MUSC) Hospital Replacement project in Charleston, South Carolina. This project used DensArmor Plus® panels and DensGlass® Shaftliner panels.

Commenting on the schedule impact of moisture-resistant Dens® Brand products at MUSC, Chris Malanuk, project director for the construction consortium, says, “The non paper-faced concept came up early in the design cycle. The original idea was to reduce both short-term and long-term mold risk. Then the possibility of accelerating the construction schedule came up, and that efficiency more than made up any cost differential many times over.”

Project Engineer Mac McClinton adds, “Hanging the drywall earlier had a huge ripple effect because other trades were able to start work sooner. Accelerated subcontractor schedules included plumbing, electrical, and HVAC, plus massive amounts of wall-related details like interior glazing, corner guards and case work.” McClinton concludes, “The DensArmor Plus just doesn’t react to moisture. We hung 675,000 square feet (62,709 sq. m.) during rainy weather with almost no replacement. That’s unheard of at this scale of construction. It was a really good investment.”

Shamrock Thompson, area superintendent for the MUSC Patient Tower building, says, “We were able to safely start hanging DensArmor Plus panels about four months before we would have hung traditional paper-faced gypsum board. Cascading rain had no effect.”

In another real-life example, a major U.S. hotel project under construction in the Southeast was first deluged by a nearby tropical storm and then hit by a major hurricane after shaftliner panels and most of the gypsum assemblies had been installed. Much of the gypsum board on the project was exposed to wind driven rain and high humidity unconditioned air for many weeks. The project used DensArmor Plus Interior Panels and DensGlass Shaftliner panels. All parties involved agreed that if traditional paper-faced drywall had been installed, the damage would have required a massive and extremely costly rip-out and remediation effort.

Fiberglass mat gypsum panels with moisture-resistant cores help reduce risks associated with early installation of traditional paper-faced drywall

Gypsum drywall installation is frequently a critical-path activity with predecessor-successor relationships to other building trades. Early installation of gypsum assemblies allows subcontractors to use less labor which can be a critical determining factor in making or losing money on a project. Fiberglass mat moisture-resistant board can be hung earlier in the schedule before other trades crowd the site and slow installation. Use of a fiberglass mat product reduces the risk of costly tear-outs due to moisture exposure.

Shafts and stair wells

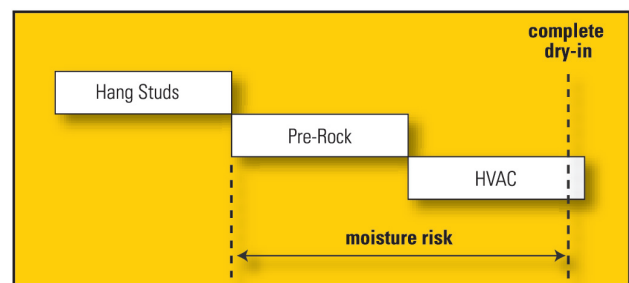
With high-rise construction, it’s common practice to seal off penetrations on two higher floors before cladding is applied, to give temporary protection while erecting gypsum assemblies with paper-skinned shaftwall gypsum panels on the floors below. In such situations, high humidity or blowing rain can cause the paper-skinned boards to become wet. Standard paper-skinned gypsum assemblies can deteriorate, or wick moisture into the paper facing and develop mold growth. The contractor may then be at risk for costly remediation.

Now, DensArmor Plus panels and DensGlass Shaftliner panels, when used together with proper design and construction practices, can help reduce moisture risk in shafts and stair wells. Additionally, a long term benefit is offered in that the building owner doesn’t have shafts lined with paper which can, when wet, become a potential food source for mold growth.

Areas behind HVAC ducts

Scheduling very often requires hanging HVAC ducts before complete dry-in. If a fire-rated gypsum wall assembly is needed behind the duct-work, it has to be hung first. There’s a risk to installing traditional paper-faced drywall in these pre-rock areas. If wet paper-faced board deteriorates or develops mold growth, it may have to be removed.

Using fiberglass mat, moisture-resistant gypsum board for pre-rock applications can help reduce the risk of expensive moisture damage that can cause traditional paper-faced products to fail.





Area separation walls

Many multi-residential construction projects use fire-rated area separation walls composed of gypsum panels between units. These gypsum assemblies are often erected early in the construction sequence. As a result, these assemblies almost always experience exposure to moisture from the elements as well as other sources. The metal framing may hold rain water which can wick vertically into traditional paper-faced gypsum boards, and this moisture can cause mold and deterioration of the panels. In multi-residential construction, the removal of a gypsum assembly between units after completion can be extremely costly.

Because of this risk, wet conditions can prevent early installation of traditional paper-faced gypsum boards, which may delay the project. DensGlass® Shaftliner can help projects stay on schedule by allowing early installation in normal weather conditions. Even more importantly, DensGlass Shaftliner panels can withstand this type of exposure to the elements for up to 12 months after installation.

Risk and rewards for the general contractor

With projects like casinos, hospitals and hotels, faster completion means that owners realize revenue sooner. Contractors can see bonuses if they bring the building in on schedule—and significant penalties if it's late.

Because this economic pressure is frequently felt in commercial construction projects, contractors often take the risk of hanging traditional paper-faced drywall in humid—and even wet—conditions. The moisture exposure can damage traditional paper-faced drywall and require major repairs. Worse, potential mold infestations may not be

evident until after the building is completed. Replacing mold-contaminated gypsum board in a commercial building can be very expensive. Incorporating newer technology such as moisture- and mold-resistant drywall can be part of an overall strategy to help reduce risk and in some circumstances help ease scheduling constraints.

The design team can help

On their clients' behalf, many architectural firms are joining in the fight against mold and moisture problems with updated designs and detailed documentation that focuses on moisture management. As part of this moisture management, innovative designers are changing their specifications to call for fiberglass mat, moisture-resistant gypsum board.

For example, where gypsum board must be installed before complete dry in, architectural documentation can require that the products used must be fiberglass mat, moisture-resistant products that meet ASTM C 1658, the standard for moisture-resistant fiberglass faced gypsum boards. Because on many projects gypsum drywall may be installed in less than ideal conditions, many architects are requiring contractors to use products that resist moisture and mold in pre-rock, shafts and other areas where traditional boards run into moisture related problems. Many firms are including language such as "Provide and install moisture- and mold-resistant fiberglass mat gypsum wallboard products complying with ASTM C 1658 where indicated on drawings and in all locations which might be subject to limited moisture exposure during construction" in their final construction documentation. Including these requirements assures that products such as DensArmor Plus® Interior Panels and DensGlass shaftliner will be part of the initial bid packages.

Make sure value engineering delivers true value

How do new technologies such as next generation drywall offering moisture-resistant solutions survive in value engineering sessions? A general contractor's representative in the pre-construction meetings can help project managers and architectural job captains alike understand the cost-effectiveness of reduced risk and acceleration of schedules. These factors, coupled with the logic of removing paper content from wall surfaces and cavities, make moisture-resistant fiberglass mat interior panels an obvious evolution for gypsum boards. It does not bring value to an owner seeking expert advice and project delivery when products that help limit mold-related risk during and after construction are eliminated from a project.

Many types of projects can benefit

DensArmor Plus® panels and DensGlass® Shaftliner panels, when used with proper design and construction practices, can add value in many types of projects such as high- and mid-rise projects where elevator and stairwell assemblies are installed before dry-in, and in multi-family area separation walls/firewalls.

It is important to note that although DensArmor Plus panels and DensGlass Shaftliner are exceptionally resistant to moisture, they must be stored and installed in accordance with Georgia-Pacific Gypsum's instructions. Damage caused by immersion in water, ponding water, or cascading water on a roof or floor is not covered by the product warranties. The product warranties also do not cover decorative finishes and other building materials and components that may be used with these products.

For more information on DensArmor Plus panels and DensGlass Shaftliner gypsum panels or any of the other Dens® Brand products from Georgia-Pacific Gypsum, and for copies of product warranties, visit our Web site at www.gpgypsum.com, or contact your Georgia-Pacific Gypsum representative.

When tested, as manufactured, in accordance with ASTM D 3273, DensArmor Plus Interior Panels and DensGlass Shaftliner panels has 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 method, indicates no mold growth in a 4-week controlled laboratory test.

In addition, DensArmor Plus High-Performance panels, when tested, as manufactured, in accordance with Modified EPA ASTM D 6329, showed zero mold growth after 12 weeks. The results in the EPA Modified ASTM D 6329 test indicates no mold growth in a 12-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, Georgia-Pacific Gypsum Dens® Brand products provide increased mold resistance compared to standard paper-faced gypsum products.

*Test results limited to DensArmor Plus High-Performance Interior Panels and do not include DensArmor Plus Abuse-Resistant and Impact-Resistant Panels.

U.S.A. – Georgia-Pacific Gypsum LLC
Canada – Georgia-Pacific Canada LP

Sales Information & 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



TRADEMARKS Unless otherwise noted, all trademarks are owned by or licensed to Georgia-Pacific Gypsum LLC. The GREENGUARD INDOOR AIR QUALITY CERTIFIED Mark and the GREENGUARD Children & Schools Mark are registered certification marks used under license through the GREENGUARD Environmental Institute.



©2010 Georgia-Pacific Gypsum LLC. All rights reserved. Printed in the U.S.A. on 10% post-consumer recycled stock. Originally published 2/07. Rev 11/10. GP-TM Lit. Item #531677.

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

UPDATES AND CURRENT INFORMATION The information in this document may change without notice. Visit our website at www.gpgypsum.com for updates and current information.

CAUTION For product fire, safety and use information, go to www.gp.com/safetyinfo or call 1-800-225-6119.

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.