

## Fiberglass Mat Interior Panels Fight Hospitality and Healthcare Mold Risk

**Proper design—including panel choice—can help minimize risks to owners.**

Mold infestations behind wall coverings in commercial buildings can be expensive. Remediation of mold can be costly, and those risks are now at the top of many owners' lists of concerns. In hospitality and healthcare facilities especially, large opportunity costs from lost revenue add to the considerable direct expense of the remediation itself.

Further, mold infestations can carry liability risks, and the cost of insuring against mold liability problems can be high. Some insurance companies are now excluding mold coverage, which makes owners and developers the direct targets of costly litigation.

In this Tech Talk:

- we'll look at the conditions that support mold growth behind commercial wall coverings
- we'll discuss risk factors in building design
- we'll present some technical details of practical solutions, including the way in which DensArmor Plus® Interior Panels from Georgia-Pacific Gypsum helps manage the problem by removing nutrient sources that support mold growth
- we'll also note industry trends toward new primers, adhesives and moisture-permeable vinyl coverings.

### Increasing problems come from construction trends

There's a very real reason for mold becoming an increasing problem in the last twenty years; we are building differently now than we did before. Technology now provides more effectively sealed construction that reduces the energy we use to heat or cool.

But as we conserve energy, we're also creating a new problem. The less stringent construction practices of the recent past allowed more air movement through the building envelope. Air movement let the building expel moisture and stay dry. As we build better, we're also tightening our buildings to the point where they retain moisture. Water vapor in a building is not an issue in itself. But when that water vapor condenses, you could create a mold problem.

### Reducing risks starts with controlling moisture and nutrients

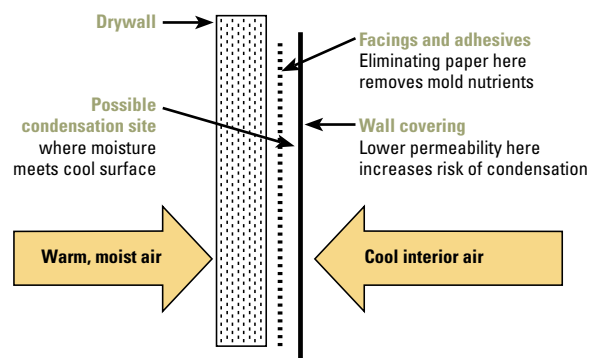
Mold and mildew need four key factors to grow:

- mold spores
- the right temperature range
- moisture
- a food source.

If any of these four are missing, mold can't grow. But at least two of them are difficult to control. Mold spores are always present in both indoor and outdoor air, and molds can flourish in any ambient temperature from 40°F to 100°F (4°C to 38°C).

### Moisture management is a starting place

In a modern, tightly sealed building, mold resistance begins with water vapor management. Mold will grow at any relative humidity above 60 percent, and condensed water quickly encourages the growth of mold. Good building design and construction practices help control moisture, but in areas where air-conditioning is common, warm moist air typically penetrates the wall cavities of exterior walls during summer months.



When moisture from a warm external wall cavity encounters a cooler, impermeable wall covering, condensation can occur behind the wall covering. If paper facings or adhesives are present, the stage is set for potential mold growth.


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Moisture in an exterior wall cavity will migrate to the back side of the interior wall covering, which is cooler than the air in the wall cavity. If the wall covering is permeable (breathable), it will let the moisture pass through into the room. Then the HVAC system can take the moisture out of the air. But if the wall covering has low permeability, moisture can't migrate through the wall covering, and the cool internal surface becomes a possible site for condensation. If there are organic substances behind the wall covering—such as paper facers, or organic binders or adhesives—the scene is set for mold growth.

### Moisture management comes from understanding risk factors

Good building practices avoid setting up double vapor barriers that can trap moisture between them. In humid climates, interior surfaces of exterior walls shouldn't create a second vapor barrier, especially when interior temperatures are cool. The chart shows condensation risk factors.

	Impermeable Wall Coverings	Semipermeable Wall Coverings	Permeable Wall Coverings
High Moisture Low Room Temp	<b>Overall Condensation Risk</b> 		
Med Moisture Med Room Temp			
Low Moisture High Room Temp			

The risk of condensation behind wall coverings increases with impermeable coverings in rooms kept at low temperatures.

### DensArmor Plus® Interior Panels eliminate paper facings to inhibit mold growth

Now, it's a given that commercial installations need wall coverings that are durable and easy to clean. But many commercial wall coverings with those desirable characteristics—including tile, some oil-based paints and many vinyl materials—have low permeability to moisture and may encourage internal condensation. That means that internal wall components must be carefully chosen to resist moisture and to eliminate paper and other nutrients that support mold growth.

In testing under ASTM D 3273, DensArmor Plus® Interior Panels were subjected for four weeks to moisture and temperatures favorable for mold growth. Where a score of zero means maximum mold growth and 10 means no mold growth, DensArmor Plus has scored a 10, the highest level of performance for mold resistance under the ASTM D 3273 test method.

Many Georgia-Pacific Gypsum products are certified or listed by testing/certification agencies. DensArmor Plus Interior Panels are GREENGUARD and GREENGUARD Gold Certified for low volatile organic compounds (VOCs) by a leading third-party organization, UL Environment. DensArmor Plus Interior panels, along with DensShield® Tile Backer also are listed in the Collaborative for High Performance Schools® (CHPS™) High Performance Product Database as a low emitting product.

DensArmor Plus panels are listed as GREENGUARD microbial-resistant. This microbial-resistant test is based on ASTM Standard D 6329, a testing standard set by ASTM International, which develops testing guidelines and procedures for building materials, products, systems and services. DensGlass® Shaftliner and DensShield Tile Backer also have been added to GREENGUARD Microbial-Resistant listings.

When paper-faced drywall gets wet, the paper facing absorbs and holds moisture, which contributes to mold growth. In addition, the paper deteriorates, and may delaminate from the gypsum core. DensArmor Plus panels are more durable than traditional drywall.

DensArmor Plus resists moisture absorption and reduces retained water in the wall assembly. The moisture-resistant fiberglass mats also make DensArmor Plus Interior Panels the ideal replacement for paper-faced greenboard or moisture-resistant drywall in areas without direct moisture exposure.

### **Good building practices control both moisture and nutrients**

Proactive control of mold calls for controlling moisture and nutrient sources wherever you can. Here are some steps you can take:

- Design buildings with wall ventilation to eliminate condensation buildup. If walls are adequately ventilated, condensation will evaporate as part of the normal temperature cycle.
- Keep the moisture out during construction. Use products that will not fail when normal moisture conditions occur. DensArmor Plus® Panels are moisture-resistant and can actually be used to eliminate delays due to costly remediation of paper-faced products during construction. In fact, DensArmor Plus panels are backed with a limited warranty against delamination and deterioration for up to 12 months of exposure to normal weather conditions.\*
- Be careful about relying on building codes and standard construction documentation alone to insure mold-resistant design and construction. Often, new strategies are required for optimal resistance to mold growth. Ask your design team members to look into the utilization of products that have moisture- and mold-resistant properties. New technologies now help provide short term protection during harsh conditions that occur during construction and long-term protection against costly remediation.

### **DensArmor Plus® Interior Panels deliver cost-effective protection**

DensArmor Plus panels have been used successfully for years, and many major healthcare and institutional builders are using DensArmor Plus panels in many interior wall assemblies. Widely available, DensArmor Plus panels are based on Georgia-Pacific Gypsum's Dens® Brand exterior-sheathing technology that has delivered proven moisture resistance since 1986.



DensArmor Plus panels have been tested with many combinations of primer, adhesives and wall coverings, and will work well with new wall covering technologies in development or recently on the market:

- Primers and adhesives that contain biocides to control mold growth
- More permeable primers and adhesives that help vent migrating moisture
- More permeable micro-vented vinyl coverings.

In new construction or renovation, the best wallcovering solution is to remove possible nutrient sources and use materials that do not fail when exposed to moisture. An ideal solutions might include DensArmor Plus Interior panels with mold-resistant primers and wall-covering adhesives, plus permeable wall coverings such as micro-vented vinyl.

### **Mold risk-avoidance is a long-term strategy**

The true costs of using mold-susceptible materials in construction may not show up for years. When you factor in possible mold remediation and insurance costs, DensArmor Plus Interior panels add protection that can be very cost-effective.

\*For complete warranty details, visit [www.gpgypsum.com](http://www.gpgypsum.com).

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Georgia-Pacific Gypsum II LLC  
Canada Georgia-Pacific Canada LP

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Southeast: **1-800-327-2344**  
Northeast: **1-800-947-4497**

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**CAUTION** For product fire, safety and use information, go to [www.buildgpc.com/safetyinfo](http://www.buildgpc.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.

