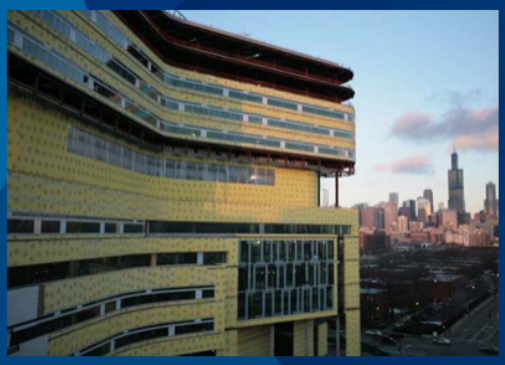


High-Performance Gypsum Panels:

Benefits for Moisture Management and Project Scheduling

Georgia-Pacific
Building Products

Benefits of High-Performance Gypsum Panels for Moisture Management and Project Scheduling

Sponsored by: Georgia-Pacific Gypsum LLC
133 Peachtree Street NE, Eighth Floor
Atlanta, GA 30303

Description: This course considers the design of energy-efficient buildings, which must include an effective, lasting moisture management strategy. Moisture management is essential to resilient, sustainable, healthy buildings.

Continuing Education Credits

AIA Continuing Education System (AIA CES)

- Credit(s) earned upon completion of this course will be reported to the AIA CES for AIA members.
- Certificates of completion for both AIA members and non-members are available upon request.
- This program is registered with AIA CES for continuing professional education. As such, it does not include content that may be deemed or construed to be an approval or endorsement by the AIA or any material of construction or any method or manner of handling, using, distributing, or dealing in any material or product.

Learning Objectives

At the end of this program, participants should be able to:

- Assess moisture management needs for energy-efficient, high-performance buildings.
- Describe construction detailing and scheduling of high-performance envelopes.
- Discuss how fiberglass mat gypsum panels are used as a rigid substrate behind air-resistant barriers.
- List benefits of water-resistant fiberglass mat gypsum panels in interiors, fighting mold and moistures, and controlling envelope moisture issues.

Continuous Insulation and Moisture Control

Designing High-Performance Buildings

Energy-efficient, resilient, high-performance buildings require carefully designed and engineered envelopes that include whole-building moisture management strategies, overall durability, and good indoor environmental quality (IEQ) strategies.

High-Performance Buildings

High-performance buildings are energy efficient as prescribed by the energy code and above-code standards and programs.

- Higher R-values or low U-values for the exterior walls differ by climate zones.
  - **R-Value:** the capacity of an insulating material to resist heat flow; the higher the R-value, the greater the insulating power.
  - **U-value:** a measure of heat transmission through a building part (as a wall) or a given thickness of a material (as insulation), with lower numbers indicating better insulating properties.
- Thicker walls with more cavity insulation installed or the use of continuous rigid insulation over exterior sheathing are prescriptive methods to achieve higher R-values or lower U-values for increased energy efficiency.
- Continuous air barriers are also prescriptive to the energy code and above code standards and programs.
  - Air barriers reduce the amount of air (and moisture) infiltration allowed into a building.

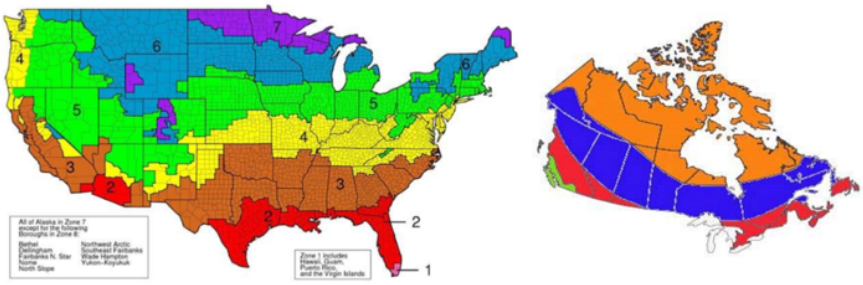
Image courtesy of Icynene, Inc

Image courtesy of Dow®

High-Performance Buildings

Continuous insulation is prescriptive to the International Energy Conservation Code (IECC).

- In the 2012 IECC for commercial construction-steel framing: continuous insulation prescriptive in all eight climate zones.



For more information, visit the Department of Energy at www.energy.gov.

High-Performance Buildings

- Continuous insulation (CI) is usually rigid foam-board insulation up to 4 inches thick, with the R-values meeting code requirements for a specific climate zone.
- CI's intent is to mitigate the impact of thermal bridging and minimize heat loss through the wall framing and exterior sheathing—where no wall insulation exists.

Image courtesy of www.high-performancebuildings.org

High-Performance Buildings

Continuous insulation is commonly installed over fiberglass mat gypsum sheathing:

- To provide fire resistance;
- To provide a drainage plane behind the insulation when the surface and joints are properly treated; and
- As a rigid substrate when foam sheathing is used as the air and water resistant barrier.

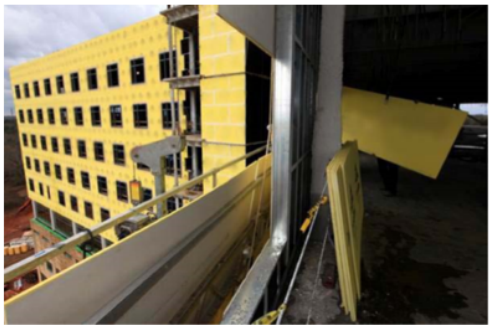
Image courtesy of Todd Fratzel

Moisture Management Strategies

Unintended and unexpected air and/or moisture intrusion can reduce energy efficiency through material and insulation degradation, increased humidity loads, and other effects.

The use of high-performance fiberglass mat gypsum panels offers advantages in the design and construction process, including improved construction scheduling of high-performance enclosures and interior assemblies.

Moisture Management Strategies



Fiberglass mat gypsum panels assist in moisture management through:

- Inherent resistance to moisture and mold;
- Compatibility with barriers and other moisture-control products;
- Use as sheathing in high-performance building assemblies; and
- Construction scheduling benefits of moisture-resistant materials.

Moisture Management Strategies

There are many benefits of proper execution using fiberglass mat gypsum panels as part of a whole-building moisture management and envelope design. To review, the primary benefits:

- Increases durability
  - Enhanced durability of the building and its assemblies
- Helps improve energy efficiency
  - An effective substrate for air and water barriers that limit water absorption and transfer to other components in the wall assembly
- Delivers long-term value
  - Greater long-term value for owner and occupants

Types of Moisture Issues

Understanding moisture infiltration is important to ensuring the best possible building performance. Moisture enters the envelope or building in various ways, but there are three primary external mechanisms.

External sources include:

- **Bulk water intrusion,** such as rain and leaks;
- **Moisture vapor diffusion,** in which moisture-laden air enters areas of the building through the envelope; and
- **Capillary action/absorption**, in which some materials draw moisture into materials through contact with the moisture-laden air and leaks.

Multiple variables of building operations and weather/climate determine how and when these moisture sources arise. They include:

- Temperature differences (outdoors vs. indoors);
- Air pressures acting on the envelope (HVAC and ventilation); and
- Vapor pressure.

Types of Moisture Issues

Moisture can also arise from the building and its occupants; these are internal mechanisms.

Internal sources include:

- **Condensation** (this depends on where warm meets cold within the envelope);
- **Leaks** in the mechanical system, fenestration, or flashing; and
- **Interior humidity** generated by building operations, processes, and human beings.

"Several factors affect moisture movement within a commercial building: temperature, pressure differences, and vapor pressure. Understanding basic building science principle concepts such as dew point, buildings are less likely to experience condensation within the envelope."

—Steve Easley, Illinois DCEO

Images :
Home Energy Magazine online, November/December 1995

Types of Moisture Issues

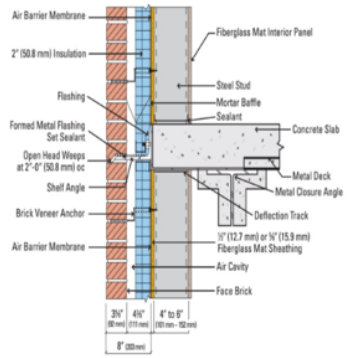
Wall assemblies many get wet via **bulk water intrusion**. Structures must deflect and drain wind-driven rain. In practice, all building cladding systems leak, so envelopes must be able to dry out after moisture enters. Moisture management requires 4-D design, which stands for:

Deflection
- Move rain and water down and away with cladding and flashings.

Drainage
- Give bulk moisture a path out.

Drying
- Let suitable areas of the envelope dry.

Durable components
- Use robust materials that survive wetting.



Types of Moisture Issues

When the four Ds are not designed or executed properly, negative effects related to moisture intrusion that may reduce energy efficiency, shorten building life span, and impact IEQ can occur.

The most common causes of these negative effects are:

- Inadequate flashing and air and waterproofing details;
- Inadequate drainage plane; and
- Materials that are not resilient (e.g., that cannot withstand periodic exposure to moisture).

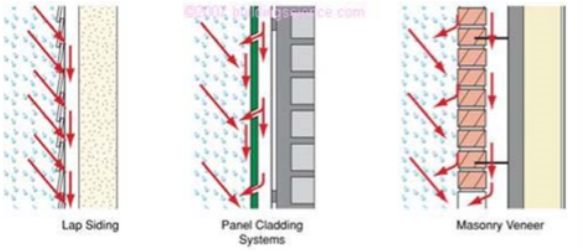


Image: © 2007 www.buildingscience.com

Moisture Management Planning

This project team must work together to prevent moisture intrusion.

Image: taylorsisland.org/images/TI_PlansAtHwyDept.jpg

Moisture Management Planning

In planning phases, the project team must follow a few essential rules:

- **Keep water out** and use water-resistance barriers.
  - Use deflection, drainage, and drying to prevent unwanted water infiltration.

Image courtesy of Grace Construction Products

- Establish **dew point** locations.
  - Most buildings allow the passage of moisture vapor.
  - If moisture vapor comes into contact with a cool surface (where the temperature is at or below the dew point of the air), it will condense.
  - This creates moisture on surfaces within the wall and an environment where **mold** can potentially grow.

Moisture Management Planning

- Allow a means to **dry out** the envelope.
  - Vapor migration by diffusion is one way to allow a building to dry to the inside of dry to the outside…
  - But it can also cause condensation and moisture accumulation.
- Use **durable materials** (for the inevitable).

Moisture management planning is a team effort. Project design and planning determine the outcomes:

- Proper material choice
- Envelope design process and detailing
- Construction coordination and scheduling

Methods to control moisture include building an energy-efficient [enclosure] with proper air sealing, proper use of vapor barriers, and vapor diffusion strategies."

—U.S. Environmental Protection Agency

Durability Strategies

As shown, poor moisture control can cause a number of undesirable effects, including: material and structural deterioration; degradation of thermal insulation, resulting in reduced energy efficiency; potential for interior moisture issues and the potential for mold; and poor IEQ.

That's why high-performance buildings have good moisture control; it leads to:

- Sustainability and energy efficiency;
- Improved IEQ; and
- Enhanced durability and longer building service life.

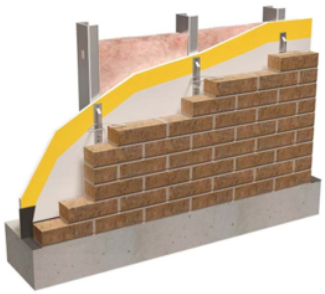
"Moisture control is a key component in designing energy-efficient, healthy buildings."

—Oak Ridge National Laboratory

Moisture Control = Energy

Controlling moisture = improving energy efficiency (unintended air and moisture due to air-barrier penetration undermines energy efficiency).

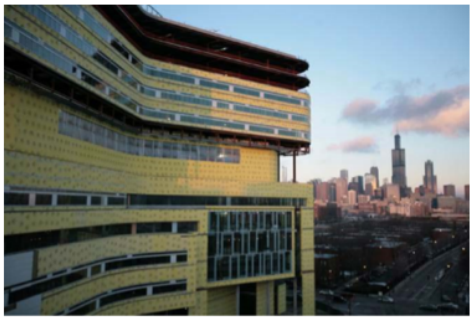
And…
Measures to improve energy efficiency = ways to control moisture.



Planning and designing a moisture-resistant enclosure requires three key performance components:

- **Control layers** that reduce air and moisture infiltration;
- **Assemblies** designed to prevent moisture issues; and
- **Materials** that resist and manage moisture.

Design for Moisture Control



All three functions can be accomplished with a number of materials. We will focus on one of them: fiberglass mat gypsum panels.

Fiberglass mat gypsum panels are:

- Commonly used in fire-rated **assemblies**;
- Often employed as a substrate for air-barrier **materials** to provide a **control layer** that decreases air and moisture infiltration; and
- Frequently specified for their weather exposure and moisture resistance.

Design for Moisture Control: Materials

What are the key attributes for materials in moisture control situations?

Moisture control materials must:	**Fiberglass mat gypsum**
• Be able to resist moisture	☑
• Be non-absorbent so they can shed water	☑
• Be compatible with air-barrier materials/assemblies	☑
• NOT support potential mold growth	☑

Fiberglass mat gypsum panels have other related benefits.

Most important in terms of moisture issues:

- **Project scheduling benefits**: Fiberglass mat gypsum panels and some treated paper gypsum panels allow for construction during humid or wet weather without affecting material performance ☑

Design for Moisture Control: Codes & Standards

Materials used for moisture-control applications and high-performance buildings should meet key ASTM standards that assure proper performance for the intended application and function.

Example Materials	Relevant Standards
Air Barriers	ASTM E2178 and ASTM E2357 IECC Section 402.4.1.2.1
Water-Resistant Barriers (WRBs)	ASTM E2556, Standard Spec for Vapor Permeable Sheet
EPS Foam Insulation	ASTM C578, Standard Spec for Rigid, Cellular Polystyrene
Windows, Doors, and Skylights	ASTM E2112, Standard Practice for Insulation
Material Mold Resistance	ASTM D2373, Standard Test for Resistance to Growth of Mold
Gypsum Board Sheathing	ASTM C1396 (material stability) ASTM C 1177 (use as sheathing) IBC Chapter 25

Envelope Design and Moisture Control

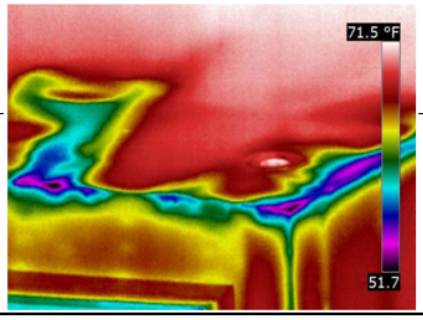


Image: © 2012 Chicago Infrared Thermal Imaging

Envelope Materials

Fiberglass mat gypsum panels are examples of envelope materials that serve multiple functions for building moisture control:

Deflection

- Fiberglass mat gypsum panels act as **control layers:** an air-barrier layer or treatment applied to compatible sheathing.

Drainage

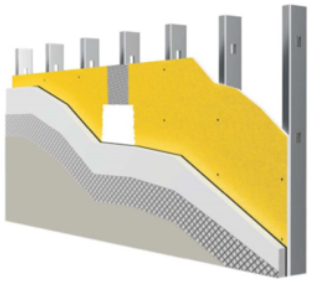
- Fiberglass mat gypsum sheathing supports water-resistance barrier serving as the **drainage plane** to control bulk water entry.

Drying

- Fiberglass mat gypsum panels are vapor permeable.

Durable components

- Fiberglass met gypsum panels are water resistant.

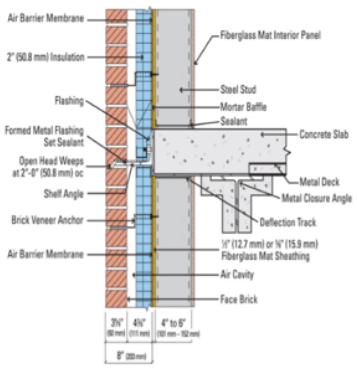


Performance Components

There are three essential performance components of a building envelope:

1. **Structure**
   - Primarily the framing and sheathing
2. **Control layers**
   - Bulk water control (water-resistant barrier)
   - Thermal barrier (R- or U- value; protects against condensation)
   - Air barrier
   - Vapor retarder (climate specific; resists moisture vapor entry)
3. **Cladding**
   - Siding, brick, EIFS, or similar

Key design principle: The location of control layers in relation to sheathing is critical to effective moisture control.



Contingency and Redundancy

Possible assembly failures or ineffective control layers are possible in building operations. Envelope materials may get wet during construction. These moisture-handling problems make it critical to protect building materials during construction and after installation in building assemblies.

The downside of ineffective moisture handling is serious. Examples include:

Trapped moisture

- Moisture may unintentionally remain within envelope voids due to use of impermeable materials, lack of drying potential, or ineffective drainage. This may cause structural corrosion or degradation, reduced insulation R-value (thermal degradation), wet materials, and potential mold growth.

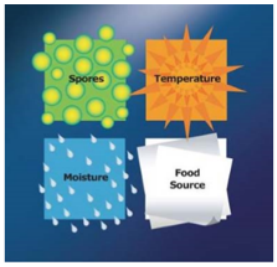
Wet materials

- Trapped moisture or wetness caused during construction can cause material deterioration and failure, may compromise barrier integrity, and can create the potential for mold growth.

Moisture Management Planning

A big challenge of unintended moisture infiltration and accumulation is the potential for mold growth. Mold can occur within 48 hours anywhere that has: 1) spores, 2) water, 3) a food source, and 4) moderate temperatures.

Mold growth is costly to remove and can result in costly litigation. The same construction measures that prevent mold growth also help limit heating and cooling energy losses, improve IEQ, and improve occupant health.



- **Eliminate the food source:** Paper, wood, and natural fibers are food sources for potential mold growth. Materials like fiberglass mat gypsum panels provide no food source for mold.
- **Reduce construction phase wetness (short term):** Construction measures can reduce inadvertent wetting of materials, such as using materials that do not absorb rain or humidity.
- **Use materials that resist moisture (long term):** Mold requires moisture to grow. Trapped moisture is less likely to cause degradation to fiberglass mat gypsum panels.

Benefits of Contingency and Redundancy

These examples show how system redundancy and contingency planning are essential to effective envelope and building design, where assembly failures or breached control layers are possible.

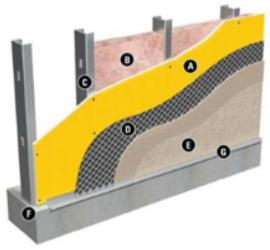
Benefits of improved moisture protections are well established and include:

Drainage plane and air gap

- Experts and research confirm field experience: effective design and construction practices frequently include an air gap and drainage cavity behind the adhered claddings to improve durability and reduce moisture failures.

Moisture-resistant materials

- Field experience and expert life-cycle studies have shown there are benefits of using materials that are resilient and can resist moisture. Resilient materials may help:
  - Reduce construction delays due to moisture damage to materials;
  - Reduce material replacement cost and labor to remediate; and
  - Potentially reduce long-term maintenance costs related to wet materials in the structure.



A. Fiberglass Mat Sheathing
B. Insulation
C. Framing
D. Paper-backed Metal Lath (serves as drainage plane and WRB)
E. Conventional Stucco
F. Min. ¼" (6mm) Gap
G. Flashing

Codes and Standards

In addition to principles of good design and construction, key codes and standards help ensure proper moisture management in buildings.

Design Issue	Key Code Citations
Moisture Control	IBC Section 1403 describes moisture control as one of the architect's responsibilities.
Resistance to Mold	ASTM D3273 is a testing standard for resistance to mold, describing material potential for microbial contamination.
Air-Infiltration Resistance	Section C402 in IECC 2012 gives mandatory requirements for continuous air barriers.
Water-Resistant Barriers	IBC Section 1404 calls for a water-resistant barrier behind the veneer, drainage to the exterior, and preventing water accumulation within the wall.

Moisture Management : Summary

- Moisture management is essential to **high-performance**, energy-efficient building design.
  - Unmanaged moisture can limit performance, increase energy costs, potentially cause mold, and impact occupant health.
- Consider the various **sources of moisture,** and apply the **four Ds** of envelope design for moisture control, as needed.
  - They are deflection, drainage, drying, and durable materials.
- Use **durable, water-resistant materials** to prevent degradation due to moisture infiltration and to maintain building performance.
  - An example is the use of fiberglass mat gypsum panels.
- Reference and follow **key codes and standards** for envelop design.
  - Key sources include ASHRAE, IBC, ASTM standards, and the IECC.
- Employ contingencies and **redundant design** to ensure envelope structure, control layers, and materials remain intact.
  - If water gets in, how does it escape or dry out without damaging the building?

Construction Scheduling and Product Choice for Moisture Control

Material Selection

Selection of a material, system, or finish can have a major impact on construction scheduling, sequencing, and budget.

An example is **gypsum sheathing** used for the building envelope. There are a variety of choices, including:

Fiberglass mat

- Fiberglass mat gypsum panels are commonly used for envelope assemblies.

Paper faced

- Gypsum panels with paper facings are also used as envelope sheathing.

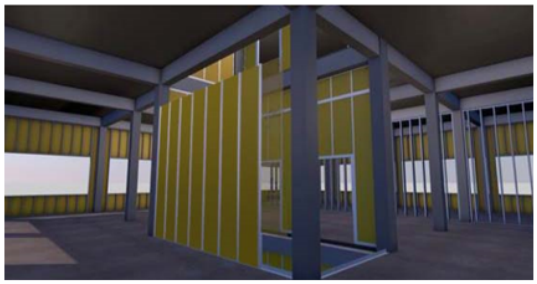
Material Selection

Paper-faced gypsum panels
Billions of square feet of paper-faced gypsum panels are employed for interior construction. As exterior sheathing, paper-faced gypsum boards may have a water-repellent coating and wax-treated, water-resistant cores. However, they can still become damaged and potentially mold from exposure to excess moisture during storage, delivery, and during the construction phase of the project. The Gypsum Association does not recommend using paper-faced gypsum products where they will be exposed to high humidity or moisture before, during, or after construction.

Material Selection

Fiberglass mat gypsum panels
Fiberglass mat gypsum panels were introduced in 1985, constructed with a fiberglass layer laminated to both sides. The gypsum core is treated with a moisture-resistant formula so the panels can be exposed to weather/rain and other moisture for up to 12 months without affecting performance.

- Panel is composed of fiberglass mat facings, moisture-resistant core
- Can be exposed to weather (up to 12 months)



Performance Benefits of Fiberglass Mat Gypsum

Performance benefits of fiberglass mat gypsum as an envelope material include:

Overall envelope performance

- Fiberglass mat gypsum panels are:
  - An effective rigid substrate for air barrier and water-resistant barriers;
  - A redundant protection for a drainage plane; and
  - An effective part of an energy-efficient assembly.

Moisture mitigation

- Fiberglass mat gypsum sheathing helps control moisture, contributing to a lasting and durable envelope.

Accelerated Construction Scheduling

Fiberglass mat panels can offer a few valuable scheduling options for the construction of high-performance envelopes. These include 1) the **early installation** of gypsum board because it can be exposed to the outdoors, and 2) **accelerated work** by subcontractors and trades, including mechanical, engineering, and plumbing (MEP) and interior wall/partition specialties, casework installation, interior glazing, and such specialties as wall-mounted fixtures, rails, and guards.

The benefits of **accelerated scheduling** can include:

- Reduced schedule delays;
- Reduced staging costs;
- Improved project efficiency; and
- Earlier occupancy.

Image: www.solard.iastate.edu/images/upl/cv070.jpg

Accelerated Construction Scheduling

Accelerated construction scheduling is beneficial for a number of advanced project delivery strategies. These methods help reduce change orders, allow higher-quality construction, and enable on-time completions. Side benefits include reducing time that materials are on the job site.

Integrated project delivery (IPD)

- Allows early planning meetings to determine how construction can best accommodate a given design

Lean construction

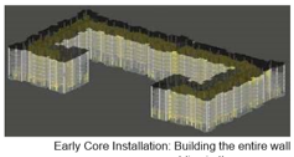
- Managing and improving the construction process to profitably delivery owner's needs

Use of BIM

- Building information modelling allows early-phase construction by ensuring no clashes, no rework

Fast track

- Greater overlapping of design and construction phases



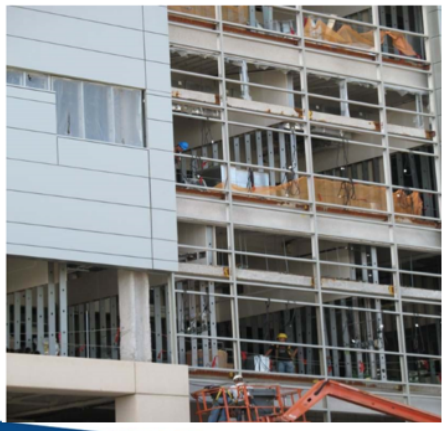
Early Core Installation: Building the entire wall assemblies in the core area.

Accelerated Construction Schedule Techniques

There are four phases of interior construction scheduling that relate to the use of regular fiberglass mat gypsum panels.

Technique	Description
Pre-Rock	Wallboard installed before windows/doors are in place (above ceilings, in interior core areas, inboard of perimeter walls/envelope, and in mechanical areas and interiors without HVAC).
Early Core Installation	For building core and other areas erected early, when the exterior envelope is not yet complete. This technique is ideal for a lengthy envelope installation phase, and it is often undertaken in conjunction with building information modeling (BIM).
Protected/Sheltered Areas	Installation in areas of reduced moisture risk and sheltered areas.
Dried In	In this method, board is installed after windows and doors are in place and the envelope is sealed, and interior areas are protected and all construction areas are conditioned. For areas of minimal moisture risk during occupancy.

Accelerated Construction Scheduling Techniques: Pre-Rock



Pre-rock is a simple technique that accelerates schedules, gives the trades an early start, and is a suitable use of fiberglass mat gypsum panels.

Accelerated Construction Scheduling Techniques: Early Core Installation

Plumbing protection

Mechanical areas, stairwells, and shafts can be protected and constructed before completion of the envelope.

Accelerated Construction Scheduling Techniques: Protected/Sheltered Areas

Areas have reduced moisture risk and are sheltered.

Accelerated Construction Scheduling Techniques: Dried In

Gypsum boards are installed after all fenestrations are enclosed. Areas in the building are conditioned. There is minimal risk of moisture exposure during construction.

Interior Walls

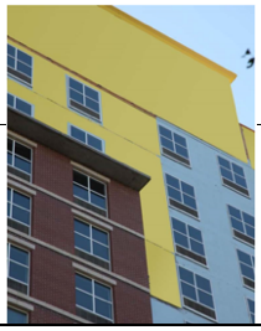
Wet areas behind tile

Accelerated Construction Scheduling: Summary

To summarize, fiberglass mat gypsum board offers specification benefits for envelope design and moisture control, as well as construction scheduling benefits related to accelerated work by trades and weather resistance of the materials. For an accelerated schedule technique, use the proper panels:

Accelerated Approach	Suggested Gypsum Materials
Pre-Rock	Fiberglass mat gypsum panels only
Early Core Installation	Fiberglass mat gypsum panels only
Protected/Sheltered Areas	Treated paper gypsum board or fiberglass mat gypsum
Dried In	All board types can be used

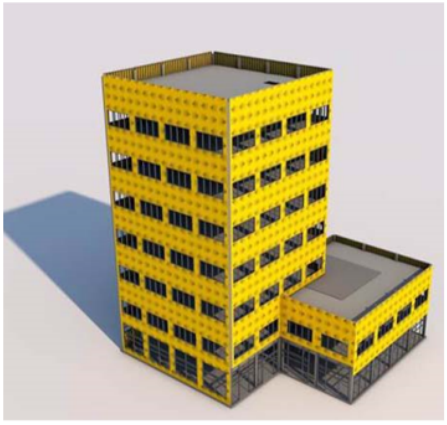
Effective Envelope Substrates



Fiberglass Mat Gypsum Sheathing

Fiberglass mat gypsum sheathing is commonly used for efficient, durable building envelopes. This is because fiberglass mat gypsum panels meet a number of key requirements for exterior wall sheathing:

- Fiberglass penetrates the gypsum panels to enhance strength, including resistance to delamination, deterioration, warping, and job site damage.
- Its flexural strength is approximately the same for both axes so it can be installed horizontally or vertically without sacrificing strength.
- Fiberglass mat gypsum panels help protect and stabilize structural framing.



Fiberglass Mat Gypsum Sheathing

Other reasons that fiberglass mat gypsum panels prove an effective and durable substrate and exterior wall sheathing include:

Durability

- Even under very humid conditions, fiberglass mat gypsum sheathing is very resistant to rippling, buckling, and sagging. Panels can exceed ASTM C1396 for humidified deflection five times better than paper-faced gypsum sheathing.

Fire resistance

- Tested noncombustible fiberglass mat gypsum panels meet ASTM E136 and NFPA 285 tests and are included in numerous UL listings and the GA-600 Fire Resistance Design Manual.

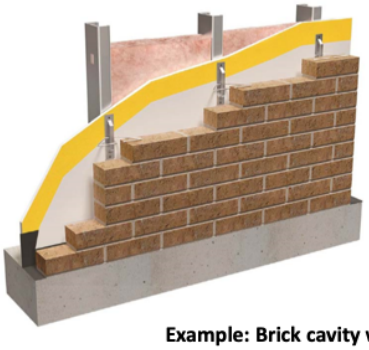
Resiliency

- Fiberglass mat gypsum panels resist moisture and are widely used as a substrate for air and water-resistance barriers.

Fiberglass Mat Gypsum Sheathing

Fiberglass mat gypsum board for use as exterior sheathing is a standard for efficient, durable envelopes. It can be used under a variety of cladding types, including:

- Brick
- Attached siding products
- EIFS
- Stucco



Example: Brick cavity wall
Masonry ties attach securely through the panels into steel or wood framing, brick spaced as required by masonry courses. Apply water-resistant/air barrier as required by building code.

Fiberglass Mat Gypsum Panels: Durable Substrate

Fiberglass mat gypsum panels can serve as an air barrier with appropriate joint and fastening treatment.

Fiberglass mat gypsum panels:

- **Block air and water** (with appropriate joint and fastening treatment) as shown in the tests ASTM E283 and E331.
- Allow for **sealing of joints**, which are required for barriers to be effective. They have a bond-enhancing coating and are compatible with:
  - Self-reinforcing tapes
  - Troweled-on materials
  - Spray-applied joint treatments
- Are **moisture resistant** and can be exposed to normal weather conditions for up to 12 months and still function properly.

Fiberglass mat gypsum panels: an effective, accepted substrate for air barriers and WRBs.

Fiberglass Mat Gypsum Panels: Durable Substrate

What are air barriers, vapor retarders, and water-resistant barriers?

- Air barriers control air movement into and out of a building.
- Vapor retarders restrict water vapor transmission.
- Water-resistant barriers (WRBs) keep liquid water from entering an enclosure.
- A combined air/vapor retarder/WRB can be provided by one material, in some cases.

Air barriers and weather-resistant barriers must be continuous, structurally supported, and meet all applicable codes and standards.*

Examples of air barriers and WRBs include:

- Half-inch fiberglass mat gypsum panels with appropriate treated joints and fasteners (air barrier only)
- Self-adhered sheet materials to fiberglass mat gypsum panels
- Fluid-applied membranes to fiberglass mat gypsum panels
- Spray polyurethane foam (medium density, closed cell) to fiberglass mat gypsum panels
- Mechanically attached sheets (asphalt felt, synthetic building wraps) with joints treated
- Boardstock air barrier (rigid foam board) with joints treated

*For more details, visit www.airbarrier.org.

Fire Resistance

Fire resistance

Because of their fire resistance, gypsum panels are installed on interiors and exteriors of buildings to meet fire codes. Today, high-performance buildings tend to have more envelope insulation and high-quality air/water barrier and flashing materials. This improves the energy-efficiency of building envelopes.

2012 International Building Code (IBC)

*1403.5 Vertical and lateral flame propagation: Exterior walls on buildings of Type I, II, II or IV construction that are greater than 40 feet (12,192 millimeters) in height above grade plane and contain a combustible water-resistant barrier shall be tested in accordance with and comply with the acceptance criteria of NFPA 285.**

Fiberglass mat gypsum panels are fire resistant and meet criteria of such tests as ASTM E119 & GA610. They have been tested for smoke, flame, and fire propagation in many assemblies meeting MFPA285.

***NFPA 285** is the National Fire Protection Association test for envelope assemblies, which evaluates "Fire Propagation Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components. "

Mold Resistance

The use of certain types of insulation, air barriers, and WRBs also can increase the likelihood that moisture will be trapped within the building envelope. Some materials get wet and stay wet.

As shown in previous sections, fiberglass mat gypsum panels have a high score in terms of mold resistance (10 out of 10) because fiberglass—unlike paper—is not a food source, per ASTM D3273, a test standard for mold resistance.

Construction Scheduling: Review

Unintended and unexpected moisture intrusion can dramatically reduce energy efficiency. The use of fiberglass mat gypsum panels offers advantages in the design and construction process, including detailing and scheduling of high-performance enclosures and interior assemblies.

Examples:

- They can serve as an effective rigid substrate for air and water-resistant barriers.
- Fiberglass mat gypsum sheathing, with the joints treated, can serve as an air barrier.
- Fiberglass mat gypsum panels are not susceptible to water damage.
- They are structurally stable, durable, and long lasting.
- The water-resistant, treated core with a fiberglass mat face and back provides a high level of protection from the elements.
- The sheathing does not need to be protected during construction on installation.

Summary

Summary

In this course, we have:

- Discussed the prescriptive use of continuous insulation;
- Assessed **moisture management** needs for energy-efficient, high-performance buildings;
- Described **construction detailing and scheduling** of high-performance envelopes; and
- Detailed how fiberglass mat gypsum panels are used as a rigid substrate behind **air barriers and water resistant barriers**.

Thank You

This concludes the AIA CES Learning Unit educational presentation. Please complete the quiz in order to earn credit and receive a certificate of completion.