System Solutions to Prevent Mold

How a systems approach to managing moisture is the most effective strategy for minimizing the growth of mold.

Moisture Control

Architects, designers, contractors and maintenance engineers must work together to prevent mold growth during construction and throughout a building's life cycle. Controlling mold requires careful design, proper construction and thorough maintenance, all of which aim to manage one basic factor: moisture.

Prevent

Moisture

Although mold spores and nutrients must be available for mold to develop, they are found everywhere and cannot be eliminated from most spaces without expensive clean room equipment. Moisture is the only variable that can be controlled within the construction environment.

What You Need to Know

Moisture exposure can occur during all phases of the construction process and throughout the building lifecycle because of condensation, inadequate drying of building products, roof and pipe leaks, gross water penetration of the facade, and natural disasters.

All products become susceptible to mold growth under certain conditions. The EPA has found that mold will grow on stainless steel and glass—in fact, mold can grow on virtually all surfaces, given the right conditions.

Control

Exposure

The issue of moisture and mold has become more prevalent due to tighter fabrication, lack of protection from snow and rain during the construction phase, and inadequate drying of concrete, plaster, and paint as the building is finished.

What You Need to Know

A systems approach to managing water is the most effective strategy for controlling moisture and minimizing the growth of mold. Since mold occurs naturally everywhere in our environment, it is important to know how construction practices can impact systems moisture management. Moisture is critical because it must be present for mold to develop and grow.

The chart at right illustrates how moisture affects building systems during all stages of the construction cycle. Controlling moisture through careful design, good construction practices and proper maintenance will help eliminate mold growth.

Construction Cycle

	Moisture Challenge	Construction Stage	Moisture Control Strategies
1	Moisture- and mold-resistant products	Manufacturing	Keep products dry. Introduce safe and effective products to enhance moisture and mold resistance. Designate correct areas for use.
2	Moisture intrusion in structure	Design	Create building exteriors—roof, cladding, doors and windows—with multiple barriers to water intrusion. Avoid trapping moisture by providing paths for drainage and drying.
3	Moisture exposure during transportation and storage	Distribution	Protect inventory from water, ensuring materials are delivered dry to job sites. Properly store materials at distribution center and jobsite.
4	Moisture exposure during construction	Construction	Cover structures open to the elements during construction to shut out weather. Install building materials when weather protection is in place.
5	Drying building materials	Construction	When moisture is introduced, such as through wet cement and painting, maintain ample ventilation and use special drying equipment where needed.
6	Moisture exposure after construction	Maintenance	Treat water infiltration from any source with the same urgency as fire. Look for leaks wherever signs of water damage are present, and repair quickly. Inspect and repair roofs, windows and all caulking. Maintain all HVAC equipment.

Manage

Risk

Testing provides a basis for comparing performance under controlled lab conditions. This does not mean that the test will accurately represent building material performance in actual end use, since unsuitable project conditions during storage, installation and maintenance can introduce moisture and cause mold.

What You Need to Know

Mold-resistant products are effective only when used in conjunction with sound design and construction practices. When moisture is limited during the construction phase, mold-resistant products act as extra protection against mold growth when incidental household moisture (such as condensation, steam, or dampness) is present.

In independent lab tests conducted at the time of manufacture per ASTM D3273, "Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber," the panel score was 10.

This ASTM lab test may not accurately represent the mold performance of building materials in actual use. Given unsuitable project conditions during storage, installation or after completion, any building material can be overwhelmed by mold. To manage the growth of mold, the best and most cost-effective strategy is to protect building products from water exposure during storage and installation and after completion of the building. This can be accomplished by using good design and construction practices.

Tested by an independent lab per ASTM D3273

	Panels	Rating
Drywall	1/2″ SHEETROCK® MOLD TOUGH™ (FIRECODE® C Core gypsum panels only)	**10**
	5/8″ SHEETROCK® MOLD TOUGH™ gypsum panels, including FIRECODE® Core, FIRECODE® C Core and AR	**10**
	3/4″ SHEETROCK® MOLD TOUGH™ ULTRACODE® Core	**10**
	SHEETROCK® MOLD TOUGH™ gypsum liner panels	**10**
	FIBEROCK® AQUA-TOUGH™ interior panels	**10**
Backerboard	DUROCK® cement board	**10**
	FIBEROCK® AQUA-TOUGH™ underlayment	**10**
	FIBEROCK® AQUA-TOUGH™ tile backerboard	**10**
Sheathing	FIBEROCK® AQUA-TOUGH™ sheathing	**10**
Ceilings	ASTRO™, BRIO™, FRESCO™, FROST™, SANDRIFT™ and SUMMIT™ *CLIMAPLUS*™ panels, and select ECLIPSE™ *CLIMAPLUS*™ panels	**10**

Choose

Performance

Wet performance describes a product's ability to perform when appropriately installed. Typically products are engineered for one or all of the following: moisture resistance, sag resistance, mold resistance, and tile bond. USG offers a comprehensive product line, application guidelines, and tools for ceilings, substrates and drywall systems to address wet performance issues.

What You Need to Know

Using the right product in the right place is critical. Building exteriors require multiple barriers to water intrusion, and proper control of condensation can prevent the trapping of moisture within the building assembly. It is also important to specify approved substrates for areas regularly exposed to moisture.

Moisture and Mold Performance

Interior Walls	**SHEETROCK MOLD TOUGH Gypsum Panels (including FIRECODE Core, FIRECODE C Core, ULTRACODE Core, and AR)**	For interior areas such as bathrooms (not tub surrounds), basements, and areas with limited humidity control, these panels deliver resistance to moisture and mold.
	FIBEROCK AQUA-TOUGH Interior Panels	Uniform composition provides resistance to abuse, moisture and mold. Can be painted or used under tile.
Shaft Walls and Area Separation Walls	**SHEETROCK MOLD TOUGH Gypsum Liner Panels**	Providing resistance to moisture and mold, these high-performance panels are used in SHEETROCK shaft wall systems and SHEETROCK area separation wall systems.
Tub, Shower and High-moisture Areas	**DUROCK Cement Board**	High-strength tilebacker provides a water-durable, mold-resistant base for walls and ceilings. Noncombustible board will not swell, soften, delaminate or disintegrate. 30-year limited warranty.
	FIBEROCK AQUA-TOUGH Interior Panels and Tile Backerboard	Derives both strength and water resistance from its uniform composition.
Floors	**FIBEROCK AQUA-TOUGH Underlayment**	Easy to cut and handle, with multiple finishing options. Uniform composition provides moisture and mold resistance.
	DUROCK Underlayment	Superior tile bond for large-format tile, stone and marble. Water-durable and mold-resistant substrate for tile will not rot, warp or delaminate when exposed to water.
Exterior	**FIBEROCK AQUA-TOUGH Sheathing**	Uniform composition provides strength, moisture- and mold-resistance, with no facing layer to delaminate. For use in most exterior systems.
	DUROCK Cement Board	Superior base for textured finish, thin brick, ceramic tile, adhesively attached or “water-managed” EIFS.
Acoustical Ceilings	**ASTRO, BRIO, FRESCO, FROST, SANDRIFT and SUMMIT *CLIMAPLUS*, and select ECLIPSE *CLIMAPLUS* Ceiling Panels**	Fine-textured ceiling panels with protection against mold growth. When installed with the DONN brand suspension system, panels are guaranteed for the lifetime (30 years) of the product, subject to use under normal conditions, to inhibit or retard microbial growth on product treated surfaces that can result from high-humidity conditions.

Resources

Literature and Websites

USG Literature

Shaft Wall Systems (SA926)
Area Separation Wall Systems (SA925)
Moisture-Resistant Systems (SA934)
Exterior System Substrates (SA700)
Abuse-Resistant Systems (SA929)
Good Construction Practices (WB2334)
Moisture, Mold and Construction Practices: Frequently Asked Questions (WB2317)
Moisture and Mold Construction Practices: Repairing Water-Damaged Building Systems (WB2315)
The Gypsum Construction Handbook (H17)
Storage and Handling—Wallboard and Other Products (WB2333)
SHEETROCK® MOLD TOUGH™ Gypsum Panel (Regular and Firecode® Core) Submittal Sheet (WB2390)
SHEETROCK® MOLD TOUGH™ ULTRACODE® Core Gypsum Panel Submittal Sheet (WB2388)
SHEETROCK® MOLD TOUGH™ AR Gypsum Panel (Regular and FIRECODE® Core) Submittal Sheet (WB2391)
SHEETROCK® MOLD TOUGH™ Gypsum Liner Panel Submittal Sheet (WB2389)
Interior Job Condition Specifications (J1364)
Finishing SHEETROCK® Gypsum Panels: Cold or Humid Conditions (J850)

USG Resources

Get Mold Facts
getmoldfacts.com

Industry Resources

Responsible Solutions to Mold Coalition
responsiblemoldsolutions.org

Gypsum Association: Assessing Water Damage to Gypsum Board
gypsum.org/pdf/GA-231-03.pdf

US EPA: Indoor Air Quality
epa.gov/iaq

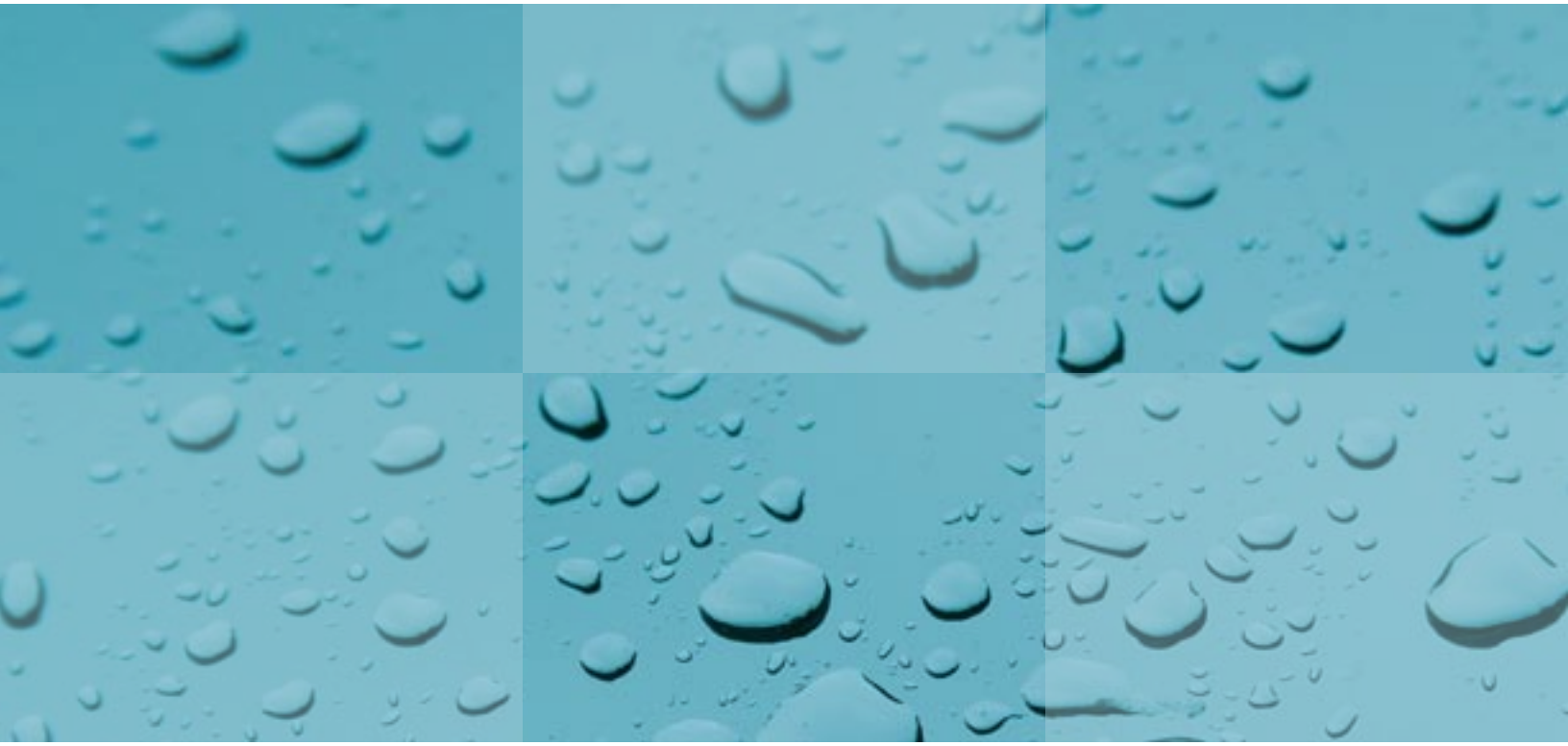
US EPA: Mold
epa.gov/iaq/molds

US EPA: Healthy School Environments
epa.gov/schools

Texas Department of Health: Indoor Air Quality
http://www.tdh.state.tx.us/beh/IAQ/

US Centers for Disease Control: National Center for Environmental Health
cdc.gov/mold/default.htm

US Centers for Disease Control: Mold
cdc.gov/mold/default.htm



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Safety First!
Follow good safety/industrial hygiene practices during installation. Wear appropriate personal protective equipment. Read MSDS and literature before specification and installation.

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