# Moisture, Mold, and Construction Practices



## Frequently Asked Questions

Understanding the impact of moisture and mold on building materials and the construction process is integral to developing good design and construction practices.

This document summarizes research and information developed by a variety of organizations such as the American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ASHRAE), the United States Environmental Protection Agency (EPA) and the New York City Department of Health (NYCDH). A complete listing of agencies can be found at the end of this document.

The following questions and answers will help you develop an understanding of the relationship between the construction environment and the performance of building materials. Throughout this document, you'll find references to additional sources that reinforce good design, construction and maintenance practices to limit the growth of mold in any building environment. If you have additional questions, contact those sources or USG.

**1. What conditions are necessary for mold to grow?**

For mold to grow on or in a material, water, spores and a food source must be present.

**2. Do building materials support the growth of mold?**

Yes, but only when they get wet. Mold can grow in or on virtually every construction material. This includes glass fiber insulation, lumber, carpet, fabric, vinyl wall coverings, paint, OSB, plywood, EIFS, siding, wallboard, ceiling panels and brick. When a building material gets wet and dirty, it becomes a target for mold growth. Even products such as aluminum, steel and glass will support mold growth under the right conditions.

**3. What is mold and where is it found?**

Mold (fungi) is present everywhere—indoors and outdoors. There are more than 100,000 species of mold. At least 1,000 species of mold are common in the United States including Cladosporium, Penicillium and Aspergillus. Mold is most likely to grow where there is water or dampness such as in bathrooms and basements.[1]

**4. How can mold affect your health?**

Most types of mold are not hazardous to healthy individuals. However, excessive exposure to mold may cause or worsen conditions such as asthma, hay fever or other allergies. The most common symptoms of overexposure are cough, congestion, runny nose, eye irritation and aggravation of asthma. Depending on the amount of exposure and an individual's vulnerability, more serious health effects—such as fevers and breathing problems—can occur, but are unusual.[1]

**5. Why am I hearing more about mold than I have in the past?**

To our knowledge, no studies have been done to quantify the prevalence of mold in current or past construction. Heightened focus on the subject in the media has brought more attention to the construction industry and all trade factors on the need to employ good design, construction and maintenance practices that will minimize risk of water damage and mold.

Some investigators have speculated that the "tighter" construction practices adopted to conserve energy in the '70s have led to a greater potential to trap moisture in wall cavities and elsewhere. In addition, construction schedules have been continually shortened as owners and developers focus on more time-efficient construction practices to minimize their carrying costs. In part, this shortening of construction schedules contributes to installation conditions being less than ideal. In many cases, short-term protection from water is not provided. As a result, many buildings are open to the elements during all phases of construction. This practice can introduce a great deal of moisture into a building. In fact, standing water has become commonplace on many job sites. With spores naturally present in the environment and limited or no protection from water on many projects, mold growth can readily develop on and in building materials.

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| **6. What environmental conditions are needed for the application and finishing of gypsum panels?** | Basic temperature information can be found in ASTM C840: Standard Specification for Application and Finishing of Gypsum Board. Proper management of job conditions before, during, and after the application and finishing of gypsum panels is critical to assure satisfactory performance and appearance. We strongly recommend eliminating any excess moisture or water from the job site as the best method to minimize the risk of mold. For more detailed application recommendations, please refer to the USG *Gypsum Construction Handbook, Centennial Edition.* |
| **7. Are USG's drywall products more susceptible to mold today?** | No. Although we have introduced many improvements over the years, USG has not altered its SHEETROCK® brand gypsum panel products in any way that would make them more susceptible to mold. |
| **8. Why doesn't USG make a mold-proof drywall?** | Any building material can be overwhelmed by mold, given the proper conditions. Products and systems can be designed to incorporate increasing degrees of mold and moisture resistance. The best and most cost-effective strategy to manage the risk of mold is to prevent the intrusion of water into the building. This can be accomplished through good design, construction, and maintenance practices. |
| **9. Which USG products and systems offer enhanced mold resistance?** | The following products are designed to meet discrete acoustical, aesthetic and environmental performance criteria while providing resistance to mold (as tested and reported per ASTM D3273-00) when installed using good design and construction practices:<br>– SHEETROCK® MOLD TOUGH™ gypsum panels<br>– SHEETROCK® MOLD TOUGH™ ULTRACODE® gypsum panels<br>– SHEETROCK® MOLD TOUGH™ AR gypsum panels<br>– SHEETROCK® MOLD TOUGH gypsum liner panels (for use in SHEETROCK® shaftwall and area separation wall systems)<br>– FIBEROCK® brand AQUA-TOUGH™ interior panels<br>– FIBEROCK® AQUA-TOUGH™ tile backerboard<br>– FIBEROCK® AQUA-TOUGH™ underlayment<br>– FIBEROCK® AQUA-TOUGH™ sheathing<br>– DUROCK® brand cement board<br>– Acoustical ceiling panels with *CLIMAPLUS*™ Superior Performance<br><br>See product literature for limitations and exclusions. |
| **10. Is USG developing additional product responses for mold?** | USG has a long history of bringing new and innovative products to market. These products are designed to be safe during manufacturing, delivery, handling, and installation, and to perform well when installed and maintained using good construction practices. All product development efforts continue to focus on ensuring the safety, quality and performance of our products. This commitment to safety and accurately representing our products' performance and limitations are the cornerstones of USG's product development process. As new and innovative products and systems are developed and tested, they will be released to the market. |
| **11. Does USG plan to offer a mold-resistant drywall panel for use in a dry environment?** | No. USG does not plan to offer enhanced mold resistance on panel products used in dry environments. USG's SHEETROCK gypsum panels have a long history (over 85 years) of excellent performance when installed and maintained using good construction and maintenance practices. |

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| **12. What else is USG doing to address the issues of moisture and mold growth?** | USG's efforts to address these issues fall into three categories:<br>**Research** Perform ongoing research to better understand the impact of construction practices, moisture, and mold on our products and systems.<br>**Assistance** Provide assistance to respected authorities and associations to aid in developing a broader understanding of construction systems and appropriate test methods for those systems.<br>**Education** Educate those who are involved in the manufacture, distribution, installation and maintenance of building products and systems, as well as building owners and occupants, on central issues pertaining to moisture and mold. These issues include product safety, materials storage and handling, good design and construction practices, moisture management, and proper building maintenance. |
| **13. Who can help me decide if I have a problem on my job site?** | USG actively participates in educating our customers about the proper design, specification, installation and maintenance of our products. We have a variety of internal and external resources to help you make appropriate decisions regarding conditions on your projects. However, USG does not offer inspection or mold testing services. |
| **14. Is moisture content a critical element in the gypsum board manufacturing process?** | Yes. We precisely control moisture to ensure that the product meets our stringent performance standards. However, once a building material begins its journey to a project, environmental conditions can sometimes make it difficult to control moisture content. For that reason, we offer comprehensive transport, storage, handling, application, finishing and maintenance recommendations that clearly advise keeping our products clean and dry. For details, please refer to the USG *Gypsum Construction Handbook.* |
| **15. What is the acceptable moisture content for gypsum board on a job site?** | Currently, there is not an industry standard for measuring gypsum board moisture content at a job site. Addressing the overall moisture impact on the entire project is the appropriate approach. Moisture can affect not only installation, but also the finished appearance of a gypsum board partition or ceiling. At every point in the construction process, minimizing moisture exposure is the key to maximizing the performance of the finished assembly. |
| **16. What are the basics of dealing with the affected area?** | It is important to dry water-damaged areas within 24-48 hours to prevent mold growth. In all situations, immediately identify and address the cause of water damage to prevent re-occurence of the problem. For more information please refer to USG's "Moisture, Mold and Construction Practices: Repairing Water-Damaged Building Systems" (WB2315). |
| **17. Who does USG recommend for assistance in cleaning affected areas?** | USG does not offer company endorsements for remediation at this time. However, we suggest reviewing "Guidelines on Assessment and Remediation of Fungi in Indoor Environments" from the New York City Department of Health Bureau of Environmental & Occupational Disease Epidemiology. These guidelines are available at nyc.gov/html/doh/html/epi/moldrpt1.shtml. Another helpful resource is the IICRC S520, "Standard and Reference Guide for Professional Mold Remediation," from the Institute of Inspection, Cleaning and Restoration Certification. This reference is available at iicrc.org/iicrcstandards.shtml. |
| **18. Who can I call if I want more information?** | For more information about the health effects of mold exposure and information on the safe removal of mold, visit responsiblemoldsolutions.org or contact your state university Extension Services. |

The following questions and answers are excerpted with permission from the New York City Department of Health:

**What are molds?**
Molds produce tiny spores to reproduce. Mold spores waft through the indoor and outdoor air continually. When mold spores land on a damp spot indoors, they may begin growing and digesting whatever they are growing on in order to survive. There are molds that can grow on wood, paper, carpet and foods. When excessive moisture or water accumulates indoors, mold growth will often occur, particularly if the moisture problem remains undiscovered or unaddressed. There is no practical way to eliminate all mold spores in the indoor environment; the way to control indoor mold growth is to control moisture.[2]

**How does mold grow?**
All molds need water to grow. Mold can grow almost anywhere there is water damage, high humidity or dampness. Most often, molds are confined to areas near the source of water. Removing the source of moisture—such as through repairs or dehumidification—is critical to preventing mold growth.

**What should you do if mold is present in your home or apartment?**
Although any visible mold can be sampled by an environmental consultant and/or analyzed by a laboratory specializing in microbiology, these tests can be very expensive—from hundreds to thousands of dollars. There is no simple and cheap way to sample the air in your home to find out what types of mold are present and whether they are airborne. Even if you have your home tested, it is difficult to say at what levels health may be affected. Therefore, it is most important to correct underlying water damage and clean the affected area.

**How should mold be cleaned?**
Mold should be cleaned as soon as it appears. Persons cleaning mold should not be prone to allergies. Small areas of mold should be cleaned using a detergent/soapy solution or an appropriate household cleaner. Gloves should be worn during cleaning. The cleaned area should then be thoroughly dried. Dispose of any sponges or rags used to clean mold.

If the mold returns quickly or spreads, an underlying problem such as a leak may be present. Any underlying water problems must be fixed to successfully eliminate mold problems. If mold contamination is extensive, a professional abatement company may need to be consulted.

**Who can I call if I suspect I have a mold problem or if I want more information?**
For more information about the health effects of mold exposure and information on the safe removal of mold, please call the New York City Department of Health, Office of Environmental Investigations at (212) 442-3372 or the Environmental and Occupational Disease Epidemiology Unit at (212) 788-4290.



**Footnotes**
1. New York City Department of Health http://nyc.gov/html/doh/home.html
2. U.S. Environmental Protection Agency www.epa.gov

**Agency Resources**
The following organizations also offer certification programs for remediation specialists:
- IAQA Certified Indoor Environmentalist www.iaqa.org
- Certified HVAC Hygienist (CHH) Certification has been changed to the Certified Indoor Environmentalist (CIE) Certification
- IICRC – Institute of Inspection, Cleaning and Restoration www.iicrc.org
- ASCR – Association of Specialists in Cleaning and Restoration (CR – Certified Restorer) WLI – Water Loss Institute (Division of ASCR) www.ascr.org www.ascr.org/wli.asp

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