



Builder Advisory

Checklist for Minimizing Mold on Structural Building Components

MOISTURE CONTENT REQUIRED FOR SURFACE MOLD AND DECAY FUNGI ON LUMBER AND/OR STRUCTURAL BUILDING COMPONENTS

Moisture content above 19 percent for approximately a week is required for significant surface mold growth to occur on lumber and/or wood structural building components. Surface mold growth on lumber occurs on most species of wood when the moisture content by weight is between 20 and 28 percent. In most situations, surface mold growth is a superficial phenomenon that does not affect the strength or long-term durability of the wood.

On the other hand, wood decay fungi require much higher moisture levels to develop. For growth to begin, the wood moisture content must be above the fiber saturation point (i.e., at least 28 percent by weight, varying for different species) for more than one week.

GOOD CONSTRUCTION PLANNING REQUIRED

Reasonable amounts of wetting can be expected and endured during the framing process. Framing will dry out under dry outdoor weather conditions after the structure is put under roof, sheathed, sided and roughed-in (mechanicals) and assuming the structural components are not exposed to further wetting from rain.

Such drying must occur before the framing is “closed-in” or covered up with insulation and drywall. This conditioning of the interior space is required for the proper application of insulation and drywall and may require temporary heat and/or ventilation to speed the process.

- Moisture content required for surface mold and decay fungi on lumber and/or structural building components.

Good construction planning will allow construction projects to be sequenced to protect all moisture-sensitive building materials from excessive wetting

that could lead to mold and will give wet structural components a chance to dry before close-in.

When mold on structural components is identified before close-in:

- Identify and correct any underlying moisture infiltration or exposure problems.
- Scrub moldy surfaces with detergent and water, rinse and allow drying before covering, enclosing or painting.
- Remove and replace damaged building materials that cannot be cleaned.

AT TIME OF DELIVERY

- Inspect all structural components for:
 - Conformance with the order
 - Dislodged/missing fasteners and/or connector plates
 - Cracked, dislodged or broken members
 - Any other damage that may impair performance

STORAGE

- Review storage options and practices for each jobsite. Store according to the supplier’s recommended practice.
- If feasible and efficient, store structural components under roof.
- Store structural components in an area that is high and likely to stay dry during the period of construction.
- If storage is going to be for a prolonged period of time, consider storing with clearance above the ground to avoid wetting from storm runoff

and to permit air circulation (see Figure 1). Do not store structural components in areas that will collect water (e.g., swales, basements, drainage areas, etc.).

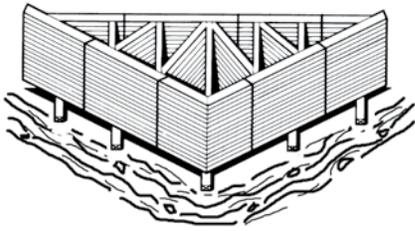


FIGURE 1

- ❑ During periods of rain, the builder should consider covering stacks of structural components with tarp or plastic sheeting to protect against moisture gain. The covering should be weighted down from the top to prevent it from blowing away but the sides of the stack should be loose; otherwise circulation will be reduced and moisture held in. One alternative is to stake the sides of the tarp so there is clearance around the structural components allowing air circulation.

AVOID HIGH RISK CONSTRUCTION PRACTICES

- ❑ Do not pour concrete basements late in the autumn; do not install the first floor deck and then cover the deck with an impermeable tarp for the winter without adequate ventilation provided to limit interior relative humidity.
- ❑ Buildings with crawl spaces frequently have mold develop on the floor components and the underside of the floor sheathing prior to the end of the construction process. To prevent this from occurring, ground moisture must be contained by placing a vapor barrier over the open ground area in the crawl space. Again, adequate ventilation should be provided to minimize interior relative humidity.
- ❑ Party walls can be frequently wetted by rain if the interface between the roof and the party wall is left unfinished. This allows rain to penetrate the entire length of the party wall and soak all the wood below. Mold frequently occurs on the paper-faced gypsum board and framing on these walls (see Photo 1).

PREVENTION

Although rain will frequently wet framing lumber before the building is weather tight, mold will not grow unless it remains wet.

- ❑ Water should be drained or removed from horizontal surfaces such as floors.
- ❑ Ventilation should be increased to facilitate drying. Sawdust and other construction debris left on the floor will inhibit the drying process.
- ❑ The moisture content of the structural components should be less than 19 percent before the components are closed in. If there has been rain during the installation process, allow for a suitable amount of drying time following the wetness before closing in building components.

A resistance-type pin (see Photo 2) or pin-free moisture meter [WTCA sells a Wagner MMC 220 Moisture Meter (see Photo 3)] can be used to determine moisture content of the structural components.

Drying of wood-based materials occurs slowly by the processes of evaporation or diffusion. Evaporation can be accelerated by ventilation, heaters, heatlamps, use of the furnace, etc.

- ❑ Before “close-in,” check the structural components and other building materials for any active mold growth.
- ❑ If mold growth is found, it can be easily removed by the following simple remediation procedures.



PHOTO 1

REMEDIATION

Although superficial mold that occurs on lumber does not affect the performance of the wood, the general public increasingly perceives it as a problem.

- ❑ Superficial mold can be removed by scrubbing with water and detergent followed by rinsing.
- ❑ The goal of mold remediation is the removal of most of the mold; it is not necessary to kill the mold. The mold clean-up is done when the involved area is free of dust and no material transfers to a clean cloth or glove that is wiped across the involved surface.

It is not necessary to test for mold once it has been identified. Testing air samples for mold is rarely useful in any building and is of no value in a new building during construction. The clean-up of mold is the same regardless of the species of mold present.

If residual staining is present or mold has penetrated a material's surface and is not easily removed (e.g., a structural beam), it can be protected with a permeable latex paint. Some paints even contain zinc, which acts as an inhibitor of mold growth.

GENERAL INFORMATION

A few potential sources of unwanted moisture in constructed buildings:

1. Improperly maintained A/C system that can create excessive condensation
2. In walls, ceilings and floor cavities when standing water is produced and gets in and stays for more than a few days
3. Plumbing leaks
4. Gaps in roofs, siding or masonry
5. Poorly sealed windows
6. Porous slabs and foundations
7. Inadequate drainage
8. Faulty roof drains and downspouts
9. Poor ventilation and/or air circulation combined with high indoor humidity—from showers, cooking or other activities that can result in condensation that promotes mold growth

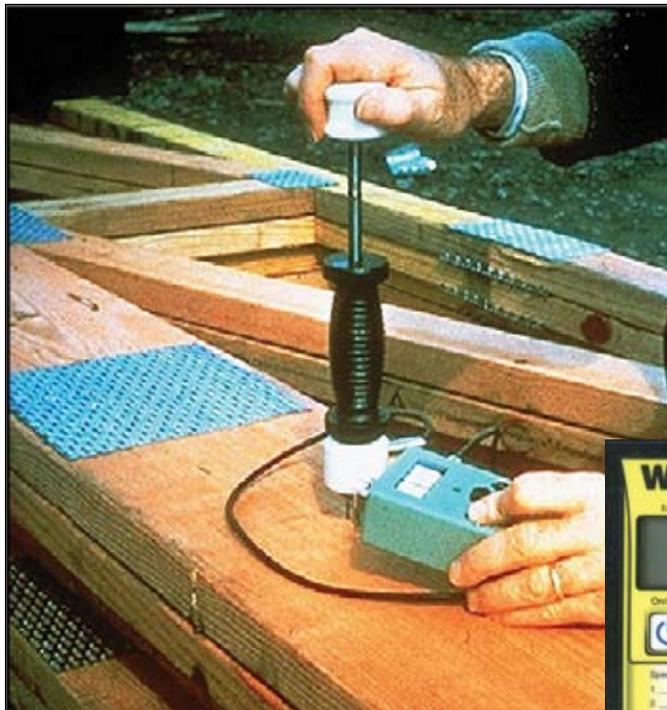


PHOTO 2



PHOTO 3

SOURCES

Structural Building Components (SBC) Magazine

www.sbcmag.info/past/2003/03jan/moldconstruc.php
Nathan Yost, M.D. Building Science Corporation,
Mold & Construction, January/February 2003.
608/271-1176

NAHB Research Center

www.nahbrc.org
The Research Center has excellent information on mold and related construction topics. See ToolBase Services for documents on mold, moisture and leaks.
800/638-8556

ADDITIONAL REFERENCES

U.S. Environmental Protection Agency (EPA)

www.epa.gov/mold/moldresources.html
U.S. EPA/Office of Radiation & Indoor Air
Indoor Environments Division
1200 Pennsylvania Avenue, NW
Mail Code 6609J
Washington, DC 20460
202/343-9370

American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Inc. (ASHRAE)

www.ashrae.org
Information on mold and moisture management.
800/527-4723

Canada Mortgage and Housing Corporation (CMHC)

www.cmhc.ca
Several documents on mold-related topics available.
613/748-2000

Centers for Disease Control and Prevention (CDC) National Center for Environmental Health (NCEH)

www.cdc.gov/health/mold.html
Information on health-related topics including asthma, molds in the environment, and occupational health. Questions and answers on *Stachybotrys chartarum* and other molds.
888/232-6789

Council on Scientific Affairs (CSA)

www.cca-acc.com/mould/literature/pdf/blackmold.pdf
CSA Report 1-I-02 Subject:
Black Mold and Human Illness
Presented by: O. Edwin McClusky, MD, Chair.

Forintek Canada Corp.

www.durable-wood.com
604/224-3221

GlobalTox

www.globaltox.com
519/766-1000

New York City Department of Health & Mental Hygiene Bureau of Environmental & Occupational Disease Epidemiology

www.nyc.gov/html/doh/html/epi/moldrpt1.shtml
Guidelines on Assessment and Remediation of Fungi in Indoor Environments.

University of Minnesota

www.dehs.umn.edu/iaq
The section on Indoor Air Quality provides background on terms, identification and abatement of mold.
612/626-6002

Western Wood Products Association (WWPA)

www.wwpa.org/index_lumberandmold.htm
The page on Mold and Wood Products contains the report *Mold, Housing and Wood (TG-2)* by Coreen Robbins, Ph.D and Jeff Morrell, Ph.D., 2002.
503/224-3930

WTCA's Truss Technology Workshop: Mold & Structural Wood Components

ttw.woodtruss.com
This workshop teaches the facts on mold and other fungi and how their presence affects structural wood components such as metal plate connected wood trusses. Participants will learn the conditions that lead to mold growth, how to remediate existing mold, why public attention to this issue has increased and some recommended steps to deal with mold.
608/274-4849

See companion document:
Facts Regarding Mold on Wood Structural Building Components – TTBMOLD-D

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An informational series designed to address the issues and questions faced by professionals in the building construction process.

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