MOISTURE CONTENT

Significant surface mold growth on lumber and other wood structural building components requires a moisture content above 19 percent for approximately a week. Surface mold growth on lumber occurs on most species of wood when the moisture content (as measured 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 in order to develop. For growth to begin, the moisture content (by weight) must be above the wood’s fiber saturation point (approximately 28 to 30 percent) for more than one week.

GOOD CONSTRUCTION PLANNING REQUIRED

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

Such drying must occur before the components are “closed-in” (e.g., covered up with insulation and drywall). Adequate conditioning of the interior of the building is required for the proper application of insulation and drywall, and may require additional heat and/or ventilation to speed up the process.

Good planning during the construction process, aimed at minimizing the exposure of all moisture-sensitive building materials to excessive wetting, greatly reduces the chance of mold growth. Such planning also allows wet structural components a chance to dry before being closed in.

If 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 to dry 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 moisture-sensitive building materials, including wood structural components, with clearance above the ground to avoid wetting from storm runoff and to permit air circulation (see Figure 1). Do not store wood structural components in areas that will collect water (e.g., swales, basements, drainage areas, etc.).
Structural components stored longer than one week should be covered with tarp or plastic sheeting to protect against moisture gain. The covering should be weighted down on top of the stack to prevent it from blowing away, but kept loose along the sides of the stack; 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 providing adequate ventilation to limit interior relative humidity.

- Buildings with crawl spaces frequently develop mold on the surface of the floor framing and the underside of the floor sheathing. Install an approved moisture retarder as ground cover to prevent this from occurring. Do this as soon as the first floor has been framed, and be sure to provide adequate ventilation to the crawl space.

- Water can collect in the interior of double party walls if the gap between the walls is not properly capped at the top. As this water wets the interior surfaces of these walls, mold will often begin to grow on the surface of the paper-faced gypsum board and the framing lumber (see Photo 1).

**PREVENTION**

It is not uncommon for framing lumber to get wet during the construction process. However, mold will not grow unless the lumber remains wet. In order to minimize the effects of wetting, the following steps should be taken.

- 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 with insulation and drywall. If there has been rain during the installation process, be sure to allow for a suitable amount of drying time before closing in the 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 the relative moisture content of the structural components.

Drying of wood-based materials occurs slowly by the processes of evaporation and/or diffusion. Evaporation can be accelerated by increasing ventilation, and/or by using heat sources* such as heaters, heatlamps, furnaces, 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 through the following simple remediation procedures.

* Caution: Gas heaters can generate large amounts of moisture during the combustion process, and additional ventilation is often required so as not to add to the moisture load.
REMEDICATION

Although mold growth on lumber does not affect the performance of the wood, it is often perceived 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 complete when the involved area is free of dust and no residue 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, the mold can be encapsulated with a permeable latex paint. Some paints even contain zinc, which acts as an inhibitor of mold growth.

GENERAL INFORMATION

These are a few potential sources of unwanted moisture in existing buildings.

1. An improperly maintained A/C system, which can create excessive condensation.
2. Water that penetrates, accumulates and stays for more than a few days in walls, ceilings and floor cavities.
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.
An informational series designed to address the issues and questions faced by professionals in the building construction process.

**Sources**

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  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

- **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)**
  www.cdc.gov/mold/basics.htm
  Information on health-related topics including asthma, molds in the environment, and occupational health.
  Questions and answers on Stachybotrys chartarum and other molds.
  800/232-4636

- **Council on Scientific Affairs (CSA)**
  CSA Report 1-I-02 Subject:
  Black Mold and Human Illness
  Presented by: O. Edwin McClusky, MD, Chair.

- **Canadian Wood Council/Forintek Canada Corporation**
  www.durable-wood.com
  800/463-5091

- **GlobalTox**
  www.globaltox.com
  519/766-1000

- **New York City Department of Health & Mental Hygiene Bureau of Environmental & Occupational Disease Epidemiology**
  Guidelines on Assessment and Remediation of Fungi in Indoor Environments.

- **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 Morrel, Ph.D., 2002.
  503/224-3930

- **WTCA’s Truss Technology Workshop: Mold & Structural Wood Components**
  ttw.sbcindustry.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**

To view a non-printing PDF of this document, visit www.sbcindustry.com/ttbmoldba.