

Indoor Moisture

A Question of Balance

Problems can occur if indoor moisture levels are either too low or too high. Goals include finding the right balance and keeping moisture out of hidden cavities.

Have You Experienced...

- Nosebleeds and sinus infections?
- Wood floor joints opening up and furniture cracking?
- Condensation and ice on your windows?
- Mold growing on bathroom walls or ceilings?

These may be signs of too little or too much moisture in your home.

Finding the Right Balance

Humidity levels that are too **low** can dry out your sinuses and are hard on wood floors and furniture. On the other hand, too **much** moisture can condense on windows, grow mold, decay building materials and contribute to health problems. Finding the balance is the key. In most of Colorado, a good winter target is 35% to 40% relative humidity (RH). In cold mountain areas, 30% RH or lower may be necessary to protect the building.

Indoor moisture levels are a result of the amount of water added to the home compared with the amount removed. Ways in which water is **added** include damp foundations, leaks, humidifiers and people's activities (such as breathing, showering, cooking). Ways in which water is **removed** include air leaks to outdoors and the use of bath and kitchen fans vented outdoors.

Humidity can vary a lot in different parts of the home, depending on where moisture is produced and how temperatures vary (for example, a closet on an exterior wall may be much cooler than the adjoining room). Even though the home as a whole may average a dry 25% RH, moisture levels may reach 70% RH or higher (the threshold for mold growth) in places like bathrooms, cold closets and windows with tightly fitted coverings.



A humidity meter helps you keep indoor moisture levels in balance.



Insulated crawl space wall

Plastic moisture barrier

Plastic sheeting, completely covering the dirt floor of this crawl space, keeps a potentially large source of moisture out of the house.



Capture the Opportunities

Keeping indoor moisture levels within a controlled range can bring many benefits:

Comfort. Humidity is a key factor that helps determine comfort level.

Health. Avoid the health and indoor air quality issues associated with too little or too much moisture.

Durability. Your house and furnishings will last longer.

Value. Fewer moisture-related problems will help maintain your home's resale value.



Cooking, showering and growing house plants are examples of household activities that add moisture to the indoor air.

Hidden Problems

Some moisture-related problems are obvious, such as condensation on windows or mold growth on the wallboard above a shower. Of greater concern are the hidden problems, where high humidity can do its damage undetected. These problems may not show up for years, with symptoms like peeling paint or wallpaper, crumbling wallboard, tile failure at tub and shower surrounds, and musty smells.



Hidden problems can be avoided by paying attention to air sealing details and controlling moisture levels within the ranges recommended on the previous page.

The “air barrier” behind this bathtub prevents moist air from reaching the cold exterior wall where the moisture could condense and do damage.



Moisture coupled with cool temperatures can support mold and building decay in hidden cavities.

What's Important

- Successful control of indoor moisture depends upon how the home is built and how you live in it.
- Build a tight home for better comfort control and to keep moisture out of hidden cavities. See [Tight Construction](#).
- Be sure exterior drainage details have been handled well. See [Exterior Water Management](#).
- Be sure moisture barriers have been installed over exposed soil in all crawl spaces. See [Foundations](#).
- Specify quality, quiet, vented exhaust fans in kitchens and bathrooms. Use them to exhaust moisture. See [Healthy Indoor Air](#).
- Specify high-performance windows to reduce condensation and icing. See [Windows](#).
- Keep track of indoor moisture levels with a humidity meter after you move in.
- Always vent clothes dryers outdoors.
- If you have a humidifier, don't operate it if the indoor RH is at 40% or above. Always follow manufacturer instructions so that your humidifier doesn't contribute to health problems.

Humidifiers

Many Colorado homeowners use central or room humidifiers in an attempt to improve comfort and health. However, humidifiers are not a cure-all for either and may cause other problems. Some things to think about:

- Some homeowners complain their humidifiers do little to boost humidity. Tight construction and controlled ventilation may provide better moisture control.
- Over-use of a humidifier can boost moisture levels high enough to create health problems or damage the building.
- Flow-through central humidifiers commonly installed in Colorado homes may use 10 to 50 gallons of water a day, much of which goes down the drain. Other designs are available that use much less water.



Central humidifiers add moisture to the indoor air when the furnace is operating.

House as a System

A house is more than just a collection of parts. It is a **system** that incorporates heating, cooling, air circulation, lighting and more. If the pieces don't work well together, there will be problems. In a high-performing home, a “whole-house” design approach and quality craftsmanship combine to deliver better comfort, healthier indoor air and energy cost savings in a package that's built to last and hold its value.

More Information

This fact sheet is one in a series. Visit the following Web site for more information about indoor moisture or to review fact sheets on other new home choices: www.ColoradoNewHomeChoices.org.

