

The Moisture Detective:

How to Save
BIG Bucks in
Your Home
in An *Easy,*
Easy Way.



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Why I wrote this booklet

I am an expert in controlling the number one factor harming your home: MOISTURE. With over 30 years of experience in the home repair, home inspection and pest control industries, and being certified in mold, radon, lead and other environmental areas, I have a unique perspective on this issue.

I have learned on all my jobs the biggest destroyer in homes is *excessive moisture*. It can cause mold, insect damage, rotting wood and sickness to you and your family. For instance, if your home has a musty smell, moisture is the likely cause.

High moisture can cost you thousands and even tens of thousands of dollars. When framing in a home reaches 20 percent moisture, it will result in mold and fungus within the materials. At 80 percent or higher moisture for longer periods of time, mold and mildew form in wood products so your home slowly deteriorates. Often you also will find insects.

But it can all be prevented. In an easy and convenient way, you can save money, protect the investment of your home and guard the health of your family. This is why I created this helpful booklet.

The simple secret

There's a simple, underlying truth to protecting your home, every creature on this planet requires three basic elements to survive: food, shelter and water. *Without any one of these, all creatures will perish, even insects and mold. If you prevent water in a sheltered place in your home, you stop mold and insects.*

This booklet describes the meaning of the moisture readings found on the front of a humidifier gauge and how to eliminate excess moisture when found.

CAUTION: The conditions in your home or business may vary and should be checked by a qualified home repair professional, especially if you suspect a hazard in your home. In addition, every home should have smoke and carbon monoxide detectors installed and checked regularly. Regular service of your heating and other appliances will save money and make your home safer.

See the moisture level of your home



The dial indicator on the humidifier gauge starts at 0 to 20 percent. If moisture is present at this level, your home or building needs moisture carefully added to make it comfortable.

If the dial indicator shows 30 to 70 percent, you have normal moisture levels. Every climate is different. Some areas such as New Orleans or Orlando are wetter while places such as Phoenix or San Antonio are traditionally much dryer.

If the dial indicator shows 80 percent or more, the problem for moisture, mold and insects begins. At levels consistently above this level you might be facing health problems for you and your family, and damage and rot to your home or business building.

What happens when your home stays wet?

Many bad things you don't want



If the framing of your home remains wet and reaches 20 percent or higher moisture levels, then decay fungus will damage the wood, and paper products will become food for mold and other fungus.



Temperature changes will cause the moisture trapped in warm air to condense on cooler surfaces. If left wet for 24 to 48 hours, you will end up with mold, rot and foul odors.

Looking for moisture problems

If your home has a basement or crawlspace, these places are where moisture levels are most likely to be high. Look here first.

Checking your basement



Check for moisture signs such as standing water in your basement, black or white stains on the foundation walls, or discolorations on the sub-floor or framing. Identify the locations of the bathroom and kitchen, and look from below for leaks and stains in the basement or crawlspace. These are all signs of excessive moisture.

Water standing in the basement for long periods causes problems in other areas. *Never* let water accumulate in your home. Remove standing water immediately.



Basement drainage systems are expensive. Typically, they come with a warranty. Read it carefully. If a warranty is sold for a lifetime, make sure you can transfer it to the buyer of the property when you are ready to sell. Take several bids and check reputations carefully.

A common type of system requires cutting out a strip of the basement floor about two-feet wide. While this method can be a major mess and loud due to cutting and drilling equipment, it can be very effective.



At times, adding a sump pump is a great starting point. It causes less disruption and can be less expensive. But you still want to look outside before you settle on any of these options. We're going there in a moment.

Inspecting your crawlspace

Now let's look at your crawlspace. Is there water standing there? Does it have a vapor barrier (plastic sheathing, concrete slab)? Does it have a sump pump? Is it ventilated? Is there a de-humidifier and how well does it drain?



If you find water standing in the crawlspace, fix the problem right away because the framing is so close. Moisture will build quickly in such a small area. A pump removes most of the water quickly, but if the floor of the crawlspace is not sloped to the sump, the water may still puddle. While you have reduced it, you have not solved the standing water problem. Re-sloping soil can be difficult, but it is less expensive than installing a drainage system.

If your crawl space has a concrete slab, due to limited access the costs can be even higher than fixing a basement. Even in this instance, looking outside your home should be the first step once you remove the water.



Inspecting the rooms in your home

Inspection of these areas should include looking for stains, wet areas and evidence of



moisture. Start with the rooms with plumbing: kitchen, bathroom, laundry room and closets.

Plumbing leaks are a great cause of moisture problems. Signs of leakage around the toilet will show in flooring and from underneath the push on the bowl of the toilet -- if it moves, it probably leaks. In the rest of the home, look for stains around windows and soft spots in the floor, mostly near outside walls.



You can investigate any soft spots on the first floor by looking in the basement or crawlspace. Soft spots on the second floor are most likely due to plumbing, roof or wall leaks. Some exterior products such as manmade stucco is known for trapping moisture.

Taking a look in the attic



Attics can collect moisture. The source is often from bathroom vents deposited into the attic space with too little ventilation. Do some scouting. How does the sheathing look, is it black or moldy? Is there an odor? Do you see vents? Is the insulation blocking the vents? Do bathroom fans vent here?

A home with a wet crawl space or basement will often have a moisture problem in the attic. If your home is taking water down low, it can show moisture problems throughout the house. When the moist, warm air rises into the cooler attic, it will stay in the air and form on the cold surfaces in the attic space.

What you will now know

As a result of the moisture inspection, you will know several key points:

- You must address standing water right away. Nothing else will help you fix the overall problem as long as water stands in or under your home.
- Fix roof leaks. They constantly will add moisture.
- Repair plumbing leaks. They add to the problem on a daily basis.
- Stains in the interior rooms or on the exterior walls indicate possible hidden problems.



Act quickly when finding any of these issues. Invest in a building inspection and an environmental inspection for all possible hidden problems such as mold or other health concerns.

Sometimes the problem is in the yard

Taking a walk on a rainy day around your home can teach you a lot about the drainage of your property. Ask some important questions.



- Are you at the bottom of a hill?
- Is the road or driveway above your house?
- Does water sit in the yard close to the house?
- Are your gutters clean? Do they move the water away from the foundation?
- Can you improve the slope near your home so it moves water away from the foundation? The slope should be five degrees per five feet and the down spouts depositing outside the five-foot area. You might have to create sunken areas in the yard guiding water away from your home.

Fixing the wet places in your home

These next few pages give important tips on how to fix specific rooms if they are wet.

The crawlspace

Temperature changes created by your air conditioning system will have an effect in your crawlspace. For example, when the outside air reaches 90 degrees on a high humidity day and comes into contact with cooler framing sticking out beyond the insulation, it will condensate and wet the surfaces. Most homes with open vents in the crawlspace can have this problem. Handle this situation in a variety of ways:



- Consider an air- conditioned crawlspace.
- Close up the vents all year.
- Make sure you have a good vapor barrier covering the entire floor. Install a dehumidifier large enough to control moisture if there is no standing water, and make sure it drains away from the crawlspace.

The basement



If there is standing water, of course you must correct it before anything else will work. If exterior drainage is wrong, water can flow down into the basement. In some cases, water can rise from under your home, or become trapped around the house. In these cases, mechanical pumps are the only solution.

Options:

- Install French drain systems and sump pumps.
- Do moisture sealing of foundation walls.
- Add dehumidifier systems and devices.

The kitchen



In a kitchen, cooking and washing dishes release large amounts of moisture. Proper ventilation will help.

- Vent the stove outside, if possible.
- Repair any plumbing leaks.

The attic



Sometimes attic problems can start in other places, and you have to repair the basement and crawlspace first. The key to the attic space is ventilation.

- Remove insulation from blocked soffit vents.
- Install more soffit vents and ridge vent power fans reducing the temperature in the summer and saving money while air conditioning the space.
- Vent bathroom fans outside

The bathroom



The main moisture issue here is a leaking shower or tub.

- Vent all fans to the outside.
- Repair all plumbing leaks.
- If there is no window, then install a fan venting moisture outside.

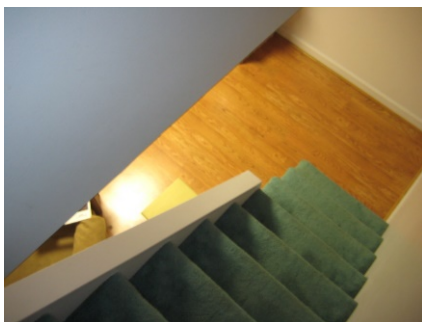
The laundry area

Dryer vents are one of the most common problems and can cause major structural damage, and health and safety issues. We have all lifted a heavy load of clothes from the washer so we know how much water the dryer removes and vents.

- Vent the dryer outside, never into attics or a crawlspace.
- Repair all plumbing leaks.
- Ventilate the room if high levels of moisture remain.



Interior rooms



Wall stains and window stains sometimes indicate big problems in homes with hard surface finishes on the exterior brick such as stone, stucco and manmade stone or stucco. The local codes are changing on the product installations to prevent moisture intrusion, and to prevent moisture from being trapped in wall systems. Some wetness problems in ceilings and walls can be caused from roof or plumbing leaks and you should fix such

problems quickly. You might have trouble spotting interior room wetness problems and may need specialty tools including infrared cameras and other sophisticated moisture detection devices. Repairs in large homes can exceed \$100,000 dollars.

- Repair wall systems with qualified contractors.
- Seal windows as part of an exterior repair.
- Fix all plumbing leaks.
- Eliminate structural damage from moisture.

Conclusion: final words on moisture problems



Mold and other fungi will grow on most high moisture surfaces. If a wet surface exists, then mold spores will land and begin evolving into an active mold colony. It only takes 24-48 hours for spores to start growing. Within a week, the mold will produce spores moving through your home seeking new wet areas to start new colonies. Here are your main goals:

- Fix all problems such as a wall leak, a roof leak or a plumbing leak. Then track the wetness to the lowest area of damage which sometimes may require refinishing or replacing a wall.
- Control moisture from laundry systems, cooking and bathing. Combat airborne issues with proper ventilation.
- General moisture problems may be caused by a high-water table underneath your home. Ground water runoff or other sources generally affect large areas and tend to be harder to correct. French drains and sump pumps can be effective, but expensive. Exterior work is the place to begin.
- Also watch out for *not enough* moisture. Sometimes moisture levels can be too low. A house or a building can become so dry it causes health problems to the people living there. Low moisture health problems can range from dry skin to respiratory problems, bloody noses and worse. Adding moisture to the home can help, but be careful in cold climates. When moisture in 70 degrees air leaks into a much colder crawlspace or attic, it can cause moisture problems and mold in cool areas.

Remember the story of Goldilocks. She was looking for the bed and the porridge that was *just right*. You're looking for the moisture level in your home that is *just right*. With a humidifier gauge and these suggestions, you can now find that level and keep it always.