



WOOD ROT

Virtually every homeowner is familiar with wood damage caused by rot. They see it in structural lumber, log homes, eaves, garage doors, windows, doors, exterior door trim, window casings and other wood used in construction. Wood damage is so common that the materials for replacing and repairing damaged wood makes up an estimated 10 percent of all wood products annually produced in the United States.

Why does wood rot?

Wood rots for one simple reason: It gets wet. It can happen to wood anywhere in your house. For the record, it's also common on boats and plants and can even be found in musical instruments.

When previously dry wood is placed in a location where it is susceptible to water leaks (rain infiltration, faulty plumbing, leaky downspout, etc.), subject to condensation (such as a humid room or unventilated crawl space), or in contact with moist soil, it is likely that wood decay problems will occur. In some instances, water can be transported to the site of decay through "rhizomorphs" (i.e. strands) of "decay fungi". Amazingly, these water-transporting strands may extend for thirty or more feet across brick, concrete or similar materials. The wood decay fungus identified as *Serpula lacrimans* has been known to transport water up three stories to an area where decay is occurring. Another fungus, *Poria incrassata*, is also capable of transporting water long distances. However, these fungi are exceptions to the rule. Most "decay fungi" must have a direct supply of water at the site of decay.

What is "decay fungi"?

Decay fungi are tiny living organisms and are the cause of wood rot. They need all of the following to survive.

- Moisture
- Favorable temperatures. Anything in the 40°F to 100°F range will do.
- Oxygen
- A food source. The fungi species that attacks wood prefers carbohydrates. Coincidentally, wood is made up of cellulose and lignin, two forms of carbohydrates.

Temperature control and oxygen supply are factors that are pretty hard to manage, so fungi abatement efforts generally focus on the one variable that we can do something about—moisture.

What wood is prone to rotting:

All wood has the potential for rotting, as it contains a certain amount of moisture. If moisture content in wood is below 20 percent, rot typically isn't a concern. But anything over this provides a potential breeding ground for "decay fungi". Green (unseasoned) lumber is a prime target.



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What happens after rotting has begun?

Gradually, the wood decomposes and its strength is lost. Such damage is often inconspicuous until its final stages, and in a few instances homeowners have suddenly found floors breaking through or doors falling from their hinges due to wood rot.

What can be done to control or repair rotting wood?

First determine the source of moisture and remove it. If adequate ventilation and soil drainage are provided and all contacts of untreated wood with the soil or moist concrete or masonry are broken, decayed wood will dry out and further decay will be stopped. When making replacements, cut out at least one foot beyond the rotten area. Avoid placing new lumber in contact with old, decayed wood. Replacement lumber should be treated before installation. Remodel to provide more ventilation and better design rather than simply replacing decayed lumber. There are also over-the-counter chemical treatments available to repair decayed wood. These could come in the form of liquids, fumigants or powders. Check with your local lumber yard for more information.

If building a new structure, what can be done to prevent wood rot?

Start by using wood properly treated with a good preservative. Build on a well-drained site and implement proper grading to prevent water from seeping under the house. Make sure you install effective drain tile, roof overhang, gutters, and downspouts. Do not place untreated wood within 18 inches of the ground. Beneath your building, provide adequate cross ventilation to eliminate dead air pockets. Also install a vapor barrier on the soil surface to cause soil moisture to condense on the barrier and return to the soil rather than condensing on the floor and above joists. Satisfactory water barriers can be made by covering the soil with asphalt roofing paper or polyethylene sheets. Install two square feet of opening for 25 linear feet of wall and make sure dense bushes or other plants aren't placed in front of these ventilators.

Credits:

Ohio State University Extension Offices
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The following is an article written by Walter Jowers. Formerly an owner of a home inspection company in Nashville, TN, Jowers now works as a litigation consultant and writes a syndicated column called "HOUSE RULES. The following is an article he wrote on rotting wood.

ROT NEVER SLEEPS

Funny thing about rotten wood: Everybody knows it when they see it, but not many people understand how it happens. For instance, how many times have you heard the term "dry rot"? Well, where wood's concerned, there's no such thing. Dry wood will not rot. That's why archaeologists are still finding intact wood containers in Egyptian tombs. That wood's dry and as long as it stays dry, it'll last until the sun goes Red Giant and sets it ablaze.

Wet wood, on the other hand, can rot really fast. This comes as a surprise to a lot of people. I know this, because once every two or three years, a customer would call my home inspection company and complain that we didn't say anything about the rotten floor under his bathroom. The conversation usually went like this:

"My plumber found a leak in our shower, and it rotted out the floor under the bathtub. He says it was an old leak, and you guys should've found it."

To which I respond, *"How does he know it was an old leak?"*

"The wood is all black and soft."

"Uh-huh," I say. "And how many weeks, months, or years does he think it took for the wood to get that way?"

"Aw, c'mon. Anybody can look at that rot and tell it's old."

Understand, I have much sympathy for folks with rotten bathroom floors. I've had rot trouble myself, and fixing it is an ugly chore. I also have sympathy for plumbers and handymen who look at wood that's all black and rotten, and assume it's been that way for a long time. But I'm here to tell you: Unless you run across a plumber or handyman who's an expert in wood biology, you probably don't want to rely on his opinion about how long your wood's been rotten. Nobody knows how fast rot grows.

Don't take my word for it. I asked the wood experts at the U.S. Department of Agriculture's Forest Products Laboratory (FPL) if there's any way to know how long it takes for a piece of wood to rot. Leslie A. Ferge, a biological technician specializing in the bio-deterioration of wood, responded, "There is no way even to crudely estimate the rate of wood decay or its age. Wood decay is a complex biological phenomenon subject to many physical and environmental factors, such as moisture level, temperature, wood species, fungus species, geographic locality and climate. Because of the varying influence of these factors, decay may progress very rapidly or extremely slowly, depending on the particular set of conditions present in each individual case."

Here's the skinny: It's fungus, not water, that causes wood to rot. Fungi are primitive little organisms. They need only air, moisture, a food source (like wood), and temperatures between around 50° to 100° to thrive. Fungus spores can colonize wood that has about 20% moisture content. That's just damp enough to feel wet to the touch. And because the spores of wood-destroying fungi float around in the air and live in the soil, this colonization can happen in a day's time. If a house has an intermittent leak (say, at a shower that hasn't been used since the last teenager went away to college), the fungus in the bathroom floor can go dormant, then start growing again when the wood gets back up to about 30-percent moisture content (say, when new owners move in and start using the shower every day). Then it's off to the rot races.

"It's a vicious circle and a remodeler's nightmare," says Terry Amburgey, professor of forest products at Mississippi State University. "Moisture promotes fungi, fungi increase wood permeability, permeability allows moisture to enter the wood, and that encourages the growth of more decay fungi."