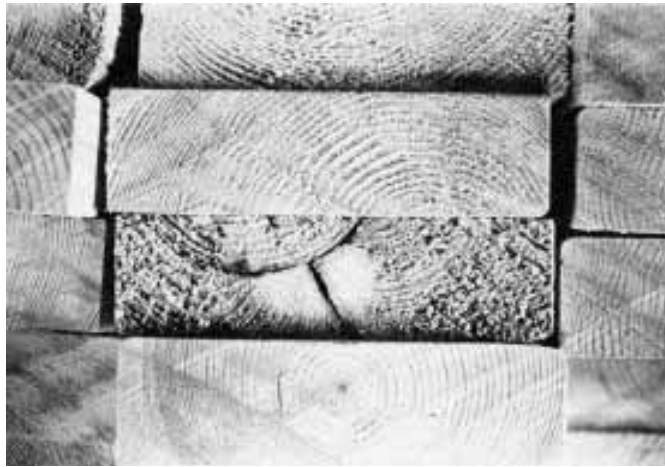
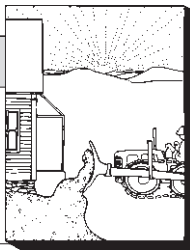


# How Well Do You Know Wood?

by Stephen Smulski



You've sawn it, nailed it, glued it, finished it, and cursed it. But how well do you really know wood? This wood awareness quiz will reveal the merciless truth. (A question may have more than one correct answer.)

1. What is the moisture content of kiln-dried lumber?
  - a) 19%
  - b) 15%
  - c) 8%
  - d) All of the above

**Answer:** If you chose d), then you already understand that "kiln dried" means only that water was removed from green wood by placing it in a temperature- and humidity-controlled chamber, with no specific moisture content implied. The moisture content of kiln-dried wood is determined by when the kiln operator stops the drying process, which varies depending on the wood's intended use and expected in-service moisture content. Framing lumber, for example, is typically kiln dried to a 19% moisture content (that's what KD19 on the grade stamp means), while hardwood flooring is kiln dried to about 8%. If you want lumber of a certain moisture content, you must specify the moisture content, not the process by which it's dried.

2. Which glued wood products have the potential to offgas formaldehyde?
  - a) Medium-density fiberboard
  - b) Softwood plywood
  - c) Hardwood plywood
  - d) Wood I-beams
  - e) Particle board
  - f) Waferboard
  - g) Glue-laminated beams
  - h) All of the above

**Answer:** Only those products that are bonded with water-resistant urea-formaldehyde adhesives have the potential to release low levels of formaldehyde for a short time after

installation: a) medium-density fiberboard, c) hardwood plywood, and e) particle board. Softwood plywood, wood I-beams, waferboard, and glue-laminated timbers are bonded with waterproof phenol- or resorcinol-formaldehyde adhesives that do not release formaldehyde because of their different chemical nature when cured.

3. Lumber pressure-treated with CCA (chromated copper arsenate) preservative is protected from attack by:
  - a) Termites
  - b) Carpenter ants
  - c) Mold and mildew
  - d) Decay fungi
  - e) All of the above

**Answer:** I wish the answer was e) all of the above, but CCA-treated wood is guarded against attack only by a) termites and d) decay fungi. Since carpenter ants don't eat wood (they just tunnel in it for shelter), they don't ingest the pesticide. And because some molds and mildew live on water and airborne organic particles, the wet surfaces of CCA-treated wood are susceptible to them. What's more, only the sapwood of lumber is penetrated by CCA preservative, so the decay resistance of the darker heartwood isn't any greater than what nature already handed it.

4. Which end of a site-cut CCA-treated post should be put in the ground?
  - a) CCA-treated wood shouldn't be put in the ground
  - b) The site-cut end
  - c) The factory end
  - d) It doesn't matter

**Answer:** The cut end of a treated post 4x4 or larger is vulnerable to decay because heartwood (which doesn't absorb CCA) or untreated sapwood will usually be exposed at the crosscut. I generally recommend burying b) the site-cut end,

even though it is generally more vulnerable, because in most soils the limited supply of oxygen two or more feet below grade won't support decay fungi. The top of a post, on the other hand, is often in a location prone to collect and trap water and promote decay. You could put the site-cut end above grade if you field-treat it with preservative and cap it with flashing to guarantee that it never gets wet.

5. Exterior trim and siding should be allowed to weather for six months before painting to develop a strong bond between paint and wood.
  - a) True
  - b) False

**Answer:** b) False. Don't fall for this popular myth. Trim and siding should be primed and painted within about two weeks of installation for the strongest paint-to-wood adhesion. Otherwise, the elements (sun and moisture) will degrade the integrity of the unfinished wood surface. The sun's ultraviolet rays degrade wood's chemical components, and repeated wetting and drying by precipitation and dew raise and loosen surface fibers and may cause bond-weakening extractives to leach to the surface. Film-forming paints perform best and last longest on fresh, smooth wood. With weathered or roughened wood, use stains instead.

6. You can promote water-shedding and decrease the chances of decay by beveling the exposed end grain of untreated wood posts out-of-doors.
  - a) True
  - b) False

**Answer:** b) False. Though intuition tells us that sloped surfaces readily shed water, research shows that there's no difference in the decay hazard between beveled or flat-topped posts. The end-grain surface of wood is like a million microscopic drinking straws. By beveling the end grain, you actually expose a greater cross-section (elliptical instead of circular) of each wood cell's hollow center to catch water. In addition, on a beveled surface the late wood layer of each growth ring will swell above the early wood, backing up water like a miniature dam. A beveled post will outperform a flat-topped one only if a water-shedding paint or water repellent is applied.

7. You can prevent water from entering joints in exterior wood siding and trim by making them tight-fitting.
  - a) True
  - b) False

**Answer:** b) False. Once again, intuition may steer you wrong on this one. Water will be drawn into tight-mated joints by capillary action just as readily as rain is wind-driven into poorly-mated ones. But with tight joints, water will remain trapped in the end grain longer than it will in more open joints, increasing the potential for decay. But since tight joints are preferred aesthetically, we'll keep making them. That's why it's so important to not only prime the back of wood siding and trim, but the end grain as well. Caulking joints to exclude water is a common practice. But my gut

feeling is that caulked joints may have an increased potential for decay because caulking, which inevitably seems to fail over time, will slow the rate of drying even further.

8. Four-ply plywood is weaker and not as stiff as five-ply plywood of the same thickness.
  - a) True
  - b) False

**Answer:** True — and false. (Okay, it's a trick question.) For the same thickness, four-ply plywood is actually weaker (easier to break) but stiffer (harder to bend) than five-ply plywood is. This paradox arises because of the differences in veneer thickness, grain orientation, and location of the panel's mid-depth centerline in each plywood construction.

For practical purposes these points are meaningless since plywood span ratings (for example, maximum allowable off-center spacing) are controlled by stiffness and not strength. (Veneer quality, or grade, determines strength.)

And since the American Plywood Association's tabulated values and based on the stiff five-ply panels, either is more than up to the job as long as you buy plywood of the proper span rating.

9. Softwood plywood sheathing, being wood-based, is permeable to water vapor.
  - a) True
  - b) False

**Answer:** b) False. The truth is, plywood is an effective vapor retarder because of the adhesive film between veneers. Three-eighths-inch plywood, for example, has a perm rating of 0.8. Three-quarter-inch plywood checks in at 0.4. Oriented strandboard and waferboard sheathing perm ratings compare favorably to plywood. Being wood-based, all act as moisture "sinks" as well.

10. You can seal wood against moisture loss or gain by applying the right finish.
  - a) True
  - b) False

**Answer:** b) False. Since all finishes, including paraffin wax, are permeable to water vapor to some degree, you can never completely "seal" wood from water. A finish merely retards the rate at which wood loses or gains water vapor from its surroundings. The highest moisture-excluding effectiveness comes with epoxy and oil enamel coatings. Moderate protection is achieved with polyurethane and oil house paints. And while latex house paints provide minor protection, latex and oil stains provide almost none.

## Wood Puzzler Score Ranker

Count 'em and score 'em as follows:

- 10: Job foreman
- 8-9: Lead carpenter
- 6-7: Carpenter
- 1-5: Laborer

*Dr. Stephen Smulski is a wood materials consultant specializing in wood performance problems in light-frame construction, based in Shutesbury, Mass.*