Why Moisture Content Matters

Invest in a moisture meter now, before it's too late.

Visit most job sites—I mean, at least the ones where the contractors and carpenters know what they're doing, and you'll find all the trim material stacked neatly on pallets or 2x4 stickers just above the floor. Most guys cover the material, too, to keep it clean. On our jobs, we always leave large plastic tarps on the site, so our crew can cover the material every night. That keeps the drywall mud off, and the painter's overspray, and besides, out-of-sight is out-of-mind, right? Or at least we hope no one steals it. **(Fig. 1)**

That's been the traditional way of handing trim material for decades, but it doesn't work anymore.

As I've said in earlier articles, the material we use today isn't the same stuff our fathers used, and we can't rely on traditional techniques anymore.

As a building materials professional, your customers expect you to provide them with information and guidance that will improve their profitability. You can improve your profitability and reduce product claims, too, by understanding more about the products you sell.

Lumber Today

Most of the trim material we use today comes from new growth wood, trees that are harvested before they've even reached 24 in. in diameter. New growth softwood is almost all sapwood, which means it's not nearly as durable as heartwood, and it won't resist rot or decay nearly as well. Softwood sapwood is also more porous than heartwood, and it takes on moisture faster. (That's why the wood treatment industry prefers to work with new growth sapwood, since it's easier for a preventive treatment to penetrate right to the core of the lumber.)

But there's another issue with new growth wood that we often overlook: The

FIG. 1: I've always stored trim material right on the wood subfloor, or on 2x4 sticking when I'm working on a concrete slab. At night, I was taught to cover my trim material with a tarp.

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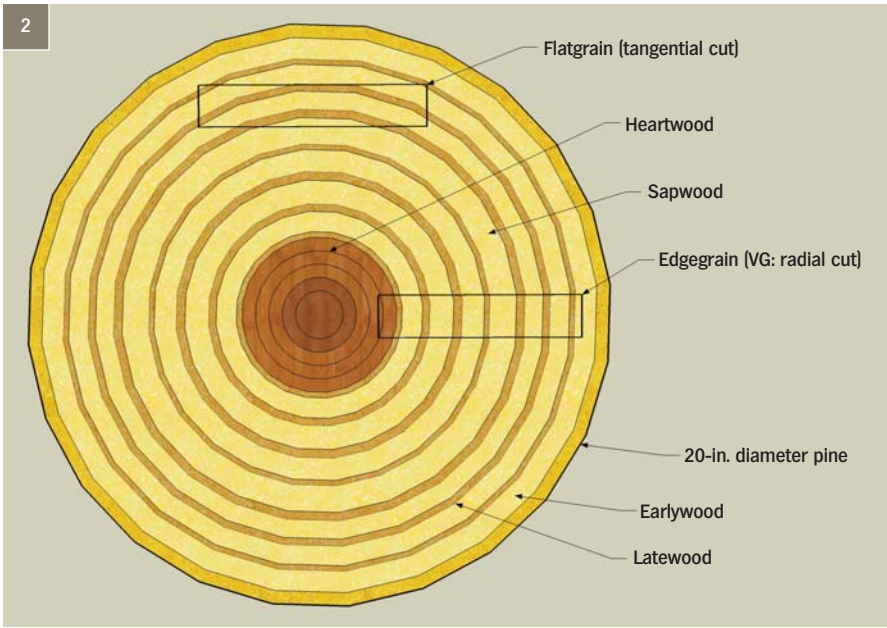

FIG. 2: Flat-grain wood will sometimes shrink twice as much as edge-grain wood, although shrinkage varies according to species. To estimate shrinkage on your material, use this calculator: http://www.woodweb.com/Resources/RSCalculatorsWoodShrinkage.html

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MOISTURE CONTENT VS RELATIVE HUMIDITY

Relative Humidity	Moisture Content
0%	0%
25%	5%
50%	9%
75%	14%
99%	23-30%

Share this chart with your customers so they'll understand what moisture meter readings mean (http://www.forestprod.org/cdromdemo/wd/wd4.html)

FIG 3: According to test data from WindsorONE, for every 4% change in moisture content, flat-grain boards with two layers of primer will change size approximately 1%. That means 1/16 in. in a 1x6 board!

majority of the boards cut from small trees are milled tangentially to the grain—they're face-grain boards. After all, you can't get many edge-grain boards out of a 20 in. diameter tree **(Fig. 2)**. And face-grain wood, because it's nearly parallel with the wood grain, moves more than edge-grain wood—a lot more. For instance, a flat-grain piece of Douglas Fir 1x6 will shrink twice as much as the same piece cut edge-grain.

What Causes Wood Movement?

Wood movement is caused by changes in moisture content, and moisture content (MC) is influenced by relative humidity (RH).

On their web page explaining "Equilibrium Moisture Content," (www.forestprod.org/cdromdemo/wd/wd4.html) the University of Minnesota includes a simplified chart that describes this **(Fig. 3).** Notice how, as the RH rises, the MC of wood increases until it reaches equilibrium, known as Equilibrium Moisture Content (EMC); as the RH falls, the MC of wood decreases until it reaches EMC.

According to the U.S. Department of Agriculture, Forest Service Forest Products Laboratory, in conjunction with the University of Wisconsin, for most areas of the country, the average EMC of interior trim is 8%; the average EMC of exterior trim is 12%. (These figures are averages. The actual EMC varies considerably according to the time of year, and the region of the country).

Moisture Meters Matter

As wood changes in moisture content, it also changes size. Wood movement varies dramatically from one species to another, and as we've already seen, between flat-grain and edge-grain lumber. For carpenters using flat-grain softwood, a general rule of thumb is for every 4% change in MC, wood will change size 1%. That 1% may not sound like much, but it means 1/16 in. in a 1x6 board; 1/8 in. in a miter between two 1x6 boards!

That's why moisture meters are so important. If the MC of the wood increases from 12% to 14% prior to interior installation, and the RH of the house dries out to a typical 8% (6% in some areas), the material will shrink more than 1%! Miters will open, and joinery will fail.

That's why stocking material near the floor is always a big mistake, especially on a damp slab, even if you put stickers down, and especially if you throw a plastic tarp over the bundle! Imagine all that moisture trapped inside that tarp every night!

When working on a slab, and on a wood floor, too, always elevate your material off the floor, and protect it for low-lying humidity—especially in high-humidity areas. And if you wrap your material with a tarp very night, protect the bottom from moisture, too. After all, anyone who has ever been on scaffolding installing crown molding knows that it's a lot warmer and drier near the ceiling than it is near the floor! ■

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