Q&A

Q. Hardwood Kitchen Countertops

A client wants me to glue up a hardwood kitchen countertop for him. Is this asking for trouble, or can it be done successfully? What potential problems should I be aware of?

A. *Dan Vos, owner of DeVos Custom Woodworking in Dripping Springs, Texas, responds:* We make a lot of kitchen countertops from a variety of hardwoods. One important thing to keep in mind is that the wider the countertop, the thicker it needs to be to remain stable. A finished thickness of 1½ inches is ample for counters up to 25 inches wide; for larger tops we'll go to 1¾ or 2 inches. In most cases, we use Titebond (or Titebond II Extend if we need a little extra working time) for gluing up the top, although we use West System Epoxy (866/937-8797, westsystem.com) for oily tropical hardwood. We find that biscuit joints aren't necessary, because a properly made glue joint is stronger than the wood itself.

For a finish, we use either a 50/50 mixture of pure tung oil and pure citrus solvent, or a product called Waterlox (800/321-0377, waterlox.com), which is a polymerized tung-oil-based penetrating finish. If the tung oil/citrus mix is used, the homeowners can cut and chop directly on the countertop as long as they reapply the finish once or twice a year. Regardless of the finish, a wood countertop must be finished equally on all surfaces — including the underside — or it's likely to twist and warp.

Because wood expands and contracts in response to changes in moisture and humidity, fastening a countertop to a cabinet with glue or some other "hard" fastening is a recipe for disaster. It should be attached from beneath with screws driven through elongated or oversized holes in corner blocks or cabinet bracing strips. That approach holds the countertop down firmly while still allowing it some freedom of movement.

If part of the counter will be directly above a heat- or moisture-producing appliance like a dishwasher or wine fridge, we apply a reflective layer of heavy-duty aluminum foil to the underside of the countertop with a spray adhesive to protect it.

Finally, make sure that the homeowner understands the special demands of a wood countertop. For example, although undermount sinks can be successfully used in a wood countertop, the exposed edge around the sink is especially susceptible to moisture. It's up to the homeowner to stay on top of the situation and keep the finish in that area in particularly good shape.

Q. New Design Values for Southern Pine

I use a lot of southern pine lumber, and I've heard that the design values for the material are about to change. How will that affect its use for things like framing or building decks?

A. *Cathy Kaake, senior director of engineered and framing markets at the Southern Forest Products Association (SFPA), responds:* Based on recent tests of visually graded 2x4 lumber, the Southern Pine Inspection Bureau (SPIB) made several changes to its 2002 rule for grading southern pine lumber. The new rule reduces some design values for bending (F_b), tension parallel to grain (F_t), compression parallel to grain (F_c), and modulus of elasticity (E and E_{min}). Included in this change are the four main species of loblolly, longleaf, shortleaf, and slash pine, as well as mixed southern pine. The SPIB didn't study the reasons for the change in strength revealed in the tests, but it may be due to changes in forestry management practices.

So far, the change affects only 2x2s, 2x3s, 2x4s, 3x3s, 3x4s, and 4x4s in No. 2 and lower grades. The revised design values will become effective June 1, 2012.

There will be no change for studs based on the IRC or the Conventional Light-Frame Construction section of the IBC, but species-specific tables for resisting wind loads will be updated. Span tables will also be updated, but because 2x2 through 2x4 material is seldom used for joists or rafters, that's unlikely to affect many users.

Truss manufacturers are expected to incorporate the new design values into their products between now and the June 1 effective date. It's likely that more trusses will now be made from machine-stress-rated (MSR) lumber and machine-evaluated lumber (MEL), neither of which are subject to the revised design values. The transition period is also designed to allow code officials to make necessary code amendments and prepare for enforcement. Because building codes may be enforced on a state, regional, or local level, exactly when enforcement begins in a given area will vary.

In general, though, projects permitted before June 1 should be able to proceed under the current values. According to standard code-enforcement practices, the design value in effect at the time a project is permitted (rather than when a project is completed) should govern.

New design values for other grades and sizes of visually graded southern pine are expected to follow testing of larger-dimension stock — including No. 2 and select structural 2x8s and 2x10s — that is now in progress and should be completed before the end of 2012. The SFPA will publish revised joist and rafter span tables after the new design values are available. More changes in design values probably lie ahead as other North American lumber species also undergo similar testing. You can find additional information at southernpine.com.

Q. How Flat Does a Subgrade Need to Be?

When you're preparing the subgrade for an insulated slab foundation, how flat does the surface need to be before you lay out the rigid foam? Is "pretty flat" good enough, or do you have to eliminate every minor hollow and high spot?

A. *Alan Gibson, co-owner of G-O Logic Homes, a design-build company in Belfast, Maine, responds:* The usual approach to preparing the subgrade for an insulated slab is to build it up in a series of 6-inch lifts of material, tamping each with a plate compactor or vibratory roller. After checking the resulting surface with a long straightedge, you can use a rake to shave off any high areas and move the material into the low spots, then compact it again as needed.

How successful you are in doing that will depend largely on the fill you have to work with. Fine sandy material is easy to scrape smooth but may not compact hard enough. A bank-run gravel may compact extremely well but tends to resist accurate leveling because of the larger stones it contains; if that's what you have to work with, you should use a finer, more evenly graded material for the topmost few inches.

If you're using 2 inches of foam or less, that tamp-and-scrape approach will probably work fine, because the weight of the fresh concrete will press the foam down tightly enough to eliminate any minor voids. Slabs enclosed by a frost wall are also a little more forgiving, because there's generally no structural loading on the slab.

But with thicker layers of foam, any long-term creeping or settling of the foam after the slab has cured could allow the slab to crack or cause other structural problems. We take that possibility seriously, because we often build on slabs-on-grade in a climate that may call for 5 inches or more of foam under the slab.

Rather than spending a lot of time trying to level a subslab by trial and error, I now prefer to top the compacted subgrade with a reliably flat and level 1½-inch layer of flowable fill. This involves ripping 2x4s down to 2x2s, staking them in position around the perimeter of the slab and in rows that divide the area into 10-foot-wide sections, and leveling them with a laser level. The flowable fill is a thin concrete mix with a sand aggregate and an aerating additive that gives the material a foamy quality. It's about half the price of regular concrete and can be easily screeded to a perfectly flat surface with a 12-foot magnesium screed. Once the flowable fill has cured for a few days, the slab itself can be insulated, formed, and poured as usual.

Q. Nailing Tips for Advanced Framing

I can see the value in advanced framing in terms of reduced thermal bridging, better insulation, and savings in framing lumber. But I've hesitated to get serious about it because I worry that the absence of some familiar framing member is going to make life more difficult for the trim guys. Are there any tricks the framing crew can use to provide better nailing for trim?

A. *David Joyce, owner of Synergy Construction in Leominster, Mass., responds:* Advanced framing — also known as OVE (optimum value engineered) framing — eliminates structurally unnecessary elements like double top plates, door and window headers in nonbearing walls, double trimmer studs, and multiple studs in partition corners. Where necessary, metal connectors — such as drywall corner clips — are added to strengthen connections. This can cut lumber use by 20 to 30 percent. Energy savings are harder to quantify, but I'd guess they're in the 20 percent range.

Our company uses advanced framing routinely, and my experience has been that it's up to the trim guys to adapt to the framing method, not the other way around. With a little practice, it's not really difficult. When running baseboard around a room framed with two-stud corners, for example, we like to cope the corners, with the coped end nailed to the stud. The square-cut end doesn't need to be nailed to anything, because it's held in place by the pressure of the coped joint that's butted against it. You just have to find the studs and plan your copes accordingly.

Fastening door and window trim effectively is generally just a matter of angling the nails inward so they'll hit the single trimmers. In some cases, a little extra work is necessary. Because ceiling strapping isn't used in advanced framing, there's no nailing for the upper edge of crown molding on the side of rooms where the ceiling joists run parallel to the wall. In this case, we cut small triangular blocks from scraps of framing lumber, nail them through the drywall to the top plate, and fasten the crown to the blocks.

If we're installing raised panels on a surface that lacks a nailing base — such as under a chair rail — we apply some construction adhesive to the backs, press them into position, and drive the fasteners directly into the drywall, angling them enough to provide some grip. In this case, it's the adhesive that actually does the work; the nails are simply there to hold the material in place until it sets up.

All this may sound kind of shaky if you're used to finding solid framing everywhere you might want to drive a nail, but the reality is that materials fastened to advanced framing are more resistant to cracking and movement than those in conventional framing.

This point was driven home to me a few years ago when we had a callback over a cracked corner in a tiled shower. It was the only cracked finish material in the entire house — and it happened to be at the only non-OVE-framed corner in the place. I'd been so concerned about getting a reliable corner in that area — knowing that it would be finished with expensive tile — I'd pulled out all the stops and constructed a multi-stud corner secured with HeadLok screws and glue. But as the lumber shrank, the corner opened up a full 1⁄8 inch, while all the floating two-stud corners elsewhere, fastened with drywall clips, were in perfect shape.

Q. Snow on Batts

I'm going to be removing the existing fiberglass batts from the attic of a moderately leaky older home, doing some air-sealing, and re-insulating with 16 inches of loose-fill cellulose. According to the homeowner, a dusting of fine powdery snow sometimes covers the batts after snowstorms, apparently because it sifts through the ridge cap of the metal roof. This hasn't seemed to hurt the batts any, but because cellulose is organic, I'm wondering if these occasional dustings of snow could lead to rot or mold.

A. *Bill Hustrunk, technical manager of cellulose manufacturer National Fiber, in Belchertown, Mass., responds:* The amount of snow you describe won't do any harm. Cellulose is highly hygroscopic, meaning it can disperse moisture over a very large internal surface area and then dry back out to reestablish its moisture equilibrium. Because of this, there are no localized wet areas that might give mold or other microorganisms the moisture they need to multiply. The borate-based fire retardants used in cellulose help, too, because they have antimicrobial properties.

The attic you'll be working in sounds well-ventilated, but cellulose's ability to accommodate moisture also allows it to work in unvented dense-packed roof assemblies. Its density prevents airflow — which we now know is the major transport mechanism for moisture — while moisture that enters through diffusion transport is managed by its hygroscopic properties. But it's important to note that this requires an assembly that's able to dry to at least the inside or outside, and preferably both.

During my nine years running the weatherization program in central Vermont, of the thousands of unvented roof assemblies that we dense-packed, I saw only one failure — in a home where a large tree limb fell on a roof during a rainstorm.

Q. Pressurization vs. Depressurization in Blower-Door Tests

When you're doing a blower-door test, does it matter whether you're pushing air in or pulling it out? In other words, is the air infiltration rate the same at –50 pascals as it is at +50 pascals? And if so, when would you use one approach and when the other?

A. *Mike Rogers of Green Homes America, a home-performance contracting company with locations across the country, responds:* The short answer is yes, it does matter. You will often get different cfm50 results depending on whether you are depressurizing (pulling air out) or pressurizing (pushing air in). Because depressurization is the standard approach in the U.S. and Canada, you will generally want to depressurize so that you can better compare apples to apples, either across buildings or as "before" and "after" measures of one particular building. (Europeans prefer to take both pressurized and depressurized readings, and average the two.)

Why is depressurization used? The most cited reason is that it more accurately mimics natural leakage where mechanical ventilation backdraft dampers are present. Depressurizing tends to close the dampers, whereas pressurizing tends to open them. In cold climates, some people have also expressed concern about blasting concentrated cold air into one area (at the blower door) when pressurizing, potentially killing indoor plants. When a structure is depressurized, cold air leaks in from many diffuse points.

In terms of finding leaks, sucking and blowing have different advantages. Depressurizing makes it easier to feel the presence of leaks with your hands. Pressurizing makes it easier to find leaks with some sort of artificial smoke.

The one time pressurizing definitely trumps depressurizing is when there is concern about drawing pollutants into a home — fiberglass fibers from the attic, rat poop, mold, or mildew from a crawlspace, or ashes from the fireplace. Incidentally, as barroom tales illustrate, it is absolutely *not* a good idea to use a blower door in either direction with a fireplace or woodstove burning!