Q&A

Q. Fireplaces in Tight Houses

I build custom homes in a northern (heating) climate. My clients want tight, well-insulated homes — we use cellulose and often spray foam — but many also want a wood-burning fireplace. Is it possible to have a traditional hearth in a modern, tightly insulated home?

A. *Kevin Stack, a certified home energy rater in Syracuse, N.Y., responds:* The traditional open-hearth fireplace has a lot of charm and is often at the top of the typical new-home buyer's wish list; it is also inefficient, creates a break in the thermal envelope, and generates both indoor and outdoor air pollution.

For these reasons, the energy codes in many states — including New York's Energy Conservation Construction Code (102.7) — require that solid-fuel fireplaces be installed with tight-fitting noncombustible fireplace doors to control infiltration losses. New York's building code also requires factory-built and masonry fireplaces to be equipped with an exterior air supply to assure proper fuel combustion, unless the room is mechanically ventilated and controlled so the indoor pressure is neutral or positive.

Unfortunately, these requirements can be both expensive and difficult to implement — while providing limited benefits.

Still, here in the Northeast, I've found that the aesthetic value of a masonry fireplace is strong enough for many buyers to be willing to overlook these concerns. So when homeowners want a conventional fireplace, my first recommendation is that we mimic a traditional-style hearth but install an EPA-certified fireplace insert. If they demand the real thing, we build them a Rumford with tightfitting glass doors, provide the required makeup air, and advise them of the problems and limitations they may encounter.

Q. Fixing Cracks in Concrete

What is the best way to seal hairline cracks in a concrete driveway? The products I've found at home centers seem too thick, and my client is concerned that the cracks will get worse during the winter months.

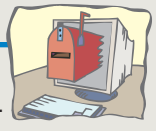
A. *Bill Palmer, former editor of* Concrete Construction *magazine and president of Complete Construction Consultants in Lyons, Colo., responds:* Cracks seldom degrade from freeze-thaw action, since water within them isn't confined and therefore can't cause damage when it freezes. In addition, most "hairline" cracks are surface cracks; they don't go all the way through the slab, so water can't get through and degrade the subbase. For cracks less than .04 inch wide (about the thickness of a standard paper clip wire), the aggregate interlock will prevent any differential movement across them, and repair is unnecessary. So if these truly are hairline cracks, the best approach is probably to do nothing: Whatever crack-repair technique you use will look worse than the crack.

Even a crack wide enough to allow water all the way through the slab shouldn't cause any damage if there's a well-compacted and well-drained subbase; without that, uneven settlement could occur around the crack. But keep in mind that cracks this size are active — they widen in cold weather and narrow in warm weather — so any sealant must have enough elasticity to handle the movement.

If you do decide to seal the cracks, the best

GOT A QUESTION?

Send it to Q&A, *JLC,* 186 Allen Brook Lane, Williston, VT 05495; or e-mail to jlc-editorial@hanleywood.com.



solution for the narrow ones you describe is to seal the entire slab. Make sure the surface is very clean, then apply a good solvent-based acrylic sealer with a pump sprayer. Don't put it on too thickly, though — it's best to apply it in two thinner coats — and don't apply it if the temperature is less than 50°F or greater than 90°F.

For a broom-finish surface texture, work the sealer into the surface with a roller. (Sealers come in both glossy and matte finishes.) Add some grit — a product such as H&C's SharkGrip (800/867-8246, www.hcconcrete.com) should work — to the mix if the surface seems too slippery.

Q. Glued Wall Sheathing

Is it okay to glue OSB or plywood sheathing to the wall framing before fastening the sheathing with nails? It seems that this would be a simple and cost-effective way to add strength to a wall assembly while reducing air infiltration.

A. *Bryan Readling, PE, senior engineer at the APA/Engineered Wood Association, responds:* That's probably a bad idea. Although glue may indeed make a framed and sheathed wall stronger, the APA provides design values only for nails, due to the high variability of field-applied adhesive performance. You'd still need to follow the same fastening schedules, so the glue would be redundant.

Also, the load-deformation characteristics of nails are often much different than they are for adhesives: The glue connection would have to fail before the nails ever saw any load. Adhesive connections tend to fail more dramatically than nails, which give more warning. Nails are also superior in cyclic seismic loading, since more deformation means more energy absorbed through damping, similar to how shock absorbers work with the springs on your vehicle.

In addition, plywood and OSB already provide good resistance to air infiltration when used with an adequate housewrap, and they won't be improved much with extra glue.

Finally, note that the APA's Engineered Wood Construction Guide (Form E30, available free online at www.apawood
.org), states: "To minimize the potential for panel buckling, gluing of wall sheathing to framing is not recommended, except when recommended by the adhesive manufacturer for wall sheathing that already has been permanently protected by siding."

Q. Flash-and-Batt Insulation: Good Idea or Bad Practice?

Is the flash-and-batt technique — where an inch or two of spray-foam insulation is applied to the interior side of roof or wall sheathing before fitting rafter and stud bays with fiberglass batts — a good way to insulate?

A. *Martin Holladay, editor of* Energy Design Update, *responds:* Even though thicker is always better with any type of insulation, applying a thin layer of spray foam is a good way to get air-sealing benefits at considerable cost savings over full-thickness spray foam.

Some spray-foam contractors dismissively call the technique "flash-and-dash"; they point out that fiberglass batts may fail to remain in contact with the spray foam, creating an air space and the potential for convective air currents through the insulation. But I think this is a relatively insignificant problem, particularly if the cavity is fairly airtight. Besides, it's easy to minimize the chance of a potential air space by simply choosing a thicker batt. In fact, batts that are compressed slightly as they are installed will yield higher R-values than ones that just fill the cavity.

Another concern is that in a heating climate, the flash-and-batt method creates a vapor retarder on the wrong side (the cold-in-winter side) of the fiberglass batt. But whether the spray foam actually becomes a vapor retarder depends on the type of foam used. Open-cell foams — that is, foams with a density of about ½ pound per cubic foot — are very vapor-permeable. However, since many low-density–foam manufacturers,including Icynene, recommend against the flash-and-batt method, most proponents use closed-cell foam with a density of about 2 pounds per cubic foot.

One inch of closed-cell foam has a permeance of about 2 perms, while 2 inches has a permeance of about 1.2

perms, so closed-cell foams are effective vapor retarders.

But does installing a vapor retarder on the cold-in-winter side of a wall create a problem? Actually, research has shown that exterior foam can safely be used as part of a cold-climate wall or roof — as long as the foam is thick enough. As a rule of thumb, walls with exterior foam sheathing or flash-and-batt closed-cell foam will avoid condensation problems as long as the foam is at least 1 inch thick in climate zone 5 (Pennsylvania, Iowa, Nevada) or 2 inches thick in climate zone 7 (northern Minnesota).

Since exterior foam reduces a wall's ability to dry to the exterior, it's important to choose an interior vapor retarder that allows drying to the interior — such as kraft-paper facing or vapor-retarder paint — instead of sheet poly.

Q. Hiding Knotholes in Exterior Trim

I'm doing an addition on a house I built several years ago. Some of the eastern white pine exterior trim — which was primed on all four sides with oil primer and top-coated with white latex — is showing sap stains. None of the knots or obvious sapwood was preprimed with BIN (www.zinsser.com), our usual shellac-based stain-blocking primer. Would it do any good now to go back and recoat the dark areas with BIN before recoating with latex? Or is it too late?

A. *Jon Tobey, a painting contractor in Monroe, Wash., responds:* Yes, you can easily reprime these areas, with a few caveats. First, don't use water-based primers for tannin stains, because these stains are water-activated. Second, because alkyd and other solvent-based stain-blocking primers are very brittle — and therefore fail easily under expansion and contraction caused by temperature changes — you'll need to apply a thin, flexible coat. On larger jobs, we use a sprayer to do this, fogging knots and stains with a very light coat of XIM X-Seal (440/871-4737, www.ximbonder.com), PrepRite ProBlock (800/474-3794, www.sherwin-williams.com), or a similar alkyd-based stain-blocking primer. On smaller jobs, rattle cans are an easy and cost-effective option. I don't recommend using brushes or rollers; they leave too thick a coat, and these primers dry so fast the tools would be ruined.

Finally, while it may look as if only the knotholes are the problem, the entire board may be bleeding, but to a lesser extent; this may become apparent once you fix the knotholes. Something similar happened to us once: We spot-primed all the knotholes, then were called back two years later because the rest of the house had yellowed (it was covered with big light spots). After that, we began lightly fogging entire houses with unthinned alkyd-based stain-blockers (at a rate of about 1,000 square feet per gallon). We haven't had a callback since.