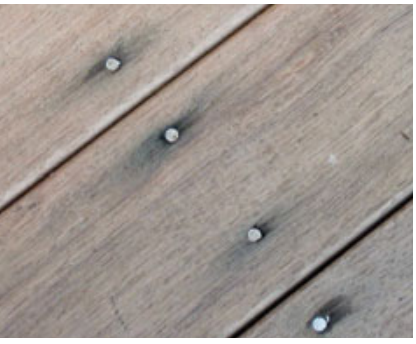
# Q&A

## Q. Nail Stains and Mahogany Decking



*The mahogany decking we installed on a house last year has developed some dark staining around the stainless steel nail heads (see photo). The staining is worse on the front porch, which is covered, and not nearly as bad on the back deck, which receives full sun. What's causing it?*

A. *Bill Feist, a former wood-finishes researcher with the Forest Products Laboratory in Madison, Wis., responds:* There are many different species and subspecies of mahogany, with varying properties, so it's difficult to pinpoint your problem. But the staining is mostly likely due to mildew, iron in the nails, or extractives in the wood.

***Mildew.*** A form of stain fungi, mildew is probably the most common cause of wood and house-paint discoloration. To test for the presence of mildew on wood, apply a drop or two of liquid household bleach (5 percent sodium hypochlorite) to the stain. The dark color of mildew will usually bleach out in one or two minutes — though my guess is that this is not a mildew problem. If it is, scrubbing the wood with a solution of one quart of bleach in a gallon of water — followed by a clear-water rinse — should remove the stains.

***Iron staining.*** Low-quality stainless steel nails, and even the wire used to collate pneumatic-gun nails, can cause staining. There is a simple test you can use to see if the staining on the wood deck comes from iron contamination: Apply a saturated solution of oxalic acid (typically used for bleaching wood, especially oak) in warm water; if iron is the source of the contamination, this solution will remove the gray or black stains in a few minutes. If that is what happens, brush the oxalic acid solution on the affected areas and then on the entire deck. After the wood has dried, rinse the deck thoroughly with clear water.

***Water-soluble wood extractives.*** In some tree species — including American or true mahogany, African mahogany, and Philippine mahogany (meranti or lauan) — the heartwood contains water-soluble extractives that give the wood its attractive color. If exposed to enough moisture, these extractives can dissolve and migrate to the surface of the wood, leading to staining. Meanwhile, nails and screws that penetrate wood expose end-grain along the shank of the fastener. Because water enters and evaporates from end-grain so readily, areas around the nail heads would have higher concentrations of the extractives, leading to staining and discoloration. These extractives are light-sensitive, often darkening initially, then bleaching out with prolonged sun exposure. If extractives are your culprit, washing the decking with an oxalic-acid solution as described above might be all that's needed to fix the problem.

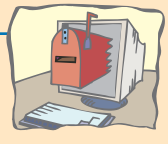
## Q. Floor Level of the Garage

*Can the floor of an attached garage be at the same elevation as the floor of adjacent living space, or does there have to be a step down into the garage?*

A. *Lynn Underwood, an engineer, licensed contractor, and building code official in Norfolk, Va., responds:* While the IRC requires certain types of doors for fire protection in attached garages and doesn't permit them to open into bedrooms, there's no requirement for a lowered garage floor. BOCA and some of the other previous model codes required a 4-inch step from the garage floor surface up to the house, presumably to prevent spilled gasoline vapors from entering the house and to provide some protection against carbon monoxide. But the IRC never adopted this constraint, mostly because of improvements in automotive design (cars don't leak very often anymore) and the popularity of single-level post-tensioned slabs.

Still, many building inspectors are like contractors — they never forget a code requirement, even when it changes to eliminate an out-of-date condition. So it's possible that some inspectors are still enforcing this even though it's no longer in the code.

### GOT A QUESTION?



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

# Q&A

## Q. How Safe is Spray-Foam Insulation?

*I've heard that polyurethane spray-foam insulation may contain penta-BDE, a chemical that is called a "toxic flame retardant" by the EPA and has been banned in some states. How much of a risk does this chemical cause for the installer and the homeowner, and are there alternatives?*

A. *Mason Knowles, a former director of the Spray Polyurethane Foam Alliance and an industry consultant, responds:* Penta-BDE (pentabromodiphenyl ether) is one of a family of brominated fire retardants that also includes deca-BDE and octa-BDE. Penta-BDE was once commonly used in the flexible-foam industry for car seats, furniture, and plastic circuit boards. However, its short shelf life made it ill-suited for SPF systems, which may not be sprayed until several months after they've been blended. According to the manufacturers I've spoken with, penta-BDE has seldom — if ever — been used in residential spray foam.

A concern with penta-BDE is that it accumulates in body fat; it first gained attention when dramatically elevated levels of the chemical were found in the breast milk of nursing mothers. According to the Agency for Toxic Substances and Disease Registry, nothing definite is known about the health effects of penta-BDE on humans, though studies with lab animals suggest it may affect the liver, the thyroid, and neurobehavioral development. Even though it's not specifically identified as a carcinogen, penta-BDE is no longer manufactured in the U.S., and some states and countries have passed measures regulating its use or banning it altogether, as a precautionary measure.

While deca-BDE and a few other brominated fire retardants are still being manufactured, they're gradually being phased out in favor of phosphorus-based flame retardants, which don't form dioxins or furans when they're burned. Probably the two retardants most commonly used in polyurethane spray foams are Tris(2-chloro-1-methylethyl)phosphate (TCPP/TMCP), which contains both chlorine and phosphorus, and halogen-free resorcinol-bis(diphenyl phosphate), or RDP. Because manufacturers are allowed to substitute one retardant for another in their formulas without having to retest, it's difficult to know exactly which manufacturer uses which flame retardant, but outside of normal precautions for workers who handle the bulk materials, I haven't heard of any health issues concerning these types of retardants.

## Q. Using Nail Guns for Vinyl Windows

*Is it okay to use pneumatic nailers to install vinyl windows, or would that void the manufacturer's warranty?*

A. *Kevin Vilhauer, a design engineer and manager of testing and R&D at Milgard Windows & Doors, responds:* Other window and door manufacturers may have a different policy, but installing Milgard products with either pneumatic coil nailers or narrow-crown staplers will not void the warranty. The most important thing is to maintain the integrity of the nailing flange around the outside of the frame, which also serves as a water barrier. If the flange is damaged, the window's warranty can be voided (though a damaged flange can also be repaired). One advantage to installing vinyl windows with a nail gun is that it's less likely that an errant hammer blow will strike and damage the window frame. Just be sure that the pressure is properly adjusted so that the heads of the nails or staples don't penetrate the flange, and use corrosion-resistant fasteners.