

# Q&A

## Q. Making Long Trim From MDF

*Because it's a lot cheaper than most primed stock, I'd like to use MDF for running trim. But that means I'll have a lot more butt joints, especially if I use 8-foot sheets, which I find to be more manageable on site than 10- or 12-foot sheets, which we can also get. What's a good way to make invisible butt joints in MDF when, for example, I'm installing baseboard or a crown frieze?*

**A.** Gary Katz, moderator of JLC Online's finish-carpentry forum and a frequent contributor to the magazine, responds: If you're working with flat stock, I'd suggest pocket-screwing all the joints together before cutting or installing the pieces. I frequently use pocket screws and butt joints for wainscoting rails and

built-up baseboard, as I've found that this is the best way to ensure tight-fitting, durable joints, especially in long lengths.

I use pocket screws in MDF casing, too, if the profile is a simple quirk-and-bead or ogee on only one edge of the molding and there's enough room to pocket-screw the casing together.

If the material is milled with an elaborate profile, there isn't always room for pocket screws, in which case I cut a 45-degree miter joint and reinforce the joints with biscuits and glue. Of course, you also have to use glue in every joint, and you should be sure to clamp the pieces firmly before driving in the screws; otherwise, the miters will slip and the joint won't be flush.

## Q. Is All Drywall Mud the Same?

*My drywall sub's crew members ran out of mud before they were able to finish the third coat of a recent project. But when the local lumberyard delivered three buckets of the familiar green-labeled compound, the two tapers refused to use it and instead drove nearly an hour round-trip to pick up the kind they preferred, claiming it was much easier to spread and sand. I wasn't aware that there was such a difference. Is there? Should different types of mud be used for different — i.e., first, second, third — coats?*

**A.** Myron Ferguson, a drywall contractor in Broadalbin, N.Y., and the author of *Drywall: Professional Techniques for Walls and Ceilings*, responds: Companies that manufacture joint compounds actually offer a wide range of products, including taping and topping compounds as well as regular all-purpose compounds.

Taping compounds [1] are formulated to have excellent bonding strength and crack resistance for embedding paper tape. Topping compounds [2] that are formulated for fill and finish coats



are lighter than taping compounds and not as strong, but they are less likely to shrink and are easier to apply and sand. All-purpose compounds ([3], page 2) are the most versatile and can be used for embedding paper tape as well as for the finish coats; this is what you'll find at most lumberyards and home centers, and most likely is what your lumberyard stocks.

As you've discovered, even all-purpose compounds are now available in different weights, each with different working characteristics. Many tapers will use regular all-purpose compound to bed their tape to take advantage of its strength, but it's common practice to then switch to a lightweight all-purpose compound for the fill and finish coats, since the lighter-weight

Photos courtesy USG Corp.



### GOT A QUESTION?

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## Q&A

compounds are a little easier to sand, and shrink less.

To avoid having to use two different products, some tapers prefer the midweight all-purpose compounds, which sand more easily than regular joint compound but are also suitable for bedding paper tape. This is probably the compound preferred by your tapers, who understood that mixing and matching compounds with different sanding properties can adversely affect the final result.

Most of these drying-type compounds (which have to air-dry before another coat can be applied) come in both ready-mixed and dry



3



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formulations. But don't confuse these powdered versions with the setting-type compounds [4] that come in powder form and are mixed with water. Since setting compounds dry chemically rather than through evaporation, they can be coated over when they set, even if they aren't completely dry. A setting compound is generally considered to be a stronger compound; it's the one that fiberglass mesh tape is typically embedded in to give the tape the extra strength it needs. But because most setting compounds are difficult to sand, they are primarily used for tape embedding and fill coats only.

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### Q. Protecting Water Heaters With Expansion Tanks

*We recently had to replace our relatively new gas-fired water heater when its internal flue tube collapsed, ruining the thermostat and causing hot combustion gases to spew out the front. The installer, who claimed that the water heater was ruined by thermal expansion, added a thermal-expansion tank to the system. But the temperature- and pressure-relief valve on the new heater still leaks occasionally, and even though we've had it replaced, the problem persists. What's going on?*

**A.** *Dave Yates, a plumbing contractor in York, Pa., responds:* Your home's incoming municipal water line contains a backflow preventer (BFP) or a pressure-reducing valve (PRV) or both; either can lead to this problem. As cold water is heated, it expands and must have somewhere to "grow." Before BFPs or PRVs were required on incoming water service lines, this thermal expansion could be absorbed by the municipal water system. However, now that most homes are closed systems (water can

enter, but can't return to the street), there's no place for this expansion to go. That's what killed your first water heater.

Your installer diagnosed your problem but may not have installed a large enough expansion tank to correct it. Residential expansion tanks start at 2.1-gallon capacity and go up from there. Regardless of the size, Federal Department of Transportation regulations limit the air charge in a thermal expansion tank to 40 psi for shipping. But if your home's water pressure is 80

psi, the installer needs to adjust the air charge to match final delivery pressure; if he doesn't, you will lose half the tank's capacity as it takes on the added 40 psi.

Even a 2.1-gallon expansion tank that's been properly charged to 80 psi, though, can be inadequate for a 40-gallon water heater. Here's why:

A 40-gallon water heater can be subject to as much as 1 gallon of thermal expansion (the exact amount depends on inlet and storage temperature range). But by applying Boyle's law (which states that volume at a constant temperature is inversely proportional to pressure, or  $P_1 \times V_1 = P_2 \times V_2$ ), we find that a 2.1-gallon thermal-expansion tank is undersized even with the correct air charge of 80 psi. For example, when  $P_1 = 80$  and  $V_1 = 2.1$ , if  $V_2 = 1$  then  $P_2$  will equal 168; this is why your 150-psi T&P relief valve is leaking periodically.

Substitute 1.1 for  $V_1$  (if the plumber fails to adjust the tank's air pressure upward) and .35 for  $V_2$  (the volume left in the pressure tank if you get another  $\frac{3}{4}$  gallon of thermal expansion), and you could see a potential expansion tank pressure of more than 250 psi. But with a 4.5-gallon expansion tank — the next, larger size of residential thermal-expansion tank — the water in your system will have plenty of room to expand without blowing your T&P relief valve or ruining your water heater.

By the way, water pressures in municipal water systems seldom remain constant; they tend to spike at night as system-wide usage drops off. Those spikes in pressure are then trapped within your home's plumbing system, which will increase the demands on the thermal-expansion tank for proper protection. By spending \$15 or \$20 more for the larger thermal-expansion tank, you have purchased a pretty cheap insurance policy for your hot-water heater.

## Q. Fixing a Ceiling Stain

*When a leak left water stains on our client's No. 2 pine ceiling, a painter tried to sand and*

*bleach the marks, and then applied a natural oil stain to match the ceiling's clear finish. Unfortunately, the repairs turned a little yellow. What caused this? Is there any way to fix the ceiling now?*

**A.** *Michael Dresdner, a professional wood finisher in Puyallup, Wash., and the author of Wood Finishing Fixes, responds:* Depending on what the painter used to bleach the wood, it's possible that residue from the bleach reacted with the stain. Most bleaches will denature dyes, and some brands of stain use dye as one of their colorants. Because bleach affects various colors of dye at different rates, it may well have lightened some of the darker tones and left the yellow component intact, resulting in the yellow hue you describe. When you use bleach, it is always a good idea to either neutralize it or wash off any residue if that particular bleach leaves one.

Another possibility is that the wood itself turned yellow, which, since it is so difficult to see true colors on sanded raw wood, the painter didn't notice until it was stained. Certain bleaches are known to lighten most woods while turning others — especially some softwoods — slightly yellow.

By now, the stain is dry, and that means the wood is at least partially sealed. At this point, your best bet is to add stain selectively to the yellow area to try to blend it to match the color of the rest of the ceiling. If you recall basic color-mixing rules, colors on opposite sides of the color wheel tend to neutralize one another. For yellow, that color is purple. As odd as it sounds, a stain with a very light purple hue will ameliorate the yellow and blend it back to beige or brown.

## Q. Anchoring a Railing To Stone

*I need to secure the base of a wrought-iron handrail to an exterior granite landing. My plan is to drill holes into the stone and use anchors. What's the best way to do this without cracking*

## Q&A

*the stone, and what should I use for anchors? I am concerned that wedge anchors might cause cracks.*

**A.** *Bruce Zaretsky, a landscape designer and contractor who lives near Rochester, N.Y., responds:* I agree that you should think twice about using wedge-type or masonry anchors in this kind of stone. When you drill and anchor so close to an edge (as you will when installing a railing), there is a good possibility that you'll crack the stone or break off a section.

Instead of anchors, we've had good results using hydraulic cement, which is a fast-setting cement product used most often for filling holes in watertight vessels.

We drill holes that are as deep as possible and one size larger than the 9/16-inch- or 1/2-inch-diameter bolts we typically use, fill the holes with the cement, and then place the rail and spin the longest bolts possible into the holes. You'll need to do this quickly, since the cement will be rock hard in about 10 minutes.

To drill the holes, we normally use a hammer drill and a bit specified for the material we're drilling (in most cases, a diamond-tip bit). If we're worried about cracking the stone, we use a core drill with a diamond bit, because it doesn't shake the way a hammer drill does.

### **Q.** *Skip the Primer?*

*Recently I discovered that an inexperienced member of my crew mistakenly used finish paint instead of an actual primer to prime a fir exterior door. Now the door has two coats of a 100 percent acrylic house paint, but no primer underneath. Since it leads to a covered porch, the door is protected from the weather, but in the winter the south-facing doorway gets a lot of sun. I'm worried that paint adhesion may be a problem, but short of stripping the door I don't know that there's much I can do about it at this point. Should I worry?*

**A.** *Bill Feist, a former wood-finishes researcher with the Forest Products Laboratory in*

*Madison, Wis., and co-author of Finishes for Exterior Wood, responds:* Many light-colored woods like fir can be self-primed (using the top coat as the first coat) with no problem. I wouldn't anticipate any adhesion problems as long as the original wood surface was properly prepared, and sunlight should not be a problem, as the acrylics are the very best resins for protection against UV degradation.

But if the door were to be fully exposed outdoors, you would need the benefit of a proper primer first coat (one recommended by the paint manufacturer for exteriors); in that case, I'd recommend that you strip the door and start over.

In general, primers should be used whether the top coat is an oil-based or a latex-based paint, because they're formulated to have better penetration, adhesion, and water resistance than either type of top-coat paint.

A good exterior primer will seal in or tie up wood extractives so that they won't bleed through the top coat; since it's nonporous, it will also inhibit the penetration of rain or dew into the wood surfaces, helping to reduce the tendency of wood to shrink and swell.

When used on woods like redwood and western red cedar, oil-based, solvent-based exterior primers tend to have better tannin-stain-blocking properties than water-borne primers.

Water-based exterior primers are generally preferred for use on pine, Douglas fir, and most plywoods, because they are more flexible than solvent-based primers and are better able to withstand the dimensional changes of those wood substrates.

When primer is applied, be sure to follow the application rates recommended by the manufacturer. Use enough primer that the wood grain is obscured, but don't spread it too thick or too thin. A primer coat that is uniform, flexible, and of the proper thickness will distribute the swelling stresses that develop in wood and thus help prevent premature paint failure.