Low-Slope Copper-Look PVC Roofing

BY JIM BENNETTE


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Photos by Dave Holbrook and Matt Quigley

As a certified installer of just about any type of roofing you can think of, my company enjoys a competitive advantage when working with products whose manufacturers restrict the number of installers per geographic region; to get the material, a homeowner typically has to go through a certified installer. This year, my crew and I spent several days on a full-house remodel in Cohasset, Mass., replacing existing EPDM roofing with Sentinel Copper Art (soprema.us), a European-made 60-mil, polyester-reinforced PVC membrane. It has actual powdered copper metal incorporated into its chemical mix **(1)**, resulting in a single-ply waterproofing membrane that weathers, or oxidizes, over time to a classic copper patina.

This PVC material has a number of benefits. Its reinforcing scrim provides high puncture resistance, which is an important feature around here because seagulls drop clams on the roofs, and the shells make sharp shards when they break. Unlike EPDM, ponding conditions don't void the warranty, so a no-slope roof is actually a go with PVC. That's because once you weld the seams, they'll never separate again, period. Another plus is that while EPDM can leach nasty solvents into the runoff, PVC sheds clean water, making it a great choice for cisterns and agricultural water capture.

The windows on the second floor of this house looked out over a couple of low-slope roof areas, and the owners wanted to see something more attractive there than black EPDM, or even white PVC or TPO. (A white roof has about 88% reflectivity, forcing us to wear shades during installation.) When I showed them a sample of the copper membrane, they were sold on the look. We sell Copper Art roofing starting at an installed cost of about $10 per square foot. Compared with solid copper, that's maybe one-third the cost, and it's probably three times faster to install, too.

UNDERLAYMENTS

After stripping the old roofing and fiberboard underlayment, we installed new, 1/2-inch-thick polystyrene underlayment **(2)** as a smooth base for the membrane. Unlike fiberboard, polystyrene underlayment doesn't absorb water, ensuring a dry base in the event we have to leave it temporarily exposed. Also, once fiberboard gets wet, it pretty much stays wet and can even promote rotten plywood sheathing—it's the cheap stuff and we never use it.

Raised perimeter trim around one of the areas of the roof called for additional build-up, so we installed 1-inch-thick R-Max Thermasheath-3 as underlayment there **(3)**. For both the 1/2-inch and the 1-inch thicknesses, we fasten the underlayment using common screw-down plate fasteners on nominal 2-foot centers.

MECHANICAL FASTENING PREFERRED

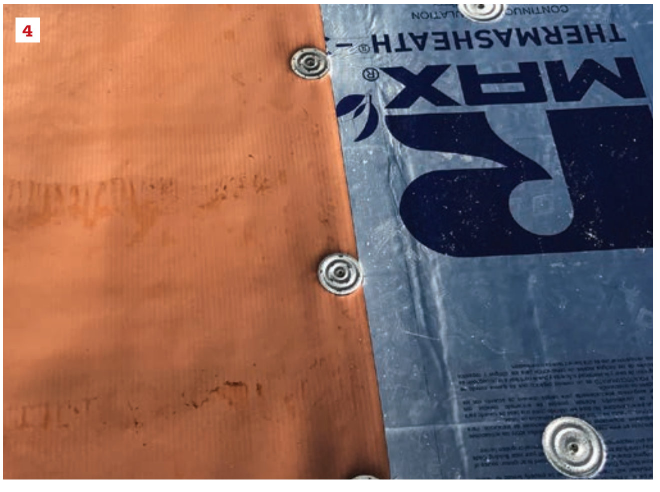
PVC membrane can be installed fully adhered using a flocking-backed membrane and approved adhesives, or it can be mechanically fastened, which is the method we typically use. Certain applications or specifications do require adhesive bonding, but it's overkill in most residential situations.

Mechanical fastening avoids the prep, the volatile goo, and the 50°F low-temperature limitation that go with the fully adhered method. Mechanical fastening also satisfies high-wind code requirements, a real concern on an oceanfront property like this one. We use proprietary, 2.4-inch "membrane stress plates"—we call them "seam plates"—along the upper edge of each 6-foot-wide course, on 12-inch centers **(4)**. These plate fasteners have barbs and ribs on the underside to better resist membrane uplift. The 6-inch overlap of the next membrane course covers the fasteners.

Over the starter membrane course along the roof's perimeter, we install PVC-clad stainless drip edge with a bonded, weldable PVC coating **(5)**. The drip edge is nailed with common roofing nails, replacing seam plates along this edge. To finish it off, we then seal it under a weld-down cover strip. Because there's a tendency during welding for the membrane to deform at any sharp corners, we round all the cover-strip terminations **(6)**.

MEMBRANE

We cut both cover strips and terminal flashing from the roll, according to need. To terminate the membrane against a wall or



parapet, we cut the sheet to the junction and fasten the edge with stress plates. Then we fold a cover strip up the wall, using a full bead of caulk along the upper edge and nailing it in place **(7)**. A few tack-welds hold the strip in place pending full seam-welding. Measuring 6 inches out along the roof plane, we then snap a line and trim the cover strip to it. Pre-formed inside and outside corner flashing is available from the manufacturer, and is the way to go for these junctures **(8)**.

Welding PVC is straightforward, though it takes some practice. We heat the seams briefly by slipping a torch nozzle under the membrane edge, and then immediately press the pieces together using a seam roller. You should see a little bit of white smoke wafting out of the seam as you work **(9)**.

We use a hand-held, 1,500W torch, with power adjustable from 80W to 1,500W, and a temperature scope from 100°F to about 1,300°F **(10)**. (On smaller jobs like this one, the hand-held torch is sufficient, but on large, commercial-scale work, we break out the "robot," which semi-automates seam welding and can crank along at up to 10 feet per minute.) While cold weather doesn't delay installation (you can even weld PVC in the rain), you do have to adjust the welding temperature upward to compensate. Likewise, in hot weather, you need to lower the welding temperature accordingly.

What you're looking for is a characteristic "bleed" at the seam edge, where molten material is squeezed out ahead of the seam roller **(11)**. That tells you that you have a fully welded bond. We use a pointed probe to check for any loose spots that would void the manufacturer's warranty.

When mechanically fastened membrane is first installed, it's common to see slight waves in the surface where the material hasn't fully relaxed onto the substrate. Over time, as the material responds to temperature cycling, the material settles to a flat, smooth appearance.

Jim Bennette owns and operates J Bennette Roofing Inc., in Sagamore Beach, Mass.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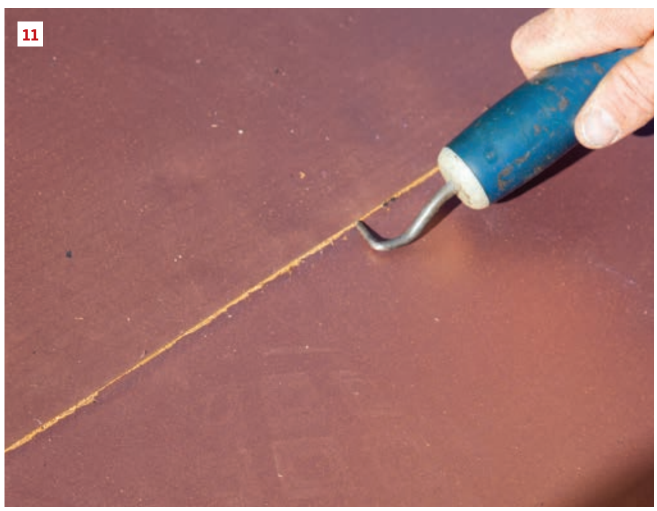
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Cubby Cabinets For a Mudroom

BY GARY STRIEGLER

I've never heard anyone complain about having too much storage in a house, and one place I try to provide plenty of storage in both remodeling and new-home projects is in the transitional space between the garage or entry door and the main house. I've heard these rooms referred to as mudrooms or launching pads. The cabinets I build for these spaces have cubbies where people can hang up their jackets, take off their shoes, and drop their things before entering the house.

In every bank of cubby cabinets I build, I try to include a partitioned space for each member of the family, with a place to sit for putting on shoes, a place to store shoes, hooks to hang coats and backpacks on, and at least one shelf or cubby to store things that don't hang. When asked, I've also included drawers and upper storage cabinets with doors in mudroom projects.

For the mudroom shown here, I built a fairly basic cabinet, with enough room for three cubbies, each 28 inches wide (I never make cubbies less than 24 inches wide). Because the room had 9-foot ceilings, I could make the cabinet $7^1/_2$ feet tall; for 8-foot ceilings, I keep the height of the cabinets to 7 feet or less.

I usually build the cabinet in two parts: a base section and an upper section that sits on top of the base. (The whole cabinet for this project would not have fit through the door in one piece). I make the base cabinet much like a window seat—usually 18 to 20 inches tall for a comfortable seat height, and 16 to 24 inches deep, as space allows. When I include drawers, I try to make the base cabinet 24 inches deep. I made this base cabinet 20 inches deep, and the upper section 12 inches deep.

Because I build the cabinets from scratch, I can match them to the decor of the house or give them a unique design. This particular cabinet was paint-grade, so I made the face frames out of poplar and the boxes out of $^3/_4$-inch birch plywood. The backs of the cabinets were $^1/_4$-inch plywood, but I've often used paneling instead to dress things up.

These cabinets usually get a lot of use, so I assemble them using glue and pocket-hole joinery to make them strong and durable. I rabbet the boxes together for alignment and to help conceal the joints, and I also use pocket screws to attach the face frames.

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Upper section pieces. Construction begins with rabbeting the vertical pieces for the upper cabinet, using a router **(1)**. A jig positions holes along the edges for adjustable shelf brackets **(2)**. The author drills pocket holes along the front edge of the vertical components for attaching the face frame **(3)**.

Build the upper section. Working in a large, flat area, the author drives pocket screws to assemble the face frame for the upper section **(4)**. He screws the box together, fitting the top pieces into the rabbets he cut into the top edges of the verticals **(5)**. Then, at the top of each section, he glues and screws one-by cleats for attaching the unit to the wall **(6)**. The cleats also add stiffness to the assembly. A second set of cleats act as spreaders and blocking to catch the bottom edge of the plywood back **(7)**. To account for the plywood, the two inboard verticals were cut 3/8 inch narrower than the outboard ones and the outboard verticals received 3/8-inch-deep rabbets along the inside edges. The extra depth gives the plywood back plenty of room.

The back. Because the upper cabinet is more than 4 feet tall, the back consists of two pieces. The author glues and nails the 1/4-inch plywood back to the cleats and to the verticals **(8)**. Next is the bottom of the upper section. It's also the seat for the cubbies, so it's wider. The author glues and screws it to the verticals **(9)**. The last piece of the upper section to go on is the face frame **(10)**, which attaches with pocket screws, drilled earlier. The upper section can now be moved so the base cabinet can be built.

The base section assembles much like the upper section except that it is shorter and deeper. The author attaches the bottom shelf 4 inches from the bottom of the box to create a kick space **(11)**. A spreader cleat along the top of the cabinet provides attachment for the plywood back, as well as support for the upper section when it is installed. The face frame attaches to the box with glue and pocket screws **(12)**, and the plywood back completes the assembly.

Combined unit. The base section is set in place first, then the upper section sits on top. Screws driven through the upper cleat and into the wall framing secure the upper cabinet in place **(13)**. The base also screws to the wall, and then pocket screws join the two sections together **(14)**. A large back-band molding with a rabbeted edge fits around the edge of the seat; a bullnose softens the edge **(15)**. The author uses a cove-and-bead bit to make a two-step trim detail on the top of the upper cabinet **(16)**. Short pieces of molding finish the back edge of the seat, and the cabinets are ready to be sanded and painted.