

Step-by-step: Coating out an overlaid plywood panel

by Raymond Chapman

As sign artists a large majority of our projects begin with the simple, often mundane process of preparing a substrate to receive our creative works of art. We call it "coat-out". While it may be one of the most common things we do, it is far from being unimportant. Proper preparation helps to insure a successful sign. It matters little how intricate our design may be if the sign fails prematurely because we did a lousy job of coating out the background.

The Internet message boards are

filled with questions about coat-out materials and procedures. One of the most basic elements of our craft is still one that perplexes both the novice and the experienced.

Each new generation that enters our profession faces the same problems that plagued many of us twenty or thirty years ago (or longer). Also, the suppliers of our materials are constantly changing formulas and procedures, so what worked for fifteen years may suddenly begin to show

signs of failure.

Several sign substrates are on the market which can be used directly off the shelf with little or no preparation for either vinyl or painted lettering. They are time-savers and may actually be a more durable and attractive product than what I am proposing here for certain applications. While these substrates are valuable it is still helpful to have a knowledge of one of the most basic of all of the procedures we use.

The workhorse substrate of the commercial sign industry has traditionally been Medium Density Overlaid (MDO) plywood, which may be labeled differently according to the manufacturer, i.e., Duraply or GPX. The generic name is MDO. (Contrary to some reports the "M" in MDO has nothing to do with "marine".) It is plywood covered on one or both sides by a wood pulp coating that resembles kraft paper. (The "Medium Density" refers to the grade of the wood pulp.) It provides a smooth canvas for our works of art and is more weather resistant than regular plywood.

The quality of this material varies greatly, even from the same supplier. One shipment may warp wildly, while the next is perfectly flat; one may be smooth, and the next may have visible football-shaped cutouts and coarse grain. Veneers and glues seem to be under constant experimentation.

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Figure 1. A piece of aluminum angle serves as a guide for the circular saw. It is held in place by clamps on each end. Since the distance from the blade to the edge of base plate is 1.5 inches, I place the straight edge at 37.5 inches.



Figure 2. The blade of the circular saw is adjusted so that about 1/8 of an inch runs below the MDO. Since the panel is on wooden sawhorses, the only damage is a small groove in the support. A sharp blade makes quick work of slicing off our panel from a 4-by-8-ft. sheet.



Figure 3. This handy block keeps the panel off the sawhorse and makes it easier to prepare the edges. It is made from scrap MDO and some screws. These can be placed between stacked panels if work space is limited.

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Figure 4. Since the screws are placed the width of a 2-by-4 they grip the sawhorse and keep the panel from sticking to the support due to paint running under the panel.



Figure 5. A 1/4-in. rounding-over bit is placed in a router. The edges of the panel are routed (both sides) to form a smooth, rounded edge. Most paint failures occur where the paint film must try to wrap a sharp angle, thus the sharp points are removed. I keep this bit in one router all the time. It is a simple procedure to just pick it up and go to work without having to readjust with each use. Other routers are equipped with other often-used bits.



Figure 6. Using my fingers, I apply exterior carpenter's putty to all exposed edges. Since the edges have been rounded over with the router, this process goes quickly. At this point the edges are extremely smooth, so the danger of splinters is nil. In my left hand is a ball of putty ready to be inserted into the dispensing tool.



Figure 7. The palm is the perfect form for shaping and smoothing the putty. This is done every few feet before the putty hardens.

While quality may vary, the price seldom does, except to increase.

MDO may be purchased in its raw state, or with a primer coating. Some suppliers also may provide a preprimed panel at an additional cost. Several years ago I used preprimed MDO and just rolled on a finish coat of enamel. Without informing the consumer, the primer was changed and failures began to occur—the finish coat would separate from the primer after about six months. It seems that the acrylic primer was so slick the finish coat could not bond to it. Also the edges of preprimed panels were susceptible to early failure because of the sparse layer of primer. For these reasons I now use raw MDO and apply my own edge treatment and primers.

As this is being written, my choice for MDO is Simpson Two Step, which has provided the most consistent level of quality for my area. Although it is available with a coating on one side only, I use the good-two-side (G2S) almost exclusively to insure a durable finished product. The difference in cost is minimal compared to the cost of the completed sign.

Coating out a board

The job used for this article is a 3-by-4-ft. single-faced sign that will hang from a structure provided by the customer. Although the back will have no lettering, it can be seen as you exit the client's place of business—hence, it needs to be the same color as the front. The color is a special mix that is close to medium green. Half-inch MDO is chosen for the substrate.

For primer, I use Chromatic Fast Dry Blockout [Akzo Coatings Inc., 5555 Spalding Dr., Norcross, GA 30092; 770-662-8464], but each paint company has a similar product. There is a growing trend to use all water-based products, and I have been leaning in that direction. But since I've had such good

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Figure 8. After the putty dries, the edges are sanded with 120-grit sandpaper on an orbital sander. You can also do this by using a folded piece of sandpaper in the palm of your hand. The paint will now have a continuous surface on which to adhere, without a “seam”.

The surface of both sides is also scuffed with the orbital sander. This may not be necessary, but gives me peace of mind that the paint film has some “tooth” to hold on to.



Figure 9. The dust is blown off with compressed air, with special attention given to the edges. The tops of the sawhorse are also cleaned so that there will be less chance for sawdust to migrate into the wet paint later. Usually several jobs are prepared at once with the floor being swept before the paint is uncorked. Fans in the shop are now turned off to help settle the dust.



Figure 10. A tack rag is used to remove the lingering powder missed by the air pressure. Again, special attention is given to the edges. Both sides are wiped down with the tack rag. Between use, tack rags are kept in covered containers.



Figure 11. The paint mixing area is in the rear of the shop, away from the customer's sight. It is by nature a messy area so it is kept from casual view. The box below the table is on rollers and contains empty mixing cans and baby food jars. Solvents and paints are kept in metal lockers. A fluorescent fixture over the mixing table provides ample light for getting just the right color.



Figure 12. Before a new can of paint is used, holes are driven into the lid channel to keep the paint from building up and preventing the lid from seating properly. Since I am dealing with solvent-based paints I normally try to wear latex gloves to protect my skin. The paint is stirred to get the heavy deposits off the bottom of the can.



Figure 13. The primer is stirred and the concoction is fine-tuned until it runs off the stick at just the right consistency. Don't ask me what that is—it just looks right. Kind of like buttermilk, more or less.

How much does it cost to prepare a 4-by-8 for lettering?

Coating out a MDO panel is one of our most common activities, but do we really know how much time and material it takes to get our canvas ready? Below you'll find a list of each operation involved in coating out a 4-by-8 sheet of half-inch overlaid plywood and the time each took, plus the materials used.

A stop watch was used to time each procedure. All the motions that I normally go through to get a

| | |
|---|---------|
| Prepare and Prime | Minutes |
| Set up panel on sawhorses and get router | .75 |
| Rout edges of both sides | 4.00 |
| Putty all edges | 5.00 |
| Wash putty off hands | 1.25 |
| Sweep up router "sawdust" | .75 |
| Sand edges and scuff both sides with orbital sander (after putty dries) | 6.50 |
| Dust off and tack rag both sides and edges | 2.25 |
| Mix paint, gather roller, cover and pan | 2.50 |
| Prime one side and edges | 4.50 |
| Turn panel over, prime other side and edges again | 4.00 |
| Clean paint tray, cover paint and store | 1.50 |
| Total time to prep and prime | 33.00 |
| First finish coat | |
| Sand primer on both sides and edges | 6.50 |
| Dust off and tack rag both sides and edges | 2.75 |
| Mix paint, gather roller, roller cover, and strain paint | 3.25 |
| Paint one side and edges | 3.50 |
| Brush bubbles and wipe drips with 3-in. foam brush | 2.25 |
| Turn panel over, coat second side and edges | 6.00 |
| Brush bubbles and edges | 2.50 |
| Total time for first coat | 26.75 |
| Final coat (the following day) | |
| Sand one side with orbital sander, dust, and tack | 3.25 |
| Get out materials, strain paint into tray | 3.00 |
| Roll final coat on one side and brush bubbles | 6.00 |
| Clean paint tray, store paint, and clean up | 2.25 |
| Total time for final coat | 14.50 |
| Total time to get panel ready to letter (That's about 1 hour 15 min.) | 74.25 |

panel ready for lettering were covered—including getting out the equipment and putting everything away. You might want to try a similar exercise—it will be a real eye opener.

For this experiment I prepared only one panel, while my normal procedure is to coat out several jobs at a time. Therefore, some of the procedure times and materials for this one sheet of plywood would normally be spread over a number of projects.

| | |
|---|----------|
| Materials | |
| One 4' x 8' x 1/2" MDO delivered to door | \$33.60 |
| Primer | 1.50 |
| Paint | 2.00 |
| Solvents and additives | .50 |
| Two sanding disks (80 grit and 120 grit) @ .43 | .86 |
| Two pairs disposable gloves @ .10 | .20 |
| Three 9" foam roller covers @ .52 | 1.56 |
| Two 3" foam brushes @ .28 | .56 |
| Three paint strainers @ .12 | .36 |
| Exterior wood putty | .05 |
| Approximate pro-rated cost of roller frames, pans, etc. | .15 |
| Total material cost | 41.34 |
| Total labor and material | |
| Labor: 1.25 hours @ \$60.00 per hour | 75.00 |
| Material cost | 41.34 |
| Material mark-up | 20.67 |
| TOTAL | \$137.01 |

From this exercise it is evident that I have to charge \$137 for this sign *before* any artwork or lettering is added, plus any charge for delivery or installation.

You may estimate your work using a different process so you can plug these times and your material cost into your system to find what you need to charge for a coated 4-by-8. Remember, though, that the shop rate includes overhead costs and other expenses.—*R.C.*

Editor's note: For information on determining an hourly rate, see Jeff Cahill's article, An Accurate Hourly Rate Makes Pricing Simpler, which appeared in the May/June 1989 issue. His worksheet, Determining an Hourly Rate, is available on SignCraft's Web site at www.signcraft.com.

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Figure 14. The primer is poured through a strainer into a paint tray. The high tech contraption that holds the strainer is a coffee can with the bottom cut out. The attached wire is for hanging it over the side of a trash can when not in use.



Figure 15. The 9-in. foam roller cover is saturated with paint. I apply a heavy layer of primer, so the roller goes through the paint several times and then is paletted over the ribbed portion of the tray.

The actual procedure that I use to get the paint on the panel seems to change with every job. Usually I begin by putting the roller down near the center of the left side of the panel and stroking up and down. I will work from left to right, overlapping each stroke. The roller is worked up to almost the top edge of the panel, then back to almost the bottom edge. Don't set the fully charged roller down on an edge, or the paint will run off the panel and make an unsightly drip on the other side.

The second stroke slightly overlaps the first. A ridge builds up because there is a heavy deposit. Another stroke is made to blend the two stripes together. Rather than continuing to roll on the paint until the cover is empty, the roller is charged with paint again after only these first two stripes are laid. The third "column" overlaps its neighbor slightly, and the process continues across the panel. After each stripe is laid, I roll back and smooth over the "seam". This procedure is done in an orderly fashion rather than just randomly pushing paint in every direction. The roller is never allowed to run dry.



Figure 16. After the panel is covered the primer is rolled in vertical columns at a 90-degree angle to the first passes. This further smooths out the paint and reduces the ridges built up by the edge of the foam cover.



Figure 17. Usually, the roller is run around all four edges. This is usually done in two passes for each edge since the sides of the panel are rounded over.



Figure 18. A foam brush is used to smooth out the drips that have run under the panel, or sometimes just a swipe with a paper towel cleans up the mess.

results from the current products and methods, I am reluctant to change.

I use plastic stirring sticks from an automotive paint supplier. When they build up with a lot of paint, it's easy to strip off the gunk with a utility knife or drop them in a can of lacquer thinner.

To allow the primer to flow out more smoothly on the panel, a small amount of Chromatic Edge is added. There is no formula for this—just add some in. In hotter weather more is used; when it's cooler, less is needed.

Since this project was being prepared on a warm spring day a small amount of Chromatic High Temperature Reducer was added. On cooler days the paint is used directly from the can. I would advise against using a generic paint thinner or mineral spirits because they may thin the paint drastically and prevent proper coverage. In my estimation, VM&P naphtha is a good reducer for paint. Each of us old geezer sign painters has our own favorites when it comes to paints and solvents.

Finishing up

The next day this panel was again sanded, tacked off, and a second coat of green was applied just as in the previous steps. Although not shown, this panel was painted on both sides with each process. The back was to be seen but would have no lettering, so the panel was turned over onto the blocks while still wet. The only damage is some small dots in the paint caused by the screws. These are easily touched up when the sign is installed.

The edges are painted with each side's application of paint, so this sign received three coats on each side, but six layers on the edges.

While this is the procedure used for the majority of my signs, several panels are usually coated out at

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Figure 19. To clean the excess paint out of the roller I use a paint scraper that has a circular notch in the side. The leftover primer is pushed down into the tray. Excess paint is cleaned out of the tray by using the foam brush, then put back into the can. The paint lid is secured with a rubber mallet.



Figure 20. The following day the primer is sanded with a 120-grit disk. The edges are usually sanded by hand. A dust brush does a good job of removing most of the sanding debris. The panel is also quickly wiped down with a tack rag.



Figure 21. A deep green is mixed using Chromatic Bulletin Enamel. The process of rolling is repeated—long, parallel strokes with a heavily loaded roller.

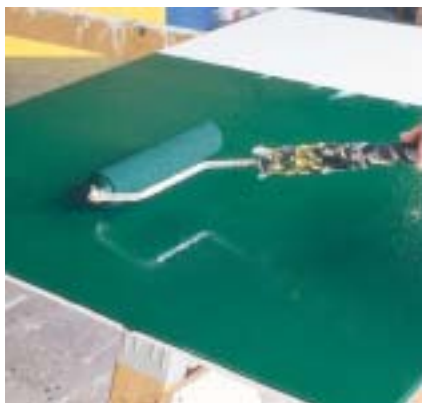


Figure 22. Throughout the process I back up and smooth out the ridge produced by the edge of the foam roller, where it overlays the previous stroke.

After the panel is covered, parallel strokes are made at a right angle to the first ones to more evenly distribute the paint



Figure 23. The edges always receive special attention. Notice the bubbles in the paint.



Figure 24. A foam brush is stroked lightly over the panel to pop the bubbles. I am not spreading paint, but just allowing the weight of the brush to smooth out the imperfections. Don't forget the edges. Drips are cleaned up with this step, too.

Any fuzz (or trapped insects) is removed with a stencil knife. A fan helps speed the drying process, but make sure it's not blowing dust into the paint.

the same time to reduce setup and cleanup time. Four or five 4-by-8 sheets are coated out at a time and kept in reserve for the typical jobs that come through the shop.

They are usually given one coat of white, then the final cover color is added when the job is sold. Most of the time I'll route the edges of leftover pieces, such as the 4-by-5-ft. piece from this job, and prime them to be ready for the next job.

Your procedure may differ greatly from what I have described. If you get a durable finish on which to add your artwork, I have no argument with your approach. Over the years this has worked for me.□



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Figure 25. A dab of paint is added to the cover of the can for future identification, along with the name of the project and what type of paint was used.□