

Paint-Grade Cabinets

Preparing wood for a demanding finish

by Lars Mikkelsen



Picking paint as a furniture finish is not just a matter of shuffling color swatches. As Lars Mikkelsen discovered when he built these cabinets, painted work requires design decisions, materials and preparation different from clear-finished work.

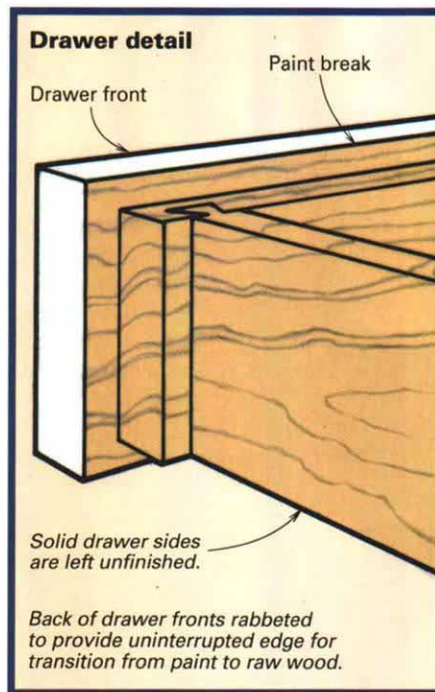
Most of us who work in wood love its color, grain and texture, and we usually build to show off these characteristics. So when a client called and asked me to make a built-in stereo and display cabinet that had to be painted high-gloss white, as shown in the photo at left, I hesitated a little. But when I saw his house and the room the cabinet was to go in, it was obvious to me that paint was what this job called for. It is a modern house, sparsely furnished, with light-filled rooms defined by strong geometric forms. It was an excellent setting for a built-in cabinet that blends architectural and furniture detailing, and a good place for paint. Once I had accepted the logic of a paint finish, and also had accepted the job, every subsequent move I made was affected by the choice of finish—from decorative and structural decisions through selection of the materials to construction and sanding.

Planning for paint

There are all grades of paint finishes, and it's important to have a clear idea of what you are aiming for before you begin. I talked with the client at length about the level to which the painting should be done. We wanted something well above the average wall-and-trim job, but taking it to the level of a grand piano would have made the cost of the prep work and the painting prohibitive. So we agreed to try for something in between: A bit of grain texture might show under careful inspection, but the overall impression should be clean and unblemished. With an understanding of what we both expected, I was ready to begin.

When designing for a clear finish, the color and grain of the wood are often the central point. A big, flat panel can be spectacular if the grain is right, and curved grain along a focal axis can pull a piece together and make an otherwise very plain design a thing of beauty. All this is lost when you paint. What you gain in return is beautiful clean shadow lines, undisturbed by grain pattern and texture. Paint emphasizes the volume of intersecting planes, and I took advantage of this in the design of the cabinet. The piece was to be built into an alcove formed by a series of sharp-edged, squared-off arches that stepped out into the room. I adapted this step pattern for the cabinet's detailing, echoing and altering the step motif, playing off it without exactly reproducing it. I would have designed differently for a clear finish because the distinctive geometric patterns and proportions I settled on would have seemed cluttered and confused had they not been painted.

I try to design built-in furniture that looks truly built-in, like the beautiful buffets so often found in Victorian houses. Thinking of trim as an important design element contributes greatly to the in-



How to pick your painter

To prequalify a painter for a difficult finishing job, I would recommend asking to see what he considers his finest work. I'd also ask him to explain in detail just how the finish will be achieved. I'd have him pre-finish one door panel using the materials and finish specified for the job. The client would approve that sample for color, gloss, smoothness of finish and durability, and then it would be used as a job standard. I have often volunteered to do this when the situation warranted it, or when the client was unfamiliar with my work. □

Dave Hughes is a professional finisher in Los Osos, Calif. For a description of how he painted Lars Mikkelsen's cabinet, see p. 64.

tegrated look that I always seek. It's easy, when designing built-in cabinets, especially painted ones, to fall into the trap of making misplaced kitchen cabinets. I try my best to avoid this by developing detailing that will give the piece a look of permanence, of belonging where it stands.

Because the piece was to be fairly big, I broke it down into four components that could be easily transported and assembled on site. I used a raised frame detail all around and between the major components. I applied these trim strips when the cabinets were set in place. This not only covered seams and edges but underscored the visual theme of the cabinet.

To take advantage of the strong shadow lines, I made all the doors and drawers inset—flush with the surrounding surface—and free of exterior hardware. With inset doors and drawers, an even gap is always important, but when a black gap line is contrasted with white paint, small discrepancies become obvious to even the untrained eye. And I was making the tolerances small, so I needed hardware with fine adjustment. I wanted concealed European hinges for the doors and chose Grass 1006 hinges on 20mm mounting plates. I picked the 1006 because it's relatively small; I was advised, though, that it won't work with inset doors that are any thicker than ¾ in. The doors are held closed and sprung open with Hafele touch-latches. For the drawers, I used Accuride full-extension slides and 1041 Flexa-Touch pushers. I purchased my hardware from Capitol Hardware, 1519 Riverside Ave., Paso Robles, Calif., 93446; (805) 238-7669.

I wanted the doors painted on both sides, but for the drawers, I wanted only the fronts painted, leaving the solid-maple drawer boxes unfinished. This posed the problem of where to make the transition from painted surface to raw wood. I solved it by running a rabbet around the inside edge of the drawer front, establishing a clean, uninterrupted line for the painter to tape off, as shown in the drawing above.

Materials to fit the finish

The materials I chose for this job were determined largely by their paintability. I needed something without open pores or great differences between hard and soft grain because such differences would telegraph through paint. I ended up choosing poplar for the solid wood and shop birch plywood. Both are relatively inexpensive, mill well and require minimal preparation for painting. Other choices for solid wood could be maple, birch or alder. The main reason I chose poplar over the others was the ease with which it can be milled. For sheet goods, medium-density fiberboard is a possible choice; it paints nicely, but is extremely heavy to haul around and, therefore, easy to damage.

Stereo speakers were to be housed behind the top doors on ei-

Spraying an opaque finish on furniture

by Dave Hughes

Ask any painter familiar with high-quality finishes and he or she will tell you that furniture-grade paint finishes are far more demanding than natural wood finishes. The simple reason is that the opaque surface of the paint highlights any defects or irregularities in grain and texture. Surfaces must be sanded, caulked, puttied and re-sanded several times, and still some rubbing out and polishing may be required to achieve satisfactory results. The deeper the color and higher the gloss, the more demanding the process. With so many variables to be controlled, a patient, methodical approach is essential in applying opaque finishes.

Now, try to achieve that flawless finish inside a client's home, with kids, dogs and neighbors dropping by for a look...to be candid, I didn't have too much enthusiasm for attempting the on-site finishing of Lars Mikkelsen's cabinets until I saw them for myself. They posed a real challenge, both technically and logistically, and that is what got me involved.

On any on-site job, you have to take particular care to cover and to mask off all adjacent surfaces and any parts and hardware that won't be painted. The tape I use is 3M's Longmask, a fine-creped blue tape with high tack that leaves no residue. I rub it down with a fingernail, and it provides an excellent edge seal, allowing no paint to creep underneath. With oil-based finishes, the tape can be pulled up when the paint is dry. With latex, which has greater bridging capacity, I score a line along a straight edge with a razor blade before removing the tape.

Good lighting is also critical for a top-quality paint job. Natural light is always best, but when I do use lamps, I place them far from the work to minimize glare.

The cabinets on Lars' job were already sanded quite smooth when I began work on them, but I always count on a certain added amount of time for re-sanding, putting and caulking because you can't really see the surface in detail until that first coat goes on. I have found it is best to fill all you can easily see; then apply a first coat of primer, and repair any small areas you have missed. The essential thing is to catch all of these before entering into the final-coats phase. This careful, methodical filling and sanding is where the patience factor really tells. For a fine finish, you must spend a certain amount of time just *looking* at every piece.

Lars had removed the doors, and I fitted each one with two small finish nails in the top and bottom edges (as shown in the drawing above) to act as stands for spraying, handling and drying. Then I set up a makeshift booth in the garage to spray the doors and drawers.

The primer I sprayed was Sherwin-Williams Hi-Build Lacquer Wood Surfacer reduced about 35% with medium-fast lacquer thinner. I used a high volume, low pressure (HVLP) spray unit, which, with its portability and reduced overspray, is particularly well-suited to on-site work. I used the HVLP unit with a Capspray fine-finishing gun.

After spraying two coats of lacquer wood surfacer, I lightly sanded all surfaces with 400-grit wet-or-dry sandpaper that I first broke in on the backs of doors or bottoms of cabinets where dry-fall overspray accumulates. I turn the paper over and use the pa-

per backing to abrade the knife-edges of doors, drawers and trim to avoid burning through the finish.

The third coat of primer was a final fill-coat, not really sanded, but rubbed with the back of sandpaper for smoothness. Before every operation, I used a static-free tack-rag and blew the surfaces off with the air line on the spray gun. I allowed four hours between coats of primer because that's how long it took to spray a coat on the case and all the parts. But a lacquer undercoat is generally dry and ready to sand in 45 minutes to an hour, depending on the weather.

I applied two finish coats of Benjamin Moore Ironclad fast-dry industrial enamel, which has superior leveling-out characteristics and fast set-up time. The short tack time is critical when finishing on-site to minimize dust settling onto the finish. I thinned the enamel with about 30% xylol solvent and sprayed it at orifice settings between .006 and .009, something less than half the opening you would use to paint an ordinary wall.

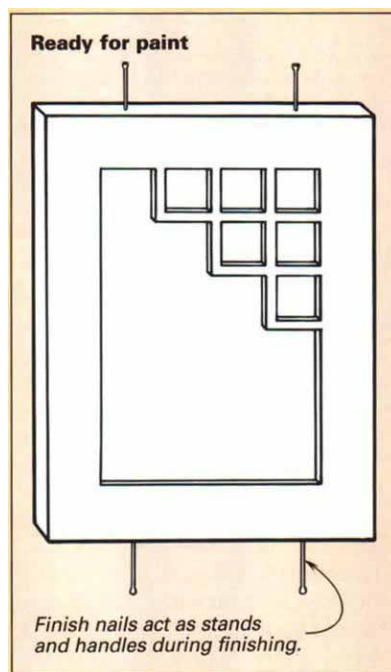
I alternated between vertical, horizontal and conical spray patterns as I worked to suit the intricate detailing on the cabinet doors, with the spray pressure just high enough to atomize the enamel. The Capspray gun enables me to spray in a cone pattern about the diameter of a pencil—it's practically an airbrush at that setting—which worked beautifully in the square decorative recesses of this cabinet. For the doors and frames, I switched to a 6-in. to 8-in. horizontal fan pattern.

A single coat was actually a two-step process. On the doors, for instance, I laid down a light tack-coat initially to cover the surface, rotated and tack-coated the back, and then flipped and rotated back for a full flowing coat. This method allows me to see how the material is performing and adjust viscosity, spray pattern, pressure and fluid levels before committing to a full coat. It also lets me lay down more material in one coat. I sanded lightly between coats of

enamel with broken-in 600-grit paper, wiped down with a tack rag and allowed 24 hours between coats. I applied a third coat to all the doors and countertops.

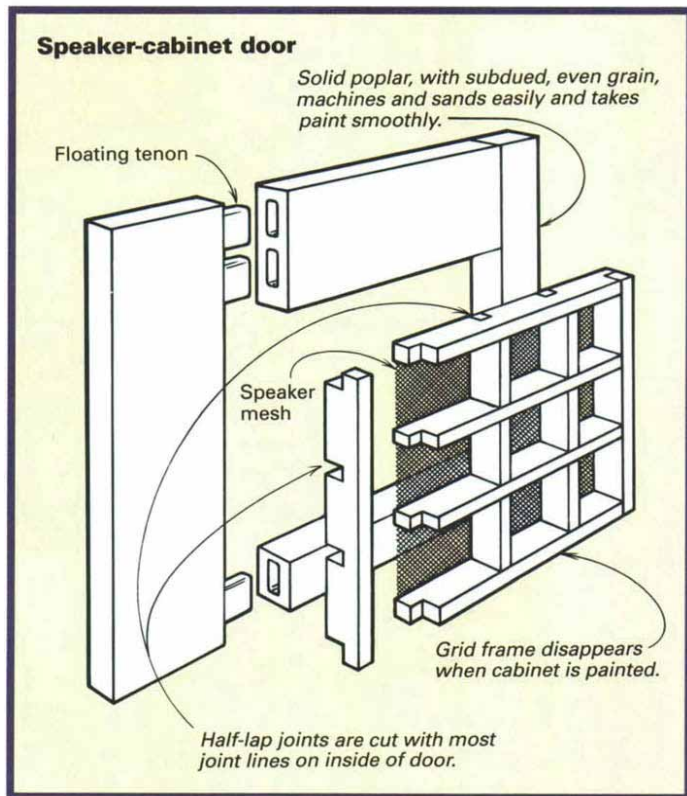
When the final coat on the doors had dried hard, I removed the nail stands, puttied the holes and touched them up with two coats applied with an artist's brush. This was the only brushwork on the job.

After spraying the final coat, I took a few days away from the job before returning to do a final inspection and any necessary buffing out or touching up. The hiatus gave me some perspective and also let the finish cure hard and reach its final sheen. If you do any small repairs before the final sheen is reached, you may find they stand out later, looking either too glossy or too dull. I repair tiny blemishes by rubbing out with rottenstone or #00000 steel wool or buffing with alcohol and a tightly woven cotton cloth. A slow, hard rub with a coarser abrasive will give a matte finish while a fast, light stroke with a finer grit will yield a glossy one. By carefully adjusting the amount of pressure and the type of polishing compound, feathering out any touch-up areas and matching the sheen to the surrounding surface, you can approach a showroom finish with an on-site application. —D.H.





Nail in the rail—The author shoots brads through the frame of the door to keep it from shrinking away from the panel, which could crack the paint and expose unfinished wood.



ther side and the center door below. I made open-grid panels for those doors and covered them on the inside with sheets of metal speaker mesh (available from better stereo outlets). The mesh was painted to the same color as the cabinet and was easy to cut and install with small screws.

Joint selection

Both the finish and the siting of the cabinet were factors in my selection of biscuits for its major joinery. Using biscuits alone on a freestanding piece that could take a lot of abuse over the years might not be a good idea; but once a built-in is in place and attached to the walls, there is not much stress on the joints. So I felt this technique would be amply strong. Because the sides of the cabinet would be hidden when it was put in place, I used screws to draw the joints together while the glue set. I lipped all the plywood with $\frac{3}{4}$ -in. by $1\frac{1}{8}$ -in. strips of solid poplar that I biscuited, glued and nailed on. It saves a lot of time to nail the wood on rather than clamping it, and the spackled nail holes disappear under the paint. I also find that with nailing, I can locate the lipping exactly, but with clamps, the strips are a bit more difficult to control.

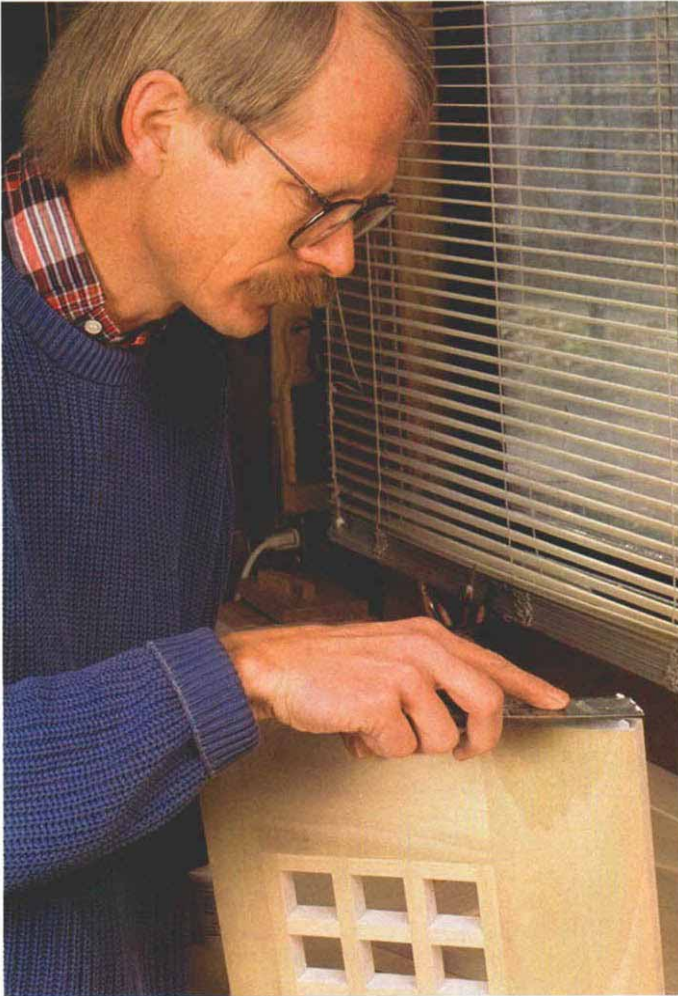
Though the carcass of a built-in does not take much abuse and you can use some shortcuts in its construction, this is not true for the doors and drawers. They need to be made with the same strength and care as for any freestanding piece. I made the drawer sides of solid wood, and then I joined them to the fronts with sliding dovetails.

I joined the stiles and rails of the doors with loose tenons. The mortises for these tenons I can cut with great precision on my mortise fixture (see *FWW#92*, p. 55). The solid doors have a $\frac{1}{4}$ -in. birch-plywood panel sitting in a groove. It is important that this panel never move in the groove, and thus expose unpainted wood, so I nailed it in with a few brads, as shown in the photo at left. The steps in these doors are strips of solid poplar $\frac{1}{2}$ in. wide by $\frac{1}{4}$ in. thick, half-lapped and glued in place. The open grids for the speaker cabinets are made with $\frac{1}{2}$ -in.-wide by $\frac{3}{4}$ -in.-thick pieces of solid poplar, half-lapped at every joint, as shown in the drawing below. Had these doors been left clear, I probably would have mortised the end of each crosspiece of the grid into the stiles and rails. But because no grain would show, I made the grid as an independent unit with a frame of its own, with all half laps, and then glued up the stiles and rails around it.

Paint prep

It would be hard to find someone who really loves filling and sanding, but the job can be made easier and less tedious by doing as much as possible as you build. For many parts, it's much simpler and quicker to do the prep work before assembly. I carefully filled and sanded the plywood panels in the solid doors before glue-up. On all the pieces of lipped plywood for the carcass, I sanded the wood flush to the plywood with a belt sander that I slowed down with an electronic speed control. The slow speed makes this operation much easier and safer. Next I inspected all the pieces carefully and then filled and sanded any little cracks or dings that might show up later. Remember that paint really magnifies these blemishes.

When the carcasses were assembled, I applied white latex caulk to all the many corners whether I could see a seam or not. I used spackle for any joint or surface that would be sanded. All this filling must be done carefully because even a hairline crack will show horribly once the paint is on. To achieve clear, crisp lines and joints, it is important to press caulk into the cracks but immediately remove all excess, leaving interior corners square rather than forming a little cove of caulk. To do this, I laid down as small



Even with end grain, it's best to scrape off most of the spackle. If necessary, apply a second time rather than build up a thick layer. Do a last round of filling when the piece has been primed. The layer of finish will highlight any imperfections.



Fill every corner, whether you can see a seam or not. For long runs, caulk is best, but in tight quarters, like the door panel grids, the author uses spackle because it's less messy. With a freshly filed putty knife, he removes 95% of the filler he lays down.

a bead of caulk as possible. Then I used a putty knife that I had filed down so that it came to a knife edge and its corners were sharp and square. I probably removed 95% or more of the caulk that I applied. I don't worry about small smears of caulk or glue, but all protrusions should be removed.

After gluing up the doors, I caulked all around the groove and panel joint, cleaning it up with my putty knife. I filled the seams between the grid pieces with spackie, as shown in the bottom photo. When there's a long run to fill, it's easier to lay down a bead of caulk, but in tight spaces like the grids, caulk will make a mess. It is important to work methodically at this, so as not to miss any of the little seams. Then I took all the doors to be thickness-sanded. Some cabinet shops offer this service, and it is very worthwhile. It saves time while doing a superior job, keeping everything wonderfully flat, resulting in a beautiful, clean reflection of light when painted.

At this point, all parts had been made, filled and sanded, and all I needed to do in the shop was to fit the doors and drawers in their openings. Before fitting anything, I assembled the four individual carcasses, screwing them together and shimming them as needed to get everything straight, flat and square. I glued my shims in place so that they would stay on one of the carcasses. That way, when I later assembled the carcasses on site, I was sure to get them exactly the way they were when I fitted the doors and drawers, saving a lot of frustration and awkward planing. I then sanded everything down to 180-grit with my random-orbit sander and broke all sharp edges by hand-sanding, creating a small roundover. A roundover always looks nice, but when painting, it is absolutely essential because paint will not adhere to sharp edges and a dark line will appear.

Installation

Now the moment of truth. No matter how many times I have done installation, it is still stressful until everything is in place. This time everything went smoothly, and the major components were quickly set and screwed together. I then shifted the unit around a bit in the wall opening to get all side margins as even as possible. I removed all doors, drawers and hardware, numbering all the hinges so that I could put them back where they came from. This makes re-installation much faster because almost no fine-tuning is needed. I left the drawer guides in place and then covered them with tape.

Though this is the point when I hand a job off to the painter, I always make certain to return when the piece has been primed. With the first coat on, previously unnoticed flaws can readily be seen, and it is the last chance to repair them without having to repaint everything. (For a detailed description of what went into the painting of this piece, see the box on p. 64.) In this case, there was nothing for me to do at the priming stage because the painter had already done any filling that was needed. I always insist on rehanging the doors and hardware myself: This is not a painter's job, and he or she cannot be expected to do it so that the doors fit properly.

The payoff

Finally, everything was done, and I could see the piece the way I had imagined it while doing the design. I was hoping my client would be as happy as I was. I got a clue when I returned for my check and found the furniture rearranged. Before, it had been facing the fireplace, and now it all faced the cabinet.

Lars Mikkelsen is a professional cabinetmaker living in Santa Margarita, Calif.