



Brush a complicated surface in several stages, working from the deepest surfaces, like the bevel on this raised panel door, to details, like the molding the author is brushing here with a sash brush. Apply finish to the panel field and door frame last.

Brushing on a Finish

Good preparation and flowing strokes yield smooth results

by Chris A. Minick

If you learned to use a brush by painting your house, the clear finish you brushed on your latest woodworking project probably doesn't look too good. Why? Because paint and varnish are very different materials. Paint needs to be vigorously brushed back and forth to get it to lay out thin because it's *thixotropic*, meaning that it's thicker when at rest, thinner when energy is applied to it. But varnish applies most evenly when it's gently flowed onto a surface.

My flow-and-go method for brushing a clear finish on woodwork was taught to me by my grandfather who was a professional finisher. I've found his combination of finish preparation and brush handling to give my projects a final appearance that rivals the smoothness of spraying. The method works for most common wood finishes like oil-based varnish, brushing lacquer, water-based finish and shellac. But before dipping the brush in the can, we must choose and prepare the finishing material.

Picking and preparing the finish

Fast-drying finishes are harder to apply by brush than slower drying finishes. Oil-based varnishes dry slowly enough to allow ample time for leveling, allowing you to work at a leisurely pace. For that reason, oil-based polyurethane varnish is my favorite brush-on finish. At the other end of the spectrum, shellac is probably the most difficult common finish to apply, especially to large areas—it just dries too quickly. I limit my shellac brushing to small projects

that I can completely coat in about 10 minutes. Likewise, most water-based finishes brush well but require a quick hand. Solvent-based lacquers are easier to brush, and retarders can be added to them to slow down drying.

Most finishes are too thick to brush right out of the can. Thinning with the appropriate solvent is usually necessary. Brushing a too-thick finish will show brush marks and streaks while an over-thinned finish tends to run, sag and drip. To get the ideal mix, start by transferring the finish to a clean coffee can, so you can thin only the amount you want to use. Now measure the finish's thickness with a viscosity drip cup and a stopwatch. A viscosity drip cup holds a predetermined amount and has a precisely sized hole in the bottom; you fill it up with finish, then time how long it takes all the finish to drip out through the hole (see the photo at right). Cups are available in paint stores and, unfortunately, come in many sizes (in other words, there's no simple standard). I usually work with about a pint of finish, thinning it a little at a time and checking its viscosity as I go. If I over thin it, I add a little finish from its original container. I find a reading of 13-14 seconds with a Zahn #3 cup, 48-50 seconds with a Zahn #2 cup or approximately 20-22 seconds with a Wagner cup seems about right.

Begin brushing

Before dipping into the finish, wet your brush with the thinning solvent to condition the bristles and to prevent the buildup of

dried finish at the base of the brush. This minimizes the likelihood that any dried finish will flake off the brush and contaminate the freshly varnished surface, and it makes cleaning the brush easier. Strike off the excess solvent by dragging the bristles across the edge of the container.

Fill the brush with finish by dipping it so no more than half the bristle length is submerged. Capillary action will automatically fill the brush's reservoir (near the ferrule) with the proper amount of finish. Now tap the bristles on the inside of the can to remove the excess finish and to prevent dripping. Don't drag the brush over the edge of the can—this might cause bubbles to form.

Using the basic brushstroke described in the box at right, I always finish the unseen areas of my project first. This gives me a chance to judge the flowing and leveling properties of the finish before I've committed myself to the show side of the piece. If the viscosity doesn't seem right, I add more finish to increase the thickness or more solvent to decrease it.

If you're brushing a complicated surface, such as a carving or a raised panel door, it's best to brush the areas farthest away first, working outward from the center. I apply a coat to both sides of a door in one session by setting it on a nail board (a piece of thin plywood the size of the door with one nail in each corner).

Normally, I scuff-sand between each coat with 220-grit sandpaper to remove nibs or dust specks. Three or four coats is about right for most projects. After the final coat has dried for a few days, I rub out the finish and apply a coat of paste furniture wax.

Dealing with defects

Drips, runs and sags are a normal part of any finishing operation. Fresh runs and sags can be removed from the surface by back brushing the affected area with an unloaded brush; capillary action draws off the excess finish. Hairs, brush bristles or other goobers should be picked out immediately. A quick tipping off (see the box at right) blends and removes your fingerprints.

Sanding out a dried drip or run flush with the surrounding finish can create a halo around the defect. It's better to slice the drip off with a sharp chisel to remove the drip quickly and cleanly; only a little touch sanding is needed with 400-grit paper. □

Chris Minick is a chemist and woodworker in Stillwater, Minn.



The basic brushstroke

A smooth finish depends on smooth brush handling. My basic method begins with a back stroke 3 in. to 4 in. from the leading edge of the panel (right). Pull the brush smoothly, and lift it just before it goes over the edge. This back stroke virtually eliminates runs along the edge. I finish the stroke by starting just behind the back stroke's wet edge and pulling the brush in one slow and continuous motion across the panel (left). Pull the brush along slowly enough to allow an even sheet of finish to flow out of the brush, but fast enough to prevent pooling. My 2-in. brush holds enough finish for a single stroke about 20 in. long, which takes between five and seven seconds.

I hold the brush loosely by the ferrule with the handle cradled between thumb and index finger. I start with the brush at about a 45° angle and gradually increase the angle to almost 90° by the end of the stroke. As the bristle angle increases, more varnish flows out. When my brush approaches the trailing edge of the panel, I decrease the pressure slightly so the bristles don't run over the edge. Each successive stroke just barely overlaps the previous one. After the whole panel is coated, I tip off the finish by lightly dragging the bristle tips through the wet finish. Tipping off with an unloaded brush levels any uneven areas and removes bubbles. Any small bubbles left can usually be dispersed by lightly blowing on them from close range. —C.M.



Checking the viscosity of a finish is the best way to know how much thinner you need to add to get the best finish flow. A stopwatch clocks the time it takes for a viscosity drip cup filled with finish to empty. Add more thinner until the time is optimal (see the section "Picking and preparing the finish" on the facing page).

Remove the excess from a loaded brush by tapping the bristles lightly on the sides of the can, side to side. This prevents the brush from dripping and doesn't create air bubbles, which can end up on the finished surface.

Slicing off a dried drip with a sharp chisel is probably the cleanest way to remove the defect.