

A Knock-Down Spray Booth for the Small Shop

Finishing with spray equipment is an awfully appealing way to get the job done. It's a good bit faster than using a brush, and with a little practice it delivers a smoother, more uniform, more easily finished finish. As efficient, good-quality delivery systems become more affordable, and as the increasing popularity of water-based finishes makes spraying in the small shop a tolerably safe proposition (please see page 4), more and more woodworkers are taking advantage of spray technology.

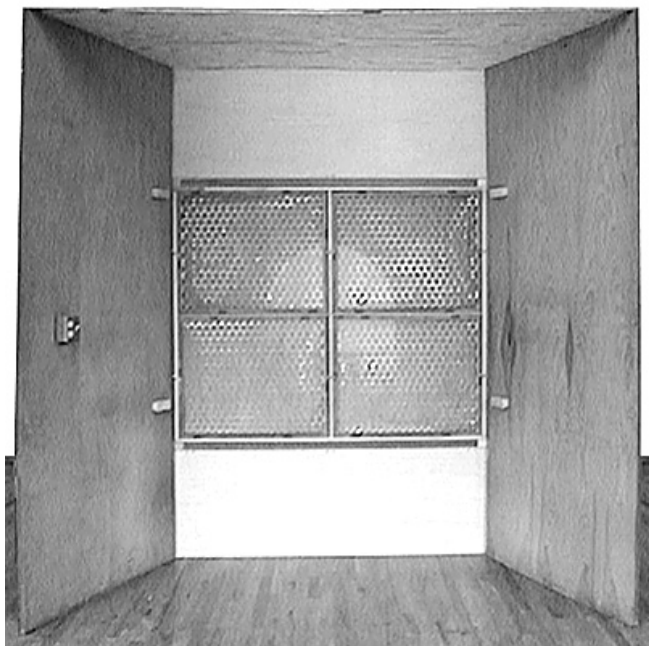


Figure 1
The assembled booth with side walls and ceiling is 8 feet high by 8 feet wide at the front, narrowing to 5 feet wide at the filter wall.

There's always been a problem more serious than cost, however, and it's a problem that even highly efficient high volume, low pressure (HVLP) spray systems can't entirely eliminate. Overspray is a term that describes all the droplets of atomized finish that go somewhere other than onto the work you're trying to finish. The state of the art these days is such that even the very best spraygun will turn close to 20% of your finishing material into overspray — and while that might sound pretty good compared to conventional efficiencies as low as 50% or worse, it's still a lot of finish left hanging.

Some portion of overspray will blow right past the workpiece and land on the floor or walls beyond, where it becomes a shop maintenance problem rather a finishing problem. A great deal of the stuff, however, remains air-



borne, floating around the finishing area in a thick cloud of tiny droplets. As the wet droplets of finish sail through the air they dry very rapidly, of course, and soon amount to nothing more than a cloud of finish-colored dust. As this overspray dust settles onto the fresh, wet finish on your workpiece, it contaminates the surface exactly as effectively as sawdust or dirt.

In many small shops the usual way around this problem is to spray outdoors, where the breeze wafts overspray away before it lands on the work (perhaps depositing it on your house and car instead). Pollen, bugs and airborne dirt mar the perfection of this system, and it is at best a distinctly seasonal option. It takes a controlled environment to make spray finishing as efficient as it can be, which means you've got to do it indoors — and that means you'll have to create a draft to replace that outdoor breeze.

Here at the store our spraying needs are similar to those in most small shops. We want to be able to spray indoors, but we can't budget part of our space or a major chunk of our budget for a dedicated finishing area. Through a couple of generations of design, we've devised a low-tech knockdown, fold-up spray booth with free-standing filter wall and fan mounting system that can be erected or disassembled in about ten minutes. Between jobs, the booth is parked out of the way against a wall (Figure 2).

The heart of the system is a 5' wide by 4' high by 16" deep box, whose front wall is a panel of inexpensive household furnace filters (which have proven quite adequate for capturing droplets of atomized



Figure 2
Spray booth components can be stored in a space roughly 4' x 8' x 10" deep.

finish), and whose rear wall houses a 24" commercial duty 3-speed fan.

Four 24" x 30" filters are secured with turnbuttons in a 5' wide x 4' high open frame (Figures 3 & 4). Two 5' wide by 2' high 3/8" plywood panels, permanently attached with tight-pin hinges, center the frame in what folds open to become an 8' high wall (Figure 3).

With the filter wall laid out on the floor, 16" wide x 8' high 1/2" plywood side walls are connected to it with 4



Figure 4
Turnbuttons hold the filters within screen stop ribs on the filter panel's 1x4 frame.

loose pin hinges each: two on the filter frame, and one each on the top and bottom panels (Figure 5). (Tip: to insure accurate alignment of all hinge leaves, do not measure anything. Screw the assembled hinges to both filter panel and side walls, then pull the pins to disassemble the structure. When you reassemble, the hinge barrels will knuckle together precisely.) Folding 16" x 5' long horizontal draft box panels in 1/2" plywood (Figure 6) are permanently attached with tight pin hinges to 2x2s on each side wall; on one side the 2x2 is mounted 2' from the top, on the other side 2' from the bottom. The free end of each panel is fitted with an angled cleat (Figure 7) that pulls it tight against the opposite side wall, locking the structure together so that one person can stand it up easily (Figure 8).

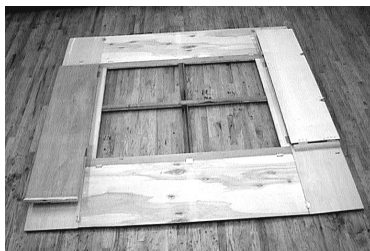


Figure 5
Removable 3/8" plywood side panels are attached to the filter wall with four loose-pin hinges on each side. Each panel incorporates a folding shelf, tight-pin hinged on 2x2s at bottom left and top right.



Figure 3
3/8" plywood folding top and bottom panels of are permanently attached to the filter frame with tight-pin hinges.

pair of brackets that slip onto the rear wall; they pop off for more compact storage (Figure 11).

The booth's side walls are full sheets of 1/4" plywood with reinforcing 1x4s attached along the edges. Single-handedly aligning tight-fitting hinge barrels while trying to control even a lightweight sheet of



Figure 7
Horizontal panels are equipped with self-tightening French cleats on the ends opposite their mounting hinges. On this bottom panel, note the channel that houses the rear wall.

plywood would be a maddening challenge, so an easier attachment system is in order. Very simple home-made hook & eye slip pin hinges make it easy for one person to make the connections (Figure 12). Screw the eyes into the filter frame's upper and lower edges.

Since the booth pictured here was built for spray finishing demonstrations it has no front wall, and since the classroom's ceiling is quite

high a spare sheet of 1/4" plywood laid atop the side walls helps direct airflow across the spray area (Figures 1 & 13). In your shop, you might want to consider rigging roll-up walls of plastic sheeting which can be stored against the ceiling joists, along with a roll-up front wall to better isolate the spray area from dust stirred up else-



Figure 6
The side walls are folded up and horizontal panels are being deployed to form a large box behind the filter wall, from which air will be drawn through all four filters.



Figure 8
The assembled filter wall is light enough for one person to stand it erect easily.

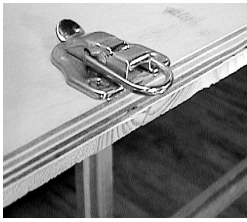


Figure 9
Draw catches secure the back panel against a strip of screen stop recessed under the top shelf.



where in the shop by the exhaust fan. A large filter panel for incoming air would keep out any dust stirred up by the exhaust fan. Within the booth, local dust can be tacked down with a light misting of water from your spraygun before you load up with finish. Unless you're sure you'll

finish nothing but small objects, plan an enclosable space as generous as possible to handle pieces as large as a 6' long table, a 7' high armoire or 8' shelving uprights; say at least 8 feet wide by 10' deep if your shop layout permits.

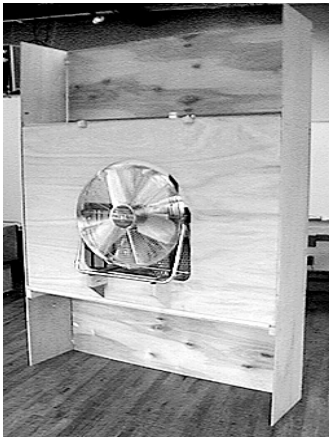


Figure 10
A single piece of 3/8" plywood forms the rear wall of the draft box, locking the entire structure into a nearly rigid unit. Our 24" fan sits in an opening cut to fit.

you usually need for general shop illumination. You'll want to leave your HVLP turbine outside the booth, but both turbine and exhaust fan should be switched within the booth for convenience. Bolt a pair of duplex electrical boxes back to back through one of the side walls, and wire receptacles on the outside to switches on the inside.

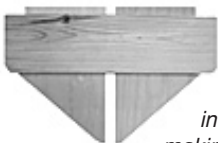


Figure 11
Simple brackets slip into notches in the back panel, making a platform to support a heavy duty fan.



Attach plugs to cords from each receptacle box to bring power to the system.

A couple of large screw hooks in the side wall will be worth their weight in brass for hanging your gun and hose, a wet nozzle-cleaning rag, a viscosity cup, or other spray accessories that prove indispensable. When the booth is

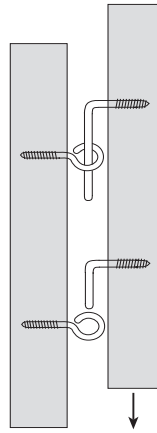


Figure 12
Leaving one shop-made hinge pin longer than the other lets you focus on one pin at a time as you manipulate the 4' x 8' side wall. Once the upper pin is slipped through the eye on the filter frame, it will remain engaged while you switch your attention to the lower pin.

knocked down for storage, loose hinge pins can be kept in a bag hung on one of the hooks.

Since it's portable, this spray booth can be backed up to a large window or garage door for warm-weather spraying, as long as your finish has no odor likely to excite the neighbors. For indoor spraying in cold weather, leave at least a couple of feet between the exhaust fan and the nearest shop wall to avoid creating back pressure, and be sure to crack windows or doors on opposite sides of the shop to provide a modest source of fresh air. Wear a chemical vapor respirator whenever you fire up the spray gun—remember, “non-toxic” on your finish container's label doesn't mean it's good for you.

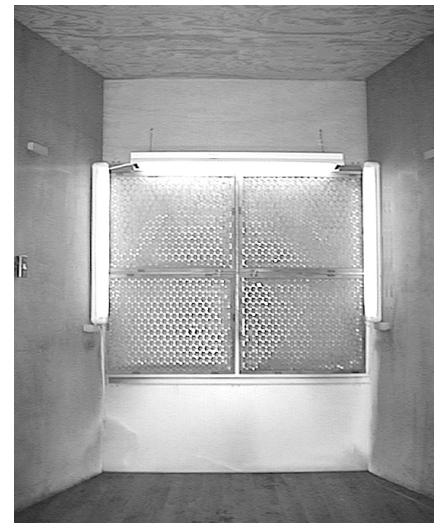


Figure 13
Arrange plenty of lighting that reflects directly off the surfaces you're finishing. Clamp lamps or other movable fixtures come in handy for large objects and vertical surfaces.

SPRAY BOOTH FAN

As long as you're committed to spraying only non-combustible finishes, practically any good fan will serve to exhaust your spray booth. Look for a unit rated to move at least 6000 CFM at its high speed. Our customers report finding suitable heavy duty fans at Home Depot, Lowe's, and W.W. Grainger.



1045 North Highland Avenue, NE Atlanta, Georgia 30306
www.highlandhardware.com 404-872-446 800-241-6748

PLEASE NOTE: The shop-built spray facility described herein is for use with NON-FLAMMABLE, NON-TOXIC FINISHING MATERIALS ONLY! DO NOT use this spray booth for spraying lacquer, shellac, oil stains or paints, adhesives, or any other combustible or hazardous product. The filters, lights, switches and fan described in this document are suggested for use only with sprayable material clearly labeled as non-flammable and non-toxic. Use of flammable or toxic material could result in fire, explosion, personal injury or death.