You probably already know this, but if you spray finish, whether it’s a waterbased finish from an HVLP rig, lacquer from a compressor and gun, or even paint from an aerosol can, you need a booth. In addition to the obvious health and safety reasons, using a booth can result in a better looking finish by helping to prevent atomized overspray from settling on your work.

The problem is that few of us can afford a commercial system that meets every health and safety requirement. Because of this, many woodworkers wait around for the “perfect” day to spray outside then wrestle with bugs and blowback, or simply ignore the rules and spray indoors.

A third option is to build your own booth. The key is to realize that a booth does not have to be elaborate or expensive. Here’s what you need to know about spray booths, including two setups that you can construct from materials you might already have in your shop. At the end of this story, you won’t have any excuses for not using a spray booth.
Spray booth basics

In its simplest form, a spray booth is a funnel designed to move air through a small opening. A fan sits at the small end of the funnel to direct the finish laden air out of the room. Because you and your project take up a lot more air space than the small surface of the fan, it’s necessary to install baffles around the fan to move air more efficiently.

When spraying, your goal is to stand in (and breathe) clean air while directing atomized finish toward your project (see Figure 1). You also want the overspray (finish that does not land on the work) to go outside where it cannot be inhaled by you or settle on your project or other objects in the room. As a side benefit, air moving across your work will help dry the finish more quickly.

The funnel is only half of the equation. In order for the booth to work, you need to supply it with as much “makeup air” coming into the room as is going out through the fan. During the summer months, you can supply plenty of makeup air simply by opening a window or a door. A screen should prevent bugs and dandelion fluff from becoming part of your finish, but when the pollen count rises, I recommend covering the opening with a furnace filter.

Winter is another story entirely. When exposed to frigid conditions, most finishes can get pretty persnickety. For home shops, you can steal heated air from your home, at least for the duration of a short spraying session. Be sure to crack a window indoors to let in fresh air. This will result in a small spike in that month’s utility bill, but the makeup air prevents the chance of a negative pressure situation. You don’t want your dryer, water heater, or other fuel-burning appliances to vent combustion gases like carbon monoxide back into your home.

Opening a window or door behind the operator helps establish the airflow needed to safely direct fumes and overspray outdoors.

About Our Author

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Benchtop booth
For spraying small pieces—bowls, boxes, and the like—I suggest making a simple booth, like the one shown in Photo A, to fit your bench and closest window. The booth is simply an inexpensive 20” box fan outfitted with cardboard angled vanes attached with duct tape (Figure 2). When not in use, I remove the vanes, fold them up, and stash them with my sheet goods.

Use painter’s tape to attach a standard 20 x 20” furnace filter in front of the fan. A cheap filter is good enough for capturing most of the wet droplets and dry particles and will keep the fan’s motor and blades clean. Be sure to replace fan filters regularly. Dirty filters move air less effectively and can cause a fan to burn out.

Spray Booth? Yes. Explosion-Proof Fan? It Depends
Many finishing articles state that explosion-proof fans must be used when spraying solvent-based stains and finishes. This is sound advice, but the reality is that fan prices start at $400. Many cash-strapped hobbyists go boothless and limit themselves to water-based finishes, or spray solvents without a fan.

Explosion-proof fan or not, if you spray, you need a booth. Water-based finishes are nonflammable, but you should not be breathing in atomized finish, nor do you want it settling on your other work or tools. Spraying solvents without a booth will quickly fill the room with fumes and overspray. Any spark-producing device, such as a switch, light, or radio, could trigger a solvent explosion.

Knowing how woodworkers work, you’d expect to read about dozens of finish-related explosions each year, but you don’t. In order for a solvent explosion to occur it must achieve a certain air/solvent concentration. This is referred to as the solvent’s lower explosive limit (LEL). As long as the fan is operating before you start to spray, a basic booth will make it almost impossible to achieve the LEL. Sparks or no sparks, nothing will happen.

Under safely controlled research conditions, I took a cheap box fan, turned it on and sprayed pure lacquer thinner and alcohol through it to see if I could achieve ignition. I couldn’t, and if you do the math for air volumes, it’s no surprise. If your goal is safety, you’re much better off with a box fan outfitted with simple cardboard walls than going boothless.
After spraying, remove the top, fold up the walls, and slide it into your plywood rack.

**Full-sized foldable booth**

For larger projects—chairs, tables, cabinets—you’ll need a bigger booth. My solution is a three-winged wall made from a large cardboard box obtained from a local appliance store (Figure 3). This spray booth is designed to sit in front of an open garage door. The side walls move in or out to fit your project. Hook-and-loop tape on the lid and walls help hold the sidewalls in place. Cut the strips long so that you can adjust the size of the booth to fit the project.

With the exception of the 1 × 1” wood support beam attached to the lid, the entire setup is cardboard. Just like the benchtop model, it folds up flat and slides neatly into my plywood sheet goods rack for storage.

A larger booth requires a larger fan. I use an industrial fan and keep it shrouded in blue filter cloth. Depending on the fan, you may choose to position it on the other side of the back wall and tape a furnace filter over the front of the opening, like the benchtop booth.

**Spin while you spray**

A turntable makes it easier to rotate the work so that you’re always spraying toward the fan. For my benchtop booth, I use a Painter’s Pyramid finishing turntable (Woodcraft #150649, $49.99). For my full-size booth, I built a turntable from plywood and a pair of two-foot long black iron pipes (Figure 4).

As luck would have it, 1” pipe just fits into 1¼” pipe. By using two equal lengths of pipe, you create a bearing that is the full length of the pipe, making the turntable exceptionally strong and stable. Add some lithium grease to the bearing surfaces, and the turntable will spin like a top. I’ve sprayed projects weighing as much as 300 pounds without any problems.
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