

The Airbrush

Demystified



A typical dual-action airbrush with gravity-feed paint reservoir.

Joe Fleming

Why airbrush?

Many turners wonder why anyone would want to add surface enhancements to their work. This is a fair question and one with many answers, depending on the type of piece being made. There are good reasons not to color a turned work. If I am making a utilitarian piece, I rarely color or carve because the simplicity of the wood works with the functionality of the piece. And if I am using exotic or highly figured wood, I let the wood stand on its own, without additional enhancement. However, in other circumstances, adding color is fun and allows for endless creative expression.

If I decide to color a turned piece, I want to control the effect to the maximum benefit of the final work. The airbrush is my main choice of coloring tool. For one, the airbrush media available today is of superb quality. Plus, I can control the intensity, placement, and penetration of the colors much more effectively than I could with a rag or bristle brush.

What is an airbrush?

An airbrush is a mini spray gun—the smaller sibling to spray guns used

by automotive and wood finishers. Airbrushes use the Venturi effect to draw a spray material (liquid paint, dye, ink, or other finish) into an airstream, atomize the colorant into tiny drops, and direct it out the front of the device.

Airbrushes can be classified into two broad groups: single action and dual action. A typical can of spray paint is a single-action airbrush; you get paint and air with a single trigger motion. Single-action devices offer limited control of paint flow, either full on or off. Dual-action airbrushes, on the other hand, activate air and paint flow separately, and this gives you much more control of the painting process. *Figures 1 and 2* show the anatomy of an airbrush and how it works.

What you'll need

In order to airbrush, you'll need only four fundamental items:

- An airbrush with air hose
- Airbrush-quality paint, ink, or dye
- A regulated air source (compressor), providing 20 to 25 psi
- Something to color

Some accessories add to the effects you can accomplish and the ease of

use, but are not strictly necessary. These include an airbrush holder, masking materials, lacquer or other surface finish, stencils and/or pre-fab designs, and drafting supplies.

Shopping for an airbrush

You'll have many choices when shopping for airbrushes. You can expect to pay \$400 to \$600 for a complete system, including airbrush paint. The cost of professional-grade airbrushes ranges from \$120 to \$600 (for the airbrush only), though you can get a serviceable model for less than \$200. There are some decent hobby-grade brushes in the \$60 to \$140 range. Hoses, paint, and other accessories will typically add another \$100 to \$150.

I suggest buying quality equipment. Less expensive airbrushes tend to have lots of plastic and large fluid nozzles. This means they don't perform detail work very well. They also have fewer features. Avoid knock-off brands you might find at discount stores. Their machining is inferior, and their tolerances and finish are generally poor. A \$30 airbrush is worth \$30—if you are lucky; it might work for a while, but the performance will deteriorate and the brush will become a maintenance headache.

Following are features I value the most in an airbrush, in order of importance:

- Dual-action rather than single-action. This is a firm requirement for me.
- Teflon seals. The rubber seals used on most cheaply made airbrushes will fail due to the solvents required.
- The right needle/nozzle size. Use a 0.3mm needle/nozzle to start. Avoid airbrushes with larger combinations because they cannot handle detail work. A smaller needle/nozzle will cause you to struggle with some paints and finishes, which may be too viscous.
- Top-gravity-feed rather than siphon/bottle/side-gravity feed. The latter versions have disadvantages for woodturners: they require more colorant than is needed in order to operate, the siphon tubes are difficult to clean,

the friction-fitting siphon cups and bottles don't always stay put (it's a big mess if one falls off), and the cups get in the way for the style of painting we do (they block the line of sight and bump into the work being colored).

- Needle travel-limiting adjustment (a knob on the back of the handle).
- A crown needle cover rather than a cone needle cover.

Shopping for an air compressor

What about air sources? There are really two choices: a dedicated airbrush compressor or a shop air compressor.

If you buy an airbrush compressor, avoid the little rectangular compressors that cost less than \$100. They are designed for fingernail manicurists and cake decorators and do not push out a sufficient volume of air for a quality airbrush. Get a compressor that puts out 0.6 to 0.7 cfm or more at about 50 to 60 psi. This will give you a good range of capability when spraying materials of varying viscosities. A suitable air compressor will run \$150 to \$300. One warning: some cheaper compressors (\$70 to \$80) may offer desirable specs but have a poor piston design that leads to "puffs" of air that show up as successive dots of paint when attempting fine lines.

If you are connecting to a general shop compressor, add a regulator/water trap to your airbrushing workstation and connect the main compressor hose to this secondary regulator. Dial the secondary regulator to about 25 psi to start.

Understanding colorants

Before diving into the coloring process, here are a few important terms and their definitions:

Dye. A colorant usually mixed in a solvent such as mineral spirits, oil, water, or alcohol. The dyes used in woodworking, very similar to those used for dyeing cloth and other materials, are transparent, as they bring about color changes in wood without obscuring the wood's ▶

Anatomy of a dual-action airbrush

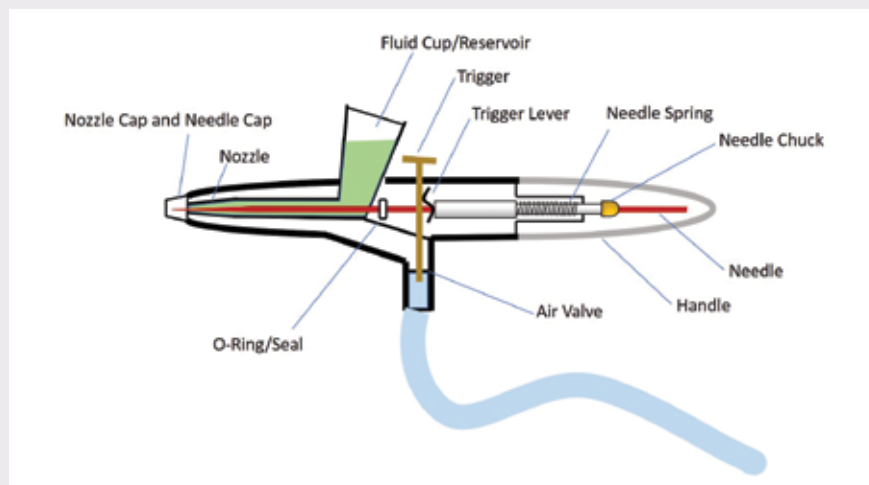


Figure 1. The parts of a typical dual-action airbrush.

How an airbrush works

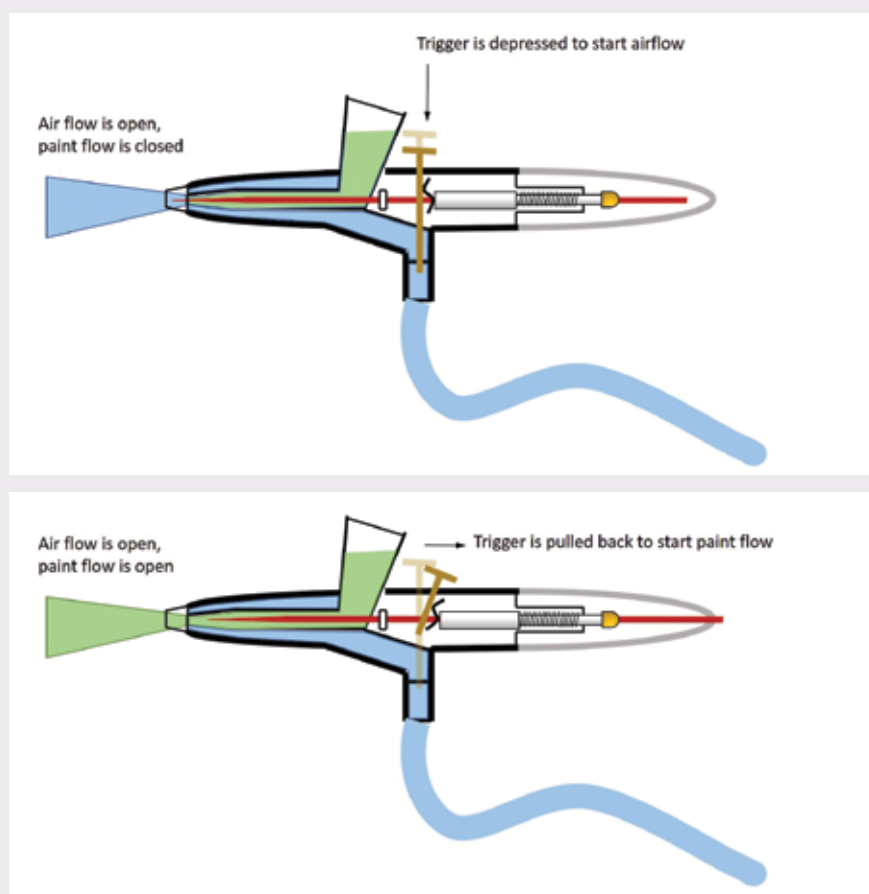


Figure 2. A dual-action airbrush allows you to control air and paint flow separately, a distinct advantage over single-action spray devices.

Common issues with dye on wood



1



2

Examples of undesired color shift. Blue dye resulted in teal (top), and red dye led to orange (bottom) due to the unbleached wood's natural color blending with the dyes. Also evident is the "white ring of death," a faint band of white that results from inconsistent absorption of the dye into the wood grain.

Bleach first, then dye



3

A maple vessel that was bleached before dye application. Note how much truer the blue color is than in *Photo 1*.

figure. Unlike the pigments in stain or paint, which are colored solids ground into small particles, dye pigments are typically soluble salts or metals. Once mixed with their solvent, dye crystals dissociate into individual molecules, which are vastly smaller than paint or stain pigment particles. Thus, dyes can get into spaces where solid pigments cannot.

Stain (transparent paint). Stains are really nothing more than very thin oil- or water-based paints. Whereas dye stains typically comprise only dye and a carrier, stains are comprised of pigment, a carrier, and a binder. Using a thin varnish (oil-based) or acrylic (water-based) as a binder, ground particles of natural and synthetic minerals are added to make stains. Stains should be stirred often to ensure an even dispersion of pigment because the particles tend to settle on the bottom.

Paint. Like stain, paint comprises pigment solids, a liquid carrier, and a liquid binder. But paints have more solids per fluid ounce, so they appear more opaque. Not all liquid acrylic paints work in an airbrush; avoid fluid acrylics made for traditional painting and, especially, craft paints, as they are far too viscous (thick) for use in an airbrush and will not flow or atomize properly. Airbrush paint should pour like cream, not like ketchup.

Coloring overview—dye

Dye is a completely transparent medium. You can think of dye as colored filters for a camera lens. If you hold up blue and red filters together, you will see purple. So when I use dyes, I usually select complementary colors and overlap the dyed areas to blend them.

When using dyes, one challenge is that the color of the wood will blend with the dye and cause a color shift. If you look at the majority of dyed pieces on the public blog sites, you will almost never see a true blue or a true red piece. They are almost always a tone of teal or orange, which may not be what was expected from the dye application. Wood tends to have yellow and red in it (poplar has green). Another consideration—and a benefit of airbrushing—is that wipe-on dye will penetrate and darken endgrain much more readily than sidegrain. When this happens, you will have a white-ish zone where the sidegrain is located. You can see both of these issues in *Photos 1 and 2*.

Two actions help prevent the white ring effect: seal the wood prior to dyeing it and apply the dye via airbrush rather than wiping to eliminate the contact wicking effect in endgrain.

When I plan to dye a piece, I usually bleach it with two-part wood bleach. I apply the bleach three to five times to get the wood's color out. You should experiment with the bleach to see how effective it is on various wood species. In my experience, maple, ash, walnut, cherry, and redwood all bleach well. Woods with green in them, such as poplar and some eucalyptus varieties, do not bleach well. The bleaching process renders truer colors, as shown in *Photo 3*.

I refer to my dyeing process as the "Don Derry Finishing Technique," as Don taught me how to build this type of finish. I've documented it on my website, airbrushingwood.com. Don learned the techniques finishing electric guitars. Here is the process I use to apply dye, and the results are shown in *Photos 4 and 5*:

JOURNAL ARCHIVE CONNECTION

EXPLORE!

To learn about bleaching wood, check out these articles in the *American Woodturner* archives. Log on at woodturner.org and use the Explore! search tool.

- "Decorative Bleaching," by Betty Scarpino, June 1996 (vol 11, no 2)
- "Make Your Own Wood Bleach," by Gary Guenther, February 2013 (vol 28, no 1)



1. Sand to 180 or 220, but no finer.
2. Wet the surface to raise the grain, then re-sand with the last grit.
3. Bleach three to five times.
4. Seal with vinyl sanding sealer or lacquer.
5. Sand back the sealer.
6. Airbrush dye, taking care not to soak the surface and get runs.
7. Seal with a light lacquer spray (too heavy an application could cause runs or reactivate the dye and cause it to run).
8. Apply additional lacquer coats to achieve build and desired gloss effect.

Coloring overview—stain/paint

When I paint specific images on a form, I focus on completing the piece

using transparent paint (stain) and masking techniques. Since stain is really just transparent paint, if you apply enough of it, the color will become opaque as the solid pigments build upon each other. You can see the grain through the paint if you have not over-applied it, as shown in *Photo 6*.

When using transparent paint, I am less concerned about the color of the wood itself because the paint can obscure the wood if I build up enough layers. In the birch piece shown in *Photo 7*, I used transparent black, purple, blue, and gray, which allow the grain to show through. Keep in mind that with transparent paints, light colors will often be obscured by dark

colors. You can use this insight to layer colors effectively.

Photo 8 shows a work on which I used several colors of acrylic, fabric, and interference paints, as well as carving, to achieve the illusion of being in a ballpark.

When I airbrush transparent paints, my process begins just as it does with airbrushing dyes. The first five steps are the same, then I take the following steps:

1. Lay out the areas to be painted, and apply frisket film to mask desired areas.
2. Cut frisket with a craft knife and lift frisket sections to expose target areas for painting (*Photos 9, 10*).
3. Airbrush transparent paint. ▶

An array of airbrushed colors



4

The author's figured maple vessels, which have been bleached, sealed, dyed via airbrush, and lacquered.



5

Figured maple disks airbrushed with dye (each with three blended colors) and gloss lacquer.



Transparent paints



6

A red oak platter, carved, burned, and painted using yellow, red, purple, blue, and gray transparent paints (stains).

Opacity



7

As muted as the grain pattern is in this birch plate, you can still see it through the transparent acrylic colors. An exception is the white areas, done with opaque paint that hides the grain pretty well.

Multiple airbrush paints



8

Acrylic, fabric, and interference paints were airbrushed on this ash bowl.

4. Remove all masking.
5. Seal with a light lacquer spray (too heavy an application could cause runs or reactivate the paint and cause it to run).
6. Apply additional lacquer coats to achieve build and desired gloss effect.

Using an airbrush

Detailed instruction on how to use an airbrush is well beyond the scope of this article. I have listed several resources at the end of this article for further reading. But I offer these basic tips to get you going:

- Use only airbrush paint. All other fluid paints will cause problems, as they are either too thick, too chunky, or both.
- Never return unused paint or dye to the source bottle, as it is very poor practice to assume the color in the airbrush is pure. Doing so can cause two irreversible problems. You can introduce different colors into the bottle if you have been using your airbrush with more than one color. And pieces of dried acrylic paint that accumulates in the airbrush will not re-liquify if it is transferred back into the bottle. Those dried chunks will eventually be poured back into the airbrush, causing a nozzle clog.
- For paint, start with only about five drops in the cup. Add more if you need it, but always five drops at a time. For dye, use only about ten drops at a time. You can always add more colorant to the airbrush, but excess will be wasted because you shouldn't return unused liquid back into the bottle.
- Practice your airbrush skills. When I sit down to paint, I always perform warm-up drills on scrap paper before painting my project. This allows me to get my airbrush fingers working and to work out any technical difficulties with the paint or equipment prior to painting my project.
- Experiment on scrap wood with different coloring techniques, color combinations, masking sequences, etc.
- When painting, allow the paint to dry before spraying the next color. Impatience will lead to smears and muddy colors. Use a hairdryer to accelerate drying if you must. Keep in mind

that paint on frisket will dry much more slowly than paint on wood.

- Most importantly, learn to clean your airbrush. When I diagnose others' airbrush problems, the most frequent cause of difficulties is poor cleaning. Just as sharpening is a critical skill to learn to be an effective woodturner, airbrush cleaning is an essential skill if you are going to use an airbrush.

Summary

An airbrush can add a significant artistic component to your arsenal of tools. You can create so many different effects with an airbrush—from broad colors to fine detail. It allows you to precisely control the amount of color you are applying to a specific area and to blend colors to make seamless gradients. ■

Joe Fleming is a software engineering manager in San Diego, California. He has been a woodturner for about twenty years and a passionate airbrush user for about sixteen years. Joe now teaches airbrushing to woodworkers. In 2014, he acquired David Nittmann's airbrush business and sells airbrushing equipment and paint. For more, visit airbrushingwood.com.

Masking with frisket



9 Clear frisket film, applied under the blue painter's tape, is strategically cut and peeled back to expose only the area to receive paint.



10

For Further Reading

- *Airbrushing* (Artist's Library series #09), by Peter West, Walter Foster Publishing, Inc., 1986
- *Don's Airbrush Tips*, by Donald Wheeler, CreateSpace Independent Publishing Platform, 2014
- *All About Techniques in Airbrush* (All About Techniques Series), by Parramon's Editorial Team, B.E.S. Publishing, 2005
- *Airbrush: The Complete Studio Handbook*, by Radu Vero, Watson-Guptill, 1997

You read the article—now see the video!

Joe Fleming has created a video illustrating some of the key points on airbrushing, including how to clean an airbrush properly. To see the video, visit tiny.cc/airbrush or scan the QR code with your mobile device.



A Gallery of Airbrushed Works

Round and brown, a standard of beauty, was set down with reverence and strict adherence in the early days of woodturning. Colors were found in the wide range of timbers: ebony for black, holly for white, padauk for red, and pink ivory and purpleheart for the exotic colors their names imply. But even this diverse selection of naturally occurring colors was not enough for some of the rebels of those early days. Shimmering fire engine

red, mossy greens, turquoises into sky blues. The wood blossomed, so to speak, like flowers.

This was not a graceful introduction; polychromed wood was a war waged in woodturning. David Ellsworth, a treasured innovator and pillar of the field, was asked to pull his colorful *Solstice* series out of galleries. This deterred no one. Merryll Saylan has always found it appropriate in her long career to use any color she saw fit. Giles Gilson and

Don Derry used colors more comfortably found on automobiles than on wood. Frank Sudol and Binh Pho actually went to airbrushing conventions very early on to acquire what was akin to arcane knowledge to the woodturning field. Forbidden almost, but not for long. They paved the road for the rest of us, and along it planted the seeds of the bright blue timbered tree.

—Derek Weidman

Dan Zobel, Pennsylvania

Airbrushing techniques allow me to add interesting detail to my turned works. I was inspired to learn this process by Binh Pho and Derek Weidman. The idea of directional airbrush spraying, something Binh used frequently, allows forms to be viewed as different colors as they rotate. Derek introduced me to airbrushing during a class I assisted him with at Arrowmont. It helps when learning new processes to have strong influences and friends.



Holey Bowl (Purple/Orange), 2019, Ash, 4½" × 7" (11cm × 18cm)

Gene Colley, Texas

I had always wanted to put my thoughts and ideas on canvas but never felt I had the talent. Years ago, when I saw Binh's first demo at the Utah Symposium, I was hooked. I studied Binh's work and then took classes with him for years, doing my best to master the skill of airbrushing. For *Time in a Bottle*, I used frisket to mask my pencil drawing. The piece was included in the AAW's *Turning 30* member exhibition in 2016. ▶



Time in a Bottle, 2016, Boxelder maple, paint, gold leaf, 4" × 6¾" (10cm × 17cm)

Donna Zils Banfield, New Hampshire



Soul Series is a body of work that contains all the elements of making that I find immensely satisfying. Using an airbrush allows me to blend and shade colors in a way not possible by hand-painting.

It Satisfied My Soul No. 19, 2018, Silver maple (pyro-engraved, textured, and pierced), acrylic paint, 3" × 9½" (8cm × 24cm)

Gallery continued

Derek Weidman, Pennsylvania

For a sculpture as large as *Remember Me*, I had a number of reasons to use an airbrush. One aspect of airbrushing that is difficult to replicate with other paint application techniques is the uniformity and efficiency of a simple color shift. I torch my sculptures after they are turned, which, along with grain, physical structure, and tool marks, emphasizes a sophisticated pattern of light and dark. The last thing I want to do is cover any of that up. But an airbrush equipped with transparent paints makes it possible to supply even washes, while building up very little paint. This allows me to retain those bare textural details and make subtle color shifts where needed.

Color does not need to be neon green or bright orange to be effective. With an airbrush, more subtle tones like browns, ochres, and grays can add a great deal of variety and richness.



Remember Me, 2019, Holly, maple, ash, steel, wood bleach, acrylic paint, not including base: 42" x 36" x 32" (107cm x 91cm x 81cm)

Photo: Rob Blankenship

John Lucas, Tennessee

A graphic artist where I used to work gave me an airbrush he no longer needed. At first, I just wanted to be able to fade colors or blend them into each other. Then I started to use stencils to create patterns with the airbrush, and it wasn't long before I began playing with masking techniques to control shapes. I was fortunate to be Binh Pho's assistant at a workshop he was teaching, and this took my airbrushing to another level. Later, trying to create the illusion of objects in space opened up even more possibilities I had not even considered. I can see how airbrushing could provide a lifetime of learning and playing.

Approaching Sector 9, 2018, Yellow poplar, birdseye maple, 5½" x 15" (14cm x 38cm)



Joe Meirhaeghe, Illinois

This vessel was made from a piece of very plain-grained maple. I decided to give it some contrast and character using basic airbrushing techniques.

Untitled, 2019, Maple, pearled acrylic and black paints, 8" x 3⅞" (20cm x 10cm)

Joey Richardson, England

In 2005, I was fortunate to be awarded a bursary award from the Worshipful Company of Turners of London. This afforded me the opportunity to travel to the United States, attend an AAW International Symposium, and take a class with Binh Pho, who was the master of airbrushing on turned wood forms. I still use the Iwata airbrush I bought from Binh, mainly with Golden transparent colors.



Estimate, 2016, Sycamore from HM The Queen's Sandringham estate, acrylic paint, 12" x 12" x 10" (30cm x 30cm x 25cm)

Michael Kehs, Pennsylvania

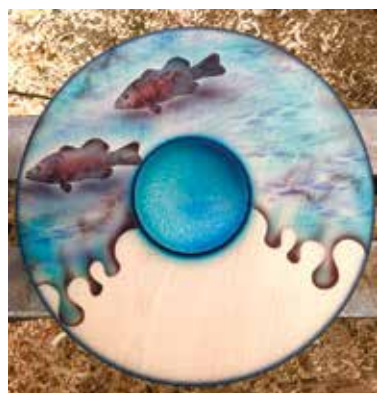
I use an airbrush to further the overall appeal of a piece. I don't usually paint scenes or images, but use the airbrush to add color and shading. An airbrush allows me to blend colors more evenly and with more control than with a traditional artist's brush. I took a class years ago with Binh Pho, where I learned to use an Iwata airbrush, which is great for applying dyes to figured woods. An airbrush also excels in creating and matching old finishes and color tints when I repair antique wooden objects.



Searching for Peace, 2016, Buckeye burl, holly, acrylic paint, 26" x 18" x 12" (66cm x 46cm x 30cm)

Nick Agar, Georgia

I got into airbrushing about twelve years ago, while decorating a deeply textured piece that required a gentle and subtle color application. Control and graduation of color were only possible with a spray gun, and an airbrush did the job perfectly. I was certainly inspired by the airbrushed work of Ron Fleming and Binh Pho. Now airbrushing is a huge part of my work and teaching, and it is becoming very popular among wood artists.



Untitled Platter, 2018, Maple, dye, stencils, lacquer 2½" x 14" (6cm x 36cm)



Steve Sinner, Iowa

I made *Along the Trail* for AAW's *Walk in the Woods* exhibition (San Jose, 2012). After masking the vessel and dividing it into squares, I peeled and lightly airbrushed each square with various random transparent colors. Then I airbrushed the entire vessel with transparent green paint and added ink lines to delineate the squares. A signature gold leaf rim completed the work. ■

Along the Trail, 2012, Sugar maple, acrylic paint, India ink, gold leaf, spar urethane, 16¼" x 6¾" (41cm x 16cm)