

Selecting an Airbrush System



If you are in the market for an airbrush system, I recommend the following:

- **Compressors:**

- If you buy an airbrush compressor, avoid the little rectangular compressors that cost less than \$100. They do not push out a sufficient amount of air for a good airbrush. They are designed for fingernail manicurists and maybe cake decorators and are to be used for airbrushes with 0.2 needles or smaller.
- 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 different viscosity materials. One warning. I would avoid the Master brand compressor that sells for around \$70 to \$80, or similar. They have the correct specs but they have a poor piston design that leads to making "puffs of air" that show up as successive dots of paint when painting fine lines. They also don't last. I have one so I know. I won't give it to a woodworker because I don't want them to be frustrated, so it sits in my classroom arsenal and sees very little action.
- You can use a shop compressor **IF** you use a second regulator close to your airbrushing station. Set the shop compressor regulator above 70 psi. Set the airbrush regulator around 25 psi.

- **Airbrush brands:**

- Buy quality.
- Professional grade brushes will range from \$120 to \$600 (brush only). You can do pretty well for under \$220. Iwata, Grex, Harder and Steenbeck are the brands I would recommend.
- There are some decent hobby grade brushes in the \$60 to \$140. Less expensive brushes tend to have lots of plastic and large fluid nozzles. This means that they don't perform detail work very well. Paasche, Badger, and Iwata have brushes in this range.
- Avoid knock-off brands: Master, Harbor Freight, Etc. A \$30 airbrush is worth \$30 if you are lucky. Their machining is inferior, and their tolerances and finish are generally poor. They might work for a while, but the performance will deteriorate and the brush will become a maintenance headache. I own several and they are, in my opinion, junk. The aggravation you will get is expensive.

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- **Airbrush features in order of importance:**

1. Teflon seals for all of the wet areas of the airbrush. Rubber sucks and most cheap airbrushes use rubber. This is a hard requirement to me.
2. Get a dual action vs single action. This is a hard requirement to me.
3. I recommend a 0.3mm needle/nozzle to start. Avoid 0.5mm and larger for the first needle/nozzle (too big and can't do detail work). 0.2mm will struggle with some paints and finishes (too small).
4. Top gravity feed vs siphon/bottle/side gravity. Side/bottom/siphon have these disadvantages for woodturners despite what Nick Agar says:
 - We generally only use a few drops of color at a time. If you fill the color cup to the top, you waste a lot of paint. If you use up the five drops, add five more drops. For dye, Joe's rule is 10 drops. We are woodturners, we are inherently frugal.
 - **BTW - Joe's rule of what to do with excess paint: Dump it out. NEVER, NEVER, NEVER pour it back into the bottle. Why? Risk of color contamination, risk of foreign debris into the paint, risk of dried bits of paint getting back into the bottle. Dried paint does not dissolve in the paint. It stays solid and will plug up your airbrush on subsequent uses. This really sucks when it happens in a demo in front of 50 people. Believe me - I have experience on this one.**
 - In order for a bottom/side/siphon to work, the entire paint channel needs to have paint in it. This is ALWAYS more than 5 drops. Built-in waste.
 - Those siphon tubes are a pain to clean. We are woodturners and we are inherently lazy.
 - I find that the friction fit of a lot of the siphon cups and bottles to be problematic to stay put. More than once, I've had one fall off. Big mess. We are woodturners and we are inherently adverse to unnecessary cleaning. I've seen my share of shops. I know this to me true.
 - Siphon/side/bottom cups get in my way for the style of painting we do. I find them awkward. We are woodturners and if a tool is more trouble than its worth, we won't use it which means a waste of money (now we are back to frugal).
5. Needle travel limiting adjustment (this is a knob on the back of the handle)
6. Crown needle cover vs cone needle cover

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Airbrush Paint and Dye:

A Few Definitions

Before diving into the coloring process, I will offer a few definitions:

- **Dye** – Dyes are colorants that are usually mixed in a solvent such as mineral spirits, oil, water or alcohol. Metal acid dyes are sometimes mixed with MEK or other “nasty” solvents. The dyes used in woodworking are very similar to those used for dyeing cloth and other materials. Dyes are characterized as transparent, as they bring about color changes in wood without obscuring the figure. The molecular size of the dye particles is so small they allow light to pass through virtually unhindered. In simple terms, the pigment in stain and paint is colored solids ground up into small particles. Dyes are typically soluble salts or metals. Once mixed with their proper solvent, dye crystals dissociate into individual molecules, which are vastly smaller than ground up pigment particles. Thus, dye can get into spaces where solid pigment cannot.
- **Stain (Transparent Paint)** - Stains are really nothing more than very thin oil or water-based paints. Whereas dye stains are typically comprised of 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 insure an even dispersion of pigment because the particles tend to settle on the bottom.
- **Paint** – Like stain, paint is comprised of pigment solids, a liquid carrier and a liquid binder. Paints have more solids per fluid ounce, so they appear to be more opaque.
- **Airbrush** – An airbrush is a spray-painting tool that uses compressed air to atomize the coloring medium and project it onto a surface in an even consistency. It is the smaller sibling to a spray gun used by automotive and wood finishers.

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Please note that not all liquid acrylic paints will work in an airbrush. Avoid fluid acrylics made for traditional painting and, especially, craft paints. There are two reasons for this. First, most of these paints are far too viscous (thick) for use in an airbrush. They will not flow properly, nor will they atomize correctly. Airbrush paint should pour like cream, not like ketchup. If you think you can thin the paint with water, you will significantly reduce the ratio of pigment to binder and the paint will not stick to the wood surface. Second, the pigments in most liquid paints are too coarse. Even if you successfully thinned the paint, the pigments are too chunky to flow through the airbrush and they will cause the airbrush to clog.

Coloring Overview - Dyes

WARNING: The first thing to know about dyes is that they are **NOT archival**. Dyes will fade over time. This includes metal acid dyes. If you are making “forever art pieces, you can count on the color fading or failing over time. Professional wood artists use pigment paints for color because the color can be archival.

I primarily color wood in two ways. If I use dyes, my colors are bold and flowing. I usually select the colors for the complementary effect of the color fields and overlap the dyed areas to create blended colors. Dye is a completely transparent medium. You can think of dye like colored filters for a camera. If you hold up blue and red filters together, you will see purple.

When using dyes, the issue is that the color of the wood will blend with the dye.. 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 tone of orange, respectively. Wood tends to have yellow and red in it. Poplar has green.

The other issue with dye is that it will penetrate end grain much more readily than side grain. This means that wipe-on dye will soak into the end grain and darken that color more than the side grain. When this happens, you will have a white-ish zone where the side grain is located.

You can see both issues illustrated in the following two pictures. The undesired color shift (teal and orange) and the “white ring of death” in these photos of unbleached ash vessels (Figure 1 and Figure 2). One is dyed with blue and one with red.

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Figure 1: "Blue" dyed vessel with white ring and teal color shift (J. Fleming, 2003, Ash, 4" x 4")



Figure 2: "Red" dyed vessel with white ring and orange color shift (J. Fleming, 2003, Ash, 4" x 4")

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. Figure 6 shows a maple vessel that was bleached before dye application. Note how much truer the blue color is.

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Figure 3: Blue dyed vessel that was bleached first (J. Fleming, 2005, Maple, 8” x 8”)

Wiping dye onto a vessel leads to color saturation in the end grain. As soon as the applicator touches the wood’s surface, the liquid is wicked into the wood. This leads to over saturation in the end grain and under saturation on the side grain, generating the “white ring of death”. Two actions help prevent the white ring. First, sealing the wood prior to application of dye helps to limit penetration on the end grain. Second, by using the airbrush, there is no contact wicking so dye is not flooded onto the wood’s surface.

My dye process is as follows:

- Sand to 180 or maybe 220 - no finer
- Wet the surface (raise the grain), then re-sand to last grit
- Bleach three to five times
- Seal with vinyl sanding sealer or lacquer
- Sand back the sealer
- Airbrush dye – do not soak the surface or you will get runs
- Seal with a light lacquer spray – not too wet or you will get runs, or reactivate the dye and cause it to run
- Apply additional lacquer coats to achieve build and desired gloss effect (Figure 4)

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Figure 4: Figured maple vessels, dye and gloss lacquer (J. Fleming, 2004, Maple, 4" x 4")

I refer to this whole process as the "Don Derry Finishing Technique" and I've documented it on my website – AirbrushingWood.com. He taught me how to build this type of finish. He learned it finishing electric guitars.



Figure 5: Figured maple disk with dye and gloss lacquer. Color blending with three colors each. (J. Fleming, 2017, Maple, 5"D")

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Coloring Overview – Transparent Paint

When I paint images, I focus on completing a piece using transparent paint and masking techniques. Transparent paint is really just stain. What that means is that if you apply enough of the paint or stain, it will become opaque as the solids build upon each other. You can see the grain through the paint if you have not over-applied the paint to your project.

In the red oak piece below (Figure 6), I used yellow, red, purple, blue and gray transparent paint.



Figure 6: Oak platter, carved, burned and painted (J. Fleming, 2010, Oak, 10”D)

In the ash piece below (Figure 7), I used several colors of acrylic paint, t-shirt paints, and interference paints as well as carving to achieve the illusion of being in a baseball ballpark.

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Figure 7: Ash bowl with acrylic paint and carving (J. Fleming, 2004, Ash, 6" x 6")

In the birch piece below (Figure 11), I used transparent black, purple, blue and gray. As muted as the grain pattern is in the birch, you can still see it in all of these colors. The white is opaque paint and the grain is pretty well hidden.

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Figure 8: Birch plate, painted with transparent acrylic paints (J. Fleming, 2018, Birch, 9"D")

With transparent paint, I am less concerned about the color of the wood because the paint will obscure the wood color. Therefore, bleaching is not usually necessary.

My paint process is as follows:

- Sand to 180 or maybe 220 - no finer
- Wet the surface (raise the grain), then re-sand to last grit
- Bleaching the wood is optional
- Seal with vinyl sanding sealer or lacquer
- Sand back the sealer
- Layout the areas to be painted using frisket film to mask areas to be painted and to be protected
- Cut the frisket with a craft knife to create the image on the vessel
- Lift mask sections to enable painting
- Keep in mind that with transparent paints, light colors will often be obscured by dark colors. Use this to layer colors effectively.
- Remove all the masks when done
- Seal with a light lacquer spray – not too wet or you will get runs, or reactivate the paint and cause it to run
- Apply additional lacquer coats to achieve build and desired gloss effect

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Paint Brands: