

# THINNING PAINT FOR AIRBRUSHING

The question "What is the exact thinning ratio when using XYZ paint in an airbrush", or some derivative thereof, comes up frequently so I thought I'd try and provide a comprehensive answer once and for all.

Short Answer Number 1 - There is no such thing as an exact thinning ratio for any paint. A particular manufacturer's paints will vary from one lot to another and even from one color to another. Additionally, what worked with a bottle of paint today may not work a month from now when it has had some time to thicken in the bottle.

Short Answer Number 2 - It really doesn't matter anyway. Asking about an "Exact Thinning Ratio" is similar to asking how much cream to put in coffee or how much oil to put in a car. You use enough to do what you want but no more.

There are four things that affect how much paint should be thinned:

1. The construction and type of airbrush. Some airbrushes atomize or pick up paint properly at lower pressures than other airbrushes. Siphon feed airbrushes usually need slightly more air pressure to feed reliably than gravity feed brushes will. Internal mix airbrushes will generally atomize paint better at lower pressures than external mix airbrushes will. This factor also includes the size of the nozzle and needle in the airbrush. Some airbrushes have tip assemblies or separate nozzles and / or needles that can be changed, some have a single combination.
2. The viscosity, or thickness, of the paint. If you try and suck molasses through a soda straw you are going to have a much harder time than you would sucking water through the same straw. Many people think this is the only reason for thinning paint, but it isn't.
3. The volume and pressure of air through the airbrush. Given enough pressure and volume you can get molasses through a soda straw, but it takes quite a bit.
4. The distance between the airbrush tip and the surface of the model.

You cannot change the basic construction of the airbrush, other than perhaps changing the nozzle and needle, but you can change any of the other three factors. To complicate matters, these factors frequently change while you are painting. The thinner in your paint will evaporate causing it to be more thick, you will move your hand closer to or farther from the model's surface, or your air pressure may change because of temperature changes or when the motor cuts on and off.

For these reasons, asking what an exact thinning ratio someone else is using may or may not work for you.

In my opinion there is only one reason to thin paint for airbrushing, and that is to lower the viscosity so that the airbrush can atomize the paint properly. Given this, if the paint is already spraying properly and it is covering the model properly then there is no reason to thin it. If not, thin the paint more or increase the pressure. If it sprays properly right from the bottle then there is no reason to thin it at all. If it's too thin right from the bottle, reduce the pressure and get close to the surface.

My advice is to pick a pressure that you want to use for painting and then thin the paint enough so that it atomizes and flows through the airbrush properly and covers the surface well at that pressure. If you are spraying a large area with a single color, such as the main color of a car, tank, airplane, or ship, then you can use a relatively high pressure (say 20 psi), leave your paint somewhat thicker, and get good coverage with each pass of the airbrush. If you are painting a critical area, such as the demarcation between two camouflage colors, you will have to reduce your pressure dramatically to prevent overspray from causing a wide line. When you reduce the pressure you are going to have to thin the paint more to get it to flow. You will additionally need to get much closer to the surface which in turn requires slightly

thicker paint to prevent the air pressure from the airbrush from blowing it around. The bottom line is that YOU will have to find what works for YOU under specific circumstances.

I use Thayer and Chandler airbrushes, and for general coverage I usually start with a 3:1 ratio (3 parts paint to 1 part thinner), I spray at around 15 psi, and about 3 - 4" from the model's surface. For camouflage painting I reduce the pressure to about 8 to 10 psi, increase the thinning to approximately 1:1, and spray about ½" from the model's surface. Trying to use the same settings for camouflage as I use for general coverage would completely eliminate any chance of getting a thin division line between the colors. At the same time, trying to use the same settings for general coverage as I use for camouflage would require many, many passes and many coats of paint to get any kind of decent coverage.

On a related note, the nozzle on your airbrush will have a big affect on paint flow and how well things work in general. Many people think that a fine tip automatically means a fine line, and that isn't always the case. Many fine tip assemblies (or individual nozzle / needle combinations) were designed for very thin mediums such as ink. The paints that we use for models, even when dramatically thinned, are much thicker than ink and in many cases will not properly flow through fine nozzles even with a lot of pressure. The particles of pigment are just too large for the nozzle. If you are having to use an excessive amount of pressure or are having to dramatically thin your paint then your nozzle is probably too small.

Another common question that comes up is what to use to thin paint. The best answer to that is to use what the paint manufacturer recommends. Read the labels (assuming that you can understand the language they are written in since they are frequently in Japanese!), and notice what the manufacturer recommends. The reducer or thinner recommended by the manufacturer is usually the best way to go, but if cost is an issue there are usually less expensive alternatives.

In general there are three types of paint for models. This is what I use to thin them. Your results may vary and you should ALWAYS test on some scrap before spraying your model.

? **ACRYLICS** -- Acrylics for model use are usually water-soluble. In many cases you can use just plain water to thin them, and in fact this is what PollyScale recommends for their acrylics. Other alternatives are Windex, automotive windshield cleaner or isopropyl alcohol. I usually use isopropyl alcohol, however this causes a couple of side affects that you should be aware of:

1. It causes acrylics to dry just a little bit quicker. Since they already dry so fast that they frequently cause "Tip Dry" on airbrushes, this just compounds the problem. I always add a couple of drops of acrylic retarder to my paint cup to slow the drying time down.
2. In the case of Tamiya acrylics isopropyl alcohol will cause glossy paint to dry with a flat finish.

Acrylic retarder is a very handy addition for anyone who uses acrylics. It is available at most art supply stores and is manufactured by numerous companies including Createx, Golden, and others. Adding a couple of drops to your paint cup will dramatically slow down the drying time of acrylic which helps with the problem of "Tip Dry" (dried paint accumulating on the tip of your airbrush) and also allows the paint to flow and level out before it dries. I don't paint with a regular brush much at all, in fact about all I use a brush for is for detailing cockpits, but when I do use acrylics for brush painting I thin it with Createx acrylic retarder and nothing else. One drop of retarder for each 5 or so drops of paint makes for a nice thin mix that flows well and does not dry nearly as fast.

? **ENAMEL** -- For enamels I use plain mineral spirits. It is available at virtually any hardware store that sells painting supplies.

? **LAQUER** -- For laquers I use laquer thinner. It is available at virtually any hardware store that

sells painting supplies.

**IMPORTANT!!!** When using something for thinning that you have not used before you should always, ALWAYS try it first on some scrap or something that is not important. If it does not do what you want it is much better to find out on something that doesn't matter than finding out by ruining a paint job you have put a lot of effort into.

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I recently received the information below in an email from Andy Hobbs (styrocket@yahoo.com). He has provided some very good information on the use of acrylics, and I personally am going to try some of the recommendations that he made and see if they improve my experience with acrylics. I have run into some of the problems that were mentioned. Nothing to lose and everything to gain!

September, 2005 Note – I have tried Golden Airbrush Medium recommended below as a thinner and it does work quite well. I sprayed a sample using the same paint on two areas; one that was straight from the bottle (no thinning at all) and another thinned with Golden Airbrush Medium alone. The paint was PollyScale (I don't remember the exact color) and was a "Flat" finish paint. The area painted with the Golden Airbrush Medium dried much smoother and less flat than the area painted without the airbrush medium. PollyScale adheres quite well so the adhesion appeared to be about the same (I couldn't pull either area off with masking tape). Also, the area that used the Golden Airbrush Medium took a very long time to dry to the touch. A couple of hours after I sprayed it, it was still tacky. I think this was because I used too much airbrush medium (as in thinned 1:1!). The retarder in the medium did work quite well and there was minimal paint drying on the tip of my airbrush. I have used it several times after this small test, and so far I like it quite well and will continue to use it.

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*Interesting tips on thinning acrylics but ignore or delete this if you like.. but I've found most modelers like to learn as much as they can about the mediums they use*

*I've also found that the modeling world is suffering from a lack of knowledge about using acrylics and many sites propagate false information like a snowball. Acrylic does not mean water based..thats a big misconception:*

*(From ArtLex.Com) Acrylic paints - Synthetic paints, with pigments dispersed in a synthetic vehicle made from polymerized acrylic acid esters, the most important of which is polymethyl methacrylate.*

*My main gripe is what people commonly recommend for thinning acrylics.*

*Before you mess with anything or add anything to a paint, test it's individual properties first. Put a drop on a piece of glass. This test will allow you to see the properties of off the shelf additives you might want to try..How quick do they dry. How flexible do they dry, how clear, do they have any adhesion or just shrink and lift...? For example, something that goes on paper must be flexible, something that goes on a hard surface must be hard and have good adhesion.*

*The biggest breakthrough I have made lately is to always use an airbrush medium when thinning acrylic paints for airbrushing..Think about it, water, alcohol, washer fluid, glycerin, grandma's recipe, do not have any bonding qualitys.*

*And the cheaper or thicker the paint the more important medium becomes.*

*Airbrush medium contains acrylic polymer. Acrylic polymer is basically clear acrylic paint. What I've found even more useful is that it contains specific additives designed to retard drying time, improve the flow of acrylic paint through the airbrush, thus decreasing airbrush clogging and preventing paint build up around the airbrush tip. A real problem especially if thinning non-airbrush specific paints.*

*Acrylics cure by the linking of acrylic polymers into long molecular chains. If too much water, washerfluid, soap, alcohol, etc. is used, the acrylic is "stretched" too far and can't form proper links. It will typically dry too rapidly and leave a rough finish. The airbrush medium contains acrylic polymer in order to guarantee that there is sufficient acrylic present to properly link and form a strong paint film. If thinning with just water ,washerfluid, alcohol the odds of the paint lifting or chipping are high because unlike other additives, the acrylic polymer in the medium doesn't evaporate and thus acts like a clear paint.*

*So while it's ok of course to use tiny quantities various non-bonding liquids for thinner, it's just as important to regain strength, flow and sprayability with some airbrush medium. It's somewhat expensive but a bottle goes a long way.*

*I use Liquitex airbrush medium, since it is readily available at Hobby Lobby. It has finally made using alternatives like thick craft paints a reality for me with excellent sprayability. And leaves a smooth texture.*

*If I find that adding medium has not made the paint thin enough before loosing the richness of the color ONLY THEN, do I add a little distilled water. And only distilled water rather than all the wacky stuff most people recommend.*

*These are some common airbrush mediums*

- ? *Blick Polyflo*
- ? *Createx*
- ? *Golden*
- ? *Jo Sonja's Lascaux*
- ? *Aquacryl*
- ? *Lascaux*
- ? *Liquitex*
- ? *Pebeo*

*I'll stop here.. If you really want to learn more about airbrushing acrylics check out the "Golden" website at [www.goldenpaints.com](http://www.goldenpaints.com) It's very informative!*

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