AIRBRUSHING NOTES USING ENAMEL PAINTS 31/10/22, Rev 03/23

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Introduction

The following notes are assembled from my experience with airbrushing, starting in 2019 when I realised my kit builds would need to be satisfactorily painted and weathered. Not wanting to make a total pants of them, I decided to take an airbrushing course to learn from experts and give myself the best basis on which to start my airbrushing journey. Much of the following is based on instruction from our dearly departed Mick Bonwick, for which I shall be ever grateful for his expertise, wit, generosity and inspiration.

Paint technology has changed considerably since I first started building and modifying rolling stock in the 80s and enamel paint has been joined by modern acrylics for modelling. Both have their advantages and disadvantages for the airbrush user and require different approaches with application and cleaning, as well as certain manipulation techniques often associated with weathering.

I use only enamels for airbrushing. This is because, I see no personal advantage to airbrush with acrylics, as they induce dry tip and have a greater tendency to block the airbrush due to drying rapidly and as such, are near to impossible to manually manipulate on the model to create effects such as rain streaking and build-up of dirt in corners, recesses, around rivets, etc. I also have the time to be patient, so do not overvalue the benefits of rapid drying. However, I use acrylics extensively with brush application.

The techniques and principles below however, will apply pretty much to acrylics as well though. Compressor settings will vary, but that's not a problem. See below.

Necessary equipment

The following is usually required for safe and satisfactory model railway airbrushing:

- A warm, well-lit and ventilated space
- Workbench and seat of correct heights for comfortable working
- Airbrush and compressor (double action internal mix airbrush and low noise, oilless, piston driven compressor, with air tank and pressure adjustment are most useful)
- Double filter face mask to safeguard against paint particles AND solvent fumes
- Spray booth with particle filter and air extraction to outside atmosphere
- Turntable to place the workpiece on for easy hands free turning in the spray booth

- Cleaning pot and airbrush stand (often sold as a combined unit)
- Broad based glass jars (NOT plastic). Mine are ex-yoghourt pots
- Stirring equipment, pipettes/eye dropper, kitchen paper, internal cleaning brushes, waste bin, etc
- Small task/desk lamp
- Suitable gloves if you have irritable/broken skin

After trying before buying, my airbrush is a double action Iwata Eclipse HP-SBS, with side mounted colour cup, 0.35mm needle, toolless nozzle removal and 2 and 9ml colour cups. The smaller cup is perfect for weathering and I rarely use the larger cup even with livery application, preferring the lighter weight with the smaller cup. This keeps my airbrush light, easy to handle, while the side cup usefully tilts through 360^0 for spraying at any angle, useful when spraying tops of models such as roofs. (This model is stocked by certain dealers, but has been replaced by the Eclipse Takumi, a gravity fed, side cup brush. This is designed to be even more comfortable and easier to use and I have upgraded my HP-SBS with a Takumi trigger for more comfortable longer airbrushing sessions).

My compressor is the ubiquitous AS186 seen everywhere and all over ebay. An inexpensive, oilless, piston compressor with a 5 litre tank, adjustable pressure setting and reasonably quiet operation, it does everything I need it to do. Nuff said.

Paint preparation

If possible, store paints at room temperature, otherwise bring them into a warm environment the day before use, as cold paint is difficult to mix and rarely sprays well. When working with acrylics, preparation is pretty simple: give it a shake for 10 seconds and squirt it out! Enamel tinlets need stirring for an age, as when the pot has been standing for even a few days, the pigment separates from the carrier and after a week, it hibernates at the bottom and like a recalcitrant dog, will stay there when called. The first thing Mick Bonwick taught me at Pendon was the art of correctly stirring Humbrol enamel paint, a basic task to be learned well and never skimped. I use a stainless steel scoop ended mixing stick from Tamiya and keep going at it for the full 2 minutes. Mick used a phone alarm as a reminder of how long 2 minutes stirring feels like and it was a useful point to make. The big problem with putting unincorporated pigment into your airbrush is that it will block the nozzle, which then takes even longer to remove the needle and nozzle, clean up and put it together again, than to stir the paint properly in the first place, so 2 minutes it is then. Of course you can simply buy a purpose made battery powered paint whisk gizmo for 10 seconds. I have one, never used it as I do not like wasting hard to get enamel paint with a whisk, as it’s difficult to get GWR colours outside of the UK.

All paint normally needs thinning, whether applying with a paint brush or airbrush. I thin and colour mix in a palette with brush painting and because it was the way I was taught, I thin and colour mix in the colour cup when airbrushing. This is quicker, particularly for weathering, when you only ever work with small paint quantities. I use a paintbrush to drip enamel into the cup. However, with any type of paint, the first thing you always put into the cup is the thinner, as when you pull back on the trigger, you don't want undiluted paint going on the workpiece, or possibly clogging the nozzle.

Personal protection

It's not the smell of enamel paint that can cause serious health issues and don't think that acrylic paint is safe because it doesn't smell. Both acrylic and enamel paint particles will get inside your lungs if you spray them without taking safety precautions and they will cause damage, ultimately very serious if protection is not used.

If I'm spraying indoors with either a rattle can or airbrush, I use a spray booth with integral extract fan and wear a twin filter face mask, covering the nose and mouth.

If I'm spraying outside, I use a large cardboard box to contain the overspray and wear the mask.

When mixing enamel, I do so in the spray booth wearing the mask.

When stirring enamel, I do so wearing the mask.

Do not risk you health by being inattentive for any reason.

Mixing/thinning paint

Keep a notebook accessible near your work bench and make notes about how you do things, even perhaps where you put things, as I used to spend too much time looking for stuff I remember buying before being slightly better organised. Keep notes on paint colour mixes, thinning ratios and compressor settings for future reference, as you will need it sometime long after you've forgotten the exact numbers.

Note: a useful tip learned well and followed thereafter, is to restrict your weathering colours to a fairly limited palette. This gets used to weather most things and gives a unified approach to the whole layout. Both my weathering paint and pigment media colours are from the same palette.

While my preference is to mix paint in the colour cup, other methods are available, but tend to be messy, wasteful of paint and over complicated. Mixing proportions is measured by

drops carefully dripped into the colour cup and I begin a weathering session with 10 drops of thinned paint in the cup.

Transferring paint to the airbrush: a little thinner (white spirit) is decanted into a broad based clean **glass** desert pot (certain plastic yoghurt pots melt, honest!)and then via a plastic pipette dropper into the colour cup. Paint can be dropped from a dropper bottle, although enamels usually are in tins, so I use a clean paint brush reserved just for this exercise and drip the paint into the cup after the thinners, then use the brush to mix the paint.

Always start with putting thinner into the cup first, as it is much better to have thinner coming out of the airbrush first, rather than unmixed paint. If I repeat this point again, it's not a bad thing.

Branded thinners, retarding agents and flow improvers are available and many YouTubers recommend their use, although I'm not always sure why, other to help boost their YouTube income. For all enamels, white spirit is all you need, is inexpensive and a bottle will last a very long time and Mr Bonwick used it for ever.

Suitable paint consistency is essential for satisfactory atomisation and the paint needs to be runny enough to atomise, but have sufficient pigment to cover and not be too thick to clog. A milky, probably semi-skimmed consistency should be aimed for, which does not rapidly run down the side of the colour cup, or mixing container. I let down the paint to a 50/50 mixture, ie, 5 drops of thinner, followed by 5 of enamel. The ready to use Vallejo acrylics sold in those superb dropper bottles suggest a good starting point and I suspect require less thinning. In fact, Vallejo market them as ready to spray, so some little experimentation will be required to find the right Vallejo milk ratio, or indeed what works best for you. I use these acrylics extensively when hand painting by brush and thin them on a palette with some water, so I suspect I would do likewise for airbrushing, but will defer to more expert advice from experienced acrylic users.

<u>Compressor settings</u>

Exact settings will depend on paint viscosity, temperature, distance from workpiece, type of finish required, etc and ultimately from your own experience and preference, but the following is a starting point.

Acrylics	15 -20psi
Enamel	20-25psi

Spraying paint

You will now be seated comfortably at the work bench with a loaded airbrush in its holder, a part water filled cleaning pot on the bench and your model on the turntable, so put on your mask and also gloves if you need them, turn the extract fan on and pick up the airbrush, who is your friend, so do not be afraid of it. You now ready to airbrush . . .

With my 0.35mm needle set up, applying weathering mist layers to a 4mm scale model can be easily accomplished with the air brush 4''/ 100mm from the model and moving the brush along the model at a steady speed of 1''/ 25mm a second. To avoid paint accidents, start with the airbrush aimed 3''/ 75mm to the left of the model, press only down on the trigger to start the air and then gently pull back on the trigger to emit a fine mist of paint, then proceed along the length of the model until 3'' past the end of it, push forward on the trigger to stop the paint flow and then release the trigger. Observe a subtle and perfect thin mist layer of weathering on the model. Turn the turntable to repeat the process until all four sides are done, then continue up and over the model as dictated by the style of weathering being applied and layering the mist coats as necessary. See following examples for more detailed illustrated descriptions:

https://www.rmweb.co.uk/topic/169120-newton-regis-workbench-wanderings-through-the-1920s-and-30s-the-great-western-way/?do=findComment&comment=4708267

https://www.rmweb.co.uk/topic/169120-newton-regis-workbench-wanderings-through-the-1920s-and-30s-the-great-western-way/?do=findComment&comment=4710194

When weathering stock, say a steam loco, this layering method is enhanced by starting at the underframes with a light colour for frame dirt, such as Humbrol leather with a tad of black, then increasing the percentage of black in the colour cup as you work up the loco sides, until at the top smokebox, boiler, firebox and cab, where the black will be at its largest percentage. No emptying or cleaning of the colour cup is required with this technique and as only very thin well atomised layers of enamel paint are being applied, the operation can be done in one continuous operation.

Incidentally, if you do encounter dry tip or spattered paint being ejected, take the crown cap off the end and with moist finger and thumb and a little kitchen towel, gently pinch the collected drying paint off the end of the nozzle. This is only usually an issue if you have been spraying for an extended time and/or possibly with insufficiently thinned paint.

Cleaning

Always think of cleaning simply as part of the airbrushing experience, as it isn't a chore and it doesn't take long.

Adopting a good cleaning regime ensures the airbrush is always ready for use and will perform as new. Provided you do a minimum after every session, approx. 5 minutes, including cleaning the needle, the need for a more intensive strip-down is reduced, although you should do this periodically and when you won't be spraying for a while. You'll know if you've done it right when you pick up the airbrush and it works! In short though, you'll be spending much more time using the airbrush than cleaning it, provided of course you work smart and use logic and common sense.

There are plenty of airbrush cleaning videos on the net and almost certainly one for your particular airbrush, so watch it, read my warning below and then take a look inside your airbrush. It's fascinating and very small in there.

WARNING: Notwithstanding what several airbrush cleaning videos tell you on YouTube, do NOT remove the needle from a clogged paint filled airbrush by pulling it out from the back. This drags paint through the packing gland and contaminates parts which paint never normally comes into contact with, making a complete strip down and comprehensive clean necessary. Instead, remove the crown, nozzle cap and the nozzle, then very gently push the needle forward until you can then hold it from the front, then avoiding stabbing yourself, slowly draw the needle out from the front of the airbrush.

<u>Bonus item</u>

The following question and answer is taken from my layout thread on the YMRC forum pages and aims to put someone's fear of airbrush cleaning to rest:

Q . . . Regarding my fear of a lifetime of airbrush cleaning, how long did you leave it between "washes" and did you clean the airbrush each time.

My thoughts are, it takes probably 30 seconds to spray a wash. 5 minutes to mix it up and 30 minutes to clean the darned airbrush. That makes 35 minutes downtime for a 30 second job .....for each pass !!

I like the idea of airbrushing very much but I do want to actually paint something, not just clean the machinery.

A . . . It's nowhere near as bad as you think Peter, just a question of a smart work approach. The reason for starting at the bottom of the loco and working up, is that you can add more thinners and black to what's left in the colour cup of the airbrush, as you work up the loco with a darkening hue.

As soon as the paint is atomised, it starts to dry, so when I finish the first pass along the side of the loco, below the footplate in about 4 seconds (an inch per second from about 4 inches away is a good enough rule of thumb), I turn the turntable through 90 deg and spray the front, then spin and spray the other side, then the back. This uses only a tiny amount of paint and I now repeat above the footplate and again upwards and do the top of the loco as well.

I was using my small 2ml colour cup (Iwata Eclipse HP-SBS) with these two examples, so then used a pipette to put another 10 drops of white spirit in the cup, then 5 drops of colour. The colour this time though had a tad more black than the first mix and then a tad more for the top surfaces and cab roof. I use a paintbrush to transfer the colour to the cup and also to mix it in the cup as well.

There are some detail tips to do while you have the initial warmer colour, like touch a 9 volt squarish battery to the wheels to turn the motion to allow you to spray behind the parts previously covered by the rods, etc. I'm sure you get the idea. By the time this is done, even with my small cup (9ml is a more normal size for many airbrushes), it's time for a cuppa, so I empty whatever paint is left from the cup and refill with white spirit and spray this through into the cleaning pot, put a few drops of thinner back in the cup, place the brush on the stand and go have my tea for ten minutes, after which, the paint has gone off sufficiently for manipulating with the flattie brush and a trace of solvent. The enamel paint will remain workable for about an hour.

So to put 4 or 5 mist coats on the loco took perhaps 5 or 10 minutes (if you are chatting to someone) and involved no cleaning of the airbrush whatsoever.

Happy modelling,

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