PAINT

Of all the model building techniques, painting is one of the trickiest. Worse, the penalty for getting it wrong is hours or remedial work and the potential loss of the part.

What follows are my own notes and comments about paint and painting distilled from my experience painting the models you see on this website. You may find them useful.

Types & Availability

1. There are three general types of paint to choose from: *Lacquer*, *Enamel* and *Acrylic*.
   Lacquers are thinner so they preserve surface detail better. They also flow better helping provide a really smooth surface. They are more volatile so they dry faster. Typically you can recoat within minutes, which is useful if you want to lay down multiple thin coats. You can also handle the part within an hour, although longer is always better. However, lacquers will attack styrene so it is advisable to use a primer or very thin first coat.
   Enamels are more widely available, especially in small tins or bottles. However, the paint is thicker and doesn't flow as well. It's harder to get a really smooth surface finish and surface detail gets lost under multiple coats. Enamels also have a much longer drying time – needing at least twenty four hours before parts can be safely handled.
   Acrylics are similar to enamels when it comes to detail and handling, but have the obvious advantage of water cleanup.
2. Paint types can be incompatible. A lacquer gloss coat on an enamel base will likely bubble or craze the enamel. The rule of thumb in laying down paint is **LEA**; Lacquer, then Enamel, then Acrylic, never the other way round. Like-on-like is generally OK.
3. Paint manufacturers have reformulated their paints so lacquers are now harder to get.
   From roughly 2006 onwards, most paint manufacturers (but not *Tamiya*) began making major changes in their formulations to reduce volatile organics. This was in order to meet more stringent EPA rules. One result is that some paints that were lacquer-based or lacquer-like now behave like enamels. So beware, and test first!! The second result is that there are now very few lacquer paints available in consumer stores. However, commercial outlets still offer lacquers, particularly those selling paints for automobiles. The hunt is worthwhile.

Techniques

There are numerous books and web articles on painting models, so it makes no sense to repeat their generally excellent advice here. What does follow here is a summary of the techniques I used on the models in this website. Some of the techniques may offend the purists, but they served the purpose.

Preparation & Overall Procedure

Before I paint, I typically assemble each individual module (e.g. engine & gearbox, rear axle, front axle, fuel tank, chassis frame, etc.) along with all the bits and pieces that go with that module. I use pegs, screws and other reversible assembly methods so the parts can easily be tweaked to fit, if necessary. So, for example, I assembled and re-assembled the arms and rods of the carburetor and controls links several times before I was happy everything was correctly sized and aligned. Also, keep in mind that, depending on the part, you'll need to make allowance for the thickness of the subsequent primer and paint.

Because lacquers are thin and let detail show through, poor surface preparation also shows through. To get a professional finish it is essential to remove flash, mold marks, sinks, scratches and burrs. The preparation can be a royal pain, especially since Pocher's production quality wasn't very good, but the end result is worth it.

Once the construction of a module is complete, I'll take it apart and paint each individual piece. Then, when the pieces have completely dried, I reassemble the module and apply any finishing

details (painting bolt heads, etc.). The module is then covered and set aside until all the modules are brought together for the final assembly.
All this is based on the principle that the less you handle a painted part the better. Fingerprints, scratches and gouges are hard to fix once a piece is part of an assembly.

For example, on the chassis frame, I'll make the fuel and lube lines and fit them to the rails, make the rear cross-member in front of the fuel tank, revise the muffler hangers and, wherever possible, drill the mounting holes for such items as revised shock absorbers, torque reaction damper cross-member, etc. Then I test assemble the frame (I slim down the ends of the cross-members slightly so they'll go together with only a little pressure. Of course, once the parts are painted they'll be a much tighter fit.) Once I'm happy everything fits, I pull it all apart for painting.

Primers
Primers are one of the keys to getting an excellent finish. Their purpose is to bond to the underlying material and provide a uniform base for the paint. But, of course, you don't want it to be too thick otherwise detail starts to disappear.
For plastic parts I typically use a Michael's gray primer.
For metal parts I use a high quality self-etching primer which I get from an auto parts store. On levers, which I paint individually, it's important to use a good etch primer otherwise the paint will likely flake off.
If the surface is rough I'll also use Duplicolor's Filler Primer and wet sand that down to a smooth finish.

Painting
- Wherever possible I always use lacquer paint (or Tamiya's equivalent). As pointed out already, lacquer is fast drying, lets you lay down a thin coat, and lets a lot of detail show through.
- I've tried airbrushing, but couldn't stomach the constant cleanup! So I've settled on spray cans which are more convenient and quicker.
- Typically the painting sequence is:
    - Mask or otherwise protect the elements of the part you don't want to paint.
    - Spray on self-etching primer (if a metal part) or regular primer (or sometimes Duplicolor's Filler Primer). The primers should be lacquer compatible.
    - I let the primers dry for at least an hour, preferably overnight.
    - For really smooth finishes, wet sand the primer coat using 800 grit paper or higher.
    - If need be, repeat the sequence.
    - Spray on Duplicolor Primer Sealer (optional).
    - Lightly apply the initial lacquer coat.
    - Wait at least 15 minutes and then apply the second lacquer coat. This second coat assures complete coverage, ensures greater 'depth' yet still lets detail show through.
    - Let the lacquer dry overnight.
    - For bodywork panels, I use automotive lacquer color coats (available in 12oz cans from www.automotivetouchup.com). They are designed to be covered with a compatible high gloss clear coat.
    - For other parts, and depending on the finish I want, I may apply a final clear coat; high gloss, semi-gloss or flat.
- Typically I will firmly mount the part on a rod or cocktail stick. There's usually a hole (or a hidden side that can accept a hole) into which the cocktail stick can be inserted. For larger parts I use styrene or brass rods so there is no risk of the part falling off.
- I spray about 8" to 10" from the part and use as little paint as possible … just enough for the lacquer to completely wet the surface. I rotate the part to help even out the coverage. For complex shapes I use multiple short bursts, with the goal of getting little, if any, build up anywhere. Paint in lots of light; it really helps to see the quality of your coverage.
- I then place the end of the stick in a piece of Styrofoam while the part dries.
- The process is repeated for the second coat and any subsequent clear coat.
- Afterwards I'll place the part in position while still on the stick so that, with a bit of care, there's almost no need to touch the finished surface.

Detailing
For contrast detailing, such as bolt heads and nuts, I use enamel paint (or acrylic) applied with the finest brushes I can find. A lighted magnifying glass (or lamp) definitely helps at this point. For hardware I use 'Navy Gloss Gray' to give them a contrast to the satin black of, say, the chassis. For hardware on silver or aluminum, I use Humbrol 'Steel' which provides a nice subtle contrast.

Chrome
'Chrome' paints are a challenge. I've yet to find a really good 'chrome' paint, and I've tried every type I can find. There are three issues.

- Firstly, chrome paints are very sensitive to paint thickness and uniformity. A thin coat is essential, but getting an even thin coat takes practice. Any spluttering is death. Try to find a lacquer-based paint that atomizes really well. A thin, lightly misted, uniform, completely wetted coat is the goal. Not easy!
- The second issue is that, even when dry, chrome paints mark very easily, especially with fingerprints. It's essential to minimize handling and assembly once the part has been painted. That, of course, is also easier said than done.
- Thirdly, chrome paints don't take clear coats. A clear coat would normally enhance the shine and make the parts easier to handle. But clear coats on chrome paint kill the shine and turn the surface gray. I've even tried a water-based clear coat on lacquer-based chrome but that didn't work either.

My best experience was with a lacquer-based Rustoleum Metallic paint that wasn't even touted as chrome. I got it from Home Depot. Currently I'm using a consumer chrome paint made by Kilz but I also think that is no longer available. However Michael's carries one or two chrome paints that work.
One trick to enhancing the quality of chrome paint is to apply it over a gloss black finish. It does make a noticeable difference.

Paint Stripping
Either because of a mistake, or because you're reworking a previously painted part, there will be times when it's necessary to strip paint off a part. With plastic parts, this should always be done with care otherwise you risk damaging the part.

- For lacquers I use lacquer thinner. However do not soak plastic parts in the thinner. It will soften the plastic, pit the surface and, before you know it, ruin the part. So proceed very carefully.
- For enamels, I use normal enamel paint thinner.
- An alternative, suggested by Ken Krausfeldt, is to use 99% isopropyl alcohol. It does not soften the plastic, but does remove paint with the aid of an old toothbrush. The key is to use the 99% concentration; the lower concentrations do not work.

Final Thought

Painting is definitely an art but you can do surprisingly well following the basic techniques. Just be patient!

In the end the hours invested fade away, and what remains is the quality of what you did.
Then the pleasure of having got it 'right', trumps the pain of having got there.

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