Common Questions and some Answers

After doing my fair share of stripping paint and re-sanding parts I decided it was time to do some web research to better understand various paints and solvents. Below is a subset of the information that I was able to find during my searches:

The volatile portion of the paint mix is what dissolves and disperses the skin (what's left behind) forming ingredients.

The volatile solvent used in enamels is usually one of the following:

- Turpentine
- Mineral spirits
- Benzol, Toluol, Xylol and Naptha

The volatile solvent used in lacquers is usually one of the following:

- Acetone
- Ethyl Acetate
- Ethyl Alcohol
- Butyl Acetate
- Toluol
- Butanol

The solvent used in Acrylics is usually one of the following:

- Isopropyl alcohol

Lacquer adheres via a chemical bond that etches itself into the surface. On the other hand, enamel and urethane bond to the surface.

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Lacquers, enamel, acrylic, Oh my! - This name describes the order in which different types of paint can be applied over. What this means is, lacquer paints can have enamel and acrylics applied over it, enamels can have acrylics applied over it but not lacquer, and acrylics can have nothing applied over them. Conversely you can't apply lacquer over enamels or acrylics. Acrylics over Enamel over Lacquer. When you think about it, it makes sense - lacquer solvents can melt enamels or acrylics, but enamel solvents can't melt lacquer based carriers/pigments, and acrylic solvents can't melt enamel or lacquer carriers/pigments.

You can get around this through misting, I have found in my experience you CAN paint enamel over acrylics, since the two solvents are completely unrelated. But, your mileage may vary.

More about 'the big 3' types of modeling paint:

For RC fans there are three different types of paint that are used, lacquer, enamel, acrylic. Of course many other types of paint exist but they're generally not used much by modelers for various reasons.

Lacquer - Lacquer paints use organic solvents as their base. Organic solvents are hazardous to you and others, plus lacquers just plain smell nasty. I've read that these chemicals are classified in the same area as nerve gas agents. Organic solvents are also found in modeling glue; it melts plastic and as such can cause damage you too! If you're not sure about what lacquer can do get some lacquer thinner from a hardware store and drop a fly into it, and watch what happens.

That's the dark side of lacquer paints. The good side of the force is, because these organic solvents are so volatile, they also evaporate the quickest of the three paint types, hence they cure the fastest. Also, since they're such a tough bunch of chemicals, the pigment and carrier is also very 'tough' - that is, sticks great to plastic and polishes out well. Won't flake off easily like acrylics. They also go on in thin coats, which is great at preserving detail.

Tamiya spray paints, Duplicolor spray paints, Plastikote spray paints, Gunze Sangyo Mr. Color, these are all lacquer paints. Lacquer thinner is used to thin lacquer paints. Lacquer thinners can be any of the following: Paint manufacturer's thinner (Mr. Color Thinner, for example), hardware store lacquer thinner, Xylene, Toulene, Methyl Ethyl Ketone, acetone, among others. Acetone is probably the nastiest of the above.

You must use a suitable lacquer primer underneath lacquer paints. Remember above how the solvents in lacquer paints are the same solvents used in glue? Spray too much lacquer paint onto a model, and it will begin to melt your model. A lacquer primer will prevent this, because the carrier and pigment of the primer are strong enough to not be melted by the lacquer paint. Tamiya primer, Duplicolor primer, Plastikote primer, Gunze Sangyo Mr. Surfacer, any 'lacquer' primer is suitable.

Enamel - Enamel paints are some what outdated. The solvent they use mineral spirits and petroleum distillates take a LONG time to evaporate and cure out. They also tend to go on extremely thick and run easily allowing paint drops to start sliding down the model messing up your paint job. They can take weeks, even months to cure completely, and even then remain relatively soft when compared to lacquer paints.

The good part is that they aren't very volatile. Petroleum doesn't harm plastic and they do rock for brush painting since they're thicker and take longer to dry than acrylics and lacquers, it gives you a lot more time to play with it and get it just 'right'. They tend to go only where your brush goes, unlike acrylics which run all over the place and dry unevenly!

Enamel paints are thinned with mineral spirits and the above mentioned lacquer thinners, besides the paint manufacturers' recommended thinner. Enamel paints include Testors, Testors Model Masters, and Humbrol.

Acrylic - Perhaps the best general purpose paint for any type of model work. They can be described as 'water-soluble' as in able to be thinned with water, but for the most part use isopropyl alcohol. There are many advantages to them. One, isopropyl alcohol isn't very dangerous Two, it dries very quickly. It's like lacquer paint but without all the dangerous effects. After application, parts painted with acrylics can be carefully handled after just a few hours. Be careful of getting fingerprints onto it, it's dry to the touch but still very soft.

Three, they're easy to clean when using with an airbrush. Windex, rubbing alcohol,

even water can clean an airbrush nicely after airbrushing with acrylics.

The bad part about acrylics is that they don't polish very well in most cases. The acrylic pigment and carrier time take a long time to crosslink, and they don't stick very well to the model. Generally if you're painting with acrylic color, paint over it with enamel or lacquer based clear coat, to polish it out best.

Clearcoats - what are they? Why use them?

Clearcoats are paints without any pigments. That is all. The purpose of a clearcoat is multifold. First, it provides a neat little barrier in the polishing process. The single biggest problem in polishing paint is when you polish through the paint down to the primer or plastic. When you have a clearcoat over the color coat, you're polishing the clearcoat, not the color coat, thus you can use the clearcoat to gauge your polishing process. Second, some people like to 'seal' in their decals with it. Yes, you can paint over decals, but be very careful, as the solvents in clearcoats can melt the decals! Third, with metallic, mica, and pearl paints, you can't polish the paint directly, because this screws up the metal flakes or mica/pearl particles. You see, they don't polish evenly, which is why you must clearcoat over them and polish the clearcoat.