



<http://www.scalemodelguide.com/painting-weathering/painting-guide/primers/>

Introduction

This article gives general information about putting a primer coat of paint on to scale models. In particular, it considers the advantages and disadvantages of applying a primer.

Definition

First of all, let us be clear on what is meant by a primer coat. The primer is the very first coat of paint on a model. It goes directly on to the model's surface (usually styrene plastic) and is completely covered by later coats of paint.

To Prime Or Not To Prime?

There are modellers who will always apply a coat of primer (or even more than one) as part of the painting process and other modellers who rarely, if ever, use a primer. Others will be somewhere in between, using a primer on specific models.

There is no doubt that stunning models can be made without using a primer and priming a model will involve additional time and expense. There is also a small element of risk involved as it is possible to spoil a model at the end of the construction stage by applying a poor layer of primer that covers fine surface detail.

With all these disadvantages and the fact that the primer coat is not even visible on the finished model, the obvious question is why would anybody bother with a coat of primer?

Reasons For Adding A Coat Of Primer



The primer coat on this figure revealed areas where the seam was still visible – marked with the red circles).

The main reasons for applying a primer coat are as follows:

1. Showing up surface defects;
2. Improve the adhesion of top coats;
3. Reduce the overall thickness of paint needed;
4. Pre-shading

Each of these will now be explained in more detail:

1. Showing Up Surface Defects

Getting a perfect surface without any visible marks or seam lines is essential for a professional finish on a model. Painting a model rarely hides defects and, in fact, tends to highlight them. Unfortunately, it is not always easy to see surface defects before painting.

This is particularly the case where fillers have been used and where the surface has been sanded leading to different colours and degrees of shine. A coat of primer gives a model a single even colour and consistent amount of shine that makes it much easier to see any surface defects.

This feature of showing up surface defects is very important in producing a top class finish and is of itself a good enough reason to prime models in almost all cases. The same effect could be achieved by applying a top coat direct to the model's bare surface (providing a single colour is applied evenly over the whole model). However, after the surface defects have been fixed, it would be necessary to apply another coat of the top coat, so the total number of coats of paint would be the same.



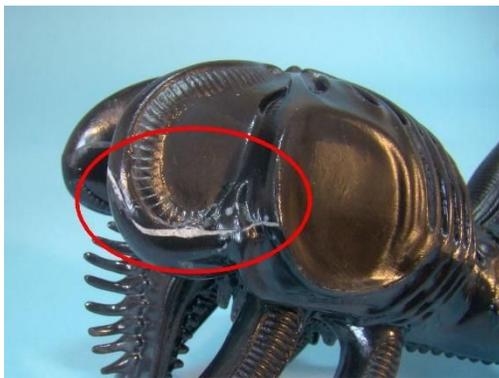
The front teeth on the Alien figure had to be completely remodelled using Milliput. It was impossible to see how well they blended in with the rest of the teeth until the primer coat gave everything a consistent colour and texture – see below.

2. Improving Adhesion

The intention is that the primer coat will adhere to the model's surface better than the top coat and the top coat will adhere to the primer better than it will to the model's surface. The primer coat grips well to both the model's surface and the top coat holding it all together. The fear is that without a coat of primer the top coat may peel off, or be easily rubbed off.



Is there any truth to this? It is certainly the case in the 'real' world in many situations. If you try to apply a gloss coat to bare wood e.g. a door frame or skirting board, or metal e.g. a garage door, it will not adhere well and may indeed peel off or flake away. However, in the modelling world the situation is not so clear.



Above – The shoulder of the Alien figure was another area with a bad seam. Below – the primer coat showed the seam was not visible, but it did reveal a molding flaw that until now has not been spotted.



Modelling paints are designed specifically to be applied to plastic and most of the time will be a matt/flat finish with the rough surface naturally giving a good grip. They are normally very high quality with good binders and very finely ground pigments. The adhesion to both plastic, resin or metal and to subsequent coats is very good, so the need for a primer to improve adhesion is questionable. In fact, the [Vallejo website](#) specifically states that 'A primer is usually not needed' for their paints in most situations (although Vallejo do produce a primer).

However, this has not always been the situation and modeller's who have been practicing the art for a long time may be able to quote instances in the past when paint did not stick well to the model. Paints available in the 1960s and 70s were generally not such good quality as those on the market today, so modeller's who are a bit long in the tooth may have developed the habit of always applying a primer to improve adhesion when in fact, it may not be needed in most cases. If a good modelling paint is used and it does not adhere well, then it is more likely to be the result of poor surface preparation rather than the lack of a primer coat. Therefore, in most cases I would advise that applying a primer for improved adhesion of the top coat is not necessary and the best way to get good paint adhesion is to ensure that the surface is prepared properly with no traces of grease or oil.

One possible exception to this is where a gloss or semi-gloss paint is to be the top coat. The shiny nature of the paint means that it is less likely to adhere to the shiny plastic surface and a coat of matt/flat paint in between the model's surface and top coat might improve adhesion, although the primer coat does not necessarily need to be a specific primer paint.

3. Reduce the Thickness of Paint

This may seem counter-intuitive. How can adding a layer of primer reduce the number coats of paint? The answer lies in the fact that most primers are very opaque i.e. they do not let the colour of the underlying surface through, and are neutral in colour. If you have a model that is made of different materials (styrene, resin, brass etc.) or uses plastic of different colours, then you may need several layers of top coat to even out the colours of the different surfaces. However, a thin layer of primer will give the model an even colour overall that can be then be easily covered by the top coat.

4. Pre-Shading

Although the primer is completely covered by subsequent coats of paint, it is not necessarily completely obscured by them. The aim when painting models is to use as little paint as possible and the best results are often achieved by applying several very thin almost transparent layers.

By selecting a primer colour that is a darker 'shadow' version of the top colour it is possible, by careful airbrushing, to leave some of the primer subtly showing through the top coats to give shading that adds depth and interest to the finish.

Are Specialist Primers Necessary?

If you have decided to add a primer coat to a model then there are three options for choosing the type of paint:

1. Specialist Model Primer paint;
2. General Primer;
3. Ordinary model paint;

Many model paint manufacturers make their own branded primers and this is probably the safe option because they will have been specifically designed to work with the other paints in the manufacturer's range. These primers should cover well and adhere well.

Some modellers use general primers – particularly the acrylic sprays made for automotive use. These can work well, are convenient and reasonably inexpensive (a large tin will cover several models). Care should be taken not to apply a layer that is too thick. A scale modeller will be trying to preserve as much surface detail as possible whereas car primer is intended to cover and hide any surface imperfections. If one of the aims of the priming is to pre-shade the model, then the best choice may be an ordinary model paint provided it will give a surface finish that is matt/flat or with a slight sheen. A paint that gives a gloss or semi-gloss finish will not make a good primer coat. Unless the model's surface is particularly

difficult to get paint to adhere to there is no reason why a normal model paint cannot be used as a primer coat.



A mixed media model like this one, with styrene, resin and metal surfaces, particularly benefits from a primer coat.

Choosing the Primer Colour

If one of the aims of priming is to pre-shade the model then clearly a colour that will make a good 'shadow' colour for the top coat is best.

When using a manufacturer's primer then you do not have a choice of colour and will probably find that you will have to use grey or an off-white. This is not a problem since these make good primer colours.

If the final colour of your model is primarily light in colour, then consider using a light coloured primer and vice versa with a model that is dark coloured – this will help reduce the thickness of top coat needed to get the desired final colour.

HINT: If you have small amounts of paint left in pots that are unlikely to get used then you may wish to consider mixing them together to use as a primer coat.

If the primer will not be seen through the top coats then the primer colour to use is down to personal choice. Grey or off-white are popular colours, being neutral and showing up the shadows of any surface defects well. Perhaps surprisingly, black is also often quoted in modelling magazines as a primer colour although intuitively it would seem difficult to see surface defects against black (Tamiya semi-gloss black being a favourite of some). Another colour used – particularly for aircraft – is silver. Silver shows up defects well and as it mimics the natural metal surface of many aircraft, it can be left to show through the top coat in places to simulate wear.

All of this shows that the actual colour of the primer can be almost anything and it is getting an even mono-colour over the model that is of primary importance.

Summary

The original purpose of a primer was to improve the adhesion of the top coats. This has become unnecessary in most cases due to the quality of modern model paints. However, there are so many other good reasons to apply a primer coat that it is almost always done by serious modellers. The only thing to take care with is to keep it thin to avoid obscuring delicate surface detail.