

Avoiding the

A 'mottle,' 'blotchy' or 'patchy' type appearance can sometimes result after spraying a metallic finish, particularly in lighter colors. So, what is it, why does it happen and how can it be prevented?

At one time or another virtually every refinish painter will have come across the 'mottle' effect. It describes the appearance of light and dark areas within a metallic finish and is also referred to as 'patchiness.' These light and dark patches appear due to the incorrect orientation of the aluminum particles within the paint film.

It's a problem that's almost impossible to detect at the basecoat stage since most basecoats dry to a silky matte finish. That means the effect doesn't become evident until after the clearcoat is applied. Naturally, at that point it's way too late to rectify the problem, and the only course of action is a re-do which can lead to serious film build problems.

Cause and cure

There are two main contributing factors—incorrect thinning of the paint and the application technique. The first scenario results from an insufficient thinning ratio or using a thinner that's too fast for the prevailing conditions—for instance, when trying to push a job through quickly. After application the solvents in the thinner evaporate too rapidly and the paint film sets so quickly that it doesn't let the metallic particles lay down smoothly, resulting in a mottle effect.

Using compatible thinners is also vital. PPG thinners are specifically designed for use with PPG products in the correct thinning ratio and according to the ambient air temperature. Following these guidelines can assist in dramatically reducing the mottle effect.

While working with individual bodyshops to help them with mottle control, PPG technical staff came across the following examples. One shop was thinning all colors to 1:1. This was working fine with dark colors, but with light colors there was mottle. It was discovered that the air pressure was around 45–55 psi which is too high for basecoat and is a major mottle contributor because it doesn't allow the metallic basecoat to be applied in a wet, even film. After reducing the air pressure to 25–35 psi, mottle was dramatically reduced.

Application technique is another important factor in reducing mottle and it's here that modern metallic paint finishes (such as in PPG's *Deltron*® and *GRS* paint systems)

require a modern technique. Previously, the final technique or pattern coat may have been applied over a dry film. However, this can cause mottle due to the paint film setting too quickly which prevents the metallic particles from laying down smoothly. In addition, because this final coat tends to be dry and dusty it can result in clearcoat adhesion problems and reduced gloss levels. Applied correctly, the basecoat will appear very smooth and, when tack ragged, there will be no or minimal color on the tack rag.

To minimize the chance of mottle, the basecoat should be applied to give an even, uniformly dull appearance and left for the

recommended flash times between coats. Proper application technique is critical when spraying light high metallic colors. Make sure to maintain a good 50% overlap and allow each coat to flash for the recommended time. Also, make sure to pick the appropriate reducer for the size and temperature of the job.

Another method is the crosscoating technique—this is where the second coat is applied at right angles to the first and immediately following the first coat. The first coat cannot be allowed to flash or the cross coat will not be able to re-flow and orientate the first coat metallics.

It's a fact of life that most light colors will have a degree of mottle and that repairing light colors will always be more difficult than dark colors. However, using the above tips and the following guidelines should help to avoid mottling:

- Reduce the paint to the recommended thinning ratio and, depending on your equipment, more thinner may be required.
- Use the specified thinner for the spraying temperature.
- Avoid using high air pressure—25–35 psi maximum.
- Allow the paint to flash off properly between coats. Multiple coats without a flash off will make the paint film very 'wet' and cause mottle.

- Don't spray in very cold conditions. This will slow down the flash off time of the paint and increase the chances of mottle.
- Don't apply the clearcoat too soon. If the basecoat hasn't set up fully, the clearcoat may cause the basecoat to dissolve and disturb the aluminum flakes, giving a mottled appearance.
- Ensure that your spray gun has a good spray pattern and, when spraying, overlap the strokes of the gun the correct amount to ensure an even appearance. Keeping the gun back from the job will make the effective fan width larger and overlapping the gun strokes will be easier.
- Develop a technique that works for you.
- Remember, if you do reduce the pressure, to make the same allowance on your spray out card. ■

Mottle Effect

