

COLOR TERMINOLOGY

Face Tone	The color when viewed straight on.
Flip Tone	The color when viewed from an angle.
Base Tinter/mass tone	The color of a single pigment or tinter.
Under Tone	The color produced by mixing a custom color with either white or aluminum.
Hue	The quality of color which is described by the words red, yellow, green and blue. Pure black, grey and white are neutral.
Metamerism	The phenomenon of two colored samples that appear to be identical under one or more light sources but are a mismatch under other light sources

SOLID/METALLIC COLORS

Solid Colors are pigments finely dispersed in a resin medium at a sufficient concentration to give opacity at a film thickness of 2 mils. Light is reflected from the paint film the same way that it is reflected from a glass surface or mirror; light penetrates about halfway into the film and is reflected away at the same angle at which it enters giving the effect of opacity and all-over color the same appearance from every angle of direction.

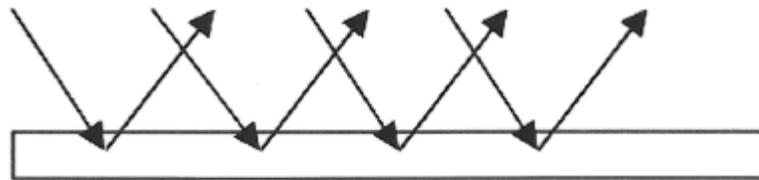


Figure 2. Light falling on pigmented film reflected away at the same angle.

Metallic Colors cause more problems for a refinisher than solid colors and therefore require much more attention in the application process to produce color match. Metallic colors are characteristically different from solid (fully-pigmented) colors. The challenge with metallic colors comes from the translucency of the material or opacity that comes from the aluminum flakes layered in. Because of this translucency, a ray of light can easily penetrate the paint surface and reflect back when it strikes on any one of these aluminum flakes. As the aluminum flakes light at all depths, the total light is reflected and scattered in all directions giving the finish its metallic sparkle; this gives metallic paint its characteristics and apparent color difference when viewed from the face and flip tone.

The layering of aluminum particles affect the appearance of the paint film and these same particles allow for different effects to be obtained via different spray methods. If the material is sprayed dry, the aluminum flakes are trapped in the surface of the paint film; this lightens the color and enhances the metallic appearance of the finish. If the material is sprayed wet, the flakes have time to sink in, bringing tinting pigments to the surface and producing a darker effect.

When repairing a metallic finish, an accurate reproduction of the original finish can only be obtained by matching both the color and the metallic appearance.

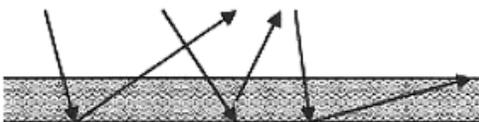


Figure 3. Light penetration and reflection from aluminum particles in a wet and heavy spray condition.

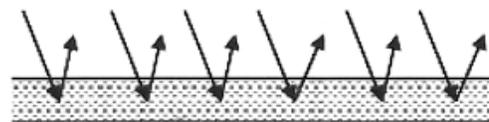


Figure 4. Light penetration and reflection from aluminum particles after a dry and light spray condition.

Understanding Color Matching

IDENTIFYING THE COLOR

Use the Prospray Intermix program to identify the color required by reference to the manufacturer's color name or code. Where the code is missing use the Prospray Minolta Color Reader by matching the car color to a color swatch.

MIXING THE COLOR

1. Use the Prospray Intermix program to obtain the mixing formula for the required color.
2. Check that all bases are thoroughly stirred. New tinters should be stirred for at least 20 minutes. It is advised that your mixing schemes are switched on twice a day for at least 10 minutes at a time, and further suggested that a short stir be carried out prior to mixing. During cold spells stirring periods should be extended.
3. It is recommended that aluminum and pearl bases are hand-stirred with a wide blade prior to being machine stirred. This ensures that all aluminum and pearl paste is thoroughly mixed, and any slight settlement is stirred in.
4. Do not leave the mixing machines running continuously. This will have a detrimental effect on the contents.
5. Ensure that all lugs on the top of cans are properly engaged, that the stirrer is rotating freely, and the pourer is clean and seats properly when closed. Failure to clean the pourer will lead to bits of dried paint in the mix and will cause problems if the technician does not strain before use.

IMPORTANT:

Always hand-stir every mix immediately after mixing and before putting on a shaker or delivering to your customer. Failure to stir mixed paint will result in little or no shelf life of mixed paint.

SPRAYING THE COLOR

1. Always spray out test panels to ensure full opacity is obtained; allow to dry and check against the vehicle before applying the color.
2. When using the color always make sure it is well-stirred and thinned with the correct thinner to the recommended viscosity (checked with a viscosity cup) and activated where necessary.
3. When using a basecoat/clearcoat system it is essential to apply the clearcoat (correctly thinned and activated); allow to dry before comparing the test panel to the car.
4. Always clean and compound the section(s) next to the one being painted; if the color needs fading-out (particularly with metallics), the necessary preparation has been done. This also ensures that when match is being checked, the proper color is showing and not a faded or dirty one.
5. The following points should be noted as the variations in technique listed will affect the final color, particularly on metallic: air pressure, speed of pass, film thickness, flash-off time (air temperature and thinners) and viscosity of paint.

Understanding Color Matching

Before tinting a metallic color, decide if one of the following techniques will solve the problems:

PAINT SHOP CONDITIONS	TO LIGHTEN	TO DARKEN
Temperature	Warm up	Cool down
Humidity	Low	High
Air movement	Increase	Decrease
SPRAY GUN	TO LIGHTEN	TO DARKEN
Fluid nozzle	Small	Large
Needle control	Close up	Open out
Air cap	High air consumption (fine atomization)	Low air consumption (poor atomization)
Fan width	Wide	Narrow
Air pressure	High	Low
THINNING	TO LIGHTEN	TO DARKEN
Type of thinner	Fast	Slow
Amount of thinner	Over thin (lower viscosity)	Under thin (raise viscosity)
SPRAY TECHNIQUE	TO LIGHTEN	TO DARKEN
Gun distance	Distant	Close
Gun speed	Fast	Slow
Flash off time between coats	Long	Short

6. For ongoing color match, we recommend building up a collection of spray test panels to create a complete color library. Write formulas on the reverse side of the test panel along with additional quantities of tinter and other valuable information to facilitate the remixing of the color at a later date.

TINTING THE COLOR

Always use daylight for color matching as artificial light gives a false impression. For example:

DAYLIGHT	TUNGSTEN FILAMENT LAMP	SODIUM DISCHARGE LAMP	MERCURY DISCHARGE LAMP
WHITE	Slightly Yellow	Light Yellow	Bluish Yellow
YELLOW	Orange Yellow	Yellow	Greenish Yellow
GREEN	Greyish Green	Brownish Yellow	Deeper Green
BLUE	Greyish Blue	Dark Brown or Black	Deep Violet Blue
RED	Slightly Orange	Brown	Dark Brown

1. Whenever possible spray out the color; do not dab paint on a panel as this will give a create a wrong color.
2. Always paint to fully dry before any comparison is made; any shade will change in the drying process.
3. Where the adjustment of a color is necessary, please refer to the Tinting Guide to ensure
4. Further advice and assistance can be obtained by contacting your Prospray Distributor and/or Representative.

MIXING EQUIPMENT MAINTENANCE

To ensure the accurate mixing of a color formula, it is essential that all the paint mixing equipment—scales and other machines—are kept in good condition.

Scales

1. Scales should be kept clean.
2. Set all scales on flat, level and firm (stable) surfaces.
3. Regular servicing by the manufacturer is recommended.
4. Prospray will not reimburse any cost incurred for servicing and/or repair.

