

When going for long road trips with my parents as a kid, our car would get absolutely covered in grime and dirt—so much so that its color was hard to determine. Once, after grocery shopping we returned to the car to find “wash me” scrawled on the side panel. We got the hint—it was time for a carwash.



Cars require clear coat to protect their paint, but pigment in the clear coat can distort the car’s final color. Image source: Pexels user unsplash.com

Just like my family did, your customers take for granted that their car’s color will remain the same no matter how much grime, acid rain, or UV light it’s exposed to. But those in the car manufacturing industry know that it’s the clear coat on top of the car’s paint that makes this possible. And they also know that clear coat can affect the color of the car’s paint, depending on the brand and number of coats used.

Clear Coat Is in a Car’s Protective Shell, But Is It Actually Clear?

The composition of clear coat is constantly being improved by paint manufacturers to aid in ease of application, reduce drying times, and lessen the amount of volatile organic compounds released into the atmosphere. While clear coat is theoretically 100% transparent, in reality it contains small amounts of pigment and other substances that can change the final car color.¹ This is an important detail for car manufacturers and auto body repair shops to understand, and it’s especially important to note if your business is considering switching clear coat brands for financial or environmental reasons.

As a manufacturer you can approach this one of two ways:

1. Ensure that the new clear coat is perfectly transparent
2. If your previous clear coat has slight pigmentation, ensure that the new clear coat matches that pigmentation

How Important Is Car Pigment?

Car manufacturers and those in auto body repair know better than anyone how important a car is to its owner. For many customers, their car is more than an object or tool; it's almost a part of the family. Moreover, the color of a vehicle says a lot [about its owner's identity](#) and sense of self, so it's important that it is consistent between batches and in line with what is advertised and promised to customers.



It's important that manufacturers and auto repair shops ensure that the clear coat they use preserves color consistency. Image source: Flickr CC user Colin

Spectrophotometers and Smart Software for Accurate Color Matching

The best way to check for any pigmentation in a clear coat or any differences in pigmentation between clear coat brands is to use a diffuse/8 degree spectrophotometer with an integrating sphere operating in Reflectance Specular Included (RSIN) mode. This device will allow you to quantify:

- What level of pigmentation (if any) there is in your clear coat with respect to the number of coatings applied to a surface
- If there are any differences in pigmentation between different clear coat brands

With proper calibration, this process can be automated by software that does the color matching and comparison for you. Colors are quantified using the *Lab* color space, that is, they are assigned numerical values in three coordinates. These coordinates can be saved and compared to the values of new samples. To save time, programs can be set up to automatically perform this comparison and

to notify the user of their results with a straightforward pass/fail response. This means that any technician can perform these QA measurements.

On a smaller scale, the same spectrophotometric methods are a valuable tool for auto body mechanics and car detailers who perform touch-up repairs and detailing on cars with faded and damaged paint jobs.

Choosing the Right Tools

[HunterLab's](#) comprehensive range of [spectrophotometric instruments](#) offers innovative end-to-end solutions to meet the specialized needs of the automotive industry. From dedicated on-line color monitoring in new car manufacturing to benchtop and portable spectrophotometers for body shops offering collision repair, customization, and restoration services, we have the tools to bring color measurement to new heights and optimize quality control. [Contact us](#) to learn more about [HunterLab's](#) complete array of instrumentation, user-friendly software, and outstanding support services.

1. "Fast drying clear coat composition with low volatile organic content," October 10, 2000,

<https://www.google.ca/patents/US6130286>