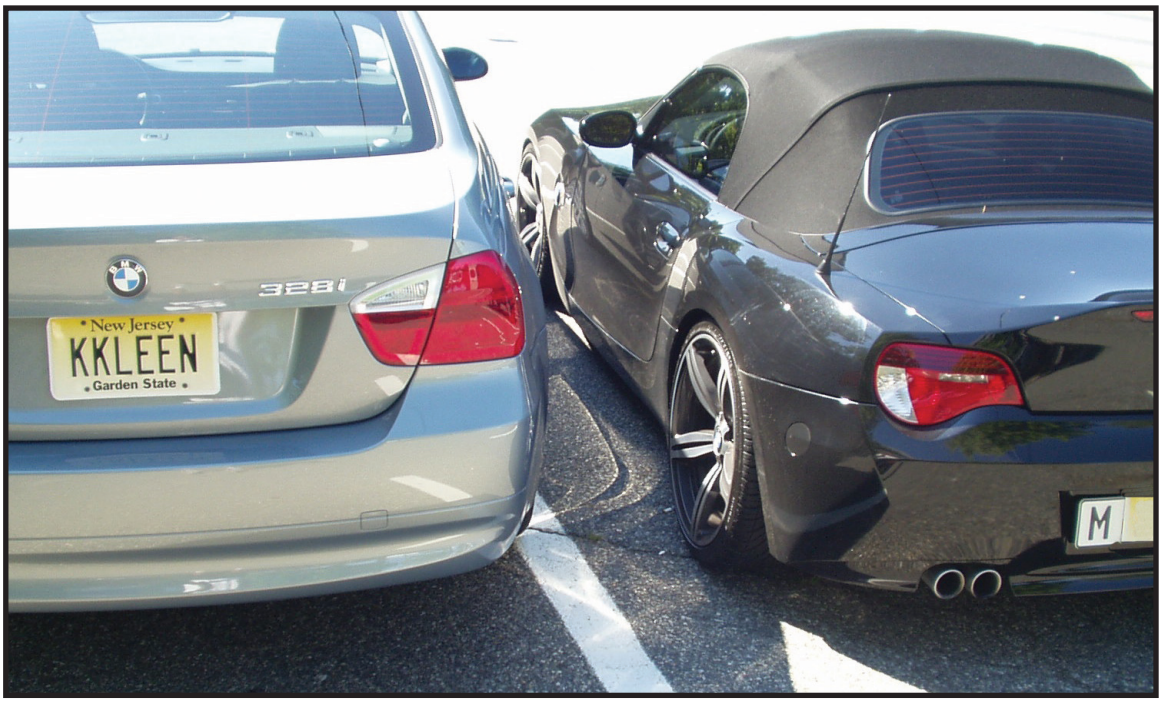


Right: Built in the same year (2007), the 3 series sedan has a harder scratch resistant clear coat while the Z4 has a softer clear coat, but you'll find no tag informing you of this.

Clear Coat

Not So Clear Cut

By Kevin Farrell

We know by now that almost all vehicles are painted with a base-coat/clear-coat system, with the clear-coat portion of the paint being what we buff. There is no secret there. We also know that clear coat is still paint — but a clear paint applied over the base or color coat — that gives the vehicle its gloss, clarity, and UV protection. It will still mar and show scratches and will still need to be taken care of to keep the finish looking its absolute best.

What is more difficult to understand is that there are many differing variations of clear coat, made by many different paint companies. Many times these variations will be found within car manufacturers and make things a bit confusing and difficult.

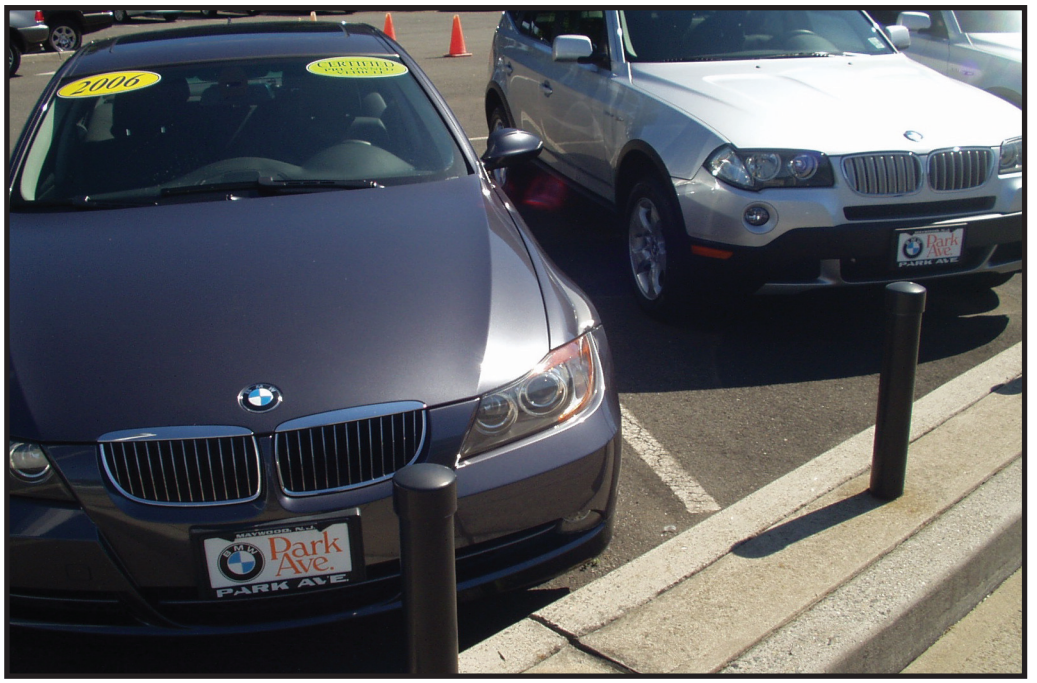
SO MANY CLEARS

Car manufacturing plants use different types of clears from model to model and from brand to brand. Just because we know that today's cars use "clear coat" as the final top coating, does not mean they will all be the same and exhibit the same characteristics when being worked on. Combine the different brands of clear coat with different substrates that they are applied on, and the way they buff can be totally different and very confusing.

Without fully going into all the different types of clear coat out there (and there are many), we have to understand and expect that they all may exhibit different reactions and results when you buff them. I have over the years seen many different variations in clear coats. Some are easy to buff and will look spectacular no matter what you do to them. Some will be harder to buff, and removing scratches and imperfections will be troublesome. Some will be very soft and will leave swirling and marring no matter how delicate you are with them. What's worse is that unless you have had major experience with many different car lines and realize how their clear coats tend to buff out, you will never know what you are in for when it comes to buffing.

AT THE FACTORY

Paint is applied early in the automobile manufacturing process. After the body is welded together and the outside panels — such as the roof, hood, deck lid, and doors — are installed, the vehicle is painted. This is a necessary step, as the car needs to be painted before the rest of the vehicle is put together. The paint needs to dry and cure very quickly to allow the assembly line to keep producing cars at a fairly fast rate. It's an amazing site to see a car painted at the factory. The precision is astonishing with robotic sprayers moving and a fine



Left: These two vehicles on a dealer's lot were built in the same year at two different plants and have two very different clear coats that will have to be buffed differently.

mist of paint covering the vehicles, turning a bare sheet-metal body into a glowing and spectacular sight.

The wet cars move into a bake oven to dry and cure the clear-coated paint. The combination of the chemistry of the clear coat, and the temperature and time duration that it's baked at, will ultimately determine how easy or difficult that particular paint job will be to buff. This can be referred to as the "hardness" or "softness" of the clear.

The problem is that the OEMs will use different brands of clear at different plant locations. You will never be able to tell the difference just by looking at the paint finish. They will all look virtually the same. But they will all buff slightly differently. Frustrating isn't it? People always ask me if there is a chart showing the different clears that the car plants use and how they will buff. Unfortunately, there is no chart. You will need to gain some experience on how different models and different years of cars buff out.

HARD VS. SOFT

If we go back about 30 years ago to single-stage paint jobs, which were lacquer or enamel, the paint surfaces were fairly hard and needed more aggressive methods to buff out. If you know anybody who has been in the business a while, they will tell you about the older buffing products that felt like beach sand when rubbed between your fingers. They will also tell you about buffing with very aggressive wool pads and very high speed on the buffer. They will laugh at the sight of an orbital buffer or a product where you could not feel the abrasives between your fingers. An orbital and a light-duty buffing product just would not work on older style paint systems. They were very hard and when they oxidized or needed correction, you needed to be very aggressive. This was the buffing method needed across the board, no matter the car manufacturer.

When the transition started to take place and clear coats came into existence in the early '80s, those initial clear coats were also very hard. They were called Melamine clears. They exhibited the same characteristics of the single stage paint systems, so detailers did not really need to change their buffing style, products, buffing speed, buffers, or buffing pads. The only real change was the absence of color transfer from the car to the buffing pad. The paint was now "clear" compared to colored, as it had been for many years.

Melamine clear coats are still in use today but generally not on better-quality makes and models. Its gloss is not as brilliant as some newer clear coat chemistries and they are not quite as etch resistant. Car manufacturers started going to a more brilliant glossy clears that had more etching resistance. Chemistry wise, however, they were "softer." These are called urethane clears. More recently, powder clears, which exhibit the same buffing characteristics, are used for VOC purposes and material

savings because the powder can be recycled. These clears originally were used on more upscale vehicles to show a more brilliant finish. While they were softer and more susceptible to scratches, they were easier to buff. A clear that is easier to buff will also be easier to swirl and haze.

HABITS HAD TO CHANGE

Old buffing habits had to change with the inception of these "softer" clears. No longer could a detailer "go to town" with high speed, a course product, and an aggressive buffing pad. Changes had to be made in the form of softer foam pads and the use of less speed while handling a high-speed buffer. This also meant the detailer needed more skill in buffing. "Old school" detailers had to adapt to newer buffing techniques. Clears would end up full of swirl marks, holograms, and have a general haziness to them with far less gloss if buffed incorrectly.

Unfortunately, many detailers did not understand the way that these newer, softer clear coats had to be buffed and did not change. Yes, they could easily remove scratches and imperfections by buffing the old way, but they never really learned how to make the clear produce a perfect gloss and clarity.

Fast-forwarding just the last couple of years, car manufacturers were seeing cars coming off lease with marred paint finishes and too many scratches. The clear coats were too soft, and far too much reconditioning and paint work had to be done to get these "pre owned" vehicles ready for resale. So, the search began for a new clear chemistry, one that was harder than a urethane or powder clear, yet retained the same brilliance and gloss. At the same time the manufacturers wanted the clear to be more scratch resistant.

BACK TO HARDER CLEARS

Many manufacturers have now gone back to a harder version of clear coat to gain more scratch resistance. The term for this new generation of clears is simply "scratch resistant clears." One brand of scratch resistant clear uses nanotechnology — microscopic ceramic particles that migrate to and interlock at the very top portion of the clear coat to give it more scratch resistance to car washing and normal everyday abrasions. It's a better version of the old Melamine clear coats. But some of these scratch resistant clear coats are very hard, which makes it very difficult to

remove imperfections. You will need to be fairly aggressive to get anywhere with some of these. Beware, though, I have seen instances where buffing penetrates the scratch resistant nano-particle section of the clear to reveal a softer clear underneath that can still swirl and mar very badly. Working on what is technically a scratch resistant clear, this can be very confusing and demoralizing for a detailer.

To add to the confusion, not all new vehicles are using these newer, harder clears. Some car manufacturers are using the scratch resistant clears on all their vehicles such as Mercedes. Some manufacturers are using these clears on some of their cars but not all of them. For example, BMW uses scratch resistant clear coat on all vehicles made in Germany. However, on their vehicles made at their plant in South Carolina — such as the Z4, X3 and X5 — they are still using the softer powder clear coats. A couple of years ago, some BMW plants in Germany made the change to scratch resistant clear, while other plants still use a soft clear. So it is not inconceivable that you will see two vehicles — same year, same model, same color — with one having a soft clear and the other a hard clear. That makes buffing rather interesting, doesn't it?

Some other car lines are still exclusively using soft clears. So, it's not so easy being a detailer these days as you can see. There are many different types of clear coats still in use and each has its own buffing characteristics.

FLEXIBILITY REQUIRED

Many detailers, especially those from the "old school," like to buff one way, and one way only. They have their favorite buffer with their favorite speed. They also use their favorite pad and their favorite product. And they never fluctuate. This will cause problems. Maybe some cars will buff out perfectly with all the imperfections being eliminated while producing a great gloss and clarity with no swirl marks or haziness. But then there will be cars that will have swirls and marring all over them because the detailer was too aggressive. Other cars will still have the scratches and imperfections left in them because this clear was not buffed aggressive enough. This is because all the clears have various chemistries that will buff out differently. That is why this rigid approach, or one-way buffing, just can't work anymore.

A detailer needs to be able to see

what's going on with the clear as he is buffing it. If you are overly aggressive, you will have a lot of cleaning up of swirls and hazing to do, which will take considerably more time and effort. If you are not aggressive enough, the car will not look as good as it should, and you may have to go back and get more aggressive, again resulting in more time and effort.

NO CHART

Wouldn't it be nice if there were a handy chart that listed all the clears that the car manufacturers have used and are using and how each will buff out? Unfortunately, there is not. Knowing how certain car lines will buff out according to the year and model will come with much experience. If you don't have that experience as yet, then it's essential to first buff a small area of the vehicle you are working on to see how the clear will react. It's always better to start with the least aggressive buffing method and see what the results are. Some vehicles may look good if buffed with an orbital buffer, while some vehicles will need to be buffed with a rotary or high-speed buffer. Even if you know from the start what kind of clear coat a vehicle has on it, you will still need the proper equipment, products, and skill to get the job done correctly.

Once upon a time, a car had either a single-stage or base-coat/clear-coat paint system and they all buffed out about the same. It's not the case anymore. Many detailers are genuinely worried, and try to keep up with all the new clears and how they will react to buffing. I know you want to try to keep track of what's on each and every car, but it's almost impossible to distinguish them by sight. And with some manufacturers using both soft and hard versions of clear, our jobs are made all the more difficult.

NEW GENERATION OF PRODUCTS

With every new generation of clear coats comes a new generation of buffing products. The trend for new products is to be labeled as "ceramic clear polishes." Simply, these are products that contain larger-micron-size abrasives or a more aggressive type of abrasive. Another trend is in "polishes" that can perform multiple tasks such as cutting *and* finishing. In a future issue of *Auto Laundry News,* we will look at some of the newer styles of buffing products that are now available and in use at several major auto plants.

Kevin Farrell owns and operates Kleen Car (www.kleencarauto.com), a full-service auto-detailing business located in New Milford, NJ. Kevin is also an instructor for a detailing program he developed for, in and in conjunction with, BMW of North America. His background includes auto dealership experience and training through DuPont, General Motors, and I-Car.