



Wheel cleaning and detailing
The dangers and proper technique to
perfect wheels

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Wheel cleaning and detailing. The dangers and proper technique to perfect wheels

Customers love clean and shiny wheels. Perfect looking wheels really makes their cars “pop”. A car however with dirty or even damaged wheels can really take away from the look of a gorgeous automobile. Wheels are more expensive than ever, with many people installing custom aftermarket wheels for a more personal look. OEM wheels are nicer than ever as well, and enhance the posture and stance of a great looking vehicle. Care must be taken to protect this ever increasing investment.

Therefore the cleaning and care of wheels is extremely important in the overall look of a detail, and in customer satisfaction. As detailers we need to fully clean all the wheels to make them look showroom new, without damaging them or ourselves, and without spending all day on them. Sometimes wheel cleaning is quite a chore and can be very dangerous.

Making it safe and easy

Wheel cleaning can be an easy part of the detail, or it can be a nightmare. If you have ever damaged a wheel with a harsh chemical or got hurt by one, you know the feeling. Also if you have ever spent 20 minutes trying to get ONE wheel clean, it's extremely frustrating. So how can we make wheel cleaning safe, yet fast and

effective?

Many detailers have always been deathly afraid of wheel acids. And rightfully so. They are harsh products which are dangerous to the wheel and to you if used incorrectly. Many people have been hurt by acids and many wheels have been permanently damaged or destroyed. However many detailers (including myself) continue to use products like this because of their effectiveness. Let's look at the reasons for both acids effectiveness and its harsh effects

It really is ACID!

Acid is highly corrosive! The skull and crossbones warning on any acid label is there for a reason. Its eats away items in its path. This is both good and bad in wheel cleaning. If wheels only had normal dirt on them, we could wash them with simple soap and water or a light solution of all purpose cleaner. However, it's not the wheels' composition that sometimes necessitates the use of acid or harsh cleaner, but what gets on the wheels that need to be cleaned. The cars brake pads and the brake rotor itself are what cause the problems. Combine this with extreme heat and neglect, and the process becomes much more difficult.

As vehicles have become faster, the need to bring the vehicle to a stop is paramount. This job falls mainly on the brake pads. Today's brake pads have gone to more of a metallic composition. This helps bring the vehicle to a quicker stop, while also prolonging the life of the pad and the ability to resist brake fade. There are also other organic compounds in the composition as well as the gluing systems to hold them together. The throw off of the shavings of the pads (which are very hot) and, to a lesser degree, little bits of the brake rotors (which also get very hot) onto a hot wheel, results in deposits that stick to the wheel and re-bond themselves to the wheel. The more that gets on the wheel, the deeper it embeds itself into the wheel and the more difficult it becomes to remove. This "brake dust" will never be fully removed with soap and water. This is why more harsh cleaners such as acids have been used for years.

What acid does

Acid basically attacks a surface and eats away at what's in the way. Acids are very effective in dissolving metals, which brake dust essentially is, and breaking down the adhesives, so its effectiveness is far better than any other cleaner. But what makes acid so dangerous?

Let's look first at the PH scale. The PH scale runs from 0 at the far left of the scale, to 14 at the far right. In the middle of the scale is 7 which is neutral. Acids are to the left of the scale and are less than 7. Alkalines are to the right of the scale and are greater than 7. The more a product moves away from 7 (or neutral) the more aggressive it becomes. Water is neutral and most car wash soaps range between a 7 and 8 on the scale. A neutral product rarely will remove any kind of embedded brake dust. Acids were almost always the choice to dissolve and clean the brake dust. Not only would acids remove the brake dust, they would also brighten the metal alloys of the older style wheels. They are quick, yet highly caustic and dangerous. So why are acids still the choice for some detailers?

Let's look at the types of acids that are in some wheel cleaning products and how dangerous they can be. Many companies use Hydrofluoric acid. This is probably the MOST dangerous form of acid out there. A 50% solution of Hydrofluoric acid can kill you if inhaled directly or is spilled on you. HF will only lightly burn your skin but the real problem comes later. It wants your bones! It seeks the calcium in your bones and in your blood! HF spilled on your skin may require calcium gluconate gel or an injection to replenish the calcium and ward off the effects those HF acid causes. Its calcium eating ability is why HF is a popular choice in concrete cleaners.

HF is still not the only dangerous acid used in wheel cleaning products. There is BiAmmonium and Ammonium fluorides. There is Sulfuric acid as well as Phosphoric and Nitric acid. All are pretty nasty.

Detail shops, car washes, dealerships, etc. that have known about the bad things acids can do, would sometimes switch to the other side of the PH spectrum and use an Alkaline cleaner to clean the wheels. The phosphates and other harmful agents in alkaline cleaners can be equally as dangerous. They can still burn you and still damage wheels.

Why all the damage?

The problems with harsh cleaners lie in the fact that years ago, the fancy wheels were alloys. There were no protective coatings over them and the metal was exposed to everything thrown at it. The harsh acids or harsh alkaline cleaners would not only dissolve the brake dust, but the alloy wheels itself! Combine these harsh cleaners with people spraying a cleaner on a hot wheel, letting it soak in or dwell for a while, and using the product in a highly concentrated state would quickly etch, or eat right through a wheel. Some wheels were more resilient like chrome or painted steel. However, aluminum alloys would take a beating.

Almost all of today's alloy wheels use a powdered clear coat process which adds the gloss and some durability to the wheel finish. Although the clear coat is more durable and will withstand the effects of harsh cleaners more than an unprotected wheel, long term damage can still occur with the use of any harsh cleaner.

Read the MSDS closely

Not only is the type of chemical being used dangerous, its concentration level should be closely examined. As stated before, a 50% concentration of hydrofluoric acid can kill you if spilled on your skin or directly inhaled. The percentage of acid used in the product will give you further evidence of just how dangerous the product truly is.

I have seen MSDS sheets of wheel acids where the concentration level of HF is slightly over 10%. I have also seen acids where the concentration level of sulfuric acid is almost 20%. These are very aggressive and dangerous products because of the high concentration levels of their acids. Also, the PH levels on some products are at 1.0 or even less! This is about as low as you can go on the PH scale as far as acidity.

After reading some of this information, you may want to run the other way from

products such as these. Wheel acids can still be used safely if certain precautions are taken. The first thing I look for is a product that does not have a large concentration level of any kind of acid. If the concentration level of HF even approaches 10%, I look for something else where the level is more in the 5% or less range. Sulfuric acids should be in the 10% or less range. This automatically makes the product less aggressive to start. I also look for the PH level to be as high as possible. I don't want anything less than a PH of 2.0 in any product I purchase. Remember, the more the number creeps toward the middle, or 7 on the PH scale, the more neutral it becomes, and the safer it is both for you and the wheels.

Mixing the product

Of course correctly and safely mixing any product, regardless of its composition is very important. In the case of wheel cleaners, especially acids, it's imperative to proceed with extreme caution. In mixing or diluting a product, always follow the manufacturer's instruction specifically. If they say dilute it at 10:1 they mean it. That does not mean mix it at 2:1 or 3:1 to get the wheels "cleaner" or get them done more quickly. Follow the instructions!

Acids used in wheel cleaners are water soluble and will be much safer at proper dilutions. What should be understood about mixing acids with water is this. Water helps makes the product safer. For every ten fold you dilute an acid, you raise the PH by 1 point. This does not seem like much, but it's huge. This is why you should purchase a product with a lower concentration of acid to begin with, and have a product with a higher PH.

ALWAYS wear eye protection, heavy duty gloves and cover your skin when using or mixing acids with water. Also, it's a good rule of thumb to add acid to water, NOT water to acid! In a lower concentration level, this is not a huge deal. But, in labs where they use high concentration levels of acids, it very important to add the acid to the water. Here's why: A large amount of heat is released when strong acids are mixed with water. Adding more acid releases more heat. If you add water to acid, you form an extremely concentrated solution of acid initially. So much heat is released that the solution may boil very violently, splashing concentrated acid out of the container! If you add acid to water, the solution that forms is very dilute and the small amount of heat released is not enough to vaporize and spatter it. So Always Add Acid to water, and never the reverse.

Safer alternatives?

Most companies today either have, or are working on, safer wheel cleaners. They realize the importance of clean wheels, yet know the dangers of acids or other harsh cleaners and are working on alternatives. The problem has been that some safer cleaners won't work quite as fast or fully remove the embedded dust that some wheels have. Check with your local supplier to see what safer wheel cleaners are available and give them a try.

A safe acid?

There is a much safer wheel acid available that is far less harmful to the wheels and to you if you still want to use acids but want to be as safe as possible. A wheel cleaner containing Oxalic acid is far safer yet still very effective to use on most

wheels. It will do a far better job than alkaline cleaners, yet is nowhere near as harmful to the vehicle or yourself. This is another option to get the wheels clean and still be safe. This type of acid is more of a ball peen hammer, compared to a sledge hammer that HF acid can be. This acid still needs to be handled with care and diluted correctly, but it's a safer acid alternative, yet very effective.

Now let's clean the wheels!

After you choose whatever wheel cleaner you like, you still have to be efficient, yet effective in getting the wheels clean and moving on. There is however right and wrong ways to clean wheels.

I have seen various ways that detailers try in cleaning wheels, and some are not good at all. A major reason for damaged wheels is "instant gratification". Many detailers just want to spray a product on, and rinse it off, and expect to have wheels that look like new. This is a main reason for detailers to choose extremely harsh wheel cleaners and to barely dilute them. They figure the stronger the chemical, the better the wheels will come out. They also spray wheel cleaners on a very hot wheel. We all know that heated cleaning is better than cold cleaning, but in the case of wheels, a cool, wet wheel is what you need to begin with. The heat and dryness of a wheel will make the cleaner react far quicker and do its damage much faster. Also, because some detailers want to rush through the job, they spray "all 4 wheels" at once and let the product sit on them. This will also quickly lead to etched and damaged wheels. You need to be smart and realize this is not a good idea and also realize that some degree of agitation is needed to release some of the brake dust.

There are many great wheel brushes available to help get into very tight areas and give the wheel a "like new" appearance. There are various toothbrushes, Christmas tree brushes, wide head wheel and tire brushes, and other brushes that will agitate the dirt and grime and help the wheel cleaner do its job. Most of these brushes have bristles that are stiff enough to remove brake dust, but soft enough not to scratch the wheel. You never want to use a brass bristle brush or a stiff nylon brush on any wheel regardless of how dirty it is.

To start, make sure you are wearing eye protection and gloves. This is mandatory. No matter how safe a product is advertised, you never want to run the risk of it splashing in your eye or soaking into your skin. From there you want to cool the wheel and make sure its wet. If steam is still being emitted from the wheel then the wheel is still too hot to spray cleaner on it.

When the wheel is cool enough, spray plenty of cleaner on it. Don't be stingy. At this point you should have a very safe cleaner at a very safe dilution, so now spraying more on the wheel is actually better. It is OK to let the product dwell for about 30 seconds, but don't let it dry. You should have your assortment of brushes with you in this step. Do not walk away to find the brush you need, answer the phone, or get distracted in any other way. Even a safe cleaner can eventually do damage to the wheel if you let it sit there too long.

How clean can you get it?

Some wheels and some cars will pose more of a challenge than others. Wheels with many nooks and crannies and cars that throw off a tremendous amount of brake dust are the hardest to clean. Many wheels now have exposed lug nuts and the brake dust seems to embed itself inside the hole of where the lug nut sits, making it very difficult to remove. Also some wheels have a major portion of the inside of the wheel visible. If this portion is not sufficiently cleaned, the entire wheel will still look rather poor even if the outside is cleaned very well.

This is where a bit of patience, some very specific brushes, continuous agitation, and a generous amount of wheel cleaner are needed. Sometimes if the customer is willing to pay for it, you can remove the wheel and really give it a thorough cleaning. By removing the wheel you will be able to get to the back of the wheel and deep into the lug nut cavities to remove all the brake dust. When this is done and the wheel is re-installed on the vehicle, its appearance is generally like new. However, with some of the newer specific brushes available, you can almost make the wheel look as good as if you removed it and did all the extra work.

For example, the small toothbrush with the tiny bristles on one end can reach deep into the lug nut cavities and brush away the brake dust. The Christmas tree brushes come in various sizes and the eyelet brush will reach deep into the back sections of the wheels. Then, use a wider brush to clean the outer surfaces and the tires. Sometimes wheel cleaning is about choreography. It's a constant ballet of spraying cleaner, switching brushes, keeping the wheel wet with water, and checking to see if it's getting clean. It's OK to spend 2, 3, or possibly even 4 minutes per wheel. However, when a wheel eats up 7 or 8 minutes of your time or more, additional charges have to be levied. This time consumption is what leads detailers to purchase the strong and dangerous wheel cleaners.

One step further

Some customers will request you to wax or polish their wheels. This should require an additional charge because of the extra labor required to make the wheels look even better. While most customers are thrilled with clean wheels and all of the brake dust removed, there will be some people who want this extra step. Because most wheels are clear coated, you really don't need special wheel polishes or waxes. You can use the polishes that you currently use to buff the cars and not spend the extra money on a specific wheel polishing product, unless it's an alloy.

It's going to be very awkward to use your buffer and large pads to polish a wheel. What some companies have done is produced a specific pads to better get into a wheel. Some are very small in diameter. Some look like big mushrooms but crush and conform to slots or holes in the wheel to get deep inside. Many can be placed on the end of a regular drill or die grinder. You can also wax the wheels in this fashion.

The bottom line

Wheel cleaning does not have to be such a chore if you have the correct tools. The tools just have to work safely but effectively. Wheel cleaner is the most important because it's the most dangerous. There are wheel acids that are safe if used with care and the directions are followed. Accidents and expensive wheel replacements can always be avoided if you do some research and are smart about your choices.

Treat any cleaner with extreme care regardless of its chemical makeup. Always protect yourself, read and follow directions precisely, have the right brushes available, and every wheel can look showroom new when you are done. Wheels are one of the first things a customer notices on their car after it's detailed. It's really not that hard to make each and every one look perfect.

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