

# OEM & AFTERMARKET WHEEL FINISHES (and how to care for them properly)

## WHEEL COMPOSITION



### Steel

This is still the most widely used type of wheel by the OEM or factory. It is usually a painted wheel (silver or black) with maybe a plastic hubcap attached for added style. (Honda Civic).



### Magnesium

The term "mag wheel" is sometimes incorrectly used to describe alloy wheels. It was used in the '60's and '70's for factory and aftermarket wheels but is now generally considered to be an unsuitable alloy for road usage due to its brittle nature and susceptibility to corrosion. Flammability doesn't help either!

### Alloy Wheels

Alloy metals provide superior strength and dramatic weight reductions over ferrous metals such as steel, and as such, they represent the ideal material from which to create a high performance wheel. In fact, today it is hard to imagine a world class racing car or high performance road vehicle (Porsche 911; Chevy Corvette; Mustang Cobra) that doesn't utilize the benefits of alloy wheels. The alloy used in the finest road wheels today, OEM or aftermarket, is a blend of aluminum and other elements. Most aftermarket wheels are made of aluminum alloy whether they are polished, chromed, painted, cleared or powder coated & cleared.



## MANUFACTURING TECHNIQUES EMPLOYED

### Low Pressure/Gravity Casting

In this most basic method, molten metal is poured from a vat directly into a mold and allowed to harden.

### Counter Pressure Casting

This sophisticated casting method draws the molten alloy up into the mold via a very strong vacuum helping it maintain a consistent temperature and leaving the impurities behind. The result is an extremely non-porous wheel of uniform density providing superior strength.

### High Counter Pressure Molding (HCM)

HCM is a manufacturing technique that exhibits approximately the same strength characteristics as forging at little more than a cast price. This unique manufacturing method is used in the more expensive wheels on the market like the BBS RX design.

### Forging

The most advanced method of manufacturing wheels, forging compresses a billet of aluminum into a wheel by using as much as 14 million pounds of pressure combined with heat. The result is a wheel that is up to three times stronger and as much as 20% lighter than a conventional cast wheel. Roll forging is a variation of forging where a rough cast rim is pressed into its final shape while rolling. Roll forged wheels require less material thickness than cast wheels which reduces the weight while maintaining strength.

## WHEEL CONSTRUCTION

Aluminum alloy wheels come in one piece, two piece, and three piece construction types, with most being one piece wheels. One piece wheels are cast, forged or roll forged in a mold in one complete section. Two piece wheels have a separate inner section and outer section. They are either bolted or welded together. Always be cautious of wheels that are just welded together, as they seem to not always be as round as one piece wheels. The two piece wheels that are bolted together tend to be of high quality. Three piece wheels use not only a separate center, but also have two outer sections, the inner and outer rim halves. These three piece modular wheels use aircraft quality bolts to hold them together, and many of them use forged components to reduce weight, while improving strength. The use of three piece wheels allows the manufacturer greater flexibility in offering many wheel models even in small quantities.

Three piece construction



## THE CARE OF ALLOY WHEELS

Today's OEM and Aftermarket wheels come in a variety of composites and finishes. It is very important to use the correct cleaning products for your particular wheel finish in order to obtain optimal results without harming the wheel.

We suggest that you follow the aftermarket wheel manufacturer's cleaning and polishing directions in all cases. Some wheel manufacturers are so adamant about the potential damage from caustic wheel cleaners that their use voids the finish warranty of the wheel. If it is an OEM wheel, follow the guidelines in your vehicle owners manual. If you are not sure, we have laid out some steps below to safely clean and polish most types of wheels encountered in the field using PRO® Products.

### Cleaning The Wheel

The easiest way to combat brake dust and road salt is to clean the wheels often, especially the front wheels. Both brake dust and road salt can eventually damage the wheels finish. Heck, salt can eat your whole car!

Select the correct cleaner product for your type of wheel finish. Read the directions on the label and follow them exactly, while keeping these tips in mind.

Always clean your wheels & tires first before washing and waxing your vehicle. That way you won't be splashing water or getting cleaner on your freshly waxed finish.

Avoid contact with the painted vehicle finish, especially when using acid based cleaners.

Clean one wheel at a time. Products are fast acting and should not be left on too long.

- 1) Shake product well before using.
- 2) If wheel is hot, cool wheel off with cold water rinse before applying product. Never apply cleaners to a hot surface or let dry on surface.
- 3) Spray cleaner onto wheel and allow to soak 30-60 seconds.
- 4) Agitate lightly with soft brush, wash mitt or sponge on heavy accumulation, if necessary.
- 5) Rinse treated surface thoroughly with high water pressure. Leaves a clean, bright finish.
- 6) Wipe dry with clean toweling or blow dry with air hose.

After wheels are clean and you are washing your vehicle, sponge wheels with a 100:1 solution of PRO® C-60 Super Car Wash Soap and rinse thoroughly. This will neutralize any cleaner left over and offer extra corrosion resistance for the wheels and lug nuts.

**When you are not sure which PRO® Product to select, choose C-41 Non-Acid Wheel Cleaner.** Its the perfect cleaner for all types of OEM (Original Equipment Manufacturer) or factory wheels. **Its non-caustic formulation** safely cleans painted and/or clearcoated aluminum, powder coated, mags, chrome and wire wheels as well as plastic hubcaps. It also cleans tires and whitewalls.

If commercial wheel cleaners are not recommended by aftermarket wheel manufacturers, a solution of C-60 Super Car Wash (100:1) can be used to safely clean the aftermarket wheel. Wash wheel just like you would your painted finish to remove loose dirt and contaminants. C-60's neutral pH will not react with the wheel to etch or mar in any way.

### Polishing The Wheel

Polish the bare aluminum wheel surface to remove oxidation, accumulated brake dust and corrosion while restoring the original brilliance and luster. C-50 Aluminum and Mag Polish can be used on almost all non-coated wheel finishes. On highly polished billet aluminum wheels (forged), use C-90 All Metal Polish to remove fine scratches and restore highly polished look. It utilizes a very fine polishing agent that will not scratch.

Follow the directions below, while keeping these tips in mind.

Allow wheel to cool off before applying product. Never apply product to a hot surface.

Polish one wheel at a time. Product should not be allowed to dry out. Work with the product while wet, to avoid any scratching.

Use only soft, 100% cotton towels or wax pads. Synthetic cloths or rags can cause unwanted scratches.

- 1) Shake product well before using.
- 2) Apply Aluminum and Mag Polish using a soft, 100% cotton towel or wax pad.
- 3) Polish with the grain of the wheel, by hand, rubbing in well, until desired shine is achieved. On non-coated aluminum surfaces, a black residue will appear on cloth, that's OK..
- 4) Buff while wet. Do not allow product to dry out.
- 5) Remove polish with the clean side of cloth.

### **Protecting The Wheel**

Apply thin coat of PRO® W-41 Yellow Wax Paste or P-35 Satin Creme to seal in lustre and protect wheel against the elements. It will also make cleaning easier next time around.

Small chips in the clearcoat should be touched up with a little clear enamel paint. Spray AX-721 in the cap and use a model/hobby paint brush to touch up.

If kept clean, the finish of your alloys will be good for the life of your car.

### **WHEEL FINISHES**

There are four basic types of finishes on aluminum or alloy wheels, each requiring different care.

#### **Polished Aluminum**

Polished aluminum is just what it sounds like, bare aluminum polished to a high gloss. Alcoa truck rims and Centerline Racing Rims are good examples. Porsche wheels are a combination black powdercoated center with a polished aluminum lip. These wheels look great, but they require constant cleaning and polishing to stay that way. Bare, non-coated aluminum will produce a black residue on toweling when polishing with C-50-Q or C-90; that's OK. Coated aluminum will not.

Clean with C-41 Non Acid Wheel Cleaner or C-42 Wheelie Clean

Do not use acid based cleaners on exposed (non-coated) aluminum alloy wheels. Acids react immediately with bare aluminum, foaming up and frosting the surface. It can also turn aluminum gray or yellowish gold. If this happens, they can usually be polished back out to their original luster with C-50-Q Aluminum & Mag Polish and a little elbow grease.

Polish with C-50-Q Aluminum & Mag Polish or C-90-22 All Metal Polish

Protect with W-41 Yellow Wax Paste or P-35-H Satin Creme

polished aluminum lip



#### **Polished Aluminum/Clearcoated**

Sometimes the polished aluminum is followed by a clear coat of urethane paint for added protection. You can also see a combination painted or powdercoated center with a polished aluminum/clearcoated lip. If no residue appears when polishing, then the wheel is clearcoated. Maintain the same as a polished bare aluminum surface to be safe. The clearcoat is susceptible to damage and discoloration from heat and brake dust. It should be cleaned, polished and protected regularly. However, any chips in the clearcoat must be repaired or the aluminum underneath will quickly discolor when exposed to C-56 (oxalic acid). To be safe, stay with non acid wheel cleaners.

Clean with C-41 Non Acid Wheel Cleaner or C-42 Wheelie Clean

Polish with P-31 #1 Polish

Protect with W-41 Yellow Wax Paste or P-35-H Satin Creme

polished aluminum/urethane clearcoat



Aluminum painted silver/clearcoat

### Painted/Clearcoated

Painted wheels are easier to maintain than polished aluminum. However, as with clearcoated aluminum, they are susceptible to damage and discoloration from heat and brake dust. Most are painted silver, magnesium or black and followed by a clearcoat of urethane paint. Silver/Clearcoat is the most popular finish among aftermarket wheel buffs because it looks like a polished or chromed finish but costs much less.

Clean with C-41 Non Acid Wheel Cleaner, C-42 Wheelie Clean or C-56 Professional Wheel Cleaner

Polish with P-31 #1 Polish

Protect with W-41 Yellow Wax Paste or P-35-H Satin Creme



### Chrome Plated

Chrome-plated wheels look great, but they are the hardest kind of wheels to keep looking like new. Chrome is actually several layers of copper, nickel and chromium electroplated to the surface of an aluminum wheel. The involved, 39 step process begins with the wheels being stripped of paint and chemically cleaned through a series of acid baths. Clean wheels are polished smooth, cleaned again and inspected before moving on to be copper coated. Again, the wheel is cleaned and inspected before getting the long-awaited nickel chrome. Two types of nickel are applied, and then the wheel is polished again prior to delivery.

These thin layers of metal are very fragile, and they can be easily damaged by corrosion from brake dust, salt, acid rain, dirt and other chemicals in the environment. They can also bubble and peel from minute pockets of chemicals trapped under the chrome during the plating process. Many manufacturers do not recommend the use of acid based cleaners because they

can deteriorate the chrome finish over time with constant usage. However, acids are the product of choice among professionals because of their effectiveness and ease of use. Acids attack the ferrous materials (brake dust) on wheels, producing much faster results than non acid products.

Clean with C-24 PRO®-Power Acid diluted 5:1, C-56 Professional Wheel Cleaner, C-41 Non Acid Wheel Cleaner or C-42 Wheelie Clean.

Polish with C-50-Q Aluminum & Mag Polish or C-90-22 All Metal Polish

Protect with W-41 Yellow Wax Paste or P-35-H Satin Creme



### Powder/Clear Coated

Powder coat followed by a clear coat of urethane paint is the most durable finish. This seals the alloy of the wheel from the elements, and it provides a high gloss European-style finish.

Clean with C-41 Non Acid Wheel Cleaner or C-56 Professional Wheel Cleaner.

Polish with C-90-22 All Metal Polish or P-31 #1 Polish.

Protect with W-41 Yellow Wax Paste or P-35-H Satin Creme

