

Nickel or Chrome? Which one is it? Which one should I use?



by Ken McNeil

Although the terms 'chrome', 'chrome plated', or 'chromium' are often used to describe any bright, shiny metal finish, it is a totally different and separate plating from a nickel plating.

Before we get into how to maintain either one, let's try to determine which one you have and which one is correct. If your vehicle is pre-1928, odds are it used nickel plated brightwork. There is no exact date as to when chrome plating replaced nickel plating for exterior trim (interior is a different story and one which we will look at in a moment), but it is pretty well accepted that chrome was introduced right around 1928. Post-1928, and certainly into the 1930s and '40s, chrome plating was the choice of virtually all manufacturers for exterior trim parts. (Stainless steel was another option, used on a number of vehicles in the mid-late-1940s and 1950s.)

Although not a foolproof method, nickel can be differentiated from chrome by color. Nickel has a slight yellow/gold cast to it, best seen in bright natural (sun) light. Most fluorescent light contains a lot of blue, and that will alter the actual color of the nickel making it more difficult to determine. Chrome (or chromium) plating has a slightly blue tint to it, again, when viewed in natural light. If you suspect that a part is nickel plated, hold it next to a known chrome plated part - a bumper of your everyday driver, for example. Before you compare the parts, wash both with a mild soap and water to remove any dirt or other surface contaminants which might alter the color perception.

We are trying to be very careful to use the correct terminology. We will (try) not to

call a part 'chrome' or 'nickel.' The trim parts are not solid chrome nor are they solid nickel. The bright, shiny surface is actually a metallic coating overlaid chemically (electroless nickel plating) or electrically applied (chrome or nickel) over a base metal (or even plastic).

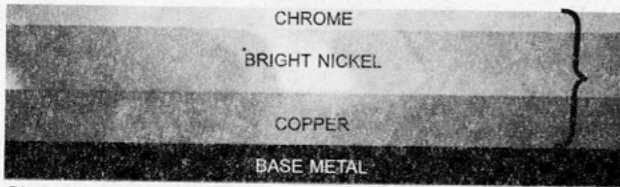
There are actually two classes of chrome plating: 'hard' chrome plating and 'decorative' chrome plating. 'Hard' chrome or chromium plating consists of heavy coatings (generally in the 0.0002 - 0.0006" thickness - that's measured in thousandths of an inch. Decorative chrome is measured in millionths of an inch.) that are used to take advantage of the special properties of chromium, which include resistance to heat, wear, corrosion, erosion, and its low coefficient of friction. Hard chromium is most often used for heavy wear applications and industrial uses.

Chrome/Chromium-plated piston rings, for example, use 'hard' chrome. Hard chrome plating is a specialized operation, and the platers often have to meet the specifications called out by the government, industry, military or engineering. Because hard chrome plating is a 'cold process' to protect the underlying base material, it cannot be substituted for decorative plating.

'Decorative' chrome plating is what is used for the bumpers or trim of an automobile. The plating is an extremely thin layer. The normal thickness for decorative chromium is in the range of 0.000020" - 0.000070". If you have ever peeled off a piece of chrome plating from a bumper, it felt rather thick. You were probably holding two or three layers of metallic plating which were each overlaid onto the steel base metal (and maybe even some of the rust from the steel). Decorative chrome is almost always plated on



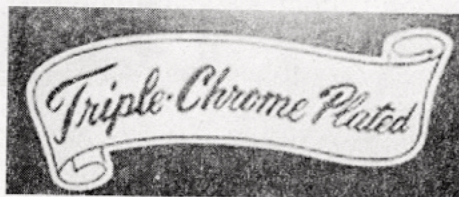
When the plating lifts off a bumper or other metal part, it is actually two, three or even more layers of plating that is peeling.



Chrome plating actually consists of several layers of metal. The chrome might only be about 0.00005" in thickness, but the other layers are often thicker.

top of either a nickel or a copper-and-nickel-plated layer(s). These sub-layers of copper and nickel tend to seal off the substrate so that the micro-cracking chrome layer does not present corrosion problems. The total deposit including the copper and nickel under-layers is typically 0.0005" thick. Copper is a non-ferrous metal; it adds a layer of protection between the base metal and the final finish. In addition, the copper layer fills tiny scratches, pits and blemishes. The copper is polished between layers (sometimes additional layers of copper plating are necessary to provide a really smooth finish). It is polished until the operator feels that the scratches will not be visible on the surface. (Deep scratches, holes or gouges may have to be filled by brazing or other application of a metal filler. Plastic body fillers will not electro-plate.) The bright nickel layer is next; it adds a very shiny layer to the metal. Ultimately a very thin (almost transparent) layer of chrome plating is applied. It protects the bright nickel plating beneath it.

This three layer process is often lauded by chrome-plating shops as 'triple-plating.'



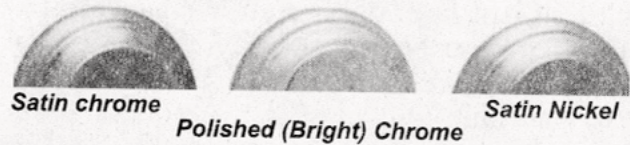
No. The part does not receive three layers of chromium; the two

under-layers plus the chrome represent the 'triple' plating. Sometimes the chromium layer is plated onto just nickel. Although as bright, this method lacks the corrosion barrier of the copper as well as the minute scratch-filling properties of the copper. And sometimes the part is double copper- or double-nickel plated and called (euphemistically) quadruple plated. (Within the plating in-

dustry, a double-nickel plating is called 'duplex nickel plating'.) Many plating shops 'sell' show-quality chrome plating. Essentially it means that the underlying copper and nickel are more highly and carefully polished, but the chrome still remains a very thin coating, measured in millionths of an inch.

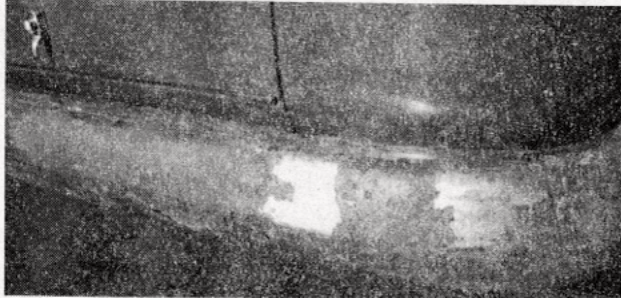
Chromium has several advantages over nickel. A chrome finish is harder and more durable and less subject to scratching than nickel. And chrome is much more resistant to corrosion than is nickel. This more durable finish is why a chrome-plating is generally used on exterior areas that are subject to degradation by weather, abrasives in the air and wear.

But nickel, with its slightly yellow tint, is a 'warmer' look. Chrome-plating, with its slightly blue tint seems 'cooler.' Often, especially on more expensive cars, nickel was used on the interior brightwork, even well beyond the 1928 era of chrome. Often the interior hardware will not be bright nickel but brushed, satin or butler finish. A 'Butler' finish is a rubbed finish, reminiscent of old silver having been polished for years by the trusted English butler. The bright sheen is gone, but the warmth remains. It is a very difficult process to replicate, and most plating shops - if they even know what Butler plating is - do not have those specialized capabilities. The best that they can offer is a brushed or satin finish.



If all of the attention mentioned above goes into the application of a chrome-plating job, why does chromium peel? There could be several reasons, one being that the base metal is not compatible with the electroplating system used to applied the nickel/chrome plating, but more likely that the part was not properly prepared prior to the plating process. A wet, oily or greasy - or for that matter, any - surface contaminant will interfere with the plat-

ing process. The first layer, be it copper or nickel, must be applied to an absolutely clean substrate. Claims that the plating peeled because you live too close to salt water, that you have chemical fumes in your garage, or that you did not seal the plating with a good wax are all nonsense. That first layer, and each subsequent layer of plating, must be applied to an absolutely clean material. Even the plater himself, with dirt or skin oil on his hands, could contaminate the piece so that the plating will not bind properly.



When the base metal is properly prepared and cleaned, and the various layers of metal electrically bonded to the underlying material, the chrome finish should not lift or peel off.

We mentioned that the copper layer not only fills tiny scratches, but is a non-ferrous material which will not rust. If properly applied, future rusting of the part will not occur. But if the layer(s) of copper are eliminated in the interests of speed or cost, moisture can permeate the chrome through microscopic cracks, pass through the nickel layer and reach the steel layer below. The results are those little 'pimples' of rust that appear on a chrome surface. Don't confuse the rust with dirt or corrosion on the surface of the chromed piece. The rust is coming from below. Once that rusting begins, it cannot be stopped, just delayed. An abrasive (a very mild abrasive) has to be used to rub away the evident rust. A common treatment is Coca-Cola® rubbed onto the chromium surface with

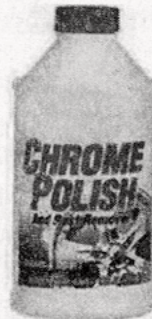


Rust pimples are the result of moisture getting through micro-cracks in the chrome and rusting the base metal underneath.

balled-up aluminum foil. This is not a good idea. First of all, the cola is acidic. That same acid that tends to make the rust disappear seeps through the cracks and pits in the chrome's surface and can cause worse, invisible damage below the chrome finish. Next, as durable as chrome is, it will scratch, and the aluminum foil (don't ever use a stainless-steel wool pad) can scratch the chrome. If applied lightly, it probably will not scratch, but if used aggressively enough to remove the rust, scratches are almost certain to occur as well.



The best solution is to prevent moisture from ever getting through the chrome's finish to the metal below. Clean the chrome-plated parts with soap and water to get rid of loose dirt, dust and contaminants. Dry the part by patting (not rubbing) it with a soft terry cloth towel or microfiber towel. Use any one of a number of good chrome polishes available at every auto parts store. Follow the directions of the package for best results. And then apply a good protective finish to the chromed part.

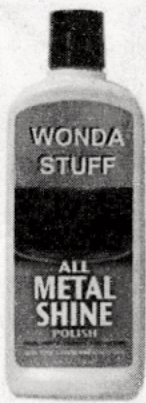


Most chrome polishes contain an abrasive which helps remove traces of surface rust. After the polish, use a natural or synthetic wax protectorant to seal the chrome plating.

Most chrome polishes contain a small amount of protection, either a synthetic or a natural wax. Try to use the same type of protective finish so that they are compatible. Don't rely on claims that the polish contains a sealer. Apply a good wax after polishing.



Because chrome is a 'hard' finish, over-the-counter polishes contain a mild abrasive. This abrasive helps remove airborne contaminants and corrosion from the finish. Unless the package indicates that it is safe for nickel, brass, copper, silver, etc. we do not recommend its use on those softer finishes or



metals. Get a product specifically designed for the surface that you want to clean/polish.

We cannot, in all good conscience, discuss chrome plating and nickel plating - both decorative trim materials, without touching on a couple of other metals.

The first of these is stainless steel. Stainless steel is an alloy of various metals and sometimes non-metallic additions. It was first 'discovered' in 1911, and since then has undergone many variations. Stainless steel is primarily iron (Fe), but in order for it to wear the stainless steel label, it must be alloyed with a minimum of 10.5% chromium (Cr). In addition though, stainless may contain Nickel (Ni), Molybdenum (Mo), Titanium (Ti), Copper (Cu), Carbon (C) and Nitrogen (N). Each of these element additions changes the structure of the alloy to fit specific purposes.

Stainless steel, looking very much like chrome-plated steel, does not have a plated finish. The metal is stainless steel through and through. Stainless is a tough metal and requires a dedicated product to bring it to a full shine.

Another common trim material is aluminum. Although we tend to think of aluminum as a matte finish metal, it will polish to a high shine. It requires special attention and often a variety of polishing grits to achieve the maximum brightness. Aluminum is a very soft metal, and so it is extremely susceptible to bending, denting and other damage. Aluminum is also subject to rapid work-hardening causing it to break.

Although not a common trim material, copper alloys were often used in earlier vehicles, and sometimes still used as base metals for trim accessories. Brass consists primarily of copper, but with the addition of zinc. It, like pure copper, is a very soft metal and is easily damaged. Bronze, though, also has a base of copper, but with the addition of tin (and often

other metals as well) is a much harder metal than either brass or copper.

Commercially available metal polishes should be labeled safe for brass, silver, copper, etc. or they may be too aggressive for those softer metals.

Brass, copper and polished aluminum tarnish very quickly. Wax will help, but the best protection comes from a product from the Eastwood Company called Exo-Armour. Exo-Armour is an extremely durable two-part coating. It can be wiped, sprayed or brushed on, and it is highly resistant to temperature and even salt spray.



S.K.

Editor's note: Often the bright metal trim is the first thing that people notice about your vehicle. The bright reflective gleam is certainly an attention-getter. By the same token though, dull or damaged trim seriously detracts from the appearance.

I would like to highly recommend a long-time advertiser with *Skinned Knuckles* magazine: Vintage Vehicles Inc. These folks have been specializing in metal repair, restoration and polishing for many years and they know their stuff! It often takes special skill and equipment (not to mention experience) to properly remove dents, rust, repair holes and other damage from relatively thin metal parts, be they beauty rings, side trim, hood ornaments, handles, knobs or even non-automotive parts like gas pumps.

Once damaged, it is much harder to repair trim pieces, so rather than risk a higher final bill, why not contact Paul or Bruce at Vintage Vehicles and get their opinion of the best way to fix, improve or merely polish your metal trim parts?

Vintage Vehicles, Inc. 1-920-787-2656 or e-mail them at vintagevehicles@centurytel.net. Their website is www.vintagevehicles.net See advertisement on page 28 of this issue.