

Replicating **Gold Cad Plating** at Home

A fresh, protective finish for your collector car's parts can be yours with a morning's work



WORDS AND PHOTOGRAPHY BY DAVID LACHANCE

In humanity's eternal quest to keep corrosion at bay, the development of cadmium plating represented a significant step forward. In its natural state, cadmium is a soft, malleable, ductile, bluish-white metal. Like zinc, cadmium helps protect steel by sacrificing itself, corroding before the steel does, and will even repair itself when it's scratched. It works especially well on fasteners because its minimal thickness will not interfere with threads.

Cadmium can be soldered, won't corrode when put in contact with aluminum, is a good conductor of electricity, and requires no additional protection. However, it's also a highly toxic material, and nothing that you really want to be messing around with in a home workshop.

It is possible to produce a finish resembling gold cad at home, however, using the Copy Cad kit developed and sold by Caswell of Lyons, New York. In place of cadmium, Caswell has developed a safer zinc chromate dipping solution that produces a golden, iridescent finish on fresh zinc plating. Their Copy Cad Zinc Kit includes the materials

and equipment needed for the zinc plating process, as well as the zinc chromate solution. The 4½-gallon kit sells for \$337.01, and the Yellow Chromium Concentrate, enough to make 4 gallons of solution, is \$31.93. Virtually anything, from tiny screws to carburetor bodies and vacuum brake boosters, can be given the golden touch—if it fits in the six-gallon buckets that hold the solution, it can be plated.

To find out how this all works, we dropped in on Tom Gentz, the technical director of the Typ 356 Northeast club, who held a tech session for club members at his home in Charlestown, Rhode Island. Gentz, who's restoring a 1966 Porsche 911, taught himself through experimentation the best way to apply a gold cad finish.

Gentz used to bring his parts to a shop to be plated, but true cadmium plating has become increasingly expensive and hard to find because of tightening federal environmental regulations. He decided to look for another way, and after discovering Caswell's Web site, decided to give home plating a try. He was quickly won over.

"I can plate the parts as I take them apart, and as I put them back together. If I want to, I can plate just a couple of parts at a time," he said. "It makes it easier to keep things organized." He's pleased that the first parts he plated two years ago have maintained their glowing finish.

A couple of words of caution: Protection is important. You'll be working with acid and other nasty chemicals, so wear clothing that protects your arms and legs, rubber gloves and goggles. Cleanliness is important, too, so make sure that you don't skip any of the water rinses that come between steps of the procedure.

Source

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Special thanks to Tom Gentz and the Typ 356 Northeast club



1: The first step is to clean the part, either by using a fine wire wheel on a bench grinder, or by bead blasting at 60psi to 80psi. Take your time: An even, shiny surface will produce a brilliant finished result.



2: The parts are wired together, using either brass or copper wire available at most hardware stores. Gentz prefers brass wire, because it does not have a lacquer coating. Heavier parts require heavier wire.



3: The parts are dipped in muriatic acid for two minutes to remove the last traces of rust. Muriatic acid is commonly sold for cleaning masonry. Don't use it straight, but dilute it, one part acid to three parts tap water. Follow with a 10-second rinse in water. You can also dilute a pound of baking soda to a gallon of distilled water to neutralize the acid, then rinse with distilled water.



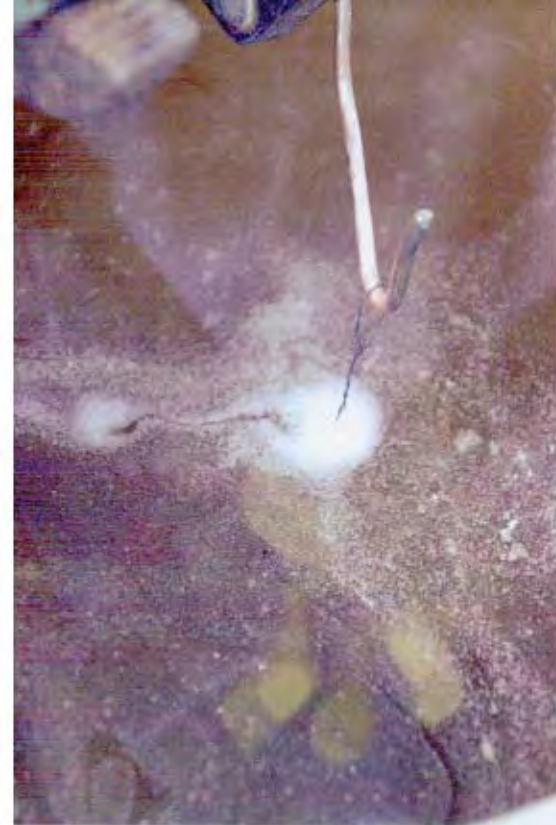
4: The parts are immersed in cleaner-degreaser solution for 3 to 10 minutes to remove fingerprints and grease. Caswell recommends that the solution should be at least 190 degrees; Gentz dips parts in an old Crock Pot set at 190 degrees for just 20 seconds. A 10-second rinse in water follows.



5: The electroplating process takes zinc from these zinc anodes and deposits it on the parts. The anodes on the right show how the material is eaten away in the process; a new anode, for comparison, is on the left. Gentz hangs them from copper wire cleaned with a Scotchbrite pad to remove the lacquer coating and inserted into a hole drilled off-center to make certain the anodes don't rotate.



6: Here's where the plating happens. The parts are hung by their wire from a hook on a conductive copper tube, which is connected to the negative terminal of a DC rectifier. The copper wires of the zinc anodes are hooked over the edge of the bucket and connected to the rectifier's positive terminal. Inside the bucket is Caswell's Copy Cad solution, mixed with distilled water and Caswell Brightener as per their instructions. An aquarium heater keeps the solution at 90 degrees Fahrenheit.



7: Caswell recommends a 1.5-volt, 300 milliamp AC adapter (for nuts and bolts) or the 3-amp constant current rectifier (for brake boosters, carbs and brackets), but Gentz chose to buy a 25-amp "tuneable" rectifier to give him more control over the process. Rather than using Caswell's mathematical formula for determining how long parts should stay in the drink, Gentz simply turns the rheostat down until only a small number of bubbles are coming off the parts. Don't overdo the voltage—too much will leave your parts spattered with zinc, rather than a nice, smooth layer.



10: The gold cad look comes from a dip in Caswell's Yellow Chromate solution, heated to 80 degrees by an aquarium heater. Leave the parts in for 35 seconds. The zinc and chromate in the solution react with the plating to form the authentic iridescent yellow-bronze finish. This solution is toxic, so make certain that you're wearing a respirator—and no, a paper dust mask won't do the job. Rinse the parts in water for 10 seconds. Heating with a hair dryer helps in the drying process.



8: The parts are left in for eight minutes per side. Don't use a wind-up kitchen timer; a digital timer will be much more precise. Plating is directional, meaning that only the surfaces that the anodes can "see" will be plated. Because Gentz places both anodes on the same side of the bucket, he turns the parts 180 degrees and leaves them in another eight minutes to assure full coverage. Alternatively, you could place the anodes on opposite sides, and could bend them to conform to the part's shape.



11: Here's the finished product. These parts were a bit pitted by rust, so the finish is not as shiny as it might be. If the rheostat is turned up too high during the plating process, the finish will be covered with tiny blobs of zinc, giving a matte finish to the part.



9: This is how the plated parts look after a rinse in water. The parts must be dried with compressed air to prevent any possible discoloration. If you want the parts to have a shiny silver finish, stop here.



12: The size of the parts that can be plated is limited only by the size of the solution buckets. This half of an alternator pulley from a Porsche 356 looks factory-fresh with its iridescent sheen. 🌐