

HOW I ACHIEVE THE HIGHLY SOUGHT-AFTER GRAY FINISHES ON ENGRAVED GUNS

by
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Master Engraver**

As an embellisher of firearms, I particularly like to use the cosmetic gray finishes to highlight my work. But, as an active hunter and user of firearms, and a professional, licensed guide in the State of Wyoming for the most part of 17 years, I am also very interested in the functional uses of firearms. I most certainly enjoy the use of my guns! So, no matter how highly embellished or how highly customized the gun is, in my mind I always evaluate a gun in light of its primary use - in the field.

On the basis of my evaluation, the cosmetic gray finishes currently available and in common use today leave an awfully lot to be desired. They just are not durable enough and don't provide enough protection to the metal and engraving under actual field conditions. So, I have been experimenting with a lot of different finishes for the engraved and embellished gun.

It's no secret that the gray finish shows off any embellishment to its very best. Bluing tends to hide or mask embellishing and engraving. The gray finish, on the other hand, shows off the embellishing very nicely, and with the use of a cosmetic ink or epoxy to accent the dark and light areas, it is very attractive and thus, is used very often in the firearms engraving field.

There are several common ways being used today to achieve the gray color and add light and dark toning to it. These "methods", if you will, tend to have similarities, and I will group them together by their similarities and discuss them that way.

HOT BLUE FIRST, THEN PARTIAL REMOVAL OF BLUE TO ACHIEVE GRAY

One of the most popular techniques is to blue the gun in a hot, caustic bluing solution, then remove a part, or "degree", of bluing with acid to achieve the desired gray color where it is wanted. The most popular acid used is Phosphoric acid, but 32% Hydrochloric acid (same material as 18° Baumé Muriatic acid) is frequently used to get the same results. These can be used full strength, or can be cut 1-to-1 with water, depending on the metal and shade of gray wanted. Prior to hot bluing, the gun is sometimes abrasive-blasted to add a little bit of sparkle to the finished gray.

METAL LEFT WHITE, TREATED WITH NITRIC ACID TO ACHIEVE GRAY

In this technique, the pieces to be given the gray finish are left in-the-white, and full-strength nitric acid is mixed with water to a diluted solution of 1 part acid to 10 parts water or 1 part acid to 15 parts water and is applied where the gray is wanted. (Diluted acid solution strength depends upon the metal and the amount of gray frosting wanted.) The metal is then flushed in fresh water. Some embellishers use club soda, (originally recommended to me by engraver John Warren) instead of water, which for some reason when flushed over a nitric-acid-treated surface gives the final product a bit more sparkle.

METAL LEFT WHITE, ABRASIVE-BLASTED TO ACHIEVE GRAY

Often, the metal is simply left in-the-white once the embellishing is completed, and is given an overall abrasive-blasting to achieve the gray color.

Once the gray color desired is achieved, it is common practice to put just a touch of black printer's ink into the areas of the engraving that are wanted darker (like the backgrounds). Then the piece is baked in an oven at 275° F. for 2-3 hours to set the ink. Another method that just became popular, and seems to be quite durable and easy to do, is to apply a coating of the flat or satin, black epoxy paint, made for the hobby model market, to the areas you want darkened. The black epoxy paint (I use "Super Poxy", made by K&B Mfg., Box 809, Downey, CA. 90241) is mixed up and put into the engraving. Then, the "excess" is wiped out with cloths, Q-tips and fine artist brushes so what is left accents, or highlights, the areas of the work you want to call attention to, and gives a pleasing, overall cosmetic enhancement to the engraving.

After the cosmetic inks or paints are dried, a variety of protective coats are applied - or not applied - as the case may be. Some engravers cover the metal with a simple, satin finish Varathane® varnish. Others use clear spray acrylic lacquers. Still others just bead it, ink it and leave it.

All these finishes rust very quickly in high humidity areas (like out in the field hunting - particularly bird or duck hunting in the coastal areas), and just don't protect the surfaces you worked so hard to embellish.

I guess that's why I got into electroless nickel plating.

Guiseppi Forté is a longtime member of the Firearms Engravers Guild of America, and served as its President during 1987. His work is highly sought after, and has been featured in numerous books and magazines. Guiseppi was kind enough to share this unique and highly desirable information with the engraving fraternity, and we are all deeply in his debt for his professional courtesy.

Frank Brownell

GRAY FINISHES FOR FIREARMS

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by **Guiseppi Forté,
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INSTRUCTIONS

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ELECTROLESS NICKEL FIRST, THEN ABRASIVE-BLAST TO ACHIEVE GRAY

There are several reasons I like the results of the electroless nickel plating - it's tough with a hardness on the Rockwell "C" scale of 53-56; it doesn't rust, and it bends without cracking. You can control the thickness you add and have a uniform, even thickness on all surfaces of the piece (usually 3/8 of a mil - .000375"), unlike electroplating with nickel which tends to build up in screw holes, pull out at corners and edges, and leave inside corners thinly plated or even unplated.

In addition, it can be used to add a little bit of metal to some parts; for example, internal parts that have worn over the years. I've used it quite often to tighten up Model 12 receivers that have been used for thousands and thousands of rounds at a trap range. And, by plating all the internal surfaces with an absolutely smooth, uniform surface, it has an apparent lubricating quality, slicking up the action. In fact, it is possible to add up to a mil (.001") on all surfaces, so I can do quite a lot of "tightening up" with it.

The potential of the electroless nickel finish just hasn't been reached at this point. I've been working with it since about 1980, and each day and time I plate, I find a different and better use for it. For example, when I do the bottom metal on a highly custom gun, I plate it. If the bottom metal parts are going to be blued, then I plate the parts that are going to be inside the wood to protect them. That way, you don't have to pull the bottom metal out after walking through a timber in a driving rain. You don't need to worry about it; it's plated, it's durable...it'll last forever.

So, not only do I accomplish durability, electroless nickel plating also gives me the fine, cosmetic texture I need to accent my embellishment. There are two basic ways to accomplish the texture, or "tone", of the plated surface. The first is to put the final tone on the metal prior to plating, using one of the methods discussed above, with acids; nitric acids at 1-to-10, or 1-to-15; or abrasive-blasting. The sequence is: final-tone the area desired with acid or abrasive-blasting; add the sparkle finish with club soda; get the texture of the metal wanted by abrasive blasting; then nickel plate.

(For "toning", I personally like to abrasive blast with either 320 or 500

aluminum oxide grit, at about 20 to 25 lbs. of pressure, with the nozzle held about 10" from the work.) I find that I can abrasive blast this way without washing out the sharpness of the engraving. As an embellisher, I'm concerned about this because I hate to put in all that work to have it washed out when the piece is toned. In fact, in Europe, particularly in Brescia, Italy, they feel if they can put the final finish on a highly embellished piece using an awful lot of "bellino" or "bluto" as they call it, and lose only 8% to 12% of the final detail, it is an acceptable loss. They expect it, and their customers accept it. I find that my loss in detail is only about 2%-3% of the engraved detail, and I'm very satisfied with that low loss.

The second way to achieve the tone you want is to apply an initial tone to the whole area, nickel plate it, then darken or remove the shiny surface of certain areas of the plated surface, as described below, to increase contrast and get the final tone for that area.

Once the plating is applied, to tone or darken areas, (for example the background), I use the method of controlled abrasive-blasting discussed above (320 or 500 grit aluminum oxide, 20-25 lbs. pressure, nozzle 10" from work). You can darken and texture the plated metal without removing more than just a "whisker" of the $\frac{3}{8}$ " mil plating that was put on. Even if you have abrasive-blasted the area before plating, you can go back over it for enhanced cosmetic effect after it is plated. This is very effective for me, and I use this technique often.

So, as you can see, the limitations of decorative plating are only bound by one's creativity. With the electroless nickel plating, I have a gray finish that is extremely attractive - or more attractive - than any other finish and is durable beyond expectation.

It's absolutely the greatest gray finish that I've worked with, and at this point in time there is no other finish that surpasses it in cosmetic effect, durability and function.

NOTES & COMMENTS ON ELECTROLESS NICKEL PLATING

The first question that always comes to mind is: "Just how hard is nickel plating to do?" Well, rest easy. The instructions are very complete, and if you will just follow them carefully, plating is as simple as bluing. The main priority is cleanliness - I can't stress that enough. The parts you want to plate have to be really clean, so just follow the instructions - paying particular attention to cleanliness - and you will have no problems whatsoever.

Operating temperature is 195° F., and it takes 45 minutes to achieve $\frac{3}{8}$ " of a mil coverage. Pay attention to the following three things: 1) Follow the instructions explicitly; 2) Be sure the parts to be plated are absolutely clean; 3) Don't over-use the plating solution. Rather than trying to stretch it out and get a little bit more area covered for reasons of economy, I find if I use it within the recommended limitation in the instructions, and stay under that limit, I do not have any problems. Maybe I don't get the maximum amount of nickel out of the solution; but, I don't have to strip and re-do a part because the nickel plating came out too thin.

In the years that I have been plating, I have used the Super Strip™ strip- per I bought only twice. Once, to re-do a piece that I had been careless about being sure was clean and then, when it was in the plating tank, allowed it to rest on the bottom of the plating tank which left a spot. The second was to get all the plating off a Mauser '98 that had been plated for naval use. The piece had been completely polished, but I forgot about the plating inside the lettering, and that did not blue. The plating came right off with the Super Strip, and everything blued up like it was supposed to.

(The interesting point about the Navy Mauser is this - why was it plated in the first place? So it would not rust or be affected by the salt water/spray to which it was going to be exposed in use. Kind of tells you what the navy types think about nickel plating and weapon life, doesn't it?!).

"Striking" is a very important part of the plating process on some guns as pointed out in the instructions. Being from Italy, I like to do things twice as long, or twice as good, or twice as hard as everybody else in the world. So, in this one instance, I deviate from the instructions, and double the time on the striking process. Where the instructions call for 5 or 6 seconds, I use 10 to 12 seconds. I don't know whether this gives me a better strike or not, but it does make me more comfortable. I've had no problems with the heavier strike, always getting the thickness and quality of plating job that I want after using it. (Editor's note: Be careful extending "strike" time in the acid. It is possible to "pacify" the steel to the extent that it will not accept plating!)

As I said earlier, the potential of nickel plating is unlimited. I'm sure once other engravers or other final-finishers become aware of it, it will be used a whole lot more, and a whole lot more effectively. It fulfills my two primary needs: It gives me the cosmetic effect I want to enhance my embellishment; and I don't hesitate to use the gun - or recommend that it be used - in adverse weather conditions. Once you learn how to use it effectively, I know you and your clients are going to be as pleased with your results as my clients and I have been with mine.