Metal Finishes

Compiled by Norm Larson, Lompoc

If you purchase a book via mail from Norm Larson, he sometimes throws in a little extra something. A few months ago I received a two-sided sheet of paper containing several metal finishing formulae, seven of which were sent to the CBA newsletter editor in 1979 by CBA members. Five others were from a 1983 Arizona Blacksmith Association newsletter, and the last one came from a 1979 British Blacksmith Association publication. If you use any of these, be sure to wear eye, nose, lung and skin protection in a well ventilated area. Some should only be handled outdoors. -California Blacksmith, Ed.

Robert Owings, Point Reyes Station

1. Clean metal with a power wire brush or sandblast.
2. Warm, using rosebud tip torch to a heat that is comfortable to touch, but uncomfortable to hold for extended periods. This evaporates the moisture on the metal surface and down in the pores and helps the finish to flow across the surface, allowing excellent penetration. Avoid heating metal too hot with the rosebud; it will cause temper colors to appear, burn finish materials and change chemistry.
3. Apply finish (see below) directly onto the metal while the metal is still warm.
4. Wipe off excess with rags.
5. This finish may be reapplied later on cold iron to build up coats. It is quick and an easy recipe for your customers to learn for maintaining their own iron. With age and the building of layers of the finish, the metal takes on a beautiful antique patina.
6. Finish mixture: Approximately half-and-half boiled linseed oil and marine type polyurethane. You can supplement this mixture with Johnson's paste wax or beeswax or plain paraffin, clear shoe polish, etc. Be generous in applying the finish. Excess is easy to wipe off. Be sure to get down into all the cracks and crevices. Try different mixtures, experiment and maintain records of what works best for you in various conditions.

E. A. Chase, Ben Lomond

For my traditional finish this works very well: 1 pound beeswax (paste Treewax® or Simoniz'" can be substituted) with a half pint of turpentine (amount depends on whether you brush or wipe). Heat wax and turpentine together slowly, mix as required. Do not overheat, but maintain enough heat to keep mixture fluid. Heat your iron to 200-300°F. Brush or wipe on the mixture. Buff with a soft rag when cool. This finish is good for indoors only.

The following formula is for a rich greenish brown finish: copper sulfate, 50% by volume, sodium thiosulphate, 50% by volume and water. Add chemicals to water and bring to a boil. Apply the solution hot to preheated and well wire-brushed iron. Iron should be hot enough to boil off water. Brush on solution with successive applications, keeping metal hot until the desired color is achieved. Rinse thoroughly with water, and let dry. Be certain all solution is removed since it is corrosive. After drying, apply wax for indoor use or varnish with a good quality urethane for outdoors. The color will darken with final finish.

Barry Berman, Goleta

Taught to me by Russ Le Croix Van Norden, an 82-year-old blacksmith and a fine friend: Take an old tin can and melt some beeswax in it - then pour in some turpentine and mix it up, about two parts wax to one of turpentine. Be careful pouring turpentine into can so that it won't explode. When the mixture hardens, you have a good paste. What Russ did was to rub the paste on the piece with his fingers, using an

old toothbrush for the hard-to-get spots. He would then rub the whole piece in a very fine Humboldt County dusty dirt. Then he'd take an old nylon stocking and rub the piece down. It would look like it was 300 years old. I have seen some 10-year-old pieces, and they still looked as fresh as when he first finished them. You have to have the fine dirt. I haven't found any here in Santa Barbara. Guess I'll move.

Jim Converse, Grants Pass, Oregon
The formula I use is made of diesel engine lube oil (Delo) or equivalent, 30w, not any mixed viscosity. Cut with 10% to 15% kerosene, no substitutes.
Bring your clean work to temperature warm to the touch, but not hot. Brush on light covering of oil mix with a paintbrush. Allow to stand 10 to 20 minutes, and wipe off excess with a cotton rag. This is good for nonsalt air climate on most items in the shop or under cover.
Ask a body and paint shop operator to mix a half pint of clear automotive enamel, cut with some flatter to reduce the gloss and add a little dryer or retarder to allow for 11/2 to 2 minutes of brushing time. Experiment with a couple of mixes to get the effect you want. Brush only. Do not spray. Brush completely with a thin coat and set aside or hang on a wire to dry. This finish is strong, brings out the beauty of the iron. It hides nothing. The mix soaks deep into the pores and scale. After some trial and error, you will get just the right amount of flatter in your formula to give patina elegante.

Doug Carmichael, Petaluma
I learned my most used finish for ironwork from Carl Jennings. It is very satisfactory for interior work: 1/4 cup powdered blue stone (copper sulphate) to 5 gallons water. Strong solutions on clean, wire-brushed iron will give a light copper plating effect. Weaker solutions left for a short time will just darken the iron; left for longer periods will turn the iron red - waxed rust.

George Erb, Frazier Park
I learned the following formula from a 72-year-old blacksmith. Bring your iron to an even 600°F and quench in pure raw linseed oil. Let it soak for a while, then wipe off. Now dip in the water for proof and watch the water bead on the iron as though it were a duck's back. The iron at 600°F should absorb enough oil to give its own iron texture and water resistance that will last forever, according to the 72-year-old smith. I have been using this technique for some time with success, but I doubt it will last forever. I've discovered it is important not to be too much over or under 600° in order to get maximum absorption of the oil.

Carl Jennings, Sonoma
The following is a rust finish for decorative ironwork. Iron tends to return to its natural state, iron oxide, if it isn't protected. If left alone to do so on its own, it isn't always very attractive. I prefer to control the rusting and speed it up. I do it with a solution of copper sulphate. Brush it, hit or miss, on oil free steel. Allow to sit overnight, preferably outside. Rinse off next morning. After the work is dry, warm and apply Johnson's paste wax or polyurethane.

Arizona Blacksmith Association
Burnt-on Oil. Apply a coat of old motor oil to the surface and heat the metal until the oily surface burns and turns black. This flat black finish is very attractive.

Wax Finish. Warm metal to a temperature at which a wax high in carnauba will melt easily when applied to the material. Let the metal cool and buff with a polishing rag.

Flat Black Paint. After the metal cools, apply a flat black spray paint liberally and let it dry. Rub the metal with a fine grade steel wool to highlight the hammer marks, twists and corners.

Linseed Oil, Turpentine and Beeswax. This is a blacksmith's finish used by quite a few smiths. Mix the three ingredients together in equal parts and apply to the metal with a paint brush. In dry climates, rub down with a rag leaving only a very thin film to avoid a heavy build-up that can be peeled off.

Tumbling. One of the nicest finishes of all is to tumble the finished product (avoid tumbling fragile projects) in a large tumbler filled with broken pieces of tile, punch outs from a punch press or other small pieces of metal. Tumbling de-burrs and rounds corners and edges, smoothes the metal, removes any scale and leaves a nice dull gray finish.

Beeswax Formulae
by Tommy Tucker, Bexley Heath, Kent, England
I must say to begin, I think the application of beeswax to iron furniture unwise because any excess will rub off, particularly in warm conditions, leaving the steel unprotected. However, there are two main methods of treatment:

Applied Beeswax protects the metal and is applied to the as-forged surface texture of the metal after any loose forge or mill scale has been brushed off. One method of application is to warm the article just sufficiently to melt on the wax and distribute it evenly, ensuring complete coverage with a piece of cloth impregnated with wax. Any excess wax in the form of drips must be wiped off. Another method is to flake the wax with a knife and dissolve it in methylated spirit to a fluid of suitable consistency to apply with a fine brush. The spirit will evaporate, leaving an even coating of wax.

Burnt Beeswax is a combined protection and coloring process. Starting with the as-forged oxide grey colored metal, the wax is applied by gentle heating as previously described, but more liberally. Apply more heat, raising the temperature. Small items can be held over a clear forge fire - the absence of smoke is desirable. A gas torch is convenient for heating large articles. Continue the application of heat until the wax is freely giving off smoke and the metal is changing color, augmented by some degree of color effect from the baked-on wax. With this method, a mixture of blue grey and brownish shades may be obtained. Results will depend on the experience of the operator. Most of the latter processing was practiced when genuine wrought iron was used as the basic material. The degree of surface porosity, due to the fibrous structure of the material, permitted slight penetration of the wax, keeping it on. As heat increased, the pores expanded and the slight surface penetration increased.
In my opinion, regular maintenance is essential by lightly wiping the ironwork with a silicone wax furniture polish to retard any outbreaks of rust, being careful not to disturb the basic wax coating.

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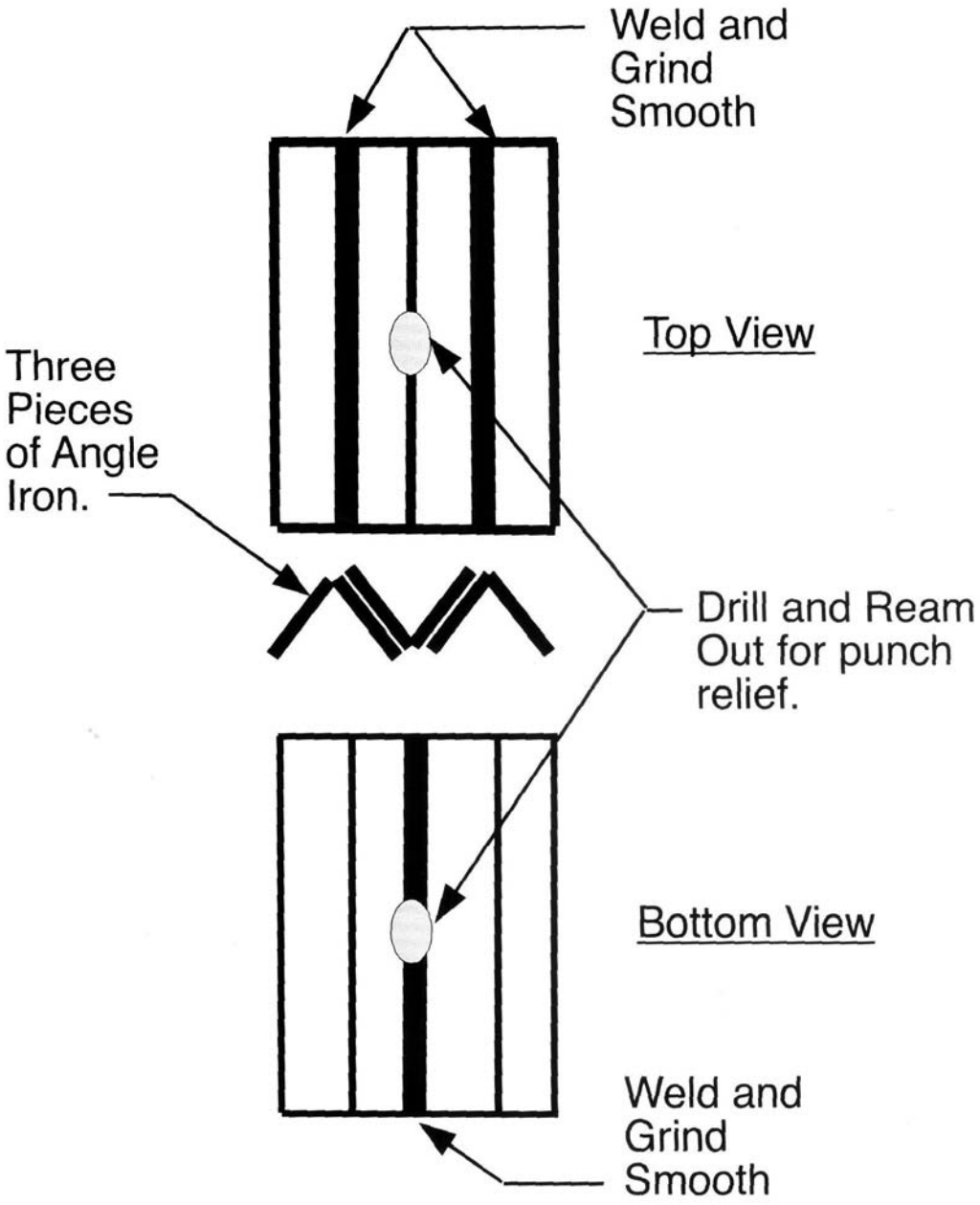
Simple Vee Block by Guy Paton

Shown Below is a relatively simple Vee Block. It is made from regular angle iron, welded, ground and drilled. Jesse Gavin brought some to the Struck Tools Class and they worked quite well. The ones he brought were made from 3/4 inch angle for 5/8 and 3/4 inch work. They were about 3 1/2 inches long. I would use larger angle for larger work.



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