

# Hot Salts Bluing (Black Oxide)

Hot Salts Bluing is a simple process for coloring metal, but you must pay attention to detail if you wish to obtain satisfactory results. I will assume that most reading this do not wish to spend a lot of money on supplies and equipment, but want an inexpensive way to produce a Black Oxide finish for small parts. The essential equipment consists of 3 parts tanks, a heat source, a Bluing Thermometer, Parts Basket, and some type of stand to place the Bluing Tank on. Supplies will be Bluing Salts, Metal Parts Cleaner, Steel Wool, Scotch Brite Pads, and WD 40.

## The Equipment

The Bluing Tank can be welded up using plain sheet metal; if the metal will rust it is suitable for the tank. The size depends on what size parts you want to Blue. A smaller tank uses fewer salts and is less expensive to use.



12 inches x 6 inches x 6 inches

The Rinse Tank can be made of the same material, or can even be an old kitchen pot. Stainless steel is fine.

The Soap Tank can be made of the same material, or can also be an old pot, or another Stainless steel, container.

The Heat Source can be a Pipe Burner,



Or for small jobs I prefer a Weed Burner, from the local farm supply, or hardware store.



I connect it to a propane bottle from the grill in the backyard.

The Bluing Thermometer is expensive, but it is a must. Cost is about 25.00.



The Parts Basket can be made of screen, plaster lathing screen, or any other screen or basket that will hold your parts, but allow the Bluing Solution to drain when lifted from the tank. I use the basket out of a gallon of carburetor cleaner for small parts. What ever you use put some sort of metal handle on it.



The Stand can be any thing that is stable and is not flammable. I use a pair of cinder blocks.

# The Supplies

As for supplies there are 3 major suppliers for Bluing Salts and related equipment. They are

Brownell`s 1-800-741-0015 <http://www.brownells.com/>

Dulite Corperation 1-860-347-2505 <http://www.dulite.com/index.html>

Jantz 1-800-351-8900 <http://www.jantzsupply.com/>

I prefer Dulite. The different brands of salts are not compatible with each other so do not mix them. They also are designed to operate at different temperatures, so follow the manufactures recommendation. You will also have to buy a cleaner from whichever supplier you choose.

# Metal Preparation

There are many ways to clean up and polish metal parts. I usually run my parts through a blast cabinet to thoroughly remove rust and crud and then finish on the wire wheel or with locite strips. Whichever method you use make sure the finish you get is uniform. Bluing changes the color of metal it doesn't hide scratches, gouges, or an uneven finish.

# The Process

Clean your tanks with Dulite #31 cleaner. Rinse

Set up your stand and place the Bluing Tank, next to the Soap Tank. Set the rinse tank off to the side away from the heat but close enough to work easily from.

Add cold water to the Bluing Tank and Dulite`s Steel Kote at the rate of 7lbs per gallon of water. Fill to within 3 inches of the tank top leaving space in case of boil over.

Fill the Soap Tank with water to within 3 inches of the top and add cleaner at the recommended rate.

Fill the Rinse Tank with water and let it overflow slowly so there is always fresh water in it.



Here is an example of professional 4-tank set up. You can get by with much less but it does illustrate the necessity of having your tanks at a close working distance.

Place your Thermometer in the Bluing Tank and turn on your burner directing the brunt of the flame at the Bluing Tank while allowing the Soap Tank to heat up as well.

When the Temperature of the Bluing Tank reaches 280 degrees, put your parts in the soap tank, then the rinse tank, then the Bluing Tank.

You must move quickly or your parts will rust.

After 15 to 20 minutes remove from Bluing tank and place them immediately in the cold-water rinse tank. If the parts look good remove them and spray them with WD 40, or better yet you can immerse them in a container of it.

The mystery is gone. Give it try, you can produce excellent results with a little effort.

# Things to watch for

The Temperature in the Bluing Tank is regulated by the amount of salts that are added to it. If it boils below 280 degrees you need to add more salts. If it doesn't boil at 280 degrees you need to add more water. You also need to compensate for altitude differences. Follow the directions that come with your Bluing Salts.

When you add water do it very slowly or the salts will boil over violently.

Place parts in the Bluing Tank Quickly, being careful not to splash.

If the parts appear to have a rusty film on them your tank is too hot, place the parts in the rinse tank and scour them with steel wool while under water. This will usually solve the problem.

Cast iron should be watched carefully as it has a tendency to turn red or green if over heated. Again move to the Rinse Tank and card with steel wool.

Do not Blue inside a building of any kind, the vapor will rust every piece of metal in the building immediately.

Never put any metal except steel or cast iron in the Bluing Tank. At the least it will contaminate your salts. Metals like aluminum will dissolve.

# Safety

Wear protective clothing. A rubber apron, a face shield, and rubber gloves are the minimum you need.

If the salts splash on you they will burn you, cool with cold water and rinse with vinegar to neutralize the salts.

Avoid breathing the fumes from the tank, and from the powdered salts before they are mixed. They will burn your lungs.

The unmixed powdered salts will also burn you, wash and rinse with vinegar.

Never allow salts to come into contact with any galvanized metal. The reaction is violent and the fumes are deadly.

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