CHEMICALLY BLACKENING BRASS

By: Pat Majewski for the Model Ship World Forum

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Disclaimer: *I have no commercial or other financial interests with any of the products, services or suppliers mentioned in this article. All products that I have been able to locate and validate have been included; however, there may be others available. I would be grateful for any further information about any new or alternate products, as well as corrections or clarifications to any of the information provided. This is a work in progress.*

There is a wealth of information about this subject to be found on the internet; however, to the novice much of it is confusing. Considerable discussion has been transacted in the various ship modelling forums, and some very useful information can be obtained from the manufacture's product fact sheets.

The following is a collection of thoughts and ideas resulting from some basic research I have conducted in trying to find brass blackening products here in Australia. I hope it is of some value to fellow modelling shipwrights.

I have drawn on the information provided in many of the above sources in writing this article. I cannot take credit for all of the information provided, and wish to acknowledge the various authors of the discussion forums from which I have drawn some of this information.

CAUTION

A word of Warning! Consistently and emphatically, the product makers and suppliers, as well as the various sources of information, stressed the same words of warning and caution.

"The chemical ingredients used in these products are dangerous."

Even though they are safer than most industrial agents, these products and chemicals must be used with caution! Wear rubber gloves, a face shield, and a mask. Open the window and put on the fan. Follow the manufacturer's instructions to the letter. Make sure you keep these agents in a well secured, safe lockable cabinet; and keep away from kids and pets. In other words, use your common sense!

Now that you maybe rethinking the use of these products and processes, and I have covered my 'you know what' – please read on.

This version: Friday, 1 June 2007

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INTRODUCTION

Firstly, what are we trying to achieve?

Some ship model makers buy brass fittings, others scratch make them, but most of us then need to blacken these pieces to achieve a realistic look. Some modellers choose to paint the brass, while others prefer to use chemicals to oxidise the surface of the brass in order to give it an authentic 'blackened' iron or weathered / aged appearance.

Either method can achieve satisfactory results. However, paint will tend to fill some of the minute details of the brass pieces, whereas a chemical blackening process won't.

The chemical blackening of metal involves the replacement of a surface skin of base metal with a selenium based compound (oxidant). There are many types of metal blackening agents; each works on a particular metal to produce a black, green or brown patina. A patina is defined as:

> *"A surface appearance of something grown beautiful especially with age or use. Usually used in reference to copper, but also applicable to bronze, steel, and other materials."*

On a commercial scale, metal can be blackened using Parkerizing, or hot or cold Bluing processes. Some of these methods, previously the exclusive domain of gunsmiths, engravers and metal shops, are readily adapted for home use with some solutions now supplied commercially in kit form – it is a matter of finding the appropriate product or chemicals, and applying the appropriate techniques.

The Hot-Bluing and Parkerizing processes only work on steel or stainless steel parts to provide corrosion protection for the metal. These processes are expensive; therefore, modellers need a cheaper, easier to use solution that will work on brass. Some of these commercial products are now sold in small quantities for the cold-bluing touch-up of firearms. These products are also extensively used by railroad modellers for blackening metal surfaces.

Although these agents are generally named after the base metal for which they are designed to react with; some work better than others on different metals. Be aware that different alloys used within the same base metals often react differently to the same blackening agent; **there are at least 12 varieties of brass**.

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BLACKENING PRODUCTS

Gun Blue Gels and Cremes: These are newer products to the market manufactured by G96 Products of New Jersey, USA. In Australia they are available through some gunsmiths and military disposal stores. There is not much reliable user information readily available, especially about their use in ship modelling applications. They are used extensively by gun enthusiasts for restoring / touching-up metal parts of weapons. These products appear to be replacing similar liquid products. G96 also make a gun blue liquid, but it is not specifically designed for Brass.

www.g96.com/miva/merchant.mv?Screen=CTGY&Store_Code=g96&Category_Code=Gun+Blue

Touch-up Pens (Sticks): these are another new blackening product range, also manufactured by G96 products. Testing suggests that the pen is useful, especially for smaller brass pieces and touch-ups, but good preparation is essential.

JAX Black – Brass, Copper and Bronze Darkening product.
www.jaxchemical.com/ordering/shopexd.asp?id=45

Jax is manufactured in New York state, USA and orders are normally shipped via UPS ground. This product will incur a fee / charge for each package containing hazardous materials, regardless of quantity, in addition to the normal UPS shipping rate. Ensure you order the 'Black' product.

A forum member, using the avatar "Bosco", uses this product for his projects with consistently good results.

Blacken-It: Blacken-It metal blackener is made by A-West, located in Woodstock, Georgia, USA. There is no web site for the manufacturer; however, the following link is the highest ranking result provided when 'googled'.

http://www.walthers.com/exec/search?manu=158&split=30

The chemicals listed on the label include: denatured alcohol, selenous acid and dilute copper chloride/copper carbonate. The copper chloride explains the light blue colour.

Comments posted in some forums, suggest that Blacken-It has a bit more of a matte finish then Brass Black and a slightly different depth of colour. However; I have seen pictorial evidence of good results from both products – good preparation is the key. One caution raised by a modeller, was that it sometimes may dissolve soft solder – so use it with caution.

Brass Black & Super Blue: These products are manufactured by Birchwood Casey of Eden Prairie, MN, USA: www.birchwoodcasey.com/sport/index.html (follow the gun blue link). It is also available in kit form which packages their cleaning solution with the blackening agent. This is a fast-acting liquid with the resulting effect and depth of colour dependent on the alloy content of the brass, and amount of time the brass is exposed to the blackening agent. However, it has been reported that it may not colour solder. The super blue appears works just as effectively as the Brass Black.

There is also a **Brass Black 52** available from Blue Jacket Ship Crafters in the USA, which reputably works quite well. Whether it is the same product or something completely different is unknown. **Russ**, from our forum **(HMS Triton Community Build)**, uses the product and is very satisfied with its performance. www.bluejacketinc.com/fittings/toners.htm

Black Magic: This product blackens brass, steel, copper - all metals except aluminium and stainless steel. It is a more diluted chemical blackening agent, and therefore much slower acting. It reputably provides more control over the degree of darkening. The price speaks for itself; however, I am unsure whether the chemical can be further diluted or not. The product is made in France and distributed in Australia by Brunel Hobbies: www.bdsonline.net/brunelmodels

Carr's Metal Black for Brass / Steel: There are several types of this popular metal blackener available but the two of most interest to ship modellers are the 'Steel' and 'Brass' agents. There is also a product dedicated to solder blackening. The steel solution is reported to work on most solders and metals (including brass) which may eliminate the need to hold several agents.

Carrs is manufactured in the UK by LCP international who also trade under the name C+L Finescale.

http://www.finescale.org.uk/show_page.php?pid=102

Modern Master's Metal Effects Range of Products: These products are manufactured by Modern Masters in the USA and distributed in Australia by White Knight Paints. They are also the distributor of the Taubmans and Bristol range of domestic and industrial paint. This means that this cheap range of product are easily available (either in stock, or by order) from any of their paint centres around Australia, or from selected Bunnings Stores (hardware chain).

The patina solution will work on any non-ferrous metal OR on their range of reactive paints. It is a very dilute solution (Blue Copper 7758-99-8 4% and Selenium Compound 7783-00-8 <1%) and can be painted or sprayed onto the brass without further dilution. Leave it for 15 minutes or longer to achieve the desired weathered effect. I am trialling whether soaking / immersing may be OK for generating an even overall patina on larger pieces.

http://www.modernmastersinc.com/metaleffects.asp

Solder Blackening: Some of the products mentioned earlier may also blacken any solder present as well as the brass, but many will not. For those instances where it has failed to do so, there are several products available.

Apart from Carr's Metal Black for Solder (see link above), there are a few other products used extensively by leadlight window makers and repairers. These products are 'paint on patinas' in liquid or paste form that is brushed directly onto the solder.

Another recommendation was to use 'LACO Brite' Flux to blacken soft, and some silver solders. The same product for two different jobs (flux and blackener) - has to be another cost saving there. ☺) This product may well work on higher content silver solder as well, but has yet to be tested. The product is made by LA-CO Markal in the USA: http://www.laco.com/ProductDetails53.aspx

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HOME BREW / ALTERNATE CHEMICAL AGENTS

Caution: Some of the methods discussed below involve caustic or poisonous liquids and fumes that may permeate an entire house. Plastic gloves and adequate ventilation are mandatory. The work area and you should be well protected from possible damage or contact.

The cautions advised at the start of this article also apply here.

The products listed below may also blacken metal parts and you don't have to be a chemist to use them (but it might help ☺). Many of the products are available in powdered / granular form that will need to be mixed with other commercial chemicals or distilled/demineralised water.

However, I have found to my dismay that this doesn't necessarily translate to a cheaper alternative. It does allow the modeller to buy bulk (sometimes cheaper), provides a longer shelf-life, and you can mix as much as you need when you need it. However, (yes there is always an however), you will need to experiment a little to find the best chemical mix ratios, time of immersion, etc. to achieve the desired effect. This has largely been eliminated in commercial off-the-shelf products as the manufacturer often provides tables of times or recommendations to achieve a desired effect.

Some of these alternate solutions include:

1. Selenium Dioxide (selenium acid): This is a good chemical for blackening copper and brass and is the first choice of many chemical trophy engravers for laminating brass plaque to make the lettering black (the lettering cuts through the lacquer). It's totally jet black and very hard. One product brand they use is called Gravoxide. It's advertised as a blue/black oxide finish for steel but it is reputably effective on brass/copper also.

2. Copper Carbonate: Normally, this chemical is used to create a green patina similar to weathered copper on metals. However, it can also produce a black / dark finish on brass. Most scientific chemical suppliers only sell the pure version of the chemical in bulk, and it is expensive. Nonetheless, industrial grades of Copper Carbonate are available from pottery supplies outlets quite cheaply in small bags.

   Available in a granular form, copper carbonate can be mixed with warm water or ammonia (either ammonia 800 – better but more expensive; or cloudy ammonia); all solutions will work. The ammonia solutions clean the brass as they blacken; however, some brass preparation is still recommended. A teaspoon or so of the granules mixed in a glass jar of water or ammonia solution usually works. Leave the brass in the solution from anywhere between 10 to 30 minutes, depending on how black you want to make it. Leave it out in the sun while it is working for better results.

Keep the solution; the carbonate will settle to the bottom, but a vigorous shake will soon have it ready for the next batch of blackening.

Note: this solution will not blacken solder!

3. Sodium Polysulphide:

Make a solution of sodium polysulphide by dissolving flowers of sulphur (pictured) in a solution of sodium sulphide. The solution can be painted onto the part, or better still, soak the brass in the solution. It forms an adherent layer of copper sulphide, which is black; so the longer you leave it soak, the blacker the result. The solution really smells and gets into your hair and clothes, so you will not be 'Mr. Popularity' if you go out partying after this! (The old 'stink bomb' formula. ☺). Our trials have shown this to be a relatively poor performer; very slow and patchy results.

4. Using Ammonia: – CAUTION ventilate well

After preparation, moisten the brass surface with strong vinegar and then suspend the part in ammonia vapour (inside a lidded bucket with half an inch to an inch or so of ammonia should work). Repeat every five or ten minutes until the desired patina is achieved.

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CLEANING & PREPARATION TECHNIQUES

I cannot emphasise strongly enough the importance of proper cleaning and deoxidisation of the brass prior to blackening. This is the 'make or break' of a good result.

The evidence from our trials reinforced earlier advice I had been given, of the importance of proper preparation. Any residue from finger oils, contaminants, glue, flux etc produced unsatisfactory blackening results.

Ensure the removal of all grease and foreign substances from the surface, with a thorough degrease of the pieces using a good solvent and scrubbing. Keep your fingers (i.e. oil) off the brass after the initial clean. Be careful not to leave fingerprints on any of the pieces as these will, in turn, leave traces of oil and other impurities. Handle only on the edges if you must, preferably with tweezers or tongs, etc. - surgical gloves work well.

Dirk (**Kelvin12**) has quite rightly pointed out that this work should, wherever possible be done outside. I found to my own cost, that using the kitchen or laundry sink is not advisable. Not only do we have the odour / ventilation issues to consider, but also deterioration of any metal sink. Even using diluted solutions, the acid can corrode the metal, and the blackening agents will definitely stain them. Use an old sink or washing dish jury-rigged on a stand and connect it to the garden tap or outdoor plumbing.

General

Peter (Powder Monkey) has provided the following general preparation advice.

There are two types of contamination to a metal surface; organic, which is oil, grease and dirt, and inorganic, which is oxidation. Sometimes both types of contamination will be present on the metal. Most cleaning methods will only take care of one type, so they need to be taken care of as separate processes. The organic contamination will always be on top. So attack the grease first, then the oxidation. Once the oils and grease are removed, the oxides can be removed.

Cleaners

Organic - The cleaners that will handle oil and grease are the solvents and detergents. The ultimate cleaner was 1,1,1 trichloroethane. It used to be the major ingredient in brake cleaner but I don't know if it still is. It has mostly been phased out of industry since it is an ozone depleting substance. It is also important that you determine the best cleaner for each application. An ultrasonic cleaner is nice because it allows you to use relatively mild solutions with it. It is the ultrasonic scrubbing action that does the work; however, it will only remove corrosion that is loose on the surface.

Inorganic - The acidic cleaners will attack oxidation. Hydrochloric acid is the most common acid used to clean brass. Abrasive methods also work great. You can use a fiberglass or wire brush. Another method uses a slurry of ground pumice and water and scrub on with an old toothbrush.

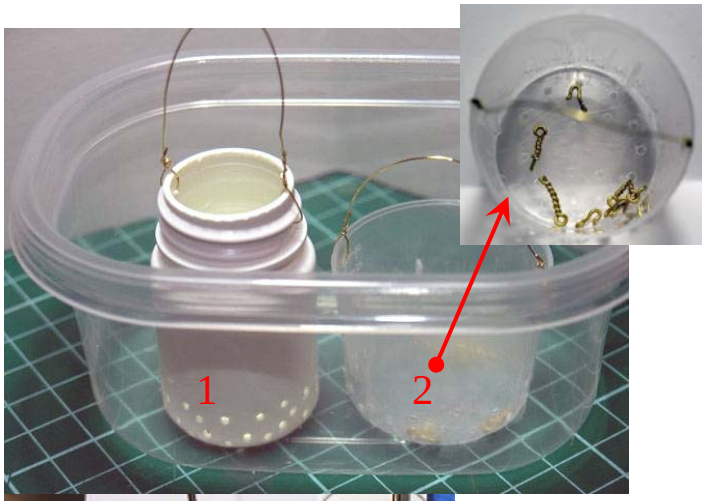
Rinsing - Rinsing is important to remove all traces of the cleaning solution. Distilled water is a good idea. It won't leave any mineral deposits that may come from tap water.

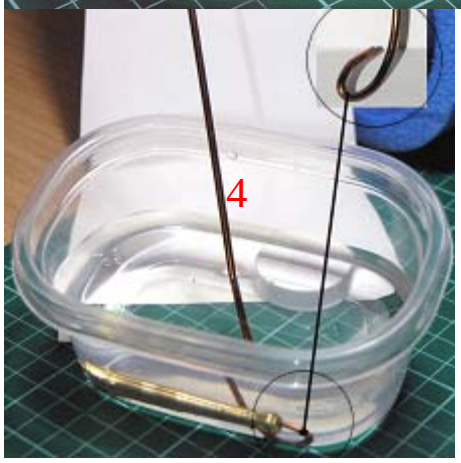
It is also important to blacken immediately after cleaning. As soon as you rinse the acid off the part, that part is as clean as it will ever be. Depending on temperature and humidity, oxidation may start all over again very quickly.

Cleaning Devices:

A few ideas for the rinsing / dipping baskets are shown below. All should be drilled with sufficient small holes to allow rapid drainage but prevent smaller parts escaping. Use brass wire or wood as the handle to ensure no contamination due to dissimilar metal reactions when dipping into the blackening agents or acids.

- small plastic container (e.g. yogurt cup)
- small pill bottles (retain the lid for added parts security) **(below: Picture point 1)**
- medicine dose measuring cups **(below: Picture point 2)**
- plastic /nylon tea strainers (see following)
- plastic lids from screw on bottles (deeper sided ones) **(below: Picture point 3)**
- use larger gauge brass wire with a curl shape bent into it to control larger pieces such as canon barrels **(below: Picture point 4)**





The item pictured right, is available from MicroMark in the USA (Small Cleaning Basket - Item Number: 81755-S). These look remarkably like a small 'tea strainer', so it may pay to take a look around.

Note: *It is advisable not to use a metal strainer with the blackening agent (contamination) or with acid cleaning solutions (obvious reasons)!*

Cleaning Techniques:

1: One of the most basic cleaning processes is a vigorous scrubbing with soap and water or a slurry of ground pumice and water. Use a stiff brush, powered toothbrush or similar to assist the scrubbing process. If the pieces are very dirty, consider using a hair dryer to heat the metal to open the pores before degreasing. Ensure you rinse all soap and residues from the pieces.

2: Wash the parts in a degreasing / cleaning solution agitating them vigorously. Assist the process by scrubbing the brass pieces (encouraged). Some recommendations for the degreasing solution include:

- muriatic acid (between 35 - 10% solution),
- nitric acid (between 35 - 10% solution),
- white spirits,
- ammonia (ventilate well or wear breathing apparatus),
- acetone,
- vinegar (did not work that well in our trials),
- brake cleaner, or
- clear PVC pipe cleaner (not the purple stuff).

CAUTION

All acids are dangerous – read the safety precautions on the package!

Dilute acids with plain tap water and store in a well marked plastic container; preferably one with a child-proof cap.

When mixing acid solutions, always add the acid to the water, not the other way, to avoid explosions (adverse chemical reaction ☺)

Note: *Muriatic acid is really hydrochloric acid and is used for cleaning concrete among other things (also known as brickies acid in Australia).*

In fact, any solvent used as preparation for painting metal surfaces would probably work. You could also try using any of the commercial citric acid (orange peel) products (e.g. Citrisol / Citriclean); or even BAM. Our trials turned out a dismal failure. **Only experimentation will determine what works best for you, and with your selected blackening agent.**

Thoroughly rinse the brass with distilled or plain water, and wipe them dry with a clean cloth or paper towel, before proceeding with

the blackening process. It is very important that all traces of any chemical cleaner are removed, especially acid based solutions, as they may cause flaking of the patina further down the track. If necessary, use a very weak alkaline solution to neutralise the acid, then rinse.

> ***Note:*** *If after applying the blackening agent, you see spotting, or light areas, try changing to another degreaser / cleanser. Some synthetics can not be cut by all solvents, i.e.: if you are using an acetone, switch to a keytone. No solvent or cleaner will remove 100% of the synthetics 100% of the time.*

3: Vigorously clean the items with a stiff brush, such as a fibreglass brush (similar construction to a propelling pencil but with the lead replaced with fine glass fibre rods). The brass should be scrubbed until it shines; apparently this will also remove any oils/grease left on the surface. For smaller pieces, you might also try a power toothbrush? A toothbrush or cotton bud is also useful in applying the solution directly to small pieces (if not using the immersion method) to work the agent into all the small nooks and crannies.

These brushes are available from most train modelling hobby stores, including MicroMark, and some electronics stores as they are used in soldering. A brass wire bristle brush of similar construction is also available.

You could also try one of those small brass bristle “suede shoe” brushes.

4. Several brands of domestic (hobby) ultrasonic cleaners are now available at very reasonable cost. With the right cleaning solution, this is reported to be the ideal cleaner as it will remove all traces of dirt, oils and corrosion etc; and you don't need to muck around with messy and/or dangerous solutions. Just place the pieces into the solution (in a basket), wait the required time (device dependent), usually only for a minute or two, then dry (don't touch with fingers). I figure at this price, you could talk the ‘ship’s purser’ into it by explaining that it will clean her jewellery to boot.

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BLACKENING TECHNIQUES

There are as many opinions on the best techniques for blackening as there are products; you will need to experiment a little to determine which works best for the type of brass you are blackening.

Many of the following blackening solutions have a long shelf life, even after dilution. Do not throw the solution out after every use; you will probably get several uses from it as long as you do not contaminate the agent. Therefore, small bottles should last quite some time.

Blackening Techniques

1: The most prevalent recommendation is to immerse / plunge the materials into a diluted blackening solution. Reputably, the best way to oxidize smaller pieces of brass is to use a weak solution so that the oxidizing agent works slowly and penetrates thoroughly.

The rate at which the brass will blacken depends not only on its composition (alloy content); but whether it has been worked (turned etc.) or whether it is a casting; the presence or lack of impurities, and/or whether the brass has been soldered.

If immersed into full strength solution, the pieces will darken rapidly but then, often start to flake. Also, depending on the type of brass, it can sometimes blacken quickly but then flake off later. Should this happen, further dilute the metal blackener with distilled water. My experience to date suggests that a dilution or between 30% and 50% works best for larger pieces; and between 15% and 30% for very small pieces.

Simply pour a little blackening solution into a small container (non-metallic), dilute it to preference, immerse the parts and agitate them until the desired depth of colour has been achieved (may need several dips – check regularly), remove the parts to drain and then rinse thoroughly to neutralise the oxidising process.

Rinsing can be achieved by simply holding the container with the parts under running water, or by swishing in a bucket or jar of water, or simply by leaving the pieces to soak in a container of water for some time. Some modellers suggest using demineralised water for this step; others recommend hot water but I have found that normal tap water works just as well.

If you choose to use a full strength blackening solution, keep a close eye on the process, as the reaction is slow initially but accelerates rapidly. There will usually be a grey/black powder residue formed on the brass which must be cleaned off. Buff the pieces with lint free cloth to enhance the effect and then seal it. If you do not seal it, there is a risk that continued reaction may occur later down the track (imperceptible over the short tern).

Bosco has a video showing one variation of this blackening technique available on his web site at: www.shipmodeling.ca/aa000092.html

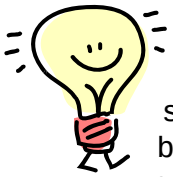
2: An alternate method of blackening recommends not immersing the parts in the solution, but rather to brush or rub the full strength solution onto the pieces using a small stiff (cheap) nylon brush to work it in. Have a cotton bud soaked with the solution nearby to assist those parts not blackening as fast as others. Use the cotton bud method on smaller parts such as eyebolts, doing each individually.

After the oxidation or surface colouring is complete, be sure to neutralise the coating by rinsing thoroughly with cold water and place them on a paper towel or cloth to let dry. An improperly rinsed item will continue oxidising until the part is a crumbling mass of mineral salts.

Blackening Britannia Metal

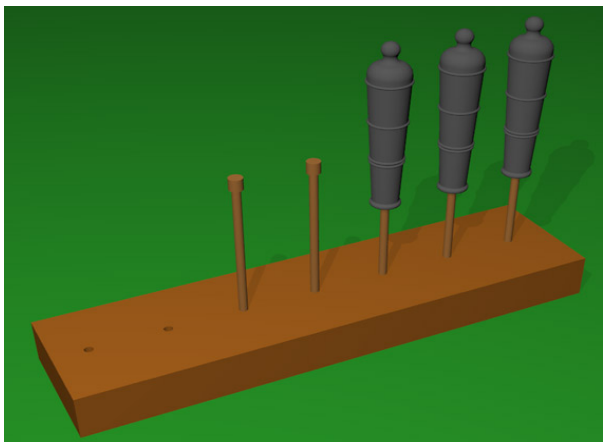
Britannia metal is a tin/antimony/copper alloy so most blackening products should work. However, some modellers have reported that they have had mixed results and prefer to use a blackener designed for pewter or white metals. One modeller reports that Pewter Black seems to produce a more realistic metallic finish. Again, the most important aspect is a thorough clean / degrease of the part before using the blackening agent.

Blackening Jigs



The following tips are curtsey of forum member **Cut-Throat-Jake.**

1. Consider using a pipette like a bellows to blow the excess solution off the surface. You could just as easily blow it off yourself, but blowing into a cannon muzzle tends to spray back in your face (probably not a good idea with the chemicals we're using).



2. The jig illustrated above is easily made from dowel; the larger part (top) of the columns being a snug fit in the bore. Holes can be drilled in a piece of scrap to take the smaller diameter columns to hold the cannon while they dry. The jig makes life a little easier because you don't have to chase barrels around the bottom of a mug with a pair of tweezers, but it's far from essential.

3. Use a tall, narrow vessel for dipping (test tube-ish) - the whole cannon can be immersed without using a great deal of the blackening or finishing solution. When blackening, ensure the inside of the bore gets coated – use an old paint brush to swish inside the bore to release any trapped air bubbles. If you're just applying a varnish then why not taper a dowel using a pencil sharpener, and use that. Then it wouldn't matter what size the bores were.

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FINISHING TECHNIQUES

The finish of the blackened brass can often be improved by a light buffing of the oxidised surface. This provides a polished surface that sometimes enhances the depth of colour.

Also, some very realistic weathered and rusted finishes can be achieved by using different reactants after the initial, or base, patina has been prepared. Subsequent treatment with alternative metal blacks can produce other useful effects. For example, Carr's product description sheet recommends that after treating brass with the 'Brass' blackening agent, follow-up with the 'Nickel Silver' blackening agent to achieve a rusty and aged finish. Applied to the appropriate parts of a canon, this may achieve that 'just fired' appearance.

As we are creating a patina and not bluing or Parkerizing the metal, it is important to seal the finish with a light spray/coat of lacquer or similar product. A low sheen or matte lacquer finish provides the most realistic appearance.

Another finishing product available from Carr's is **ELECTROFIX**. This is a clear lacquer which will prevent the black being rubbed away. It will also provide a low strength seal for nuts and bolts where it is not desirable to use Loctite etc.

Modern Master's (White Knight) also have a water based sealing product called PERMACOAT, and a spray on metal sealer called CLEAR GUARD (This would mean less dangerous products to store, as all of the products are very dilute and/or water based.

For those modellers who prefer to work in wood, but would like a metallic look, they also have a range of reactive and non-reactive paints. Simply seal the wood, paint on the metal colour you want, let touch dry, apply a reagent if required, then seal. This would be ideal for achieving an *iron* look on wood canon barrels, *brass* for a bell, *iron* look for a stove, *copper* for a bell housing etc. etc. All could be weathered by using the reactive paint and using one of these patina effects.

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PRODUCT SOURCES:

Please note that many suppliers will not post many of the products listed in this article; they need to be picked up personally or delivered by courier – well here in Australia anyway. A few suppliers will still post, but for how much longer ….?

Potential sources for blackening agents include:

- Hobby suppliers (e.g. MicroMark etc.)
- Train model specialist hobby stores (blackening agents)
- Gunsmiths (gun blue and blackening agents)
- Jewellery suppliers (solders, flux and some ageing agents)
- Engravers (and their suppliers)
- Chemical / Scientific equipment suppliers (chemicals and acids)
- Pottery suppliers (industrial grade copper carbonate)
- Leadlight suppliers (flux and paint on patinas)

Australia:

Carr's Metal Blackeners:

DCC Concepts (WA) www.dccconcepts.com

Brass Black:

Brunel Hobbies (VIC) www.bdsonline.net/brunelmodels

Victorian Arms (Gunsmith) (VIC) www.viccityarms.com.au

Black Magic:

Brunel Hobbies (VIC) www.bdsonline.net/brunelmodels

Metal Effects Black (NSW):

Home: http://www.whiteknightpaints.com.au/page/about but products not listed yet. Available via Bunnings hardware (craft section), or Bristol / Taubmans Paint Centres.

Also Try: http://www.modernmastersinc.com/metaleffects.asp

Copper Carbonate:

Clayworks Potters Supplies (VIC) (03) 9791 6749

Walkers Ceramics (VIC) (03) 9725 7255

Paint on Patinas:

Carr's: (DCC Concepts - WA) www.dccconcepts.com

LACO Brite Flux: DCC Concepts - WA) www.dccconcepts.com

Neil's Paint on Patina: www.unitedglass.com.au (select your closet leadlight specialist from the options provided)

Europe:

Carr's Metal Blackeners:

C+L Finescale: http://www.finescale.org.uk/show_page.php?pid=102

'O' Gauge: http://www.ogauge.co.uk/carrs.html (then scroll down)

Chronos Engineering: http://chronos.ltd.uk/acatalog/index.html?http%3A//chronos.ltd.uk/acatalog/Chronos_Catalogue_Metalblacking_Products_187.html&CatalogBody

USA:

Blacken-It:

Walthers: http://www.walthers.com/

Jax: http://www.jaxchemical.com/ordering/shopexd.asp?id=45

Brass Black: www.birchwoodcasey.com/sport/index.html

Brass Black 52: http://www.bluejacketinc.com/fittings/toners.htm

G96 Products: http://www.g96.com/

Modern Masters Metal Effects:

http://www.modernmastersinc.com/metaleffects.asp

Paint on Patinas:

LACO Brite Flux: http://www.laco.com/ProductDetails53.aspx

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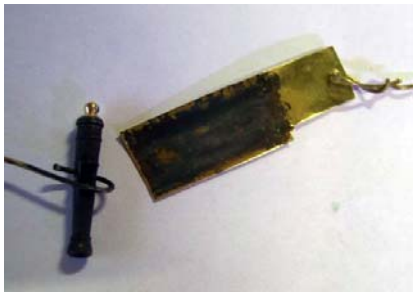
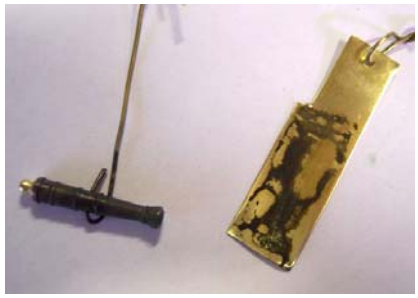
BLACKENING TRIALS

The following are some very preliminary test results. I would like to acknowledge and thank Dirk De Bakker **(Kelvin12)** for his help and advice in conducting these tests. I would also like to acknowledge Eric **(Old Salty)** for his feedback.

Test 1.

In this test Dirk has trialled the G96 touch-up pen. The brass was prepared by soaking in 100% white vinegar, which has produced mixed results. The smaller pieces have blackened better than the larger pieces; however, the larger piece (coupon) has not.



Front and back of same pieces.

In a separate test, Dirk recoated some of the same pieces using the same pen with excellent results. This is probably due to the pieces being very clean the second time around and reinforces the need for thorough cleaning in the first place. The following are the same brass screw and cannon shown above.

In Dirk's opinion: "Rating (out of 10): 9+. Good finish, smooth clean appearance, hard and buffs up well. It can also be burnished which really makes the rings on the cannon stand out. This is also by far the easiest operation to carry out, …… certainly my choice and recommendation."

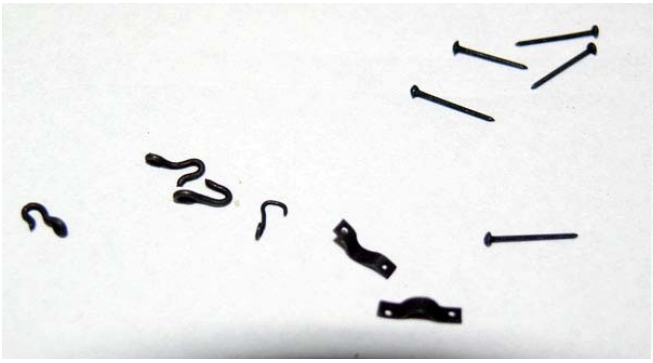
Test 2.

In this test I trialled the Brass Black diluted to 10% solution. The brass was prepared by soaking in 10% hydrochloric acid solution for about 5 minutes. This worked well for the smaller parts, but did not totally clean the canon. Small parts were immersed and swished around in the diluted blackening agent for about 2 minutes to achieve the shown results.

As the canon turned out very mottled / splotchy, I left it to soak for another 5 minutes. The mottled areas did not reduce but the existing patina grew darker and a powdery residue started to form. I wiped off the powdery residue (paper towel) and then vigorously scrubbed the canon in the acid solution using a toothbrush (wearing gloves, safety goggles and apron ☺ of course). I then dipped the canon in a stronger Brass Black solution (topped up to about 20% – 25%) for about 10 minutes. I then dried, buffed and coated the canon with a matt lacquer to seal it.

The results were quite pleasing with the following observations noted:

- Scrub larger pieces, do not just soak them.
- It is possible to re-clean mottled brass areas after the initial blackening process.
- Brass Black appears to produce a grey / charcoal patina rather than matt black. It may have deepened further with longer immersion in the agent.
- The smaller pieces only took about a couple of minutes to get to this colour in a 10% solution, so be very careful if using stronger solutions.
- The larger the brass piece, the stronger the solution; but overall, it should remain well diluted.
- The agent gets blacker with use (residual powder suspended in the solution) but it retains its reactive power with repeated use.



Test 3.

The parts pictured left were dipped into 100% Birchwood Casey Super Blue. This product appears to produce consistently good results but is very fast acting so keep a close eye on the process; the pictured results are after a 3 minute dip. Note the heavy oxidation on the brass coupon (flat strip); this is flaking and produced a rough/pitted surface. For similar pieces, a diluted solution may work better. Dirk cleaned the pieces with steel wool then dipped them in a hydrochloric acid solution for cleaning. In Dirk's opinion: "Good black/ dark grey look. Rating 8-9 (out of 10)."

Test 4

Forum member **Seewolf** has updated us on his first efforts to blacken canons. He reports that initially, he let them stand in 30% vinegar for about 20 minutes and scrubbed them slightly with an electric toothbrush afterwards. He then rinsed them and immersed them for 15 minutes in Carr's Acid dip diluted 25% solution. He again rinsed the canon with neutralising rinse. The blackening itself was done by immersing the canons in 25% Carr's Brass Black solution for about 2 minutes.

Effect after first immersion

Result after second immersion

Before and after shots from Seewolf – note the areas behind the barrel that did not blacken on the first attempt. A thorough second cleaning with acetone and an electric toothbrush, and moving them while submerging them in the same blackening agent achieved the final finish (second photo).

Test 5

Dirk and fellow forum member **Buckaroo** have trialled the Crème products with mixed results. In Dirk's test, he cleaned the pieces with steel wool and brickies acid and applied the crème. The following photo shows the results of three "short duration" applications. Dirk noted that the

blackening effects were being removed rather than enhanced on his third attempt.

Buckaroo has reported much better results using the Birchwood Casey Perma Blue Crème but he left the crème on for a much longer duration (5 minutes for each application). The results will be included as we get more details.