## To Blacken Brass:

Dissolve copper carbonate in distilled water and then add 0.880 g/cm$^3$ ammonia, to the solution.

| Ingredient | Imperial | Metric |
|---|---|---|
| Copper Carbonate | 87.5 grains | 6 g |
| Ammonia 0.880 g/cm$^3$ | 0.5 fl. ounce | 15 ml |
| Distilled water | 1.5 fl. ounce | 45 ml |

Heat solution to 175ºF – 80º C and immerse brass for 30 seconds (or longer).

For a larger quantity of solution, use:

| Ingredient | Imperial | Metric |
|---|---|---|
| Copper Carbonate | 3.5 ounce | 100 g |
| Ammonia 0.880 g/cm$^3$ | 8.8 fl. ounce | 0.25 l |
| Distilled water | 26.4 fl. ounce | 0.75 l |

Or, for even larger quantity of solution, use:

| Ingredient | Imperial | Metric |
|---|---|---|
| Copper Carbonate | 1 lb | 500 g |
| Ammonia 0.880 g/cm$^3$ | 1 quart | 1.25 l |
| Distilled water | 3 quarts | 3.75 l |

The formula gives a beautiful black brass. It will not take on solder, if any soldered joints then rub soldered joint with stannic chloride using an iron wire brush. The joint will then be brass-plated and prepared for blackening.

**"Henley's Twentieth Century Book of Recipes, Formulas and Processes "**

**Black Colour on Brass** - A black or oxidized surface on brass is produced by a solution of carbonate of copper in ammonia. The work is immersed and allowed to remain until the required tint is observed. The carbonate of copper is best used in a plastic condition, as it is then much more easily dissolved. Plastic carbonate of copper may be mixed as follows: Make a solution of blue vitriol (sulphate of copper) in hot water, and add a strong solution of common washing soda to it as long as any precipitate forms. The precipitate is allowed to settle, and the clear liquid is poured off. Hot water is added, and the mass stirred and again allowed to settle. This operation is repeated six or eight times to remove the impurities. After the water has been removed during the last pouring, and nothing is left but an emulsion of the thick plastic carbonate in a small quantity of water, liquid ammonia is added until everything is dissolved and a clear, deep-blue liquid is produced. If too strong, water may be added, but a strong solution is better than a weak one. If it is desired to make the solution from commercial plastic carbonate of copper the following directions may be followed: Dissolve 1 pound of the plastic carbonate of copper in 2 gallons of strong ammonia. This gives the required strength of solution.

The brass which it is desired to blacken is first boiled in a strong potash solution to remove grease and oil, then well rinsed and dipped in the copper solution, which has previously been heated to from 150° to 175° F. This solution, if heated too hot, gives off all the ammonia.

The brass is left in the solution until the required tint is produced. The colour produced is uniform, black, and tenacious. The brass is rinsed and dried in sawdust. A great variety of effects may be produced by first finishing the brass before blackening, as the oxidizing process does not injure the texture of the metal. A satisfactory finish is produced by first rendering the surface of the brass matt, either by scratch-brush or similar methods, as the black finish thus produced by the copper solution is dead —one of the most pleasing effects of an oxidized surface. Various effects may also be produced by colouring the entire article and then buffing the exposed portions.

The best results in the use of this solution are obtained by the use of the so-called red metals—i. e., those in which the copper predominates. The reason for this is obvious. Ordinary sheet brass consists of about 2 parts of copper and 1 part of zinc, so that the large quantity of the latter somewhat hinders the production of a deep-black surface. Yellow brass is coloured black by the solution, but it is well to use some metal having a reddish tint, indicating the presence of a large amount of copper. The varieties of sheet brass known as gilding or bronze work well. Copper also gives excellent results. Where the best results are desired on yellow brass a very light electroplate of copper before the oxidizing works well and gives an excellent black. With the usual articles made of yellow brass this is rarely done, but the oxidation carried out directly.

**Black Finish for Brass.** A handsome black finish may be put on brass by the following process: Dissolve in 1,000 parts of ammonia water 45 parts of natural malachite, and in the solution put the object to be blackened, after first having carefully and thoroughly cleaned the same. After letting it stand a short time gradually warm the mixture, examining the article from time to time to ascertain if the colour is deep enough.
Rinse and let dry. The blacking of brass may be accomplished by immersing it in the following solution and then heating over a Bunsen burner or a spirit flame:
Add a saturated solution of ammonium carbonate to a saturated copper-sulphate solution, until the precipitate resulting in the beginning has almost entirely dissolved. The immersion and heating are repeated until the brass turns dark; then it is brushed and dipped in negative varnish or dull varnish.