



Product Bulletin

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BLACK MAGIC® CBL (CB LIQUID)

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BLACK OXIDE FINISH FOR COPPER AND COPPER ALLOYS

Black Magic® CB Liquid is used at a concentration of 45% by volume in water. The alkaline solution is used at a temperature of 200° to 210°F. to blacken a wide range of copper, copper-plated and copper-alloyed surfaces. Used in conjunction with HUBBARD-HALL's **Black Magic® BAL**, (Brass Activator Liquid), **Black Magic® CB Liquid** produces the ultimate black finish on high zinc-alloyed copper surfaces.

INSTRUCTIONS

SOLUTION MAKEUP

Rectangular Tank - solution level 6" from top.

$$\begin{array}{l} \text{Black Magic® CBL} \\ \text{In Gallons} \end{array} = \frac{\text{L" x W" x (D" - 6") (0.45)}}{231 \text{ cubic inches per gallon}}$$

Add **Black Magic® CB Liquid** to water. Do not add water to **Black Magic® CB Liquid** when making up solutions.

Heat is then applied to the solution and, as the temperature rises, it should be stirred frequently to ensure thorough mixing and a uniform temperature throughout. When the temperature reaches 200° to 210°F., the **Black Magic®** solution is ready for processing work. All that is required for continuous, high-quality, trouble-free operation are small periodic additions of water and concentrate to compensate for evaporation, drag out and solution depletion.

FINISHING PROCEDURE

Pieces to be blackened may be processed in baskets, tumbling barrels, hung on racks or hooks, depending upon the shape, the weight and production requirements.

1. Thoroughly clean and degrease pieces with HUBBARD-HALL's Mi-Clean™ 14, 16 or 31 hot (180°F.) alkaline soak cleaners or with HUBBARD-HALL's Mi-Clean™ 100, a heavy-duty, low temperature (65° to 160°F.) alkaline soak cleaner. A typical cleaning time is 5 to 10 minutes.
2. Rinse in bottom-fed, overflowing cold water rinse.
3. Immerse in a 25% to 50% by volume muriatic acid solution or in an 8 oz. to 2 lbs. per gallon solution of Hubbard-Halls's Acid Salt W at room temperature for 30 seconds to 2 minutes to remove surface oxidation.

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4. Rinse in bottom-fed, overflowing cold water rinse.
5. Immerse in **Black Magic® CB Liquid** solution (200° to 210°F.) until a uniform, deep black color is developed. Immersion time will usually be from 5 to 10 minutes for copper and copper-plated surfaces, and up to 20 minutes for high zinc alloyed copper surfaces.
6. Rinse in bottom-fed, overflowing cold water rinse.
7. Seal the finish by immersing for one minute or longer in HUBBARD-HALL's Metal Guard® 500 for an oily finish; Metal Guard 310® or Metal Guard® 450 for a soft, "dry-to-the-touch" finish; or Metal Guard 600® for a hard, dry finish.

NOTE:

To produce the ultimate black finish on high zinc alloy surfaces (15% to 35% zinc), HUBBARD-HALL's Black Magic® BAL must be used as a pre-dip prior to immersing in the **Black Magic® CB Liquid** solution. Thus, Step 5 would include:

1. A. Immerse in Black Magic® BAL. Used at a concentration of 16% by volume. The solution temperature is maintained at boiling (200°F.) with immersion times of one to 3 minutes.
B. Immerse, without an intervening rinse, in **Black Magic® CB Liquid** solution as described above.

OPERATING TIPS

Problems will rarely arise with a properly maintained and controlled Black Magic® solution. Most problems can be traced to insufficient surface preparation of the work or an incorrect operating temperature. Other tips would include:

1. A glass thermometer should be kept on hand to accurately check the temperature of the bath.
2. Frequent small additions of concentrate will produce more uniform results than large amounts added less frequently. This is also true for water replenishment to compensate for evaporation loss. The strength of the solution and the amount of replenishment salts to be added can be determined by titrating with sodium thiosulfate as outlined in Chemical Control for **Black Magic® CB Liquid**.
3. Ideally, the temperature of the solution should not drop below the recommended operating range of 200° to 210°F. when work is introduced. Sufficient heat should be maintained to ensure that the solution does not drop below this temperature range for more than a few minutes, even with the heaviest loads. Maximum loads should not exceed one pound of work per one-half gallon of solution. Optimum loads would be approximately one pound of work to one gallon of solution, including the weight of barrels, baskets and racks.
4. A thorough final rinse after blackening will minimize contamination of the sealant solutions.

EQUIPMENT

The Black Magic® tanks may be constructed of mild steel or stainless steel. The cleaning and rinse tanks may also be constructed of mild steel. Acid pickling tanks should be plastic, rubber-lined or rigid polypropylene. Heated tanks should be insulated.

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Gas-heating units are preferred and should be under fired. Electric immersion units may be constructed of mild steel. Tanks to be heated should be insulated. Racks, hoods and baskets may be constructed of mild steel. Non-ferrous metal such as galvanized iron, bronze, copper, tin or aluminum should not be used for racks or baskets as these materials will contaminate or deplete the Black Magic® solutions.

Hot alkaline cleaning, acid pickling and the Black Magic® solutions should be exhausted. The duct work may be of the same material as recommended above for the tanks. Galvanized steel should not be used. Your Hubbard-Hall representative is readily available to assist you in selecting and installing the proper controls as well as the complete tank system required for the process.

CAUTION

THIS MATERIAL CONTAINS CAUSTIC SODA. CAUSES SEVERE BURNS.

This material contains sodium chlorite, a strong oxidizer. Avoid contact with organic materials.

Do not get in eyes, skin or on clothing. Avoid breathing dusts or mists. Do not take internally. When handling, wear goggles and face shield.

While making solutions or additions, add concentrate slowly to surface of solution to avoid violent reaction and spattering.

In case of contact, immediately flush skin or eyes with plenty of water for at least 15 minutes. For eyes, call a physician. Do not mix this product with any other material. Avoid contact with acidic materials and solutions.

Read and understand OSHA Safety Data Sheet prior to handling or working with this product.

WARRANTY

THE QUALITY OF THIS PRODUCT IS GUARANTEED ON SHIPMENT FROM OUR PLANT. IF THE USE RECOMMENDATIONS ARE FOLLOWED, DESIRED RESULTS WILL BE OBTAINED. SINCE THE USE OF OUR PRODUCTS IS BEYOND OUR CONTROL, NO GUARANTEE EXPRESSED OR IMPLIED IS MADE AS TO THE EFFECTS OF SUCH USE, OR THE RESULTS TO BE OBTAINED.