



Better Chemistry. **Better Business.**

**Black-Magic™ SS-C**

Product Code: 2232004  
Revised Date: 01/11/2013

### **Black-Magic™ SS-C**

#### **DESCRIPTION**

Used in the hot black oxide process for stainless steel and cast iron, **Black-Magic™ SS-C** oxidizing salts are a free-flowing, dust-free granular composition designed to blacken cast and malleable iron as well as steel.

#### **FEATURES AND BENEFITS**

- Powder concentrate used at 4.75 lbs per gal in water
- Chromium Free
- Temperature 255 to 265 F
- Military Spec MIL C 13924
- Wear-in Break-in function
- RoHS and REACH Compliant
- No build up on threaded parts

#### **TYPICAL APPLICATIONS**

- Sporting Arms Gun Bluing
- Black Body heat absorption
- Optics, non-reflective
- Automotive
- Fasteners



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**Black-Magic™ SS-C** oxidizing salts are a free-flowing, dust-free granular composition used in water at a concentration of 4-3/4 lbs. per gallon of solution. The alkaline solution is used at a low boiling temperature of 250-260°F., to blacken cast and malleable iron as well as steel. For a superior quality finish on carbon steel, Hubbard-Hall's "Activated" Black-Magic™ "Plus" is recommended.

## SOLUTION MAKEUP

Rectangular Tank - Solution level 6" from top

$$\begin{aligned} \text{Black-Magic™ SS-C Lbs. salt} \\ \text{required for initial solution} &= \frac{L" \times W" \times (D"-6") \times 4-3/4 \text{ lbs. per gallon}}{231 \text{ cubic inches per gallon}} \end{aligned}$$

Compute the amount of salts required by using the above equation. Fill the tank a little less than half full with **cold** water. Do not apply heat at this time. Start adding the salts to the water with continuous stirring to avoid the formation of lumps. When the required amount of Black-Magic™ salts has been added, continue to stir and fill the tank with water to within 6" from the top.

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 250-260°F, the solution should begin to boil. If it does not, keep stirring, water should be slowly added until it begins to simmer. If the solution boils before reaching 250°F., additional Black-Magic™ salts must be added and stirred into the solution. Black-Magic™ is used as a super-saturated solution, and it should be allowed to boil for at least one hour before additional salt is added to ensure that the true boiling point has been reached with all of the salts thoroughly dissolved.

When the Black-Magic™ solution is boiling in the range of 250-260°F, it is ready for processing work. Although the temperature of the solution can be maintained by manually adding water, an automatic indicating temperature controller should be used. The only reason for the boiling point to rise is due to the evaporation of water. The automatic temperature controller will replenish this water as needed to maintain the correct boiling point and concentration set valve to add water slowly. It will also protect against the undesirable and detrimental overheating of the solution.

An automatic controller also relieves the operator of the responsibility for maintaining the temperature; and it ensures consistent, uniform, high-quality finishes.



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### **FINISHING PROCEDURE**

1. Thoroughly clean and degrease pieces with Hubbard-Hall Mi-Clean™ 14 hot (180°F.) alkaline soak cleaners, or with Mi-Clean™ 100, a heavy-duty low temperature (65-160°F.) alkaline soak cleaner. Liquid cleaner Aquaease SL 689 10%, 160F. A typical cleaning time is 5 to 10 minutes.
2. Rinse in bottom-fed, overflowing cold water rinse.
3. Activate the stainless steel surface with a 2 to 5 minute immersion in a 50% by volume Muriatic Acid solution, used at room temperature.
4. Rinse in bottom-fed, overflowing cold water rinse.
5. Immerse in Black-Magic™ solution (boiling at 250-260°F.) until a uniform, deep black color is developed. Immersion time usually will be from 2 to 30 minutes, depending upon the mass of parts and the type and condition of the stainless steel. 5 minutes is optimum
6. Rinse in bottom-fed, overflowing cold water rinse.
7. Seal the finish by immersing for one minute in Hubbard-Hall Metal Guard® 510 for an oily finish; Metal Guard® 310 or Metal Guard® 450 for a soft, "dry-to-touch" finish; or Metal Guard® 600 for a hard, dry acrylic finish; Metal Guard 700 for water based inhibitor.

### **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 boiling temperature. Other tips would include:

1. A glass thermometer should be kept on hand to check the accuracy of the automatic temperature controller.
2. Frequent small additions of replenishment salts will produce more uniform results than large amounts added less frequently.
3. Ideally, the temperature of the solution should not drop below boiling when work is introduced. Sufficient heat should be maintained to ensure that the solution does not drop below the boiling point for more than a few minutes, even with the heaviest loads.



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Maximum loads should not exceed 1 lb. of work per gallon of solution. Optimum loads would be approximately 1 lb. of work to two gallons of solution, including the weight of barrels, baskets and racks.

4. Transfer time from the Black-Magic™ bath to the rinse water should be as short as possible to avoid the development of an off-color on the metal surface.

### EQUIPMENT

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

Gas-heating units are preferred and should be under fired and insulated. Electric immersion units should be constructed of mild steel and also be insulated. Racks, hooks and baskets must be constructed of mild steel. Non-ferrous metals such as galvanized iron, bronze, copper, tin or aluminum should not be used for racks or baskets, as these materials will contaminate the Black-Magic™ solution.

Hot alkaline cleaning, acid pickling and the Black-Magic™ solutions should be exhausted. The duct work may be of the same materials 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.**

Do not get in eyes, on skin or clothing. Avoid breathing dusts or mists. Do not take internally. When handling, wear goggles or face shield. **While making solutions, add 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.

### 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.



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