



Better Chemistry. Better Business.

**Black-Magic™ SS L**

**Product Code: 2231003**  
**Revised Date: 01/11/2013**

### **Black-Magic™ SS L**

#### **DESCRIPTION**

**Black-Magic™SS L** is a hot black oxide process for stainless steel. An easy to use liquid formulation, Black-Magic™ SS L is a highly concentrated solution of Hubbard-Hall's Black-Magic™ SS oxidizing salt formulation. This patented formulation containing a unique blend of activators, rectifiers, catalysts, penetrants and wetters, is the standard against which all other black oxide processes are compared for performance and quality.

**Black-Magic™SS L** is recommended for black oxide installations where it is desired to automate the replenishment additions of the blackening salt solution through a pump and liquid level control system. It is also ideal for the initial charging of black oxide baths, which will be replenished with our conventional, dust-free Black-Magic™ salts.

#### **FEATURES AND BENEFITS**

- Easy additions with Liquid Product
- Economical dark black appearance
- Temperature 255 to 265 F
- Military Spec MIL C 13924,
- Wear-in Break-in function
- No dimensional change
- No build up on threads

#### **TYPICAL APPLICATIONS**

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



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### **INSTRUCTIONS**

The **Black-Magic™ SS L** solution is operated at a boiling temperature of 255-260°F., to blacken a wide range of stainless steel.

### **BATH MAKEUP**

A new bath is started by filling the tank with **Black-Magic™ SS L** solution, as received, to within six inches from the top. Heat is applied and the solution is brought to a gentle rolling boil at approximately 255-260°F. **Black-Magic™ SS L** is used as a supersaturated solution and it should be allowed to boil for awhile to evaporate some water and reach a boiling temperature of 255°F. Thereafter, the solution must be maintained at 255°F to 260°F, for blackening steel. Maintain the proper working level in the tank by the addition of **Black-Magic™ SS L** solution preferably by means of a metering pump directly from the shipping container. **If Black-Magic™ SS L** solution is added manually, care should be taken to avoid too rapid an addition, which could lead to splattering or an eruption on the surface. Allow the **Black-Magic™ SS L** solution to slowly run down along a corner of the tank. If the temperature of the solution climbs above 260°F, water must be added to replenish evaporated water and reduce the temperature. Extreme care must be taken when adding water at high temperatures to avoid splattering and eruptions. In order to safely add water and control the boiling point of the solution, water should be introduced by a water feed pipe, hung across the backside of the tank, near the top, with 1/8" or 3/16" holes, drilled 2" apart which directs incoming water against the tank wall, allowing water to uniformly cascade down the tank wall into the black oxide solution.

**DO NOT INTRODUCE WATER BELOW THE SURFACE OF THE SOLUTION.** We recommend that an automatic indicating temperature controller and motor operated water inlet valve be used to safely control the additions of water. The automatic controller will replenish evaporated water as needed to maintain the correct boiling temperature and concentration. It will also protect against the undesirable and detrimental overheating of the solution. Automating the water additions will relieve the operator of the responsibility for maintaining the temperature and ensures consistent, uniform, high-quality black finishes. Hubbard-Hall can supply the automated temperature controller and water inlet valve with the preferred drilled piping to introduce the water along the rear wall of the tank above the solution level. Consult us for advice prior to installing a water inlet to a tank.



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### **FINISHING PROCEDURE**

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

1. Thoroughly clean and degrease pieces with Hubbard-Hall's Mi-Clean 14 or 31 hot (180°F) alkaline soak cleaners or with Mi-Clean 100, a heavy-duty low temperature (70-160°F.) alkaline soak cleaner. A typical cleaning time is five to ten minutes.
2. Rinse in bottom-fed, overflowing cold water rinse.
3. Activate parts in 50% by volume muriatic acid for 2 to 5 minutes at 75-80°F.
4. Rinse in bottom-fed, overflowing cold water rinse.
5. Immerse in **Black-Magic™ SS L** solution (boiling at 255-260°F) until a uniform, deep black color is developed. Immersion time will be from 2 to 30 minutes, depending upon the mass of parts and type of steel alloy and condition of the surface. Most parts run best at 5 minute dwell.
6. Rinse in bottom-fed, overflowing cold water rinse.
7. Seal the finish by immersing for one minute in Hubbard-Hall's Metal Guard® 510 for an oil finish; Metal Guard 310 for a soft, dry film; or Metal Guard 600 for a hard, dry Acrylic film; Metal Guard 700 water based inhibitor

### **OPERATING TIPS**

Problems will rarely arise with a properly maintained and controlled Black-Magic™ SS L solution. Its unique rectification eliminates the necessity for frequent sludge cleanout as is required with conventional formulations. Most problems can be traced to insufficient cleaning of the work or an incorrect boiling temperature. Other tips would include:

1. A glass mercury thermometer should be kept on hand to check the accuracy of the automatic temperature controller.
2. Frequent small additions of replenishment solution will produce more uniform results than large amounts added less frequently.



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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. Maximum loads should not exceed one pound per gallon of solution. Optimum loads would be approximately one pound of work to two gallons of solution, including the weight of barrels, baskets and racks.
4. Operating the bath at temperatures approaching 265°F or over will kill the Black-Magic™ solution.
5. The bath should be periodically dislodged to remove accumulation of sodium carbonate.
6. Transfer time from the **Black-Magic™ SS L** bath to the rinse water should be as short as possible to avoid the development of an off-color on the metal surface.
7. A thorough final rinse after blackening will minimize contamination of the sealant solution.

### EQUIPMENT

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

Gas-heated tanks are preferred and should be under fired and insulated. Immersion electric 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™ SS L** solution. Aluminum reacts violently with the hot solution.

Your Hubbard-Hall representative will be pleased to assist you in selecting and installing the proper controls as well as the complete tank system required for the process.

Hot alkaline cleaning, acid pickling and the Black-Magic™ Liquid solutions must be exhausted. The duct work may be of the same materials as recommended above for the tanks. Galvanized steel should not be used.

Notice: Before using this material, read and understand Material Safety Data Sheet for this product and specific instructions and precautions should be followed to assure correct use and personal safety.



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**CAUTION...THIS MATERIAL CONTAINS CAUSTIC SODA. CAUSES SEVERE BURNS.**

### **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.