



Black-Magic[®] RT A3

Black-Magic RT A3 is a room temperature solution for blackening Aluminum.

Features & Benefits

Wide range of aluminum	Blackens die cast, sand cast, and wrought alloys
Heat absorption	Black body applications
Non-reflective	Optics applications

Operating Conditions

Solution Make Up

Black-Magic RT A3 liquid concentrate is diluted to 25% by volume with water by slowly adding it to the water, while stirring, to avoid splattering and splashing. The diluted solution is used at a temperature of 60°F to 80°F, with immersion times of 30 seconds to 2 minutes. The bath temperature should not be allowed to go above 85°F, as etching of the aluminum surface may occur.

Equipment

Plastic tanks, tumbling barrels, racks, hooks or baskets should be used with the Black-Magic RT A3 solution. Tanks for cleaners and deoxidizers should be as specified on the appropriate instruction sheets.

The Black-Magic RT A3 tank should have a removable perforated catch-basket that covers the bottom of the tank to retrieve parts that may fall from racks or baskets. Parts that do fall from racks or baskets should be retrieved as soon as possible, otherwise etching of the part will occur. If aluminum parts can accumulate on the bottom of the tank, dissolution of the parts will occur, and the solution will be depleted.

Surface Preparation

Extrusions & Wrought Alloys

1. Thoroughly clean and mildly etch parts in an appropriate Hubbard-Hall cleaner.
2. Bottom-fed, overflowing cold water rinse.
3. Deoxidize for 5 minutes in a 40% by volume nitric acid solution for 1 to 5 minutes.
4. Bottom-fed, overflowing cold water rinse.



Die Cast, Sand Cast, and Small Machined Parts (i.e., grommets, screws, etc.)

1. Thoroughly clean parts in an appropriate Hubbard-Hall cleaner.
2. Bottom-fed, overflowing cold water rinse.

Blackening

1. Immerse parts, while still wet from preceding rinse, in the 25% by volume Black-Magic RT A3 solution for the length of time necessary to produce a uniform black finish (usually within 30 seconds to 2 minutes depending upon the alloy). Rotating perforated barrels are recommended for processing small parts. If dip baskets are used, the parts should be agitated when first introduced into the solution to break air bubbles and to assure solution contact with all surfaces.

2. Bottom-fed, overflowing cold water rinse.

3. Seal the finish and enhance the depth of black with the appropriate Hubbard-Hall Metal Guard sealer to provide the desired finish and / or corrosion protection. a hard, dry finish.

Note: Prolonged immersion times in the Black-Magic RT A3 will result in a rough non-adherent finish and may also cause excessive etching of the part.

Solution Replenishment and Maintenance

The solution is gradually depleted with use but may be replenished indefinitely with periodic additions of Black-Magic RT A3 concentrate. The strength of the bath and the amount of concentrate to be added can be determined by a simple titration control procedure listed below.

The frequency of additions will depend upon the volume of work processed. For optimum results the solution should be maintained at 85% of its original strength or greater and frequent small additions are recommended.

Test Kit Method

1. Using the 5 mL syringe, accurately measure 5 mL of Black-Magic RT A3 working solution and transfer into the glass mixing bottle.
2. Dilute with water to the 10 mL mark.
3. Using the 10 mL syringe, accurately measure 10 mL of 6 N Hydrochloric Acid and transfer to the mixing bottle.
4. Add 5 to 10 drops of Methyl Orange indicator.
5. Add drop wise, counting the drops, the 0.09133 N Potassium Bromate solution until the solution in the flask turns from reddish orange to clear yellow.
6. Record the number of drops used.

Calculation

$$\text{Concentration} = \# \text{ Drops } 0.09133 \text{ N KBrO}_3 \times 1.08$$



Example: 23 Drops x 1.08 = 25% by volume Black-Magic RT A3

Caution

The Black-Magic RT A3 solution is highly alkaline. Avoid contact with eyes, skin and clothing. Wear eye shields, protective gloves and apron when mixing the solution or while working with the solution.

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For more information on this process,
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