

# Mi-Tique® 1793

Room temperature blackening and metal antiquing solution for sterling silver, nickel- and silver-plated surfaces, and copper alloys. Blackens silver and nickel. Oxidizes brass, bronze, copper, and Munz for a color range of light brown to deep brownish blacks without red tones.

## Features & Benefits

Molybdenum free black for brass and bronze	Reduction of hazardous chemicals
Uniform deposition coating	Easily relieved to get varying levels of worn antique appearance
US 10 B, finish	Matching of hardware finishes

## Operating Conditions

The Mi-Tique 1793 liquid concentrate is diluted with water and used as an immersion "oxidizing" solution. The color developed and the reaction rate with the various metal surfaces is controlled by varying the concentration and the length of immersion. Prior to charging a production tank, some experimentation should be done with properly prepared sample parts to determine the conditions required to produce the desired finish.

### Equipment

Acid resistant tanks, tumbling barrels, baskets, and racks must be used with the Mi-Tique solutions. Plastic, plastic lined, rubber lined, glass or stoneware is suitable. Mild steel may also be used for the cleaning, rinsing and sealant tanks.

### Blackening Silver Surfaces

1. Clean, if necessary, with the appropriate Hubbard-Hall's Aquaease cleaner. Mechanically engraved surfaces do not have to be clean, if they are blackened immediately after engraving.
2. Rinse thoroughly with cold water to remove residual cleaning or chemical etching solutions.
3. Dilute one (1) part Mi-Tique concentrate with 1 to 3 parts water and determine by test the shortest immersion time required to produce the desired depth of black. The immersion time is controlled by varying the amount of water.
4. Rinse with hot or cold water and force dry.

5. A variety of attractive antiqued or "highlighted" finishes are produced by buffing, scratch brushing, barrel or vibratory burnishing.
6. Apply a topcoat of a wax or clear acrylic lacquer to enhance the depth of black.

#### Blackening Nickel Plating

1. Freshly plated nickel surfaces should be kept wet with rinse water to avoid the surface becoming too passive to react with the Mi-Tique solution. The reactivity will depend upon the level and type of brighteners used in the nickel plating and it may be necessary to activate the surface with an acidic or reverse current nickel activator.
2. Rinse thoroughly with cold water to remove residual activator solution.
3. Dilute one-part Mi-Tique concentrate with 3 to 9 parts water and determine by test the shortest immersion time required to produce the desired depth of black. Varying the amount of water will shorten or lengthen the immersion time. Interference colors of varying intensity and color from gold to purple will be developed on the surface prior to the desired black. Immersing parts longer than necessary will cause the black finish to fade out.
4. Rinse with hot or cold water and force dry.
5. Apply a topcoat of a wax or clear acrylic lacquer to enhance the depth of black.

#### Finishing Brass, Bronze, Copper, and Muntz Metals - Surface Preparation

##### Plated Surface

1. Minimum plate thickness should be 3 to 4 mL.
2. Rinse thoroughly in cold water.
3. Rinse for 15 to 30 seconds in dilute solution of the appropriate Hubbard-Hall's acid salt to neutralize residual alkaline plating solution, which could contaminate the Mi-Tique solution.
4. Rinse thoroughly in cold water.

##### Wrought Alloys and Sheet Stock

1. Thoroughly clean and deoxidize with the appropriate Hubbard-Hall's Aquaease cleaner followed with the appropriate Hubbard-Hall's acid salt, or burnish, belt sand, glass bead or sandblast the surface.
2. Rinse thoroughly with cold water to remove residual cleaning solutions or blasting dust.

#### "Oxidizing", Relieving, and Sealing

1. Immerse pieces, while still wet from preceding rinse, in the Mi-Tique solution for the length of time necessary to produce the desired color. The darker brown shades are obtained with dilutions of 3 to 6 parts water and 2 to 3 minute immersions. Dilutions of 8 or more parts water and 1 to 2 minute immersions produce light brown shades. Rotating perforated barrels is 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. Rinse thoroughly with water. If a hot water rinse is used to accelerate drying, it should be preceded with a short dip in cold water to minimize staining.
3. Force dry in heated spin drier, oven, or cob meal. Large architectural panels should be wiped dry or blown dry with compressed air. Small parts do not have to be dried if they are to be barrel or vibratory burnished immediately after rinsing.
4. A variety of attractive antiqued or "highlighted" finishes are produced by buffing, scratch brushing, barrel, or vibratory burnishing.
5. A protective topcoat should be applied to enhance the color and give added corrosion and abrasion resistance. The appropriate Hubbard-Hall's Metal Guard should be applied to obtain the desired finish.

### Solution Replenishment and Maintenance

The solution is gradually depleted through use but may be replenished indefinitely with periodic additions of Mi-Tique concentrate. The strength of the solution and the amount of concentrate to be added can be determined by titrating with sodium thiosulfate as outlined in Chemical Control Procedures, or the strength can be maintained by recording the time of immersion. When the time required to produce the desired color increases, add enough concentrate to reduce the time to your established standard.

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.

With automatic lines, a bath history should be established immediately after charging the tank by keeping a record of the number of loads processed versus the titrated strength to determine the point at which the bath is depleted approximately 10% to 15% and replenishment is necessary. Timed metering pumps, triggered by the load, are recommended for maintaining a consistent strength.

The life of the solution and the coverage will be increased by continuous circulation and filtration. An alternative is to allow the solid by-products of the reaction to settle to the bottom of the tank and transfer the solution to a clean, plastic lined drum to be retained for recharging after the tank is cleaned.

## Titration Method

A sample of a freshly prepared production bath should always be taken as a control solution prior to running any parts through the bath. If a sample was not taken, a laboratory prepared solution at the same concentration may be used as the control solution.

Equipment required

- 25 mL pipette
- 50 mL burette
- Burette Stand
- Ring Stand
- 250 mL Erlenmeyer Flask

Chemicals required

- 6 N Hydrochloric Acid
- 15 %w/w Potassium Iodide
- 0.1 N Sodium Thiosulfate
- 2 %w/w Soluble Starch Solution

1. Pipette 25 mL of production bath into a 250 mL Erlenmeyer flask.
2. Add 75 mL water to flask.
3. Add 10 mL 6 N Hydrochloric Acid to flask.
4. Add 20 mL 15 %w/w Potassium Iodide to flask.
5. Swirl the solution once, stopper or aluminum foil stopper, and store in the dark for 10 minutes.
6. Add 10 mL starch solution to give a dark blue green almost black color.
7. Titrate with 0.1 N Sodium Thiosulfate solution until the dark black color changes to a light brown. Please note: Upon standing, the light brown color will turn dark again, but additional Sodium Thiosulfate should not be added. The first endpoint is correct.
8. Record mL used.

Calculation

$$\text{Concentration} = \text{mL } 0.1 \text{ N Na}_2\text{S}_2\text{O}_3 \times 0.6268$$

**Test Kit Method**

Equipment required

- 4 oz mixing bottle
- 2 syringes (5 mL)
- 2 syringes (3 mL)

Chemicals required

- 2 oz 0.5 N Sodium Thiosulfate
- 4 oz 6 N Hydrochloric Acid
- 8 oz Potassium Iodide 15 %wt./wt.
- 4 oz 2 % Starch Indicator

1. Transfer a 5 mL sample of the production bath into the 125 mL Erlenmeyer Flask.
2. Dilute with water to the 50 mL mark.
3. Add 2 mL 6 N (1:1) Hydrochloric Acid to the flask.
4. Add 4 mL of the 15% by weight Potassium Iodide solution.
5. Add 2 mL of starch solution. The solution will become a dark blue to almost black color.
6. Add the 0.5 N Sodium Thiosulfate solution, from the dropping bottle -drop by drop- counting the drops while swirling the flask. The end point is marked by a sudden change in color from dark black to light brown.
8. Record the number of drops used.

Calculation

$$\text{Concentration} = \# \text{ Drops } 0.5 \text{ N Na}_2\text{S}_2\text{O}_3 \times 0.625$$



## Caution

The Mi-Tique solution is mildly acidic. Avoid contact with eyes, skin and clothing. Wear eye shields, protective gloves and aprons. The solution is toxic if taken internally. Read and understand OSHA Safety Data Sheet and drum warning labels prior to working with or handling this product.

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For more information on this process,

please call us at 203.756.5521 or email: [techservice@hubbardhall.com](mailto:techservice@hubbardhall.com)

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