

## Insta-Blak® Z-360

### Room Temperature Blackening Solution for Zinc and Cadmium

**Insta-Blak Z-360** liquid concentrate is diluted with water and used at room temperature as a blackening solution for plated zinc and cadmium, zinc diecast and galvanized surfaces. It is especially effective on mechanically plated zinc and cadmium surfaces.

#### EQUIPMENT REQUIRED

Acid resistant tanks, tumbling barrels, baskets, hooks and racks must be used with the **Insta-Blak Z-360** and the **E-Kleen 154** and other acid solutions used in the process. Polypropylene, polyethylene or PVC dipping baskets, polypropylene rotating barrels, plastic lined or rubber lined steel tanks and plastic coated hooks and racks are suitable. Mild steel may be used for the alkaline cleaning solutions, water rinses, and **E-Tec** sealants used in the process.

#### SOLUTION MAKE UP

**Insta-Blak Z-360** is used at a concentration of 10% by volume in water (one part **Insta-Blak Z-360** concentrate to nine parts water) at room temperature.

#### FINISHING PROCEDURE

Surfaces to be blackened must be thoroughly cleaned and deoxidized before blackening to ensure a uniform and adherent black finish. Plated surfaces must be free of chromate conversion finishes which can be removed with one of **EPI's E-Kleen** brand of alkaline soak cleaners or the acidic **E-Kleen 154**.

The blackening process will consist of either five (5) or seven (7) steps depending upon the condition of the metal surfaces and the necessity for deoxidizing and activating steps.

- CLEAN:** Aged surfaces may be cleaned without etching in a solution of **E-Kleen 146** or cleaned and etched in one step using **E-Kleen 111**. Both cleaners are used at 6 to 8 wt. oz. per gallon of water at 160°F to 180°F and with a minimum immersion time of 5 minutes. Freshly electro or mechanically plated surfaces usually require only a short one minute

immersion in an **E-Kleen 154** solution to activate the surface which will reduce the required immersion time in the **Z-360** solution.

2. **RINSE:** Using a bottom-fed, overflowing cold water rinse.
3. **ACTIVATION:** Optional deoxidization/activation at room temperature in a 10% by volume solution of **E-Kleen 154**, 10% by volume Acetic Acid or 10% by volume Sulfuric Acid solution. Prior to charging a production tank, some experimentation should be performed with sample parts to determine if activation is required and if so, which method produces the most uniform and adherent black finish.
4. **RINSE:** Using a bottom-fed, overflowing cold water rinse.
5. **BLACKEN:** Immerse parts in **Insta-Blak Z-360** solution until a uniform black finish is developed, usually within 2 to 5 minutes.
6. **RINSE:** Using a bottom-fed, overflowing cold water rinse.
7. **SEAL:** To displace the rinse water, enhance the depth of black, impart corrosion resistance and seal the finish, immerse parts in **EPI's** water emulsifiable **E-Tec 510** diluted at 5% in water for a relatively dry finish or 10 to 20% for a light oily finish or the solvent based water displacing **E-Tec 501** for an oily finish, **E-Tec 504** for a soft "dry to the touch" finish, water based **E-Tec 522** for a waxy finish, or **E-Tec 520** for a hard, clear acrylic finish. For architectural finishes use **E-Tec 520**, **E-Tec 521** and **RENWAX**. The ultimate depth of black will not develop until a sealant is completely absorbed into the **Insta-Blak Z-360** surface and may not develop for several hours.

Baskets and barrels used to contain parts should not be immersed in the **E-Tec** solutions. The parts should be unloaded through an unload chute into perforated catch baskets or trays submerged in the **E-Tec** solution. This is done to eliminate the necessity of cleaning the baskets and/or barrels after each load and also to eliminate the contamination of the other solutions in the process with run-off of the **E-Tec** solution while transporting the baskets/barrels over the tanks to the start of the line.

If dip baskets or racks are used, the parts should be agitated when first introduced into each solution and water rinse to break air bubbles and to assure uniform solution contact with all surfaces. When processing parts in a dip basket, agitate or shake parts several times during the immersion to avoid nesting of the parts and the possibility of a non-uniform finish.

### **SOLUTION MAINTENANCE**

The **Insta-Blak Z-360** solution is gradually depleted through use, but may be replenished indefinitely with periodic additions of **Insta-Blak Z-360** concentrate. The frequency of additions depends on the amount of work processed. It is recommended that the working solution be kept at 70% of its full strength at all times. Frequent small additions of **Insta-Blak Z-360** concentrate are recommended. The strength of the solution and the amount of concentrate to be added can be determined by titrating the solution with a burette titration procedure or simple dropping bottle method.

A sample of a freshly prepared production bath should always be taken. A laboratory prepared 10% by volume solution may be used as a control solution.

### **DROPPING BOTTLE CONTROL**

1. Transfer 20 ml of the **Insta-Blak Z-360** working solution to a 250 ml beaker by means of a graduated cylinder. Add 10-20 ml of clean water to the graduated cylinder and add to the beaker.
2. Add 4 ml of 2% by weight Sodium Bicarbonate solution to the beaker.
3. Add 1-2 ml of Starch Indicator solution to the beaker.
4. Slowly add 0.25N Iodine solution to the beaker drop-wise by means of a dropping bottle. Count the number of drops needed to produce a permanent blue-black color end point that lasts 30 seconds. Color change is from pale green to dark blue-black.
5. **% concentration Z-360** = drops of 0.25N Iodine solution x 0.371.

A test kit for the above procedure is available from **EPI**.

### **BURETTE TITRATION CONTROL**

#### **Equipment Required**

250 ml Erlenmeyer flask  
100 ml Graduated cylinder  
25 ml Graduated cylinder  
25 ml Burette  
Burette clamp and stand

#### **Chemicals Required**

2% Sodium Bicarbonate  
.2% Soluble Starch Solution  
0.05N Iodine Solution

1. Measure 100 ml of the **Z-360** control solution into a 250 ml Erlenmeyer flask.
2. Add 20 ml of 2% Sodium Bicarbonate Solution.
3. Add 10 ml of Starch Indicator solution.
4. Titrate with 0.05N Iodine solution to a dark blue endpoint that lasts 30 seconds or longer.
5. Calculate the amount of **Z-360** concentrate to be added as follows:

$$C_2 = \frac{T_c - T_b}{T_c} \times C_1$$

Where

**C<sub>2</sub>** = **Insta-Blak Z-360** (gallons of concentrate to be added to working solution).

**T<sub>b</sub>** = Milliliters Iodine to titrate bath samples.

**T<sub>c</sub>** = Milliliters Iodine to titrate control solution.

**C<sub>1</sub>** = Volume of concentrate in gallons used to make up the original "new" bath.

## **CAUTION**

The **Insta-Blak** solution is mildly acidic. Avoid contact with eyes, skin and clothing. Wear eye protection (glasses or face shield), protective gloves and rubber apron when mixing solutions and while working with the solutions. Avoid contact of the **Insta-Blak** solutions with cyanide and alkaline materials. Do not mix **Insta-Blak Z-360** with any other chemicals or solutions. Do not work with **Insta-Blak** solutions without first reading and understanding the **Material Safety Data Sheet** furnished by **EPI**.

## **PACKAGING**

One (1), 5 and 55 gallon non-returnable containers.

## **IMPORTANT NOTICE! For Industrial Use Only**

The following is made in lieu of all warranties, expressed or implied, including the implied warranties of merchantability and fitness for purpose: seller's and manufacturer's only obligation shall be to replace such quantity of the product as proved to be defective. Before using, user shall determine the suitability of the product for its intended use, and user assumes all risk and liability whatsoever in connection therewith. **Neither seller nor manufacturer shall be liable either in tort or in contract for any loss or damage, direct, incidental or consequential, arising out of the use or the inability to use the product.**

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