



Electrochemical Products Inc.

# **InstaBlak<sup>®</sup>**

**The No. 1 Room  
Temperature  
Blackening For  
Ferrous Metals**



# What Is **InstaBlak**<sup>®</sup>

## The Modern Low Cost Successor To Hot Black Oxidizing

It is a mild chemical solution used at room temperature to blacken all types of iron and steel surfaces and powdered metals by immersing the parts in the **InstaBlak**<sup>®</sup> solution for two minutes.

## Why Blacken?

**Corrosion Protection**—Adds years of service life to parts and extends the shelf life of stored parts.

**Durable**—The black chemical conversion finish does not chip, craze or peel.

**Anti-Galling**—When it is necessary to break-in mating parts, the anti-galling surface sacrifices the lubricating layer of black during initial contact and abrasion while a work-hardened surface is formed.

**Lubricity**—Oil-based, post treatments not only provide protection against corrosion, but provide for smoother running of mating parts.

**Dimensional Stability**—Blackening process produces essentially no dimensional change with only 5 to 10 millionths of an inch added to dimension, which means the blackened parts retain their surface properties with polished

surfaces retaining their gloss and heat-treated parts retaining their Rockwell hardness. Tool integrity is preserved and critically sized parts can be finished.

**Esthetic Appeal**—Produces a pleasing, decorative black finish which enhances the perceived quality of the part, which improves the salability of the part.

**Reduce Glare**—For lessened eye fatigue.

**Productivity and Economy**—A much faster process which saves time and money versus painting or plating processes. A cost-effective means of providing corrosion protection to iron and steel parts.



## Why InstaBlak?

**Convenient**—Easy to do in house. No waiting for heatup of blackening solution. No waiting for the unpredictable return of parts from an outside vendor. Eliminates high outside vendor costs. Retain control of production and quality. Ideal for high volume or short runs. Works especially well for blackening large volume of small parts in a rotating barrel.

**Higher Productivity**—Parts can be blackened in two minutes vs 15 to 30 minutes for hot oxide. Normally twice the amount of parts can be blackened in the same amount of time as with hot oxide. Reduces two shifts to one. Easily automated.

**Controllable**—Long bath life, blackening solution may be replenished indefinitely with periodic additions of fresh concentrate.

**InstaBlak** is so easy to install and use that you can now economically apply a pleasing decorative, sales-appealing black corrosion-resistant finish on parts previously left unfinished.

**Versatility**—Blackens cast iron, forged steels, mild steels, hardened tool steels and powdered metal parts. No white salt bleedout as is common with hot oxide.

**Dimensional Control**—No heat distortion. No smutty rub-off as with other room-temperature blackening processes.

**Energy Cost Saving**—Blackening is done at room temperature vs hot oxide blackening done at 290°F.

**Safety**—Blackening solution uses odorless, mild water-dilutable chemicals that require no venting vs hot oxide. No hazardous caustic chemicals with fumes that present health hazards and no spattering of hot, skin-burning chemicals when making additions to the blackening solution.

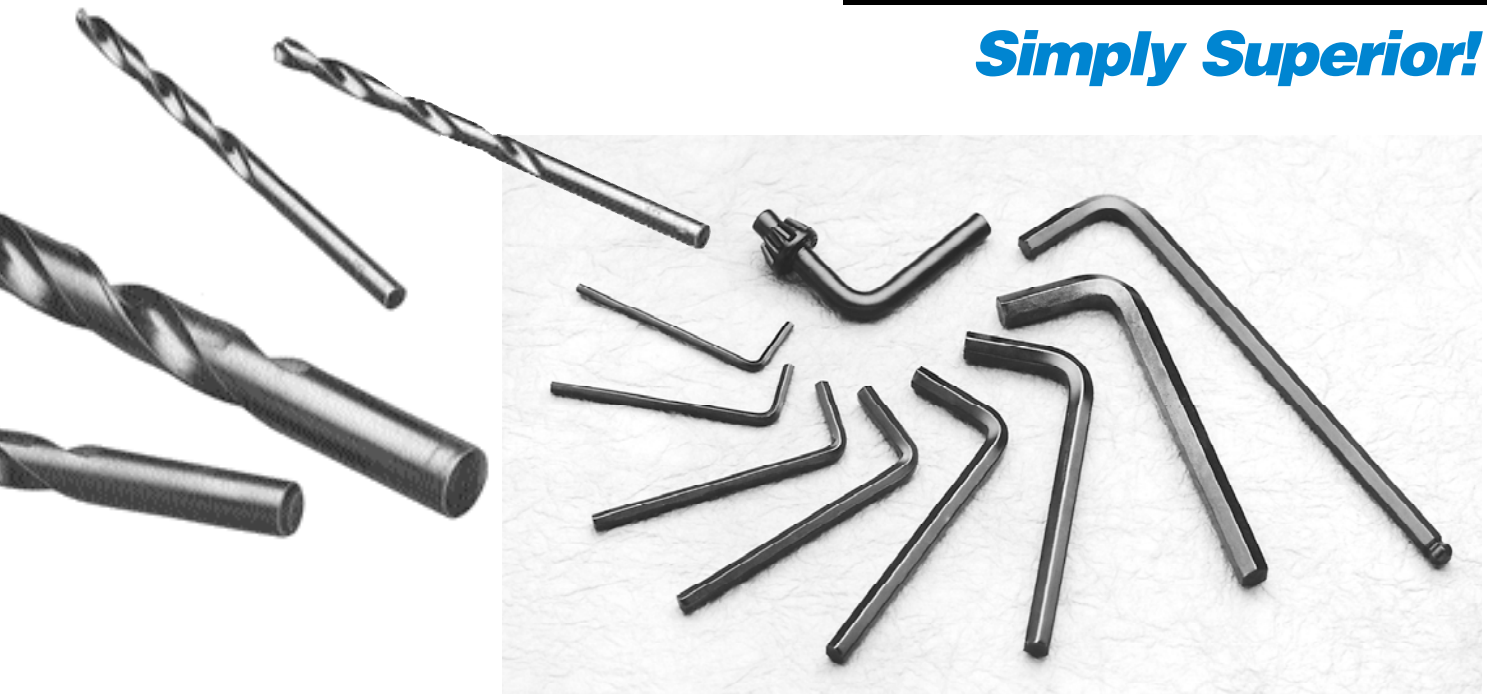
**Low Capital Outlay**—Expensive equipment not required. Simple five or seven tank system vs more expensive tanks, heaters, controls and hoods for hot oxide. **EPI** will engineer turnkey equipment designed to your specific requirements.

**Low Maintenance—Longer Equipment Life**—No expensive pollution control equipment. Only a simple ion exchange system is required in those rare installations when discharge of metals exceeds regulations.

**Parts Coverage**—600 to 1200 sq. ft. of surface area blackened per gallon of replenishment concentrate.

The logo for EPI, featuring the letters 'EPI' in a stylized, bold, blue font with a white outline. A registered trademark symbol (®) is located below the 'i'.

**Simply Superior!**



# The Blackening Process

The most commonly used process in commercial blackening includes seven steps. However, the **InstaBlak** process in most installations requires only five steps.

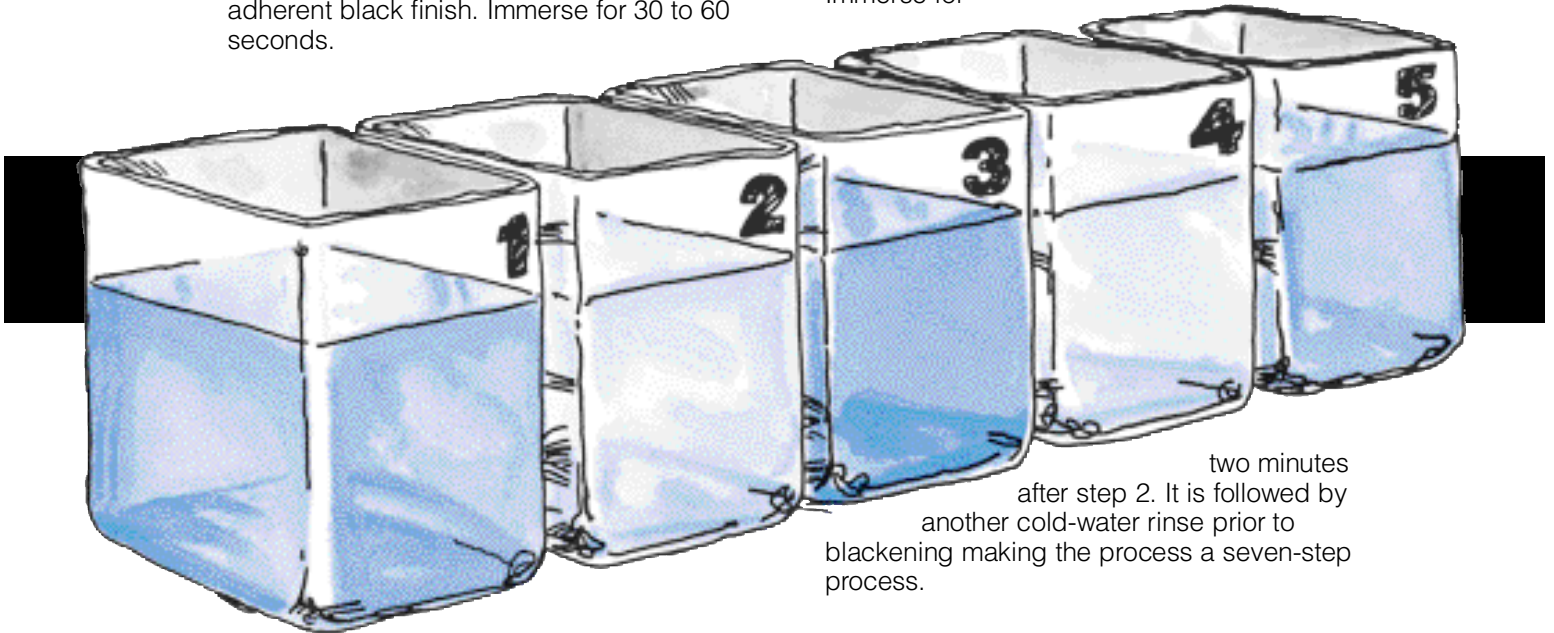
**1 Cleaning**—Soils such as cutting oils, coolants, lubricants and rust inhibitors must be removed. Soils can inhibit or prevent subsequent operations. They can negatively affect coating adhesion and appearance. **E-Kleen SR 148E**, an aqueous alkaline soak cleaner, is most often used with an immersion of the parts for two to five minutes in a 10% solution of **E-Kleen SR 148E** at 120° to 170 ° F.

**2 Rinse** In Cold, Overflowing Tap Water—It is necessary to rinse the parts to remove residual cleaning solution. Parts carrying over an unrinsed clinging film of alkaline cleaning solution would quickly contaminate a subsequent step of activation or blackening, resulting in a spotty or non-adherent black finish. Immerse for 30 to 60 seconds.

**5 Seal**—The finish by immersing the parts for one minute in a compatible **E-Tec** water displacing solution. The **E-Tec** corrosion inhibitors are formulated to rapidly displace the residual acidic solution from the preceding rinse. The **InstaBlak** coating is porous and absorbs the **E-Tec** solution, producing long-term corrosion protection. As the **E-Tec** is absorbed it enhances the depth of black which may take several hours.

**E-Tec** formulations are available for oily finishes, dry-to-the-touch soft finishes and dry, clear hard finishes.

**Activation**—In most applications an alkaline cleaning in **E-Kleen SR 148E** is sufficient. However, some difficult to blacken steel alloys, will require an activation with **E-Prep 258** to make the steel surface receptive to the blackening reaction. **E-Prep 258** is used at 5 to 10% by volume in water at room temperature. Immerse for



**3 Blacken**—Immerse for two to four minutes at room temperature in a 10% to 15% by volume solution of **InstaBlak 333**.

**4 Rinse**—In cold, overflowing tap water for 30 to 60 seconds to remove residual blackening solution.

## ENVIRONMENTALLY FRIENDLY—ZERO DISCHARGE

In those rare instances where the concentration of metallic ions exceeds local regulations, an ion exchange unit can be installed on tank 4 to remove them.

**EPI** can customize a process for your particular application, and design and supply you with the necessary equipment.

## How Does InstaBlak 333 Compare With Other Room-Temperature Blackening Processes?

It produces a super-deep, rich blackness and corrosion resistance equal to hot oxide blackening with no smutty rub-off problems as in the case with ordinary room-temperature formulations.

In most applications **InstaBlak 333** will produce a deep black finish with a simple five-step process, whereas with other room-temperature blackening processes they must use a seven-step process, which always includes an activation step and another rinse prior to blackening. Very seldom is an activation step required with **InstaBlak 333**.

**Wider window of operation. InstaBlak 333** produces the same degree of blackness with a two-minute or a four-minute immersion time, whereas other processes with short 90-second immersions

require timing almost to the second to develop the optimum black and to avoid the formation of an undesirable smutty rub off; which means that the results are dependent upon the operator whereas the immersion time is not critical with the **InstaBlak** process.

Also, **InstaBlak** produces the same results at a 10%, 15% or 25% concentration. The wider window of operation means that the quality of the black finish can be maintained with different operators and concentrations and makes it practical to install **InstaBlak 333** in automated finishing machines.

**InstaBlak 333** offers superior corrosion resistance with resistance to 130 hours salt spray when sealed with **E-Tec 501**.

## Process Chemicals

### Blackening Solutions Used In The Process

**InstaBlak 333** is a single component, liquid concentrate which is used at 10% by volume in water to blacken carbon steels, alloy steels, tool steels as well as cast iron and forged steels. It will not blacken stainless steel.

**InstaBlak 333M-333E** is a two-component system which enables the metal finisher to fine-tune (customize) his blackening process to fulfill his unique requirements for high-volume blackening. The **333M** component is the make-up/maintenance liquid concentrate which contains the basic blackening chemical components and is used at 10% by volume in water. The **333E** enhancer component controls the reaction which governs the speed of the blackening reaction and depth of blackness.

### Cleaning Compounds Used In The Process

**E-Kleen SR 148E** an alkaline liquid concentrate used at 10% in water at 100° to 170°F.

### Activators Used In The Process

**E-Prep 258** general-purpose surface conditioner/activator used on difficult-to-blacken steel surfaces. It eliminates iridescent blue finishes and produces a deep black color when used prior to **InstaBlak**. **E-Prep 255** is used as combination light-duty cleaner and activator to eliminate the alkaline cleaner for steel surfaces which have been sand or glass-bead blasted or pre-cleaned in a vibratory unit. Liquid concentrate used at 10% by volume in water at 75° to 150°F.

### Sealants Used In The Process

**E-Tec 501** is formulated to give a very rapid water displacement and to leave a thin, transparent, corrosion-resistant film. It will not gum up under high humidity and high temperature conditions. It leaves a slightly oily film with maximum corrosion protection.

**E-Tec 503** --same as **E-Tec 501** but leaves a very light oily film.

**E-Tec 504** --similar to 503 but leaves a dry-to-the-touch film.

**E-Tec 505** --similar to 504 but leaves an ultra-thin, soft dry, not tacky finish.

**E-Tec 505+** --same as 505 but leaves a much thicker, dry, soft finish with maximum corrosion resistance.

**E-Tec 512** --an emulsifiable (water-soluble oil) formulation for dry-to-the-touch film

**E-Tec 520** --a gloss clear acrylic water-based lacquer

**E-Tec 521** --a gloss clear water-based wax

**E-Tec 521-B** --a black gloss, water-based wax

**E-Tec 522** --a satin clear, water-based wax

**E-LAQ 525** high corrosion resistance lacquer.

# What You Should Know About **EPI** The Brightest Name In The World of Metal Finishing

Founded in 1954 **EPI** is a name that is synonymous with plating and finishing excellence. Our strides-ahead track record includes:

- Developer of **InstaBlak 333**, the new state of the art in room-temperature blackening of ferrous metals.
- Developed **E-Brite 205 K**, an Ultra Bright and Leveling non dye-type acid copper process.
- First with **E-Brite 30/30**, a non-cyanide alkaline copper plating process.
- Also developed the first successful single-additive brightener systems for copper, brass and nickel plating in the 1960's.

## The **EPI** Product Line

**InstaBlak S-334** a touch-up, swab-on finish or **InstaBlak 333 GEL** on vertical surfaces for iron and steel.

**InstaBlak Z-360**, immersion process for diecast and plated zinc surfaces. **InstaBlak A-380**, immersion process for aluminum and **InstaBlak A-384** swab-on for engraved aluminum.

### **E-Phos**<sup>™</sup>

Iron, Zinc and manganese phosphates including black zinc phosphate coatings.

### **B/OX**<sup>™</sup>

Room-temperature antiquing/oxidizing process for copper, brass and bronze surfaces. Produces black to blackish-brown to pleasing brown tones.

### **E-Brite**<sup>™</sup>

Addition agents and brighteners for plating:

- Copper — non-cyanide alkaline, acid and cyanide processes
- Silver — non-cyanide alkaline
- Nickel — bright and semi-bright
- Zinc — acid and alkaline
- Tin
- Brass
- Cadmium

### **E-Pik**<sup>™</sup> and **E-Prep**<sup>®</sup>

Acid salts, deoxidizers, desmutters, etchants and activators for metal surfaces.

### **UltraBlak**<sup>®</sup>

Conventional hot black oxide finishes for iron, steel, stainless steel, copper, brass, zinc and nickel surfaces.

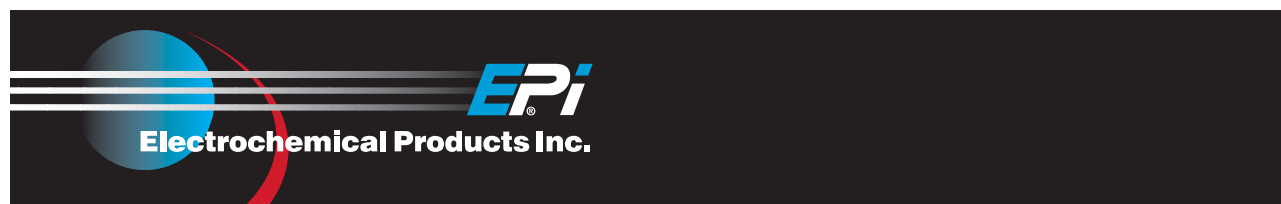
### **E-Kleen**<sup>™</sup> Metal Cleaning Products

Alkaline-based hot soak, spray and electrocleaners for all metals. Acid-based cleaners. Liquid and powdered formulations.

### **E-Tec**<sup>™</sup>

Rust preventives and corrosion inhibitors.

In addition to providing this wide range of top-quality products, all of which can be used in both rack and barrel operations, EPI offers you superb technical advice, outstanding laboratory service from knowledgeable technicians utilizing up-to-the-minute lab facilities, and fast response—all at competitive prices. Write, call, FAX or e-mail for descriptive literature. Your inquiry will receive prompt attention.



17000 WEST LINCOLN AVE. / NEW BERLIN, WI 53151-2781  
262-786-9330 / Fax: 262-786-9403 / Email: [us-sales@epi.com](mailto:us-sales@epi.com) / [www.epi.com](http://www.epi.com)