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 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 148E** at 120° to 150°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.

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.

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 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 two minutes after step 2. It is followed by another cold-water rinse prior to blackening making the process a seven-step process.

**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.