UltraBlak blackens faster than all other black oxide formulations—five to 10 minutes quicker—which increases productivity.

There is 20 to 30% less salt consumption with UltraBlak versus other black oxide formulations, which greatly reduces costs.

It blackens a wider range of steel alloys than other processes because it contains the maximum amount of penetrants, catalysts, activators, rectifiers and wetting agents.

Operating costs are lower because only 5.75 pounds of UltraBlak salts are used per gallon of water versus the 7 to 8 pounds per gallon with other processes. This also results in a lower operating temperature of 205°F, which saves energy.

Its unique wetting agent produces a more uniform black finish and a quicker reaction. The reduced viscosity ensures complete coverage of all surfaces. In addition, the water reduces chemical consumption by reducing the viscosity of the solution resulting in less drag-out of chemicals.

UltraBlak complies with and exceeds the requirements of military specification MIL-C-13924C and AMS-2465. It meets and exceeds the oxalic acid test and salt spray requirements.

There is no smutty rub-off as is common with other processes.

Its unique rectifier eliminates the problem of colloidal red iron in the solution by flushing it to the surface where it is removed by being carried out on the work and then washed off in the rinse water. The rectified red iron may also be periodically removed from the solution by skimming.

This eliminates the increased energy consumption and frequent tank clean-out which results from the iron settling to the bottom of the tank. In addition, the rectifier eliminates contamination of the solution with zinc, copper and lead by combining with these metals so they are removed on a continuous basis.

UltraBlak produces a pleasing anthracite-black finish—the blackest of the black.

UltraBlak offers many advantages compared to painting, including:

- No dimensional change (paint builds up)
- Reduces handling of parts—many parts can be done in a rotating barrel
- No prime or precoat phosphate required
- No bake oven
- No volatile organic solvents
- Less equipment and less maintenance of equipment
- Less set-up time and less processing time for higher productivity

Why UltraBlak 400?

The Blackening Process

In most installations only a simple five-step process is required:

1. **Cleaning**—Soils, such as cutting oils, coolants, lubricants and rust inhibitors must be removed. Soils can inhibit or prevent subsequent operations. E-Kleen 195 or E-Kleen 191 aqueous alkaline-soak cleaners are most often used, with an immersion of the parts for two to five minutes at 120° to 150°F.

2. **Rinse**—Use cold, overflowing rinse water. It is necessary to rinse the parts to remove residual cleaning solution. Immersed for 30 to 60 seconds. A cold-water rinse is sufficient for rinsing light parts. However, heavy, thick parts may chill the blackening solution, so a hot-water rinse is preferable, which will preheat the parts, resulting in a faster, more uniform blackening.

3. **Blackening**—Parts are immersed in a boiling 285°F solution of UltraBlak until a deep uniform black is developed, usually within 10 to 20 minutes. The bath chemistry is regenerative—the only chemicals being consumed are those physically dragged out on the parts into the rinse water. Since the UltraBlak solution is saturated, it automatically maintains a concentration of 5.75 pounds of salts per gallon of solution when operating at its boiling point. If the solution boils below 285°F, additional salts must be added to raise the temperature to 285°F. If the solution boils above 285°F, water has to be added with an automated water-addition system until the boiling point is reduced to 285°F.

4. **Cold-Water Rinse**—To remove residual blackening solution and to ensure the sealant is not contaminated.

5. **Seal**—Parts are immersed in one of E-Tec brands of corrosion inhibitors to impart corrosion resistance and lubricity to the finish. E-Tec formulations are available to deposit an oily, slightly oily or dry-to-the-touch finish with either water-displacing solvent-based solutions or water-soluble formulations.

Optional: Activation or derusting/descaling for a seven-step process.

UltraBlak will not cover up surface rust or heat treating scale. These imperfections must be removed in a 50%-by-volume hydrochloric (muriatic) acid solution following Step 2 above. The use of a hydrochloric acid dip will also serve to activate difficult-to-blacken surfaces resulting in a faster blackening reaction and a more uniform finish. The residual acidic solution must be removed with a hot or cold-water rinse prior to the UltraBlak 400.

Please see the individual technical data sheets or MSDS sheets for the E-Kleen, UltraBlak 400 and E-Tec products to ensure proper and safe operation.