

## Base Materials and Black Oxide Coating

Black Oxide is a conversion coating. The coating is created via a chemical reaction with the iron in the metal. This chemical reaction forms a protective surface. A black oxide conversion coating is applied to ferrous alloys when the oxidizing salts react with the iron to form magnetite, which is the black oxide of iron. Though standard Black Oxide is set up for steel, it can be done on other substrates such as copper, brass, and stainless steel. Black oxide offers a matte black appearance at a low cost.

<b>Description</b>	Conversion Coating caused by a chemical reaction with iron in metal to form an integral protective surface.
<b>Reason</b>	<ul style="list-style-type: none"> <li>• Cost Competitive</li> <li>• Dark Black Color (Decorative Finish)</li> <li>• Can be Mechanically or Chemically removed and re-applied</li> <li>• Dimensional Stability</li> <li>• Anti-galling</li> <li>• Abrasion Resistance</li> <li>• Improved lubricity</li> <li>• Corrosion Protection</li> <li>• Reduced light Glare</li> <li>• Will Not chip, peel, flake, or rub off</li> <li>• Color Change Resistant to temperature</li> <li>• No Hydrogen embrittlement</li> <li>• No white Corrosion</li> <li>• Weldable ( Produced NO welding Fumes)</li> <li>• Can be coated for additional Protection</li> </ul>
<b>Common Materials</b> (MIL-DTL-13924D Class 1 for wrought iron, cast and malleable irons, plain carbon, and low alloy steels)	<b>Ferrous Steel Alloys</b> <ul style="list-style-type: none"> <li>• Mild Steel</li> <li>• Stainless Steel</li> <li>• Carbon Steel</li> <li>• Low Alloy Steel</li> <li>• Corrosion Resistant Steel</li> <li>• High Silicon Steel</li> </ul> <b>Iron</b> <ul style="list-style-type: none"> <li>• Cast Iron</li> <li>• Malleable Iron</li> </ul>

<p><b>Process</b></p>	<ol style="list-style-type: none"> <li>1. Inspection (Clean and Degrease Metal Parts)</li> <li>2. Uni Kleen (Rinse Metal Parts for 3 -15 mins)</li> <li>3. Rinse with Rust Remover ( 30 sec. to 5 min)</li> <li>4. Optional Acid Salt</li> <li>5. Rinse Metal Parts</li> <li>6. Blacken Parts in boiling alkaline salt Solution approximately 285F°</li> <li>7. Rinse metal parts</li> <li>8. Seal and Finish (Supplemental Coating optional oil, wax or paint)</li> </ol>
<p><b>Testing</b></p>	<ul style="list-style-type: none"> <li>• Visual Testing</li> <li>• Smut Testing</li> <li>• Relative Humidity Test</li> </ul>
<p><b>Industry for Use</b></p>	<ul style="list-style-type: none"> <li>• Ammunition Manufacturers</li> <li>• Appliance Industry</li> <li>• Architectural Industry</li> <li>• Auto Industry</li> <li>• Camping and Hunting</li> <li>• Collars/Coupling Industry</li> <li>• Fastener Industry</li> <li>• Hardware Industry</li> <li>• Metal Stampers</li> <li>• Military Components</li> <li>• Power Hand Tool Manufacturer</li> <li>• Recreational Vehicle Industry</li> <li>• Tool &amp; Die Industry</li> <li>• Tube Cutters/Fabricators</li> </ul>
<p><b>Reason For Some Industry</b></p>	<p>Automotive- Add no weight to parts and is compelling in interior components          Architectural- Design aspects for appealing look (aesthetically pleasing)</p>
<p><b>Application</b></p>	<p><b>Specific products that can be blackened with black oxide include:</b></p> <ul style="list-style-type: none"> <li>• Locks, automobile parts, motorcycle parts, machine parts, power tools</li> <li>• Architectural applications, electronic hardware, iron ware, exercise equipment</li> <li>• Hydraulic/pneumatic components, lawn and garden equipment, candleholders, and electronic hardware.</li> </ul>