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Plating Processes

*Room Temperature Antiquing &
Metal Blackening Processes*

Hot Black Oxide Finishes

Metal Cleaning & Surface Preps

Phosphate Finishes, Chromates & Rust Preventatives

Black Oxide FAQ

1) What is Black Oxide?

Black Oxide is a blend of caustic, oxidizers, additives that is used to black oxide ferrous metals. There are two types of metal blackening: hot black oxide and room temperature blackening.

Hot black oxide is a conventional hot (285 F°) process which produces a true black oxide iron magnetite, Fe₃O₄, finish. It is a premium grade salt mixture which will blacken a wider range of steel alloys than any other process on the market.

Room temperature blackening is the preferred metal blackening process for safe and convenient in-house blackening. It is important to note this is not a true black oxide process; however, it may be referred to as room temperature black oxide. It produces a super deep blackness and corrosion resistance equal to hot oxide blackeners. It is an excellent non-bleed out black finish for powdered metal and cast iron. Room temperature blackening process is an autocatalytic reaction of a black selenium-copper compound that deposits on ferrous parts through an immersion process.

2) What Makes EPI's Black Oxide and Metal blackening processes better?

EPI's Insta-Blak process does not produce a smutty rub off like other room temperature products. Ultra-Blak is a premium grade black oxide. They are easy-to-use with a wide window of operation.

3) What are the advantages of Black Oxide and Metal Blackening?

Ultra-Blak

- Produces true black oxide finish Fe₃O₄ magnetite finish
- Abrasion resistance
- Corrosion protection
- Meets military spec MIL-DTL-13924D and AMS 2485H
- Blackens faster than other hot black oxides
- Less sludge generation than other hot black oxides, which means lower gas bills

Insta-Blak

- Capital costs less \$7,000- \$15,000 for turnkey operations
- Energy savings
- No CO2 emissions or green house gases
- Process time for blackening 1-5 minutes
- Powder metal does not bleed out white salts like hot black oxide
- Cast Iron and Steel Castings do not turn red
- No ventilation costs
- Provides Corrosion resistance
- Dimensional stability thickness 5-10 millionths of an inch
- Can be painted over
- Anti-galling properties
- Esthetic appeal

4) What can Black Oxide be used for?

Black Oxide can be used for a wide variety of metals. Specific products that can be blackened with black oxide include: locks, automobile parts, motorcycle parts, machine parts, power tools, hardware, architectural applications, electronic hardware, iron ware, exercise equipment, hydraulic/pneumatic components, lawn and garden equipment, candleholders, and electronic hardware.

5) Who uses Black Oxide?

Large companies such as lock manufactures or auto manufacturers use black oxide on a large scale basis to blacken metal parts. Black Oxide can also be used by the home hobbyist who would prefer to blacken just a few items. Below are some of the major industries that utilize Black Oxide coating.

- Ammunition Manufacturers
- Appliance Industry
- Architectural Industry
- Auto Industry
- Camping and Hunting
- Collars/Coupling Industry
- Fastener Industry
- Hardware Industry
- Metal Stampers
- Military Components
- Power Hand Tool Manufacturer
- Recreational Vehicle Industry
- Tool & Die Industry
- Tube Cutters/Fabricators

6) How is Black Oxide Applied?

Hot Black Oxide is applied through a seven step process.

1. Clean and Degrease Metal Parts
2. Rinse Metal Parts
3. Optional Acid Salt
4. Rinse Metal Parts
5. Blacken Parts in boiling Solution – approximately 285F°
6. Rinse metal parts
7. Seal and Finish

Room Temperature Metal Blackening is applied through a five step process.

1. Clean and Degrease Metal Parts
2. Rinse Metal Parts
3. Blacken Metal Parts 1-5 minutes at 65-85 F°
4. Rinse Metal Parts
5. Seal and Finish
6. *Some steels require an additional prep and rinse adding two more steps

7) What types of metal can you blacken with Hot Black Oxide or Room Temperature blackening?

Steel, Stainless Steel, Cast Iron, Copper, Brass, Cadmium, Zinc, Nickel and Electroless Nickel

8) What is the difference between hot black oxide and room temperature metal blackening?

[Hot black oxide](#) takes 15 – 30 minutes to blacken; there is a 2-4 hour wait to heat mixture. Parts are blackened between 272 F – 285 F°. There is a seven step process required to blacken parts. "Room temperature metal blackening/pages/room-temperature takes approximately two minutes to blacken. There is no wait period for mixture to heat because parts can be blackened at room temperature. There is a five step process required to blacken parts.