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**ZINC BLACK™ ZN4 Blackening Concentrate**  
Operating Instructions

**DESCRIPTION**

ZINC BLACK™ ZN4 is a mildly acidic black molybdate finish for all zinc plated surfaces and zinc die-castings. Supplied as a liquid concentrate, the solution operates at 120°F and produces a clean black finish. When sealed with a clear, protective topcoat, the ZN4 finish serves as a direct replacement for trivalent black chromates, with similar corrosion resistance but higher hardness, making it better suited to barrel processing. ZN4 contains no chromates and generates no hazardous fumes.

**OPERATING CONDITIONS**

Bath Make-Up	Mix at 20% by volume, then adjust pH to 3.5 – 4.5 by adding sulfuric acid (about 600 mL of 50% sulfuric acid per 50 gallons of mixed bath.)
Immersion Time	2-4 minutes.
Operating Temperature	120-140° F
Equipment Construction	Tank: Polypropylene or acidproof materials Heater: 316 stainless steel, quartz, teflon

**PARTS PROCESSING GUIDELINES**

1. ZINC PLATE PARTS with 0.2 mils or more of zinc. Zinc die-castings should be CLEANED to remove oil and mold-release compounds, using SAFE SCRUB® M liquid cleaner, mixed at 10-20% by volume; 120-140°F; 4-6 minute soak.
2. RINSE in cold overflowing tap water tank.
3. ACTIVATE (Optional) in 2-5% sulfuric acid solution, 30-90 seconds to remove tarnish and/or plating brightener residues. Then, rinse well in cold overflowing tap water tank.
4. BLACKEN by immersing parts in the ZN4 bath for 2-4 minutes or until uniformly black. Immersion time depends on the temperature of the bath and reactivity of the substrate. Agitate parts, if necessary, to separate points of contact and break air bubbles.
5. RINSE in cold overflowing tap water tank.
6. SEAL out corrosion by topcoating with a clear sealant appropriate to the end use of the article. Allow parts to drain and dry, or follow with a short spin dry.

## **BATH MAINTENANCE**

The black coating is the result of a chemical reaction between the ZN4 solution and the zinc surface. Chemical activity is gradually diminished with use, but may be restored to desired strength by periodic additions of ZN4 concentrate and sulfuric acid. Fresh ZN4 concentrate can be added to bring the immersion times back to the previous standard. The best test method to use is Atomic Absorption for molybdenum content. **PLEASE NOTE:** For optimum performance, the pH should be maintained at 3.5-4.5 with sulfuric acid additions. The ZN4 solution is designed to be operated as a semi- permanent bath, but will gradually absorb zinc from the parts and will require periodic replacement with a fresh bath.

***Before Using This Product – Please Read, Understand and Follow all the Precautions shown on the Product Label and on the Safety Data Sheet.***

The Safety Data Sheet can be found on our website: [www.birchwoodtechnologies.com](http://www.birchwoodtechnologies.com)

**Use Appropriate Warning Labels on any Container used to Store or Apply this Product.**

## **PACKAGING**

5 and 55 plastic, non-returnable containers. Store in closed containers.

**NOTE:** The information contained herein is provided in good faith and is believed to be correct as of the date below. However, Birchwood Laboratories LLC makes no representation as to the comprehensiveness or accuracy of the information. It is expected that individuals receiving the information will exercise their independent judgment in determining its appropriateness for a particular purpose. Accordingly, Birchwood Laboratories LLC will not be responsible for damages of any kind resulting from the use of or reliance upon such information.