

# FROST AUTO BLACK ZINC OXIDE INSTRUCTION MANUAL

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## Short description

Black Zinc Oxide is a ready-to-use, room temperature conversion for zinc and zinc die-casting. The product is not passivation, but a black-oxide process (similar to chemical blackening of steel) that forms a thin, black conversion layer without significantly affecting the dimensions.

After blackening, a sealer is mandatory to deepen the color and prevent corrosion.

- Works on: freshly galvanized (blue/clear trivalent is suitable), existing zinc that is in good condition, zinc diecast.
- Does not work on yellow (iridescent) chromated zinc.

## Required equipment

- Tanks/baths and suspension: acid-resistant PP/PE/PVC or rubber/plastic-lined steel.
- Sinks with clean (preferably demi/DI) water.
- Warm air (optional) for controlled drying (no contaminated compressed air).
- Personal protection: safety glasses or face shield, acid-resistant gloves and apron/coverall; good ventilation/local extraction.

## Preparation

- Cleaning & degreasing: make parts completely grease and dirt free with an alkaline degreaser, then rinse thoroughly cold.
- Old/existing zinc: if oxidized or uneven: mechanical or dry cleaning until a fresh, uniform zinc layer is visible; rinse well.
- Freshly galvanized (immediately after galvanizing): rinse very thoroughly to prevent alkaline introduction. Optionally, apply a short, mild acid pre-dip if you suspect traces of plating residue:
  - 50–100 g/L citric acid at room temperature, 30–60 s, then rinse.

(Do not allow to dry between steps.)

## Protecting the black layer (sealer)

The black conversion layer on zinc is not intrinsically corrosion resistant. The corrosion resistance and color depth come from the sealer.

Options: oil/wax sealer (deep, maintainable shine) or clear lacquer (hard, dry film). Apply without drying in between so that water is completely expelled.

## Step-by-step plan

### Rinse

Rinse cold with clean water (preferably demi/DI). Do not allow to dry.

### Black oxidation

Immerse in the undiluted Black Zinc Oxide liquid at room temperature.

Target time: 1–10 minutes (stop once a uniform, deep black image is achieved).

Moving slightly/swiveling helps to ensure an even film and to prevent air entrapment.

### Rinsing

Rinse thoroughly cold with clean water. Drain the workpiece briefly over the bath.

### Sealing (mandatory)

Seal directly without drying so that the sealer displaces the water:

- Oil/wax type (e.g. DeepSeal galvanizing shop) for a deep, maintainable black shine.
- Hard, clear lacquer (e.g. acrylic sealer) for a dry, hard top coat.

Give enough time to work in; drain/remove excess material.

### Drying & curing

Dry with warm air or in the air. Not with contaminated compressed air.

For the final colour/resistance: preferably allow to cure for 24 hours before loading/packaging.

## Working conditions

Solution: use ready-to-use, undiluted.

Temperature: room temperature (approx. 18–30 °C).

Time: 1-10 minutes (usually until the desired black is reached; do not lengthen unnecessarily).

Rinse: before and after the black bath thoroughly (preferably demi/DI).

Sealer: immediately after rinsing, while the surface is still wet.

Storage: in lockable, chemical-resistant container; cool, dry and ventilated.

Material tanks/suspension: PP/PE/PVC or rubber/plastic-lined; No bare copper/bronze/aluminum in contact with the bath.

## Technical characteristics

Property	Specification
Product	Verzinkshop Black Zinc Oxide (room temperature blackener)
Substrates	Zinc, galvanized steel (blue/clear trivalent OK), zinc die-cast
Not suitable	Yellow (iridescent) chromated zinc
Use	Undiluted, dipping
Temperature	Approx. 18–30 °C (room temperature)
Immersion time	1-10 min, until uniform deep black
Agitation	Light movement/swivel recommended
Rinse	Cold water before and after; preferably demi/DI
Sealer	Obligatory; Apply while surface is still wet
Dry	Warm air/air; ±24 hours curing for final result
Tanks/suspension	PP/PE/PVC or rubber/plastic-lined; acid-resistant
Storage	Lockable, cool/dry/ventilation; Avoid spillage/introduction
Influence of dimensions	Negligible; thin conversion layer

## Problems and solutions

Problem	Probable cause	Solution
Spotty/uneven black	Insufficient cleaning; Fingerprints; Bubbles	Re-clean/degrease; do not touch with bare hands; Slight swirling to break up air
Grey/iridescent instead of deep black	Too short a time; passive/oxide skin; old zinc layer	Longer dipping (within 1–10 min); activate/clean surface to fresh zinc; blacks again
"Rub-off"/rub off on rub	For too long; polluted/exhausted bath; insufficient rinsing	Limit time; bath refreshing/conditioning; Better rinse
Streaks/stains after drying	Poor rinsing; Uneven drying	Rinse well (preferably demi/DI); drain evenly; Warm air drying
Red/brown rust after sealing	Residual acid/blackener in pores; Sealer does not displace water	Additional rinsing; if necessary, short bicarbonate dip (neutral), then rinse again; Apply sealer immediately and generously (2× if necessary)
White deposits/spots	Hard water/minerals in coil	Use demi/DI water; Make sure sealer displaces all water
No or slow effect	Surface no zinc; Underlay unsuitable (yellow chromate)	Attach substrate; Remove yellow chromate or re-galvanize/blue passivation

## Warning!

The black oxide product is acidic. Avoid contact with eyes, skin and clothing. Wear eye protection (goggles, goggles, or face shield), protective rubber gloves, and aprons when preparing solutions and while working with the solutions. Do not mix the product with cyanide or alkaline materials, or other chemical substances. The product is toxic when used internally.

- Do not work with Verzinkshop products without first reading and understanding the safety information.
- The safety data sheet can be found on the product page or can be requested from verzinkshop.nl by e-mail: [info@verzinkshop.nl](mailto:info@verzinkshop.nl)
  - Do you have any questions? Contact us via:
    - Mail: [info@verzinkshop.nl](mailto:info@verzinkshop.nl)
    - Whatsapp or call: +31 6 28090022
    - [Www.verzinkshop.nl](http://www.verzinkshop.nl)

## Safety

- Always wear a dust mask, respirator, gloves, and apron when necessary.
  - Always treat any chemical as if it could kill you.
- Always label buckets and storage containers with a permanent marker so that you and others know what's inside.
- Never pour water into acid; it can heat up and explode. Always pour acid into water.
- Never leave electroplating baths or other systems that use power unattended. These products may cause a short circuit and cause a fire.
- Never come into direct contact with chemicals. They can cause serious burns or other damage and are very dangerous substances if not treated with respect.
- Never think you can get away without taking safety precautions! That is not possible!
  - Never leave the lids off the tanks when not in use.
  - Always work safely and ensure good protection and ventilation.
- The safety data sheet can be found on the product page or can be requested from verzinkshop.nl by e-mail: [info@verzinkshop.nl](mailto:info@verzinkshop.nl)

## **Disclaimer**

Did you find an error or something unclear in the manual? Please let us know via [info@verzinkshop.nl](mailto:info@verzinkshop.nl)

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