VERZINKSHOP BLACK OXIDE GEL INSTRUCTION MANUAL

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WHAT IS COLD CHEMICAL BLACKENING

Black Oxide Gel is a room temperature conversion coating for iron/steel (not for stainless steel). It is a swab-on gel that you apply with a cloth, sponge or brush.

The gel is specially developed for large and horizontal areas where you cannot use liquid.

It reacts in a controlled and local way, creating a deliberately irregular, patinated image (swept, lived through).

Not intended for even deep black over large areas.

The layer is very thin and does not change the size.

After the process, always finish with a sealer for protection and depth.

It is suitable for:

- Cold and hot-rolled carbon steel
- Alloy steel
- Tool steel
- cast iron
- Forged steel
- sintered metal

Note: This product cannot be used on stainless steel.

Galvanizing Shop Black Oxide Gel works well on carefully cleaned panels and parts made of steel for interior applications and meets the Living Building Challenge Red List.

EQUIPMENT REQUIRED

For the gel, you use:

- acid-resistant tanks or baskets PP (polypropylene), PE (polyethylene) or PVC
- tassel, cloth, Scotch-Brite or sponge.
- Sodium bicarbonate (baking soda) to neutralize acid.

Stainless steel should not be used with Galvanizing Shop Black Oxide Gel.

CLEANING & DEGREASING

Use an alkaline degreaser.

An alkaline degreaser is a water-based, all-round cleaner (high pH) that effectively removes oil, grease, coolants and tensiles, polishing paste and similar contamination. This type of cleaner is recommended as a standard step before metal surface treatments such as black oxidation.

Examples (practically available):St. Marc, Blue Wonder Degreaser, Dasty DegreaserProfessional: Kärcher RM 31, Zep Industrial Purple Degreaser

Use: Light the degreaser as shown on the product label, apply generously, leave on briefly, brush/wipe if necessary, and then rinse thoroughly with clean water.

RUST REMOVAL

Make sure that the object to be treated is completely free of rust, dirt and grease. This is very important to get a good result and not to contaminate the black oxide gel.

Parts that are rusty can be derusted with:

- Mechanical processing
- Galvanizing Shop Metal Activator (flash rust)

METAL ACTIVATION

If the desired depth of the black is difficult to obtain, activation of the surface before blackening is required by treating parts for 1 to 2 minutes with Galvanizing Metal Activator, another etching agent or by sanding or other mechanical processing. Then rinse very well to prevent acids from getting into the containers of the next steps.

Do not use hydrochloric acid to etch the metal, this will stain (other) the black conversion coating!

PROTECTING THE CONVERSION COATING

Black oxide conversion coatings are not inherently anti-oxide and will oxidize further if they come into contact with oxygen. The corrosion resistance is obtained by applying a moisture-resistant sealer and is therefore necessary.

INTERIM RINSING

Thorough rinsing between each step of the process is extremely crucial, especially after chemical blackening. If this is not done sufficiently and black oxide gel remains on the object, it can lead to rust formation after applying the sealer when it dries.

Adding a small amount of baking soda to the final rinse water will help ensure that the remaining acids are completely removed and neutralized. Then rinse well with clean water.

NEUTRALIZING ACID

Acid from the etching agent or the black oxide gel can cause corrosion if it is not completely washed away. As an additional step before sealing, you can dissolve 1–2 tablespoons of sodium bicarbonate (baking soda) in 2 litres of water and briefly immerse the workpiece in it to neutralise any remaining acid. Rinse the object with clean water and apply the sealer.

CHEMICAL BLACKENING - APPLY BY HAND

- Degrease and rinse the object thoroughly.
- Remove rust and activate if necessary.
- Rinse the item well again and work wet-on-wet to prevent oxidation.
- Apply Black Oxide Gel generously to the object with a cloth, sponge, brush or Scotch-Brite with a light rubbing motion.
- Work in lanes or sweeps for the desired patina image.
- Response time typically 1 to 3 minutes per zone; Color intensity follows the contact time.
- If necessary, add fresh gel when the reaction subsides and the desired result has not yet been achieved.
- Rinse several times until all gel residue is gone; A small amount of sodium bicarbonate (baking soda) in the rinse water helps to neutralize the remaining acid.
- Dry the object at room temperature, with a cloth or a heat gun - do not use compressed air.
- After drying, rub lightly with a soft cloth to remove any loose reaction products.
- Repeat the application when needed for a darker result.
- Finish the object with a sealer.
    - Galvanizer shop DeepSeal Metal Sealer for an oily finish that dries dust-dry.
    - Galvanizing Acrylic Sealer on acrylic base for a shiny thin hard finish. Suitable for indoors.

TECHNICAL CHARACTERISTICS

Property	Specification
Product	Black Oxide Gel (swab-on)
Type	Room temperature conversion coating (patina/mottled), non-uniform by design
Substrates	Iron/steel, alloy steel, cast iron; not suitable for stainless steel
Application	Apply manually with cloth, sponge, brush or Scotch-Brite
Temperature	18–30 °C (no heating required)
Contact time	1–3 minutes per operation; Repeat if desired for more depth
Result	Dark patina, swept/spotted; Not intended for uniform deep black
Rinse	Rinse generously cold; last coil preferably demi/DI
Neutralization	Optional: light bicarbonate rinse, then rinse again with clean water
Dry	Air or warm air; no compressed air; light rubbing to remove loose film
Sealer	Obligatory; oil/wax type (e.g., DeepSeal) or clear lacquer (e.g., acrylic Sealer)
Coverage	Approx. 2.5 m² per litre of gel (guide value; depending on technique/structure)
ph	Mild acid (gel form)
Influence of dimensions	Negligible (very thin conversion layer)
Storage	Tightly closed, cool, ventilated; Do not contaminate with water/metal shavings

PROBLEMS AND SOLUTIONS

It is very important that acids from any etching bath, or from the black oxide agent itself, are properly rinsed away. If acids remain, the metal will react to this during sealing or later and brown rust will occur.

Baking soda can be added to the final rinsing water, after the black oxide process and before the sealer, to neutralize residual acids. Then rinse the object well.

It is also important to make sure that, during sealing, the chosen sealer expels all the water and no moisture remains on the black oxide coating. Immerse the object in the sealer several times to expel the water.

Problem	**Probable cause**	**Solution**
Spotty / non-uniform	Insufficient defatting; Fingerprints; gel dried on the part	Layer removal; thoroughly degreasing; clean gloves; Smaller work surface, faster rinsing
Too light / grayish	Too short contact time; passive surface; Too little product	Longer rubbing within 1–3 min; activate light in advance; Apply larger, fresh gel
Bluish glow	Insufficient activation; high-alloy/hard steel	Pre-activate; second gel cycle; possibly fine mechanical pre-treatment
Release (smut) when rubbing	Too long service life; pollution/oil; gel not rinsed out properly	Shorter cycles; better degreasing; rinse more generously and more often; After drying, rub lightly and seal immediately
Stripes / overlap marks	Overlapping strokes with different residence time	Working in sections wet-on-wet; overlap blending out immediately; Keeping the pace
Dark Edges/Bunching	Folds or puddles of gel at edges/corners	Thinner layer; gel "pull out"; rinse immediately; work in two light passes if necessary
Rust after treatment	Gel/acid residue remained; hard water; too late or too thin sealer	Longer rinsing (preferably demi/DI); optional bicarbonate dip, then clean water again; Direct and spacious sealing

Problem	Probable cause	Solution
White spots / limescale trace	Hard water in flush step	Rinse with demi/DI; fast drying; Direct sealing to expel water
Matte or "etched" spots	Rubbed in one place for too long; Aggressive residual contamination	Shorter, even strokes; checking and repeating preparation; Rinse immediately
Response slow or stops	Surface passive; gel contaminated/exhausted	Pre-activate; use fresh gel; Avoiding cross-contamination with alkaline
No effect	Substrate is not iron/steel (e.g. stainless steel)	Checking substrate; use a suitable stainless steel system for stainless steel
Gloss spots after sealer	Too much sealer; not rubbed out	Apply thinly; decrease/rub out surplus; several thin layers instead of one thick one

WARNING!

The Black Oxide Gel 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 Black Oxide products are toxic when used internally.

Do not work with the Black Oxide products or other Galvanizing Shop 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

Do you have any questions? Contact us via:

Mail: info@verzinkshop.nl

Whatsapp or call: +31 6 28090022

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 pools 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. They WILL fall over!

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

DISCLAIMER

Did you find an error or something unclear in the manual? Please let us know via info@verzinkshop.nl

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