

Weldphos Black

Weldphos Black is a black pre-dip concentrate formulated to treat ferrous metal prior to zinc phosphating. A black deposit is produced that is subsequently sealed by phosphating. Weldphos Black propagates a more crystalline zinc phosphate structure.

Features/Benefits

- Hard water stable. Resistant to contaminants.
- Produces a uniform black finish.
- Economical single step system – low use cost, long solution life.
- Liquid material for ease of use; bath is easy to control and maintain.
- Coating can be removed in a strong alkaline soak bath. Equivalent to removal of phosphate coating and acid cleaning.

Equipment

Polypropylene, PVC, or polyethylene plastic tanks are preferred. Koroseal lined steel tanks may also be used. Acid resistant racks, barrels, or baskets are required for processing. Tank agitation is required to prevent settling.

Operating Conditions

Concentration	0.125 to 2 % by volume Weldphos Black 0.125 to 1 % by volume Weldphos Black, optimal Titration to maintain 10 - 14% acid. See HCL acid test below.
Temperature	27 to 43º C (80 to 110º F)
Time	30 to 120 seconds
Agitation	Very mild.

Remove parts from tank bottom.

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Operational Guidelines

Concentration

The rate of deposition is greatest within the optimal concentration (0.125 to 1 % by volume). Well-machined parts, such as threaded screws, turn black within seconds. The concentration may need to be raised for parts with flat surfaces. Higher concentrations produce a thicker working solution, while lower concentrations settle quicker. Mild agitation is required for Weldphos Black.

Time

Work should be dipped into the Weldphos Black for enough time to produce a uniform black deposit. Work left in too long will result in excess build-up. If this occurs Zinc Phosphate will chip off. In addition, the deposit may fall off contaminating rinse tanks or the zinc phosphate.

Process

Good rinsing is required following Weldphos Black to avoid contamination down the line. Parts are matte black after phosphating. Guardcoat™ Oil adds corrosion protection and a glossy finish.

Typical Phosphating Cycle

	Stage Operation	Immersion Time	Temperature
1.	Alkaline soak clean	5 to 10 minutes 30 seconds	60 to 82º C (140 to 180º F)
2.	Rinse, overflowing water		Ambient
3.	HCL clean 30 to 50%		
4.	Rinse		
5.	Black pre-dip, Weldphos Black	10 to 60 seconds	27 to 43º C (80 to 110º F)
6.	Rinse, overflowing water	30 seconds	Ambient
7.	Hot rinse	30 seconds	60 to 71º C (140 to 160º F)
8.	Phosphate, Weldphos Zn	10 to 20 minutes	71 to 79º C (160 to 175º F)
9.	Rinse, overflowing water	30 seconds	Ambient
10.	Seal rinse*	30 to 60 seconds	60º C (140º F)
			60 to 82º C (140 to 180º F)

11. *Rust Preventative Oil, Guardcoat™ Oil 30 to 60 seconds.

HCL Acid Test:

1. Transfer 2 mls of acid solution into test beaker.
2. Add 5-drops of Methyl Orange Indicator.
3. Titrate with 1.0N caustic to colour change.
4. Number of mls of 1.0N NaOH times a factor o5 = % by volume as 32% acid

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Operating Hints:

1. If the bath is cloudy it means either the Weldphos Black concentration is too high or the HCL concentration is too low. If the Weldphos Black is too high then dilute the bath to reduce the concentration. Re-test and adjust for proper acid level. If the HCL acid concentration is too low then add acid to normal range between 10- to 14% to achieve bath clarity.

2. If the coating is blotchy or has voids then there could be oil on the parts or your acid concentration is over 20%. Check the cleaner to ensure the parts are not oily and improve rinsing. If the acid is too high dilute acid level. Adjust for proper Weldphos Black level after dilution.

3. If the black coating rubs off then it could be temperature is too hot, time duration is too long, or the Weldphos Black concentration is too high. If it is the temperature adjust the temperature into lower range. If it is time duration reduce time and if the concentration is too high reduce it.

4. Taking too long or the colour is too light then test the bath chemistry to ensure the parameters are within range. Adjust per parameters.

Process Hints and Suggestions:

(i) It is preferred not to overheat zinc phosphate bath when processing black. Should maintain temperature to less than 80^0 C.

(ii) Pre-cleaning and rinsing are critical with black conversion coating. Oils cause voids.

(iii) It is better to make small periodic additions to the bath than "slug"- adds – large additions.

(iv) Barrel rotation at the slowest level possible is desired. Rotation scrubs the coating off the parts. ½ rpm or periodic slow rotation.

(v) High alloy steels can be sensitive to over acid cleaning. Avoid pickling whenever possible with black treatments.

(vi) Weldphos Black coated parts can go directly into the zinc phosphate bath without rinsing. This minimizes scratching and rub-off.

The data and statements contained in this bulletin are based on testing information and are believed to be accurate and reliable. This bulletin is not a Guarantee or Warranty, express or implied regarding the products use. The product is sold on the condition that the purchaser will do their own tests to determine the suitability of the product in a par - ticular application.

READ THE SDS BEFORE USING THIS PRODUCT