

BONDERITE M-AC ZN POWDERED CONDITIONING AGENT (KNOWN AS FIXODINE ZN)

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1. Introduction:

BONDERITE M-AC ZN (known as FIXODINE ZN) is especially formulated to prepare iron, steel, aluminum, zinc and zinc-alloy surfaces for subsequent phosphate coating applications. These surfaces may be treated individually or in mixed production by either spray or immersion processing.

The titanium-containing conditioning pretreatment promotes the formation of a dense, fine grained phosphate coating which is preferred as a paint base for the automotive industry and which offers superior adhesion and durability in corrosive environments.

2. Operating Summary:

<u>Chemical:</u>	<u>Bath Preparation per 100 Gallons:</u>	
	<u>Spray:</u>	<u>Immersion:</u>
BONDERITE M-AC ZN (known as FIXODINE ZN)	0.85 pounds	1.7 pounds
Soda Ash (Bath will contain 10 ppm total titanium)	to pH 8.5 to 9.5	

<u>Operation and Control:</u>	<u>Spray:</u>	<u>Immersion:</u>
	Total Titanium	7 to 10 ppm
Filterable Titanium	3 to 5 ppm	5 to 10 ppm
pH	8.5 to 9.5	
Temperature	<120° Fahrenheit	
Time	20 seconds minimum	

3. The Process:

All metal to be treated with the conversion coating solution must be properly cleaned and properly conditioned before the treatment.

The complete process for surface preparation normally consists of the following steps:



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- A. Cleaning
- B. Water rinsing
- C. Treating with the BONDERITE M-AC ZN (known as FIXODINE ZN) solution

4. Materials:

BONDERITE M-AC ZN (known as FIXODINE ZN)

Soda Ash

Hach Pocket Photometer

5. Equipment:

The process tank, housing, pumps and piping for use with this solution may be constructed of mild steel. In spray applications, maintenance will be simplified if nozzles are fabricated from 300 series stainless steel. All process circulating pump seals, valve seats, door seals, and other elastomers which come in contact with the working process solution may be Buna-N, EPDM, FKM or PTFE. Note that while CSPE is compatible with the process solution, it is not compatible with acid equipment cleaners which may be used.

Automatic process control equipment, which promotes consistent quality and controlled costs, is available for automatically controlling this process. Auxiliary equipment, which is engineered and specified for this process, include air operated chemical transfer pumps, chemical metering pumps, reliable level controls, solenoid valve assemblies and bulk storage tanks. Chemixers are available in three sizes for preparing solutions of powdered products which then may be metered into the process at a controlled rate. All chemical pump seals, valve seats and other elastomers which come in contact with the concentrated solution can be Buna-N, EPDM, FKM, PTFE or CSPE.

Your local sales representative should be consulted for information on Parker Amchem automatic process control equipment for this process and any additional questions.

6. Surface Preparation:

Cleaning:

All metal to be treated with the conversion coating solution must be free from grease, oil and other foreign matter before the treatment. A complete line of cleaners is available and our representative will recommend the proper one for each installation.

Water Rinsing:

After cleaning, the metal must be thoroughly rinsed with water. The rinse should be warm, however the temperature should not exceed 120° Fahrenheit to avoid affecting the conditioning chemical. The rinse should be overflowed continuously at a rate which will keep it clean and free from scum and contamination.

7. Treating with the BONDERITE M-AC ZN (known as FIXODINE ZN) Processing Solution:

BONDERITE M-AC ZN (known as FIXODINE ZN), a conditioning pretreatment, must be added to the water rinse before the conversion coating treatment stage to obtain the proper coating crystal structure.



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Preparation of the Dispersion:

The proper preparation of the conditioner dispersion will improve both the consumption of chemicals and the effectiveness of the conditioning step. Undispersed material may precipitate and will be unavailable for conditioning. Any remaining particles may be deposited on horizontal surfaces and thus contribute to paint film roughness. The most efficient method of preparing the dispersion uses a correctly sized tank equipped with a mixer. The requisite amount of conditioning chemical should be added slowly to the needed water with stirring. Stirring should be continued until there are no particles visible in the dispersion. In order to achieve complete dispersion in a reasonable time, the temperature of the water should be at least 60° Fahrenheit but not greater than 120° Fahrenheit. A temperature of 80° Fahrenheit is preferred.

Spray Application:

The preferred method for spray application is to meter a dispersion of BONDERITE M-AC ZN (known as FIXODINE ZN) into the final riser in the rinse stage before the conversion coating treatment solution. The nozzle arrangement in the final riser should provide coverage of all accessible metal surfaces.

The amount of BONDERITE M-AC ZN (known as FIXODINE ZN) in the dispersion should provide 7 to 10 ppm of total titanium and 3 to 5 ppm of filterable titanium in the solution from the final riser. Since the conditioning chemical loses its effectiveness with aging, the dispersion should be made up fresh each day in a stirred day tank. The method for control of the BONDERITE M-AC ZN (known as FIXODINE ZN) Chemical level is explained in the instructions for the use of the titanium test kit.

An alternate method of application is to meter a dispersion of BONDERITE M-AC ZN (known as FIXODINE ZN) into the main header of the rinse section preceding the conversion coating treatment solution section. It will be necessary to make a daily addition of predispersed BONDERITE M-AC ZN (known as FIXODINE ZN) directly to the rinse tank to provide an initial total titanium concentration in the rinse solution of 5 to 7 ppm (2 to 3 ppm filterable).

The metering rate should provide enough titanium to allow the solution measured at a riser to provide 7 to 10 ppm of total titanium. A starting metering rate which will provide one pound per hour of BONDERITE M-AC ZN (known as FIXODINE ZN) is suggested.

These concentrations are starting recommendations which have been shown to give maximum conditioning results as seen in the crystal size of the resulting coatings and our representative should be consulted for optimization of the parameters.

Immersion Application:

For immersion application, the conditioning bath is prepared by the addition of the pre-dispersed BONDERITE M-AC ZN (known as FIXODINE ZN) to obtain a total titanium level of 15 to 20 ppm and a filterable titanium level of 5 to 10 ppm. Agitation of an immersion bath is required to prevent settling of the bath. Since the conditioning bath becomes less effective with aging, the working solution must be replenished. A suggested regimen would be to add a concentrated dispersion from a day tank at such a rate that the BONDERITE M-AC ZN (known as FIXODINE ZN) in the bath is turned over in a 5 day period. This will require that the bath tank itself have an overflow rate such that the tank volume remain essentially the same.

In general, once the BONDERITE M-AC ZN (known as FIXODINE ZN) concentration, rinse overflow rate and dump schedule have been established for optimum conditioning, they should be maintained for consistent results. Changes in production rate or metal mix may require re-evaluation of the operating conditions.



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Operation:

The cleaned metal is treated with the conditioning pretreatment bath immediately before the conversion coating treatment solution. Either spray or immersion application may be used. pH of the conditioning pretreatment bath must be maintained between 8.5 and 9.5.

Time: 20 seconds minimum.

Temperature: <120° Fahrenheit.

8. Testing and Control:

The titanium concentration in the conditioning bath is best maintained using the pocket photometer instructions below. Customers still using the discontinued Henkel Conditioner Test Kit IDH#: 592454 (Color Wheel) should follow the instructions found at the end of this section.

Preparation of Reagent Solution 140:

Prior to use, add exactly 45 milliliters (ml) of Reagent Solution 46 (using supplied graduate) to the quart bottle containing 900 ml of Reagent Solution 140A; mild gassing may occur. Attach the vented cap and mix thoroughly. Discard the shipping cap and attach the supplied label (Reagent Solution 140) over the original label.

Procedure - Total Titanium by pocket photometer:

1. Agitate the bath sample to suspend all particles.
2. Using a 25 ml graduated cylinder, add 25 ml of bath sample to a 150 ml beaker.
3. Using a 10 ml graduated cylinder, add 5 ml of Reagent Solution 140 to the bath sample in the beaker.
4. Swirl the mixture, if titanium is present, a yellow color will develop.
5. Fill a sample cell with water. The solution level should completely fill the lower rectangle of the cell.
6. Turn on the pocket photometer. Place the water cell in the sample holder with its tab facing the user and cover it with the light-shielding cover.
7. Press the Zero button on the photometer to record the zero point.
8. Fill the other sample cell with the yellow mixture from step 4. The solution level should completely fill the lower rectangle of the cell.
9. Place this cell into the sample holder on the photometer with its tab facing the user and cover it with the light-shielding cover.
10. Press the Read button on the photometer to obtain a measurement.
11. Record the Absorbance number obtained. To obtain the Total Titanium in PPM, divide the Absorbance number by 0.0179.

Procedure - Filterable Titanium by pocket photometer:

1. Agitate the bath sample to suspend all particles.
 2. Filter the bath sample through Whatman No. 42 Filter Paper or the equivalent. Use gravity filtration.
 3. Using a 25 ml graduated cylinder, add 25 ml of filtrate to a 150 ml beaker. The filtrate is the portion of bath sample which passed through the filter paper.
 4. Using a 10 ml graduated cylinder, add 5 ml of Reagent Solution 140 to the filtrate.
 5. Swirl the mixture, if titanium is present, a yellow color will develop.
 6. Fill a sample cell with water. The solution level should completely fill the lower rectangle of the cell.
 7. Turn on the pocket photometer. Place the water cell in the sample holder with its tab facing the user and cover it with the light-shielding cover.
 8. Press the Zero button on the photometer to record the zero point.
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9. Fill the other sample cell with the yellow mixture from step 5. The solution level should completely fill the lower rectangle of the cell.
10. Place this cell into the sample holder on the photometer with its tab facing the user and cover it with the light-shielding cover.
11. Press the Read button on the photometer to obtain a measurement.
12. Record the Absorbance number obtained. To obtain the Filterable Titanium in PPM, divide the Absorbance number by 0.0179.

Additional Notes:

1. Clean and dry the sample cells after each sample for best results.
2. This test method tolerates some turbidity. If the sample remains excessively cloudy after the Reagent Solution 140 is added, your Henkel representative should be notified.

Procedure - Total Titanium by (Color Wheel):

1. Insert the titanium disc into the comparator box.
2. Agitate the bath sample to suspend all particles.
3. Using a 25 ml graduated cylinder, add 25 ml of bath sample to a 150 ml beaker.
4. Using a 10 ml graduated cylinder, add 5 ml of Reagent Solution 140 to the bath sample in the beaker.
5. Swirl the mixture, if titanium is present, a yellow color will develop.
6. Place the mixture into one of the viewing tubes provided with the titanium disc. The solution level should be at or above the mark on the tube.
7. Fill a second viewing tube with water. The solution level should be at or above the mark on the tube.
8. Insert the two viewing tubes into the comparator box. The tube containing the titanium solution should be placed in the hole closer to the center of the box.
9. Hold the comparator box in front of a white background and view the two solutions through the windows in the side of the box. The box should be several inches from the white background so that the windows receive equal lighting with a minimum of shadowing.
10. Rotate the color disc until the colors seen through the windows match as closely as possible.
11. Record the number found in the window which is located below the solution windows. The number represents parts per million (PPM) total titanium in the conditioner bath.

Procedure - Filterable Titanium by (Color Wheel):

1. Insert the titanium disc into the comparator box.
2. Agitate the bath sample to suspend all particles.
3. Filter the bath sample through Whatman No. 42 Filter Paper or the equivalent. Use gravity filtration.
4. Using a 25 ml graduated cylinder, add 25 ml of filtrate to a 150 ml beaker. The filtrate is the portion of bath sample which passed through the filter paper.
5. Using a 10 ml graduated cylinder, add 5 ml of Reagent Solution 140 to the filtrate.
6. Swirl the mixture, if titanium is present, a yellow color will develop.
7. Place the mixture into the viewing tubes provided with the titanium disc. The solution level should be at or above the mark on the tube.
8. Fill the second viewing tube with water. The solution level should be at or above the mark on the tube.
9. Insert the two viewing tubes into the comparator box. The tube containing the titanium solution should be placed in the hole closer to the center of the box.



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10. Hold the comparator box in front of a white background and view the two solutions through the windows in the side of the box. The box should be several inches from the white background so that the windows receive equal lighting with a minimum of shadowing.
11. Rotate the color disc until the colors seen through the windows match as closely as possible.
12. Record the number found in the window which is located below the solution windows. The number represents parts per million (PPM) filterable titanium in the conditioner bath.

Notes:

1. The titanium color disc will fade if exposed to direct sunlight for long periods of time. When not in use, the disc should be stored in the comparator box or in the opaque plastic bag provided with the Comparator Test Kit.
2. This test method tolerates some turbidity. If the sample remains excessively cloudy after the Reagent Solution 140 is added, Henkel Surface Technologies representative should be notified.

9. After Treatment:

The surface is now ready for application of the conversion coating solution. No further surface preparation treatment is needed.

10. Storage Requirements:

BONDERITE M-AC ZN (known as FIXODINE ZN) is a powdered product and does not require special protection in cold weather or special storage conditions.

11. Waste Disposal Information:

Applicable regulations covering disposal and discharge of chemicals should be consulted and followed.

Disposal information for the chemical in the form as supplied, is given on the Material Safety Data Sheet.

The pretreatment bath is slightly alkaline and contains phosphate and heavy metal based on the chemicals as supplied. Waste treatment and neutralization may be required prior to discharge to the sewer. (Refer to Waste Treatment Information Bulletin WT1002, available on request.)

The pretreatment bath can contain ingredients other than those present in the chemical as supplied and analysis of the solution may be required prior to disposal.

12. Precautionary Information:

When handling the chemicals in the form as supplied, the precautionary, first aid and handling recommendations on the Material Safety Data Sheet for the product should be read, understood and followed.

The pretreatment bath is slightly alkaline and can cause mild irritation of the skin and eyes. Do not get in eyes, on skin or on clothing. In case of contact, follow the recommendations on the Material Safety Data Sheet for BONDERITE M-AC ZN (known as FIXODINE ZN).



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Testing Reagents and Apparatus
(Order only those items which are not already on hand)

<u>Code</u>	<u>Quantity</u>	<u>Item</u>
Hach #5870042 ..	1	Pocket Photometer, 420 nm
Hach #4864302 ..	2	Sample Cell, Plastic, 1 cm pathlength
***	1	Filter Paper, Whatman No. 42 or equiv. (VWR #28480-106 recommended)
***	1	Plastic Funnel, 65 mm (VWR #414004-269 recommended)
***	1	Graduated Cylinder, 25 ml (VWR #65000-002 recommended)
***	1	Graduated Cylinder, 10 ml (VWR #65000-000 recommended)
***	2	Beaker, 150 ml (VWR #89000-202 recommended)
592418	1 L	Reagent Solution 140A
592436	500 ml	Reagent Solution 46

*** Order these items from any standard laboratory supply company.

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