AQUABOND
Chemistry for Tomorrow

Summary Technical Data Sheet

Green Bond ™ Seal

Chrome-Free Rinse

Product Name:	**Green Bond ™ Seal**
Appearance:	Clear colorless liquid
Solubility:	Miscible with water
Specific Gravity:	1.0 - 1.1
pH	1.0 -2.0

Green Bond ™ Seal is a concentrated liquid rinse that is diluted with water and used as a final rinse after phosphate treatment with zinc phosphates or iron phosphates. Green Bond ™ Seal contains no chromium in any form. Green Bond ™ Seal is specially formulated with Zirconium-based active agents that provide enhanced corrosion protection and adhesion to steel, zinc, and aluminum.

GREEN BOND ™ SEAL FEATURES AND BENEFITS:

- ✓ Chrome free
- ✓ Effective for phosphate steel, aluminum, zinc, and zinc alloys
- ✓ Enhances corrosion protection and adhesion
- ✓ Environmentally satisfactory
- ✓ Reduces waste treatment and disposal expenses

The above information, while not guaranteed, reflects our analysis and believed to be accurate. It is the end user's responsibility, prior to use of the above mentioned product to determine the suitability of the product. Aqua Bond shall not be, directly or indirectly responsible for damages of any nature whatsoever resulting from the use or reliance upon the above information.
Revised 2020/01/06

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RECOMMENDED INSTRUCTIONS FOR USE:

Application Type	• Immersion • Spray
Concentration:	1.0% by volume
Temperature:	Ambient
Time:	30 – 60 seconds
pH of rinse solution:	4.2 – 4.8

Green Bond ™ Seal should be diluted to 1.0% by volume with water, deionized water is preferred.

For best performance, it is recommended that Green Bond ™ Seal bath should be disposed of and replenished every week.

BATH PREPARATION

- Fill the tank with 75% of water, preferably Deionized water.
- Add 1% of Green Bond ™ Seal relative to the total volume of the liquid. For example, use 10 gallons of Green Bond ™ Seal for 1000 gallons of total volume of liquid in the tank.
- Mix the Green Bond ™ Seal and water thoroughly. Bring the liquid level close to the working level.
- Measure the pH and add a buffer while mixing to reach pH in the operating range (pH= 4.2 – 4.8).

ANALYSIS PROCEDURES:

Analysis of Green Bond ™ Seal Concentration using Colorimeter:

Equipment:

- Colorimeter (ex. Hach DR890 colorimeter),
- Colorimeter vials,
- Eppendorf adjustable pipette or Volumetric 250 mL Flask and 5 mL pipettes with bulb.

Reagents:

• Arsenazo III Dye

• 1:1 Hydrochloric Acid/Water (6.0 Normal Hydrochloric Acid)

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Procedure:

1. Turn on the colorimeter and select the appropriate test method, such as Program 105 on the Hach DR 890.

2. Add 5.0 ml of Arsenazo III Dye to the vial and dilute up to the 25 ml mark with 1:1

Hydrochloric Acid/Water reagent and mix thoroughly. Insert the vial into the colorimeter.

Press the ZERO key to zero out the instrument.

3. Make a test sample by adding 10 ml of the bath of Green Bond™ Seal to a beaker or cup.

4. Add 40 ml of water (preferably distilled or purified water) to a final volume of 50ml and mix.

5. Add 0.5ml of this test sample to the cuvette.

6. Press the TIMER key and press 1, 0, 0 to set the timer for one minute.

7. Press ENTER to start the timer. Cap the vial, invert it several times. Place it in the colorimeter and cover with the light shield.

8. When the timer reaches zero, the colorimeter will beep and the display will change to READ icon. Press the READ key after the timer stops beeping. The display will show the concentration of Green Bond™ Seal.

Replenishment of Green Bond™ Seal Bath (Colorimeter method)

The optimum concentration is 140 ppm and the effective operating range is 110-170 ppm. Using the Colorimeter test method only, to raise the Green Bond™ Seal concentration by 10 ppm, add an additional 275 ml of Green Bond™ Seal concentrate for each 100 gallons of liquid volume.

Green Bond™ Seal Concentration Test by Fluoride Titration (Alternative)

Equipment:

- Ion Specific Electrode (ISE) meter
- Combination Fluoride probe
- Magnetic Stirrer and stir bars
- 50 ml. Graduated cylinder
- 2 ml pipette and pipette bulb

Reagents:

- 100 ppm Fluoride calibration standard
- 500 ppm Fluoride calibration standard
- 10% Sodium Citrate Buffer solution

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Procedure:

1. Calibrate the meter using 100 ppm and 500 ppm fluoride calibration standards.

The standards must be diluted with 50 ml of a 10% Sodium Citrate Buffer by pipetting 2 ml of the standard and mixing with 50 ml of 10% Sodium Citrate Buffer.

2. Prepare the Green Bond™ Seal sample by pipetting 2 ml of the bath and mixing with 50 ml of 10% Sodium Citrate Buffer.

3. Place the fluoride electrode into the diluted Green Bond™ Seal sample. The concentration of fluoride in the diluted Green Bond™ Seal will be displayed when the electrode stabilizes.

Replenishment (Fluoride Test Method)

The optimum concentration of Fluoride is 185 ppm, with a range of 140 - 230 ppm. Using the Fluoride test method only, to raise the concentration by 15 ppm, add in 300 ml of Green Bond™ Seal concentrate per 100 gallons of liquid volume.

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pH Measurement

Equipment:

• pH meter

• Beaker

Reagents:

• Standard Buffer Solution, pH 4.0

• Standard Buffer Solution, pH 7.0

Procedure

1. Follow the manufacturer's instructions for the operation of the pH meter.

2. Calibrate the pH meter with the pH 4.0 and pH 7.0 buffer solutions. Rinse the electrode with deionized water and dry with tissue.

3. Immerse the electrode into the beaker with the sample and read the pH on the meter.

4. Rinse the electrodes with deionized water.

pH of Green Bond™ Seal Rinse Bath

Optimum pH of the bath of **Green Bond™ Seal** should be maintained between pH = 4.2 – 4.8.

Reduce pH: If the bath pH is higher than 4.8 add **Green Bond™ Seal** to reduce pH.

Raise pH: If the pH of the bath is lower than 4.0, a buffer or Sodium Hydroxide may be used to raise the pH.

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