CHROMIUM-FREE ORGANIC PASSIVATING RINSE

PRODUCT DESCRIPTION

CHEMSEAL 100 is a chromium-free organic passivating rinse. It is formulated to provide improved adhesion and corrosion protection when applied to metal treated with iron or zinc phosphates.

TECHNICAL PROPERTIES

Composition:	Liquid
Appearance:	Clear, Colorless to Pale Yellow
Recommended Concentrations:	1% by volume
Recommended Temperatures:	Ambient to 140^0F

PRODUCT ADVANTAGES

- Environmentally compliant
- No toxic metals
- Ambient temperature operation
- Long bath life
- Promotes adhesion
- Enhances corrosion protection
- Apply by spray or immersion

USE & CONTROL INSTRUCTIONS:

Operating Properties (Typical):

Operating Concentration:	1.0% by volume
Operating Temperature:	Ambient-140^{0}F
Operating Time:	30 - 120 Seconds - Immersion
	30 Seconds – Spray

Charge Instructions:

Fill the tank ¾ full with deionized water (Fresh water may be used but the efficacy of **CHEMSEAL 100** may be reduced.). For each 1000 gallons of working volume, add 10 gallons of **CHEMSEAL 100,** and then mix thoroughly. Bring the solution level close to the working level, and check the pH. While mixing, add CHEMFIL BUFFER to bring the pH within the operating range of 4.0 – 4.8. The amount of CHEMFIL BUFFER necessary for pH adjustments will vary for each installation due to water hardness and pH.
CHEMSEAL 100 may foam when it is first charged. If foam is encountered, add 100 ml. of FOAM DEPRESSOR 100 for every 100 gallons of tank volume.
The bath is normally operated at ambient temperature, but can be used heated up to 140^{0}F if necessary to aid in part drying.

ANALYSIS PROCEDURES: (Use either 1A or 1B *and* 2)

(1A) CHEMSEAL 100 Concentration Analysis by Colorimeter test method:

CAUTION: DO NOT PIPETTE BY MOUTH!

Equipment:

- Hach DR890 colorimeter
- 25 ml Hach vial
- Adjustable Eppendorf pipette with pipette tips **-OR-**
- 250 Volumetric Flask with stopper
- 5 ml pipettes with bulb
- several disposable pipettes

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PRETREATMENT TECHNICAL DATA SHEET

Reagents:

- Arsenazo Dye III
- 1:1 Hydrochloric Acid/water (6.0 Normal Hydrochloric Acid)

Procedure:

1. Turn on the colorimeter with the EXIT key.
2. The method is Program 105 on the Hach DR 890. To access it, press PRGM, then 105, followed by ENTER.
3. Add 5.0 ml of Arsenazo Dye III to the vial and dilute to the 25 ml. mark with 1:1 Hydrochloric Acid/Water reagent (carefully). Cap the vial, invert it a few times, and place it into the colorimeter with the diamond on the vial facing the keypad. Use the instrument cover as a light shield. Press the ZERO key to zero out the instrument.
4. Prepare a dilution of the sample by adding 10ml of the bath to a small clean beaker or cup.
5. Add 40 ml of water (DI or RO water preferred) to a final volume of 50ml. Swirl the beaker gently to mix for a few seconds
6. Add 0.5ml (½ ml) of this diluted sample to the cuvette.
7. Press the TIMER key and press 1, 0, and 0 in succession. This will set the timer for one minute.
8. Press ENTER to start the timer. Cap the vial, invert it a few times, and replace it in the colorimeter with the diamond facing the keypad. Replace the light shield.
9. When the timer reaches zero, the colorimeter will beep a few times and the display will change to one that shows the READ icon. Press the READ key after the timer stops beeping. The concentration of CHEMSEAL 100 will be displayed.

Replenishment (for Colorimeter method):

The optimum concentration is 150 ppm, with a range of 120-180 ppm. For the Colorimeter test method only, to raise the CHEMSEAL 100 concentration by 10 ppm, add 250 ml. of CHEMSEAL 100 concentrate per 100 gallons of solution volume.

Replenishment chart for Colorimeter test method

CHEMSEAL 100 Concentration (ppm)	CHEMSEAL 100 Addition in ml. / 100 gallons
180	0
170	0
160	0
150	0
140	250
130	500
120	750
110	1000
100	1250

(1B) Alternate CHEMSEAL 100 Concentration Analysis by Fluoride probes:

Equipment needed:

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

Reagents needed

- 100 ppm Fluoride calibration standard (prediluted with Sodium citrate buffer) REAGENTS INC Part number F-1360-500mL
- 500 ppm Fluoride calibration standard (prediluted with Sodium citrate buffer) REAGENTS INC Part number F-1362-500mL
- 10% Sodium Citrate Buffer solution from REAGENTS INC Part number LS-SODCITB-1

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PRETREATMENT TECHNICAL DATA SHEET

CAUTION: DO NOT PIPETTE BY MOUTH!

Procedure:

1. Calibrate the meter using the 100 ppm and 500 ppm fluoride calibration standards. These standards should be used fresh and should be kept in their original sealed bottles until used. (Note: When using the recommended Prediluted Reagents Inc buffers they should be used directly from their bottles).

   IF AND ONLY IF USING ANOTHER BRAND OF FLUORIDE STANDARD THE STANDARDS MUST BE DILUTED WITH 50 ML OF A 10% SODIUM CITRATE BUFFER USING THE SAME METHODOLOGY AS THE SAMPLE IN #2 BELOW BEFORE USING. PLEASE CALL YOUR PPG REPRESENTATIVE IF YOU HAVE QUESTIONS ABOUT THIS.

2. Prepare the **CHEMSEAL 100** sample by pipette. Use 2 ml. of the bath and mixing with 50 ml. of Citrate Buffer.

3. Place the fluoride electrode into the diluted **CHEMSEAL 100** solution. When the electrode is stable, the concentration of fluoride in the diluted **CHEMSEAL 100** will be displayed.

NOTE: Ensure that the sample temperature and calibration standards are within 2^{o}F of each other. Also ensure that the stirring speed is the same for samples and calibration standards.

Replenishment (for Fluoride probe test method):

The optimum concentration is 210 ppm, with a range of 165-255 ppm. **For the Fluoride probe test method only,** to raise the concentration 15 ppm, add 275 ml. of **CHEMSEAL 100** concentrate per 100 gallons of solution volume.

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PRETREATMENT TECHNICAL DATA SHEET

Replenishment Chart for Fluoride probe test method

CHEMSEAL 100 **Concentration** **(ppm)**	**CHEMSEAL 100** Addition in ml. / 100 gallons
255	0
240	0
225	0
210	0
195	275
180	550
165	825
150	1100
135	1375

(2) pH Determination

Equipment:

- pH meter with combination electrode
- 250 ml beaker

Reagents:

- Certified Buffer Solution, pH 4.0
- Certified Buffer Solution, pH 7.0

NOTE: Never pour reagents back into original container—Dispose of them after each use or maintain separate containers and change weekly. Observe expiration dates on buffer containers.

Procedure:

1. Follow the manufacturer's instructions for operating the pH meter.
   NOTE: PPG recommends that the slope of the efficiency range on the pH meter be within the range established by the manufacturer.
   NOTE: It is recommended to run all pH readings with samples and buffers at 77^0F (25^0C).
2. Standardize the instrument with the pH 7.0 and pH 4.0 buffer solutions.
3. Rinse the electrode(s) with distilled or deionized water and blot dry with absorbent tissue.
4. Immerse the electrode(s) into the beaker containing the sample and read the pH on the meter. No calculation is necessary.
5. Rinse the electrodes thoroughly with deionized water first to remove the majority of the sample.

NOTE: The electrodes must always be placed in pH 4.0 buffer solution when not in use.

BATH pH	CHEMFIL BUFFER Addition / 100 Gallons
4.3-4.8	0 ml.
4.0-4.2	9 ml.
3.7-3.9	28 ml.
3.5-3.6	47 ml.
3.3-3.4	85 ml.
3.1-3.2	110 ml.
2.9-3.0	160 ml.
Less then 2.9	add 220 ml. and then recheck

The pH of the bath should be maintained between 4.0 – 4.8.

Reduce pH

If the bath pH is higher than 4.8 add **CHEMSEAL 100** to reduce pH.

Raise pH

If the pH of the bath is lower than 4.0, CHEMFIL BUFFER may be used to raise the pH.

NOTES:

1. The pH of the **CHEMSEAL 100** baths may drift downward in some installations. The pH can be adjusted with CHEMFIL BUFFER as described above. The pH should not rise above the recommended range if the appropriate concentration range is maintained.
2. In the event that the concentration level is correct and no additional product add is warranted, but the pH is high, use CHEMSEAL pH CONTROLLER 150 to drop the pH without increasing concentration level.
3. CHEMSEAL pH CONTROLLER 150 should only be used to adjust pH after determining that the concentration levels in the CHEMSEAL 100 are at the appropriate concentrations and the pH of the CHEMSEAL 100 is above the recommended operating range.

   To lower the pH by 0.1-pH unit, add 500 ml. of CHEMSEAL pH CONTROLLER 150 per 1000 gallons of operating solution.

Equipment:

All tanks and equipment for the **CHEMSEAL 100** stage, may be constructed of mild steel. However, for prolonged life, 304 stainless steel is recommended.

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