

**PRETREATMENT TECHNICAL DATA SHEET****CHROMIUM-FREE  
ORGANIC PASSIVATING RINSE****PRODUCT DESCRIPTION**

**CHEMSEAL 19** is a chromium-free 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 Green
Recommended Concentrations:	0.75 % by volume
Recommended Temperatures:	Ambient – 150 <sup>0</sup> F

**PRODUCT ADVANTAGES**

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

## PRETREATMENT TECHNICAL DATA SHEET

### USE & CONTROL INSTRUCTIONS:

#### Operating Properties (Typical):

Operating Concentration:	0.75 % by volume (when used with a Final water rinse)
	0.40% by volume (when used without a Final water rinse)
Operating pH:	4.0-4.8
Operating Temperature:	Ambient - 150°F
Operating Time:	30 - 120 Seconds - Immersion
	30 Seconds – Spray

#### Charge Instructions:

Fill the tank  $\frac{3}{4}$  full with deionized water (Fresh water may be used but the efficacy of **CHEMSEAL 19** may be reduced.). When using a Final water rinse, for each 1000 gallons of working volume, add 7.5 gallons of **CHEMSEAL 19**, and then mix thoroughly. (When not using a Final water rinse, for each 1000 gallons of working volume, add 4 gallons of **CHEMSEAL 19**, and 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.

The bath is normally operated at ambient temperature, but can be heated up to 150°F if necessary to aid in part drying.

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

##### (1A) CHEMSEAL 19 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

# CHEMSEAL 19

## PRETREATMENT TECHNICAL DATA SHEET

### Reagents:

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

### Replenishment chart for Colorimeter test method

<b>CHEMSEAL 19</b> (With Final Water Rinse) Concentration (ppm)	<b>CHEMSEAL 19</b> (Without Final Water Rinse) Concentration (ppm)	<b>CHEMSEAL 19</b> Addition in ml. / 100 gallons
180	110	0
170	100	0
160	90	0
150	80	0
140	70	200
130	60	400
120	50	600
110	40	800
100	30	1000

### (1B) Alternate CHEMSEAL 19 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

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### Reagents needed:

- 100 ppm Fluoride calibration standard
- 500 ppm Fluoride calibration standard
- Citrate Buffer solution

### Procedure:

#### CAUTION: DO NOT PIPETTE BY MOUTH!

- Standardize the meter using the 100 ppm and 500 ppm fluoride calibration standards. These standards should be fresh each week and should be kept in sealed jars during that week.

### 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**. Press **ABS%T**.
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. Using the Eppendorf pipette, add 100 micro liters of the bath to the vial. Avoid air bubbles. Do not let the pipette touch the sides of the vial.
5. Press the **TIMER** key and press **1, 0, and 0** in succession. This will set the timer for one minute.
6. 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.
7. 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 19** will be displayed.

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**Note:** An alternate method to using the Eppendorf pipette would be to prepare a dilution of the **CHEMSEAL 19** bath. Prepare the dilution by pipetting a 5 ml. bath sample into a 250 ml. volumetric flask and filling to the line with Deionized or Reverse Osmosis water. Eliminate step 4 above and pipette a 5 ml. sample out of the 250 ml. volumetric flask and add it to the vial. This will equal 100 micro liters of undiluted bath. Follow steps 5-7 to complete the analysis.

### Replenishment (for Colorimeter method):

1. When using a Final water rinse, the optimum concentration is 150 ppm, with a range of 120-180 ppm. When used without a Final water rinse, the optimum concentration is 80 ppm with a range of 60-100 ppm. **For the Colorimeter test method only**, to raise the **CHEMSEAL 19** concentration by 10 ppm, add 200 ml. of **CHEMSEAL 19** concentrate per 100 gallons of solution volume.
2. Prepare the **CHEMSEAL 19** sample by pipetting 2 ml. of the bath and mixing with 50 ml. of Citrate Buffer.
3. Place the fluoride electrode into the diluted **CHEMSEAL 19** solution. When the electrode is stable, the concentration of fluoride in the diluted **CHEMSEAL 19** will be displayed.

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

### Replenishment (for Fluoride probe test method):

When using a Final water rinse, the optimum concentration is 205 ppm, with a range of 160-250 ppm. When used without a Final water rinse, the optimum concentration is 110 ppm, with a range of 80-140 ppm. **For the Fluoride probe test method only**, to raise the concentration 15 ppm, add 225 ml. of **CHEMSEAL 19** concentrate per 100 gallons of solution volume.

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Replenishment Chart for Fluoride probe test method

<b>CHEMSEAL 19</b> (With Final water rinse) Concentration (ppm)	<b>CHEMSEAL 19</b> (Without final water rinse) Concentration (ppm)	<b>CHEMSEAL 19</b> Addition in ml. / 100 gallons
250	155	0
235	140	0
220	125	0
205	110	0
190	95	225
175	80	550
160	65	825
145	50	1050
130	35	1275

### (2) pH Determination

#### Equipment:

- pH meter with combination electrode
- 250 ml beaker

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### 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°F (25°C).

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

4.3 - 4.8  
4.0 - 4.2  
3.7 - 3.9  
3.5 - 3.6  
3.3 - 3.4  
3.1 - 3.2  
2.9 - 3.0  
Less than 2.9

### CHEMFIL BUFFER Addition / 100 Gallons

0 ml.  
10 ml.  
25 ml.  
50 ml.  
85 ml.  
140 ml.  
200 ml.  
add 240 ml. and then recheck

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

## PRETREATMENT TECHNICAL DATA SHEET

### Reduce pH

If the bath pH is higher than 4.8 add **CHEMSEAL 19** 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 19** 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 19** are at the appropriate concentrations and the pH of the **CHEMSEAL 19** 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 19** stage, may be constructed of mild steel. However, for prolonged life, 304 stainless steel is recommended.

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### TECHNICAL DATA SHEET DISCLAIMER—INDUSTRIAL COATINGS:

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