

**PRETREATMENT TECHNICAL DATA SHEET****A CHROME-FREE
FINAL RINSE****PRODUCT DESCRIPTION**

CHEMSEAL 59 is a chromium-free concentrate for use as a final rinse after phosphate with CHEMFOS® iron or zinc phosphates.

TECHNICAL PROPERTIES

Composition:	Liquid
Appearance:	Clear, Colorless to Pale Yellow
Recommended Concentrations:	1.0% by volume
Recommended Temperatures:	Ambient

PRODUCT ADVANTAGES

- Formulated to provide improved adhesion and added corrosion protection
- Automotive approved
- Environmentally acceptable
- Minimizes waste disposal costs
- Can be used safely on phosphate steel, zinc, zinc alloys and aluminum.

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USE & CONTROL INSTRUCTIONS:

Operating Properties (Typical):

Application:	Spray, Immersion
Operating Temperature:	Ambient
Operating Time:	30-60 seconds
Operating pH:	4.2-4.8
Operating concentration:	1% volume

Specific process conditions may warrant operating the above parameters outside of the typical ranges. Please consult your PPG representative.

It is recommended that the CHEMSEAL 59 bath be dumped on a weekly basis.

Bath Preparation

Fill the tank 3/4 full with fresh water (Deionized water is preferred). For each 1000 gallons of working volume, add 10 gallons of CHEMSEAL 59 and then mix thoroughly. Bring the solution level close to the working level, check the pH and add enough CHEMFIL BUFFER while mixing to bring the pH within the operating range. The amount of CHEMFIL BUFFER necessary for pH adjustment will vary for each installation due to water hardness and pH.

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

(1A) CHEMSEAL 59 Concentration Analysis by Colorimeter test method:

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

Reagents:

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

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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 **CHEMSEAL 59** 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 ($\frac{1}{2}$ 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 59** will be displayed.

Replenishment (for Colorimeter method):

The optimum concentration is 140 ppm, with a range of 110-170 ppm. For the Colorimeter test method only, to raise the CHEMSEAL 59 concentration by 10 ppm, add 275 ml. of CHEMSEAL 59 concentrate per 100 gallons of solution volume.

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Replenishment chart for Colorimeter test method

CHEMSEAL 59 Concentration (ppm)	CHEMSEAL 59 Addition in ml. / 100 gallons
170	0
160	0
150	0
140	0
130	275
120	550
110	825
100	1100
90	1375

(1B) Alternate CHEMSEAL 59 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 (Preferred source: Reagents Incorporated (800-732-8484):

- 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

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 59** 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 59** solution. When the electrode is stable, the concentration of fluoride in the diluted **CHEMSEAL 59** 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):

The optimum concentration is 185 ppm, with a range of 140-230 ppm. **For the Fluoride probe test method only**, to raise the concentration 15 ppm, add 300 ml. of **CHEMSEAL 59** concentrate per 100 gallons of solution volume.

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Replenishment Chart for Fluoride probe test method

CHEMSEAL 59 Concentration (ppm)	CHEMSEAL 59 Addition in ml. / 100 gallons
230	0
215	0
200	0
185	0
170	300
155	600
140	900
125	1200
110	1500

(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.

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Procedure

1. Follow the manufacturer's instructions for operating the pH meter.
2. NOTE: PPG recommends that the slope of the efficiency range on the pH meter be within the range established by the manufacturer.
3. NOTE: It is recommended to run all pH readings with samples and buffers at 77°F (25°C).
4. Standardize the instrument with the pH 7.0 and pH 4.0 buffer solutions.
5. Rinse the electrode(s) with distilled or deionized water and blot dry with absorbent tissue.
6. Immerse the electrode(s) into the beaker containing the sample and read the pH on the meter. No calculation is necessary.
7. 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.

<u>BATH pH</u>	<u>CHEMFIL BUFFER</u> <u>Addition / 100 gallons</u>
4.2 - 4.8	0 ml
4.0 - 4.2	10 ml
3.7 - 3.9	35 ml
3.5 - 3.6	75 ml
3.3 - 3.4	100ml
3.1 - 3.2	150 ml
2.9 - 3.0	200 ml
Less than 2.9	add 225 ml and then recheck

The pH of the bath should be maintained between 4.2 – 4.8.

Reduce pH

If the bath pH is higher than 4.8 add **CHEMSEAL 59** 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.

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NOTES:

1. The pH of the **CHEMSEAL 59** 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 fluoride range is maintained.
2. In the event that the fluoride 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 fluoride level.
3. CHEMSEAL pH CONTROLLER 150 should only be used to adjust pH after determining that the fluoride levels in the **CHEMSEAL 59** are at the appropriate concentrations and the pH of the **CHEMSEAL 59** is above the recommended operating range.
4. To lower the pH by 0.1-pH unit, add 500 ml. of CHEMSEAL pH CONTROLLER 150 per 1000 gallons of operating solution.

Equipment:

While existing mild steel equipment should be acceptable for use with **CHEMSEAL 59**

Stainless or lined equipment is preferred.

New construction should be stainless, lined or other corrosive-resistant material.

TECHNICAL DATA SHEET DISCLAIMER—INDUSTRIAL COATINGS:

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