



## IRON PHOSPHATE CONVERSION COATING

### PRODUCT DESCRIPTION



### PRODUCT ADVANTAGES

**CHEMFOS® 51** is a concentrated liquid material that imparts to the steel surface a complex iron phosphate coating, which provides improved paint adhesion and excellent corrosion resistance. Use of **CHEMFOS® 51** offers simplicity of operation when used in spray phosphating equipment and is recommended for applications where extra detergency is required.

**CHEMFOS® 51** is a dual action chemical process, which can be used to simultaneously clean, and phosphate steel surfaces prior to painting.

### TECHNICAL PROPERTIES



Composition:	Liquid
Appearance:	Clear Yellow
Odor:	Slight
Specific Gravity:	1.01
Pound per Gallon:	8.43
Flash Point:	N/A
Foaming Tendency:	Yes-below 120 <sup>0</sup> F
Recommended Diluent:	Water
Behavior in Hard Water:	Good
Rinsability:	Good
Biodegradable Surfactants:	None
Recommended Concentration:	3% by volume
Recommended Temperatures:	140 <sup>0</sup> F – 150 <sup>0</sup> F
pH (concentrate):	1.5
pH (working solution):	4.5-5.8
Viscosity:	8 CPS
Stability:	Moderate 2-3 months – Rotate stock

## USE & CONTROL INSTRUCTIONS:

### THREE STAGE SPRAY APPLICATION:

- Stage #1     **CHEMFOS® 51** - 3% by volume  
Acid consumed or pH control 0.0-0.5 points  
140°F - 150°F for one minute  
Total Acid range 2.9-7.5 points
- Stage #2     Water rinse overflowing, room temperature to 130°F for 30 seconds.
- Stage #3     Water rinse or CHEMSEAL rinse (the proper CHEMSEAL product will be recommended by your PPG representative).

**Note:** If the spray equipment consists of four or more stages, your PPG representative will recommend the most advantageous way to utilize those facilities.

When extra cleaning ability is required; it is recommended that CHEMKLEEN ADDITIVE A-140 be added to the **CHEMFOS® 51** stages. Add 0.5 gallon (4.3#) of CHEMKLEEN ADDITIVE A-140 per 100 gallons of **CHEMFOS® 51** solution. Only add the CHEMKLEEN ADDITIVE A-140 when extra cleaning ability is required; do not add the CHEMKLEEN ADDITIVE A-140 instead of **CHEMFOS® 51** for normal replenishment purposes.

### MAKE-UP

Fill the processing tank approximately 3/4 full with water. Bring the solution to the operating temperature, around 145°F. With the circulating pump in operation, add the required amount of **CHEMFOS® 51** to charge the bath to a concentration of 3% by volume. (Approximately 3 gallons of **CHEMFOS® 51** per 100 gallons of water). Add sufficient water to bring the solution up to the proper operating level.

## USE & CONTROL INSTRUCTIONS: (continued)

### CONTROL PROCEDURES

#### Total Acid (TA)

1. Using a 10-mL pipette, transfer a 10-mL sample of the **CHEMFOS® 51** solution to a clean 150-mL beaker.
2. Add 4 to 5 drops of INDICATOR #5 (Phenolphthalein).
3. Titrate with TEST SOLUTION #3 (0.1N NaOH) using a 10 mL Automatic Burette, stirring continuously, until a pink color appears.
4. The number of mL of TEST SOLUTION #3 required is the Total Acid in points of the **CHEMFOS® 51** bath. The relationship between Total Acid and concentration is as follows:

2.9 mL = 1.5% CHEMFOS® 51

5.8 mL = 3.0% CHEMFOS® 51

7.5 mL = 4.0% CHEMFOS® 51

The recommended range for Total Acid is 2.9-7.5 points.

The TA level is best controlled by the continuous addition of **CHEMFOS® 51** concentrate by using a metering pump rather than by infrequent additions of large amounts of chemical.

### pH CONTROL:

After the bath has been adjusted to yield a TA of 2.9-7.5 points pH control measurements can be made by the following methods.

## USE & CONTROL INSTRUCTIONS: (continued)

### pH Control by Titration (preferred method)

1. Pipette a 10 mL sample of **CHEMFOS® 51** solution into a clean, 150 mL beaker, add 4 drops of INDICATOR #2 (Brom Cresol Green), then titrate with TEST SOLUTION #4 (0.1N H<sub>2</sub>SO<sub>4</sub>). A color change from blue to green indicates the end point. The number of mL of TEST SOLUTION #4 required is known as the pH Control in points for the **CHEMFOS® 51** baths. The recommended operating range for the pH Control is 0.0-0.5 points.
2. The optimum operating range for your facility will depend on many factors (spray time, temperature, type of steel parts, etc.) and will be determined by your PPG representative.
3. In order to maintain the pH control in the range of 0.0-0.5 points; use pH CONTROLLER solution or CHEMFIL BUFFER to lower or increase the pH control as needed.
4. To lower pH control by 0.1 points, add 170 mL of pH CONTROLLER solution for each 100 gallons of solution.
5. To raise pH control by 0.1 points, add 103 mL of CHEMFIL BUFFER for each 100 gallons of solution.

### pH Control - By meter or slide comparator

1. The pH of the operating solution should be checked with either an electronic pH meter or a slide comparator.
2. Maintain the pH in the range of 4.5 – 5.8 for optimum quality.
3. pH adjustments can be made in the following manner:
  - a) To raise the pH approximately 0.1 units, add 40 mL of CHEMFIL BUFFER per 100 gallons of operating solution.
  - b) To lower the pH approximately 0.1 units, add 65 mL of pH CONTROLLER solution per 100 gallons of operating solution.

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## PRECAUTIONS:

Consult the most recent Material Safety Data Sheet for health and safety information relative to the safe handling and storage of this material.

Emergency 24 hour Chemtrec number: 800.424.9300