



INDUSTRIAL COATINGS

CF146FD

CHEMFOS® 146FD

PRETREATMENT TECHNICAL DATA SHEET

MULTIMETAL IRON PHOSPHATE CONVERSION COATING

PRODUCT DESCRIPTION

CHEMFOS® 146FD is a dual action chemical process which can be used to simultaneously clean and deposit an iron phosphate on steel substrates prior to painting. **CHEMFOS® 146FD** may be used to process steel as well as aluminum and zinc substrates

TECHNICAL PROPERTIES

Composition:	Liquid
Appearance:	Clear Yellow
Recommended Concentrations:	3% by volume
Recommended Temperatures:	140 ⁰ F-150 ⁰ F

PRODUCT ADVANTAGES

- Concentrated liquid material that imparts to the steel surface
- Complex iron phosphate coating, which provides improved paint adhesion and excellent corrosion resistance
- Offers simplicity of operation when used in spray phosphate equipment

FEB12/REV7

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USE & CONTROL INSTRUCTIONS:

Operating Properties (Typical):

- | | |
|--|--------------------------------------|
| • Application | Normally used in a spray application |
| • Operating concentration | 1.5 to 4% by volume |
| • Operating pH | 4.0 to 4.6 |
| • Acid consumed (alternative for pH control) | 0.0 to 0.4 |
| • Operating temperature | 140-150F |
| • Operating time | 60 to 90 seconds |

Charge Instructions:

Charge Details:

- 1) Fill the clean tank to approximately $\frac{3}{4}$ of the operating level with fresh water.
- 2) Start circulating pump.
- 3) Slowly add 3.0 gallons (11.3 liters or 28 pounds) of **CHEMFOS® 146FD** for every 100 gallons of bath volume.
- 4) Add approximately 12 fluid ounces (0.4 Liters or 1.0 pound) of **CHEMFIL BUFFER** for every 100 gallons of bath volume.
- 5) Slowly add **CHEMFIL BUFFER** solution to the tank, ensuring good circulation.
- 6) Mix well and adjust the final volume to the operating level with additional water as needed. This should produce a bath having a pH of 4.3 and a Total Acid of at least 5.3 points. It is important that the pH be between 4.0 and 4.6 before operating. Most baths will require some additional adjustment before reaching this exact specification. Use **CHEMFOS® 146FD** to decrease the pH and **CHEMFIL BUFFER** to increase the pH.
 - a) Approximately 10 fluid ounces (300 ml) of **CHEMFOS® 146FD** per 100 gallons will decrease the pH by 0.1 pH units.
 - b) Approximately $\frac{3}{4}$ fluid ounces (25 ml) of **CHEMFIL BUFFER** per 100 gallons will increase the pH by approximately 0.1 pH units.
- 7) Heat bath to operating temperature.

CAUTION: DO NOT PIPETTE BY MOUTH!

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Total Acid (and optional Acid Consumed titration):

Equipment needed:

- Burette Assembly (add a second one if Acid consumed is tested in place of pH)
- 10-ml pipette and bulb
- 250-ml flask or beaker

Reagents needed:

- Phenolphthalein indicator
- Bromophenol Blue indicator (optional-used for running acid consumed test)
- 0.1 N Sodium Hydroxide
- 0.1 N Sulfuric acid (optional-used for running acid consumed test)

Total Acid Procedure:

1. Pipette a 10 ml sample of the bath into a clean, dry flask or beaker.
2. Add 3-5 drops of Phenolphthalein indicator and swirl to mix.
3. Using the burette, titrate with 0.1N Sodium Hydroxide until the mixture turns to a light permanent pink.
4. Record the number of ml of 0.1N Sodium Hydroxide as the Total Acid.

Calculation:

Mls of Total acid X 0.56 = Percent by volume of CHEMFOS® 146FD

Points of Total Acid	Concentration of CHEMFOS® 146FD in percent by volume	Addition of CHEMFOS® 146FD Per 100 gallons of tank volume
7.1	4.0%	0 gallons
6.2	3.5%	0 gallons
5.3	3.0%	0 gallons
4.4	2.5%	0.5 gallons
3.5	2.0%	1.0 gallons
2.7	1.5%	1.5 gallons
1.8	1.0%	2.0 gallons
0.9	0.5%	2.5 gallons

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The TA level is best controlled by the continuous addition of **CHEMFOS® 146FD** concentrate by using a metering pump rather than by infrequent additions of large mounts of chemical. After the bath has been adjusted to the proper concentration pH adjustments can be made.

Acid consumed titration for pH control (optional):

1. Pipette a 10 ml sample of the bath into a clean, dry flask or beaker.
2. Add 10 drops of Bromophenol Blue indicator and swirl to mix.
3. using the burette, titrate with 0.1N Sulfuric Acid until the mixture turns from blue through green, continue further on to yellow.
4. Record the number of ml of 0.1N Sulfuric acid as the acid consumed (or negative free acid or pH control) value.

pH determination (preferred method for pH control):

Equipment needed:

- pH meter
- Suitable pH electrode(s)
- Plastic squirt bottle (for rinsing the electrode)

Reagents needed:

- pH 4 buffer solution
- pH 7 buffer solution

pH meter procedure:

1. The pH of the operating solution should be checked with an electronic pH meter following calibration and operational procedures provided by the manufacturer.
2. Maintain the pH in the range of 4.0 – 4.6 for optimum quality.
3. pH adjustments can be made in the following manner:
 - a) To raise the pH approximately 0.1 units, add 25 mL of CHEMFIL BUFFER per 100 gallons of operating solution.
 - b) Frequent additions of **CHEMFOS® 146FD** should be used as indicated previously to lower pH and to keep the concentration constant. In the event of an emergency the pH can be lowered 0.1 units by adding approximately 50 mL of pH CONTROLLER solution per 100 gallons of operating solution. (It should be noted that the pH CONTROLLER only reduces the pH. It may also keep the total acid in range but does NOT add the additional chemistry needed to produce a quality coating and should not be used for on-going bath replenishment.

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TECHNICAL DATA SHEET DISCLAIMER—INDUSTRIAL COATINGS:

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