BONDERITE®

# BONDERITE M-FE 1070
## IRON PHOSPHATE
**(Known as BONDERITE 1070)**

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### 1. Introduction:

BONDERITE M-FE 1070 (Known as BONDERITE 1070) is formulated for spray and immersion application to steel, aluminum and zinc surfaces to simultaneously clean and develop a conversion coating. The process produces a uniform non-metallic phosphate coating which inhibits corrosion and increases the adhesion and durability of paint finishes.

The substantial increases in paint life results from the fact that the coating provides:

A. A clean, soil-free surface
B. A corrosion-inhibiting base for paint
C. A non-conducting bond between the base metal and the paint.

### 2. Operating Summary:

| Chemical | Bath Preparation per 100 Gallons: |
|---|---|
| BONDERITE M-FE 1070 | 3.0 to 6.0 gallons |
| BONDERITE M-AD 500 (Known as PARCO NEUTRALIZER 500) | 0.04 to 0.05 gallons |

| Operation | Control: |
|---|---|
| Total Acid | 4.5 to 9.0 points |
| pH Range | 4.0 to 4.9 |
| Time/Spray | 30 seconds to 3 minutes |
| Time/Immersion | 1 to 5 minutes |
| Temperature | 110° to 150° Fahrenheit |

### 3. The Process:

The complete process for the BONDERITE M-FE 1070 treatment normally consists of the following steps:

A. Alkaline Cleaning
B. Water rinsing
C. Treating with BONDERITE M-FE 1070 Processing Solution
D. DI or RO Rinse
E. Post Treatment (optional)
F. Drying

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**4. Materials:**

BONDERITE M-FE 1070
BONDERITE M-AD 500
BONDERITE M-PT 6 (Known as PARCOLENE 6)
BONDERITE M-PT (Post Treatment)
Testing Reagents and Apparatus

**5. Equipment:**

Process tanks and housings may be fabricated from mild steel plate, however, equipment life will be greatly extended by using a 300 series alloy stainless steel, such as 304L or 316L. The 316L being preferred for maximum tank life. In all cases approved welding techniques must be used.

Process piping and pumps should be constructed of 316 or 304 stainless steel alloys. Various formulations of plastic pipe may be used with recommended support spacing, Schedule-80 being generally recommended. PVC Type I is limited to maximum process temperatures of 140°Fahrenheit. CPVC and PP may be used up to a maximum process temperature of 190° Fahrenheit. PVDF may be used for all expected operating temperatures and may reduce the rate of scale buildup in process piping.

Heat exchanger plates should be polished 316 stainless steel. If gas fired burner tubes are used, they should be made of Schedule-80 mild steel pipe or equivalent. All process circulation pump seals, valve seats, door seals, etc., which come into contact with the process solution and occasional acid equipment cleaners, should be Buna-N, FKM or PTFE. Note that while CSPE is compatible with the process solution, it is not compatible with acid equipment cleaners which may be used.

Chemical feed pump parts and other elastomers which may come into contact with the concentrated replenishing chemical should be Buna-N, CSPE, FKM or PTFE.

Support equipment available from Henkel Technologies for this process includes: chemical feed pumps, level controls and transfer pumps.

Your local sales representative should be consulted for information on Henkel Technologies automatic process control equipment for this process and any additional questions.

**6. Treating with BONDERITE M-FE 1070 processing solution:**

Buildup:

Fill the tank about three-fourths full with cold water. Add 3 to 6 gallons of BONDERITE M-FE 1070 for each 100 gallons of working solution volume. Add sufficient water to bring the solution up to the working level and then heat to the operating temperature.

Operation:

Time: Spray: 30 seconds to 3 minutes.
Immersion: 1 to 5 minutes.
Temperature: 110° to 150° Fahrenheit.
Application: Power spray or immersion.

After the best values for time and temperature have been established, they should be maintained closely. Temperature should be held within ± 5° Fahrenheit.

**7. Testing and Control:**

Never Pipet by mouth. Use pipet filler.

Total Acid:

Pipet a 10 ml sample into a 150-ml beaker. Add 5 drops of Indicator 3, then titrate with Titrating Solution 11 to the development of a permanent pink color. The ml of Titrating Solution 11 required indicates the total acid value in points.

Total acid range: 4.5 to 9.0 points.

The typical operating bath concentration is 3-6% V/V, but operating the bath outside of this range may give satisfactory results. Our representative will determine the optimum concentration for each operating line.

To increase value 1.0 point: 0.65 gallons of BONDERITE M-FE 1070 per 100 gallons of solution volume.

| BONDERITE M-FE 1070 Concentration (%v/v) | Volume Titrant (mL) |
|---|---|
| 1 | 1.5 |
| 2 | 3.0 |
| 3 | 4.5 |
| 4 | 6.0 |
| 5 | 7.5 |
| 6 | 9.0 |
| 7 | 10.5 |
| 8 | 12.0 |

pH Range:

The BONDERITE M-FE 1070 processing bath should be operated within the pH range of 4.0 to 4.9. Our representative will determine the optimum pH value for each operating line. Once established, the pH should be maintained within +/- 0.1 pH units. BONDERITE M-FE 1070 product should be used to decrease the pH while BONDERITE M-AD 500 should be used to raise the pH value.

**8. After Treatment:**

Water rinsing:

After phosphating, the work is thoroughly rinsed with water at ambient temperatures for 20 to 40 seconds. The rinse should be continuously overflowed, and the flow should be regulated with the rate of production so that the main body of the rinse never becomes excessively contaminated.

Post Treatment:

The coated metal, wet from the water rinse, is treated with a dilute BONDERITE M-PT (Post Treatment) solution. This treatment materially increases the corrosion resistance of the coating and is an essential part of the process. A number of BONDERITE M-PT (Post Treatment) products are available and our representative will recommend the proper one for each installation.

Deionized Water Rinse:

A water rinse may be required following the post treatment. Deionized water is preferred but relatively pure tap water may be used. The paint used and the quality required for the finished part will determine if rinsing is necessary and if deionized water must be used.

**9. Storage Requirements:**

No special storage is needed for the products used in this process. BONDERITE M-FE 1070 freezes at 15°Fahrenheit. Should it freeze, simply thaw it to room temperature and stir prior to use.

**10. General Maintenance:**

In the operation of the process, a small quantity of sludge is formed as a by-product of the coating reaction. This residue settles to the bottom of the tank and should be removed before its presence causes dusty coating, or interferes with the operation of the spraying system. A satisfactory method of removal is to transfer the solution to a rinse tank, leaving as much sludge as possible in the bottom of the processing tank. The sludge may then be removed by any convenient means.

When the solution has been heated for some time, scale will form on the heating unit and must be removed at intervals so that adequate heat transfer will occur and the proper processing temperature will be maintained. To remove the scale, dry the heat transfer surface either by removing it from the solution or by pumping the solution from the tank. The scale may then be removed by a suitable chemical or mechanical method.

**11. Waste Disposal Information:**

Disposal information for the chemical, in the form as supplied, is given on the Material Safety Data Sheet.

The processing bath is slightly acidic and contains phosphate. Neutralization and/or waste treatment of rinse water or processing solution may be required prior to discharge.

The processing bath and sludge which accumulates in the bath can contain ingredients other than those present in the chemical as supplied and analysis of the solution and/or sludge may be required prior to disposal.

**12. Precautionary Information:**

When handling the chemical products used in this process, the first aid and handling recommendations on the Material Safety Data Sheet for each product should be read, understood and followed.

The processing bath is slightly acidic and may cause irritation of skin and eyes. Do not get in eyes, on skin or on clothing. In case of contact, follow the recommendations on the Material Safety Data Sheet for BONDERITE M-FE 1070.

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Testing Reagent and Apparatus
(Order only those items which are not already on hand)

| IDH Code | Quantity | Item |
|---|---|---|
| VWR# 89000-202 | 2* | Beaker, Glass, 150-ml |
| 592477 | 2 | Buret Assembly, 25-ml Automatic, Glass |
| 592478 | 1 | Buret Assembly, 5-ml Automatic |
| 592398 | 1 | Indicator 3 (Phenolphthalein) |
| VWR# 16353-065 | 2 | Indicator Dropping Bottle, 2 oz. |
| VWR# 890003-506 | 2* | Pipet, 10-ml Volumetric, Glass |
| VWR# 53497-009 | 1 | Pipet Filler |
| VWR# 53600-108 | 1 | Pitcher, Graduated, Plastic |
| Thomas Scientific Part #30250 | 1 | Thermometer, Floating |
| 592427 | 1 gal | Titrating Solution 11 (0.1N NaOH) |

* Includes one more than actually required, to allow for possible breakage.

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