

BONDERITE M-NT 2 CONVERSION COATING

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1. Introduction:

BONDERITE M-NT 2 is a phosphate-free reactive conversion coating especially formulated for use in the treatment of steel, zinc and aluminum surfaces. BONDERITE M-NT 2 contains no regulated heavy metals and is free of all organic components. BONDERITE M-NT 2 is designed to increase the adhesion and corrosion resistance of painted metal surfaces.

The pretreatment solution may be applied by spray or immersion applications under ambient conditions and is typically followed by a deionized or reverse osmosis water rinse. The BONDERITE M-NT 2 pretreatment is compatible with all types of paint applications.

2. Operating Summary:

Chemical	Bath Preparation per 100 gallons
BONDERITE M-AD 700 (known as PARCO NEUTRALIZER 700)	5 – 7 fl. oz (150 - 200 mL)
BONDERITE M-NT 2	2-4 gallons
BONDERITE C-IC 2520 (known as DEOXIDINE 2520 (US	optional, as needed

Operation	Control
pH	3.8-5.0
Concentration	0.14-0.25 absorbance @ 500 nm
Time	20-120 seconds
Temperature	Ambient

3. The Process:

The complete process for conversion coating a metal surface normally consists of the following steps:

- A. Cleaning
- B. City water rinsing
- C. Low conductivity water rinsing
- D. Conversion coating
- D. DI/RO water rinsing
- E. Post treatment – BONDERITE M-PT (optional)
- G. Deionized or low conductivity water rinsing
- H. Forced air or oven drying (optional)

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4. Materials:

BONDERITE M-NT 2
BONDERITE M-AD 700 (known as PARCO NEUTRALIZER 700)
BONDERITE C-IC 2520 (known as DEOXIDINE 2520 (US))
Testing Reagents and Apparatus

5. Equipment:

All equipment and piping for use with the process bath should be constructed of 304 or 316 stainless steel. If mild steel is used in construction, it must be appropriately lined.

All process circulation pump seals, valve seats, door seals, etc., which contact the process solution should be Buna-N, EPDM, FKM or PTFE. Note that while CSPE is compatible with the process solution, it is not compatible with acid equipment cleaners that may be used.

Chemical feed pump parts and other elastomers that may contact the concentrated replenishing chemical can be Buna-N, EPDM, CSPE, FKM or PTFE.

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

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

6. Surface Preparation:

The pretreatment follows thorough cleaning and water rinsing. Adequate water rinsing following the cleaning step is required to avoid excessive contamination of the pretreatment.

7. Pretreating with BONDERITE M-NT 2

Buildup:

Fill the tank about three-fourths full of deionized water (Good quality tap water may be used <100 ppm Total hardness). Test for pH. It should be below 6.5. Small increments of BONDERITE C-IC 2520 (known as DEOXIDINE 2520 (US)), no more than 70 mL per 100 gal, should be added to lower the pH. Repeat the addition if the pH is not below 6.5.

After adjusting the pH, add 2 - 4 gallons of BONDERITE M-NT 2 for each 100 gallons and then add enough deionized water to bring the solution up to the working level. Mix thoroughly. Determine the pH and adjust if required before beginning operation. If necessary, increase pH with addition of small increments of BONDERITE M-AD 700 (known as PARCO NEUTRALIZER 700). Always add BONDERITE M-AD 700 in a turbulent area of the tank so the BONDERITE M-AD 700 can be diluted with bath solution very quickly. This will help prevent the active components in the BONDERITE M-NT 2 tank from precipitating.



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Operation:

The clean metal, wet from the water rinse, is pretreated with BONDERITE M-NT 2. Either spray or immersion application may be used. Maintain the temperature of rinse water below 110 °F to minimize the possibility of flash rusting on clean steel parts. Use water overflow to lower the temperature of rinse water.

Time: 20 to 120 seconds.
Temperature: Ambient.

The temperature of the rinse(s) following the cleaner stage should be maintained so that the carry over heat does not increase the Bonderite M-NT-2 processing bath temperature above 100 °F.

8. Testing and Control:

pH Determination:

The pH is determined using a fluoride stable pH probe standardized at pH 4 and pH 7.

Recommended pH Range: 3.8 to 5.0.

To reduce pH by 0.1: Add 2.2 liters (0.57 gallon) of BONDERITE M-NT 2 per 100 gallons.

To increase pH by 0.1: Add 1.2 fl. oz (36 mL) of BONDERITE M-AD 700 (known as PARCO NEUTRALIZER 700) per 100 gallons.

Frequent testing of pH and small additions of BONDERITE M-NT 2 or BONDERITE M-AD 700 (known as PARCO NEUTRALIZER 700) is preferred. Always avoid large additions of either pH adjustment chemical. If the Hach absorbance reading is in the range of 0.250-0.500, a small amount of BONDERITE C-IC 2520 (known as DEOXIDINE 2520 (US)) instead of BONDERITE M-NT 2 can be added to adjust pH down to below 5.0. Make sure the pH meter is standardized. Excessive BONDERITE C-IC 2520 (known as DEOXIDINE 2520 (US)) can reduce the bath life of BONDERITE M-NT 2.

Concentration: HACH DR300 Pocket Colorimeter 500 nm Method

- I. Pipet exactly 50 ml of a BONDERITE M-NT 2 bath sample into a 100-ml volumetric flask and add DIW to the calibrated line. This is the 50% diluted sample.
 - II. Take approximately 5 ml of the 50% diluted sample from above and filter through Whatman 42 (2.5 micron) filter paper. This is the filtrate.
 - III. Pipet exactly 1.0 mL of filtrate into a 50 mL beaker including a PTFE stirring bar.
 - IV. Pipet exactly 1.0 mL of DI water as the blank solution into a second 50 mL beaker including a PTFE stirring bar.
 - V. Pipet 1 mL of Titration Solution 1561 each to the sample solution and blank.
 - VI. Pipet 2 mL Buffer Solution 4.7 each to the sample solution and blank and mix for at least 5 minutes.
 - VII. After mixing, pipet exactly 1.0 mL Reagent Solution AT each to sample solution and blank.
 - VIII. Stir the blank and sample mixtures for 5 minutes. The resulting solutions should be orange to orange red.
 - IX. Pour the blank solution into one of the plastic cells (1-cm path length) from the HACH DR300 Pocket Colorimeter.
 - X. Pour the sample solution into a second plastic cell (1-cm path length).
 - XI. Remove the instrument cap from the pocket colorimeter.
 - XII. Insert the cell with the blank solution into the cell compartment with notch-to-notch fit.
 - XIII. Place the instrument cap on the Hach meter so that it covers the cell compartment.
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- XIV. The cover acts as a light shield during measurements.
XV. Press the **ZERO** key. The meter should read 0.00. If the meter doesn't read 0.00, press the **ZERO** key again.
XVI. Replace the blank cell with the test cell, and cover the cell compartment with cap. Press the **READ** key.
XVII. Record the reading as absorbance.

This reading represents the concentration of active component in BONDERITE M-NT 2 bath. For consistent and accurate results, check battery and clean and dry the outside of sample cells before inserting them into the pocket colorimeter.

In the recommended concentration range: To increase absorbance by 0.06, add approximately 1.0 gal of BONDERITE M-NT 2 per 100 gal. If operating outside of the recommended concentration range, contact your Henkel Representative as additional bath dilutions may be required to insure accurate results.

The concentration may be determined from the following table:

Concentration, % V/V	Gallons / 100 gallons	Absorbance
1	1	0.07
2	2	0.14
3	3	0.20
4	4	0.25
5	5	0.30

9. After Treatment:Deionized or reverse osmosis Water Rinsing:

A deionized or reverse osmosis water rinse is preferred in order to obtain optimum results from the treatment. A deionized water rinse will most effectively remove any water-soluble salts from the treated surface. The design of the equipment is important for efficient use of deionized water. Our representative should be consulted for recommendations.

Drying:

Treated parts can be oven-dried at temperatures from 225 to 350 °F for 10-20 minutes. Our representative will advise if a drying oven should be used for the operation.

10. Storage Requirements:

BONDERITE M-NT 2 should be stored between 32° and 110° Fahrenheit. If the product freezes, thaw and mix thoroughly prior to use.



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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. Neutralization by the addition of caustic soda to the rinse water or processing solution may be required prior to discharge. Please consult with Henkel Sales and Tech. Service Representatives on this topic.

The processing bath and sludge that 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 essentially non-irritating and non-toxic.

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Testing Reagents and Apparatus

(Order only those items which are not already on hand)

IDH Code /VWR Code	Quantity	Item
VWR# 89000-202	2*	Beaker, 150 ml
VWR# 89000-198	2*	Beaker, 50 ml glass or plastic
VWR# BDH5018	500 ml	Buffer Solution 7
VWR# BDH5046	500 ml.	Buffer Solution 4
643722	4.0 L.	Buffer Solution 4.7 (Sodium Acetate), pH = 4.7
VWR# 89003-340	2*	Pipet, 1-mL volumetric
VWR# 89085-170	2*	Pipet, 50 ml volumetric pipet
VWR # 29615-007		100-ml volumetric flask
VWR# 28480-106	1 box	Grade 42 filter paper (2.5micron pore size)
VWR# 50087924	2	1" PTFE magnetic stirring bar
***	1	Magnetic stirrer
643723	1.0 L.	Reagent AT
596416	1.0 L.	Titration Solution 1561 (0.1 M disodium EDTA)
***	1	Fluoride stable pH probe / Meter
***	1	Conductivity meter
HAC LPV4459750110	1	HACH DR300 Pocket Colorimeter 500 nm

*** Purchase from any standard laboratory supply company

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