

BONDERITE M-ED 50001 P1/ BONDERITE M-ED 50002 P2

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PRODUCT DESCRIPTION

The Bonderite MGC immersion process provides the following product characteristics:

Technology	Chromium Free
Product Type	Liquid
Application	Electrolytic
Process components:	
BONDERITE M-ED 50001 P1	Make-up
BONDERITE M-ED 50002 P2	Neutralizer

The Bonderite MGC immersion process produces an electrolytic coating specifically formulated for coating magnesium and its alloys.

The ceramic coating produced by this chromium free product is typically in the thickness range of 2 to 6 microns.

The coating may be used unpainted in some applications, however, it also provides an excellent base for adhesive bonding, and organic finishes.

This process enhances corrosion protection relative to conversion coatings and provides a hard base for organic finishes to improve the overall abrasion resistance.

DIRECTIONS FOR USE

Preliminary Statement:

Prior to use it is necessary to read the **Material Safety Data Sheet** for information about precautionary measures and safety recommendations. Also, for chemical products exempt from compulsory labeling, the relevant precautions should always be observed. Please also refer to the local safety instructions and contact Henkel for analytical support.

Bath make-up:

Bath preparation per 100 L add:

BONDERITE M-ED 50001 P1 (MU)	12.7 L
BONDERITE M-ED 50002 P2 (Neutralizer)	2.3 L

Operating Parameters:

*Concentration, %	10 to 13
Alkalinity, points	14 to 25
*Time, min	1 to 5
Temperature, °C	15 to 50

* The actual control ranges used are application specific and will be established through application testing.

Process Description:

1. Alkaline clean
2. Rinse
3. Rinse
4. Rinse (counter flowed)
5. Deoxidizer (an optional desmutter and additional rinses may also be used)
6. Rinse
7. Rinse
8. Rinse (deionized water counter flowed)
9. Bonderite MGC electro-ceramic coating
10. Rinse
11. Rinse
12. Rinse (deionized water counter flowed)

Equipment:

Bonderite MGC is an electrodeposition process. It is critical to electrically isolate the process from the operators by the use of nonconductive barriers such as clear PVC or other plastics. The process may involve pulsating current and persons with pacemakers or other similar implanted devices should not be permitted within 12 feet of the tank or wiring. The Process tank, housing, pumps and piping should be fabricated from polypropylene or CPVC.

Heat exchanger cooling plates should be polished 316L. Any metal components such as the heat exchanger must be shrouded in plastic to additionally ensure that no conductive surface is provided to plant personnel. 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 FKM or PTFE. A large clear plastic wall must be constructed between worker access points and the electrified chemistry to further eliminate shock risk. Chemical feed pump parts and other elastomers which may come into contact with the concentrated replenishing chemical should be FKM or PTFE. Support equipment for this process is available from Henkel.

These include chemical feed pumps, level controls, transfer pumps and bulk storage tanks. Our sales representative should be consulted for information on automatic process control equipment for this process. In addition, the "Henkel Equipment Design Manual" may be consulted. All equipment which will be in contact with Bonderite MGC liquid or processing solutions should be thoroughly cleaned prior to use with the process. This includes such items as chemical metering pumps, solution tank, and housings. Our representative will supply a recommended clean-out procedure which may be followed.

Surface Preparation:

Cleaning:

All metal to be treated with the processing solution must be free from grease, oil and other foreign matter before the

treatment. A complete line of cleaners are available and our representative will recommend the proper one for each installation.

Water Rinsing:

After cleaning, the metal must be thoroughly rinsed with water. The rinse water should be overflowed continuously at a rate which will keep it clean and free from scum and other contamination. The final rinse before and after the Bonderite MGC tank should be maintained at or below 20 micro Siemens maximum conductivity.

Tank Charging Procedure:

Buildup:

Recommended buildup is 12.7 % of per 100 gallons of processing solution volume of BONDERITE M-ED 50001 P1 and 2.3% of the BONDERITE M-ED 50002 P2. Fill the tank about half full of deionized water. Add the correct amount of BONDERITE M-ED 50001 P1 and BONDERITE M-ED 50002 P2 and then add sufficient water to bring the solution up to the working level. Mix thoroughly.

Testing and Control:

Never Pipet by mouth, use a pipet filler.

Alkalinity Titration:

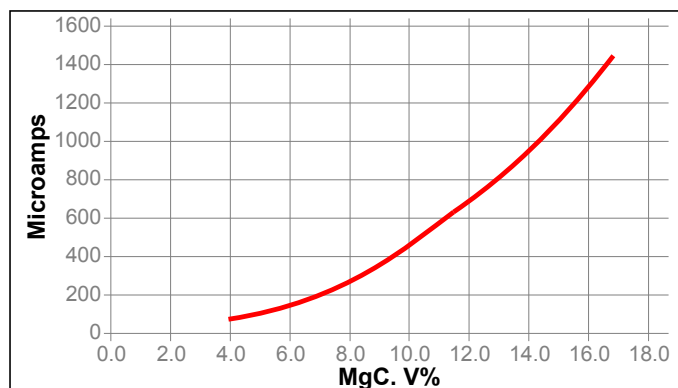
Pipet 50 mL (volumetric pipet) of the bath into a 150 mL beaker add 5 drops of Indicator 3. Using TS-20 (Titrating Solution 20), titrant from a pink color until a clear endpoint is reached. The standard Alkalinity level will be 14 to 25 points (milliliters).

Concentration measurement:

Sample Preparation:

Dispense 10.0 mL of working bath into a 100 mL volumetric flask. Add about 50 mL of Deionized water. Using a volumetric pipet add 10.0 mL of Reagent Solution 49 (Concentrated Hydrochloric Acid), add additional water to 100 mL. Mix thoroughly with sealed top on and pour about 50 milliliters of this acidified and diluted bath into sample cup of 101D meter. Measure microamps (reading stabilizes in 6 minutes) and consult table below for concentration. Note: The 101D meter should be standardized prior to use with Standard Solution 500F.

MgC Concentration versus microamps



$$y = 2.5969x^{2.2272}$$

$$R^2 = 0.9994$$

Operation:

*Voltage, Volts	130 to 170
Time, sec.	120 to 180
Temperature, °C	45

*Current density and other parameters are application specific. The solution concentration may be increased or reduced to meet the metal or specific line conditions. Our representative will assist in establishing the proper concentration.

Replenishing

Normally the BONDERITE M-ED 50001 P1 will be replenished more regularly than the BONDERITE M-ED 50002 P2 neutralizer after the initial tank charge. Depending on the line conditions it is often favorable to use an auto decant system as the line operates to maintain a constant concentration and contaminant loading level. Our representative will recommend the proper replenishment for your process line.

Coating Thickness

Any standard nonferrous commercially available eddy current gauge unit that can read to 0.5 µm.

Racking

All racking material must be made of aluminum. All wetted areas of the rack must be painted or plastic coated to prevent large current losses due to the rack. Heavy 1-2 mm thick vinyl plastisol or ECTFE are generally preferred to protect the racks. Note that damaged rack masking can create hard to rinse pockets on the rack surface— as a result rack masking must be properly maintained. Titanium and ferrous (including stainless) racking is not compatible with this process.

Water Rinsing

After treatment, the metal must be thoroughly rinsed with high quality DI or RO water. All rinses should be overflowed continuously at a rate which will keep it clean and free from scum and other contamination. Note that with some harder to clean alloys it may be necessary to use a 25KHz ultrasonic rinse stage or a high pressure rinse after deoxidizing.

After Treatment:

Drying:

Parts coming from the water rinse after treatment should be dried in an indirectly fired oven or by other means which will not contaminate the metal with fumes, oil or partially burned gases. In some instances the final rinse is heated and no further drying is required. Products with cavities or pockets which trap moisture should be blown dry with a jet of clean, compressed air.

If handling of the dried, unpainted work is necessary, operators should wear clean lint free cotton gloves.

Waste Disposal Information:

When handling the chemical product used in this process, the first aid and handling recommendations on the Material Safety Data Sheet for the product should be read, understood, and followed. The processing solution is Basic may be irritating to skin and may cause burns to eyes. Avoid contact with skin and eyes. Note that in case of contact follow the recommendations for contact given on the Material Safety Data Sheet for BONDERITE M-ED 50001 P1 and



BONDERITE M-ED 50002 P2.

Storage

Recommended Storage Temperature, °C >5

Classification

Please refer to the corresponding **Material Safety Data Sheets** for details on:

Hazards identification
Transport information
Regulatory information

ADDITIONAL INFORMATION

Disclaimer

Note:

The information provided in this Technical Data Sheet (TDS) including the recommendations for use and application of the product are based on our knowledge and experience of the product as at the date of this TDS. The product can have a variety of different applications as well as differing application and working conditions in your environment that are beyond our control. Henkel is, therefore, not liable for the suitability of our product for the production processes and conditions in respect of which you use them, as well as the intended applications and results. We strongly recommend that you carry out your own prior trials to confirm such suitability of our product.

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Henkel AG & Co. KGaA
40191 Düsseldorf, Germany
Phone: +49-211-797-0

Henkel Corporation USA
Madison Heights, MI 48071
Phone: +1-248-583-9300

Henkel (China) Co. Ltd.
201203 Shanghai, China
+86.21.2891.8000

For more information, please contact us on www.henkel.com