

BONDERITE M-FE 3955

Known as Duridine 3955

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PRODUCT DESCRIPTION

BONDERITE M-FE 3955 provides the following product characteristics:

Technology	Cleaner - coater
Product Type	Acid 1-component
Application	Spray and spray/immersion processes
Concentration	10 to 30 g/l
Temperature	40 to 65°C

BONDERITE M-FE 3955 is a liquid product based on acidic phosphates and a combination of highly efficient surfactants. BONDERITE M-FE 3955 degreases and cleans steel, galvanized steel and aluminum.

On cold rolled steel and iron it simultaneously generates a uniform iron phosphate layer with a coating weight of 0.2 to 0.4 g/m².

The iron phosphate layer provides an excellent adhesion for organic coatings and improves the corrosion resistance.

Also on galvanized steel and aluminum surfaces the adhesion of organic coatings is improved by BONDERITE M-FE 3955.

When parts out of aluminum or galvanized steel are treated (>10 %), BONDERITE M-AD 339 L should be added to avoid a distortion of the iron phosphating process.

In combination with fluoride-containing products BONDERITE M-FE 3955 generates conversion coatings on aluminum and HDG.

Application Areas:

BONDERITE M-FE 3955 is used in spray- and spray/immersion processes. It must be combined with a suitable cleaning booster.

Iron phosphating baths can be controlled by measuring the pH value or the conductivity, as well as by titration.

Composition:

- BONDERITE M-FE 3955
- BONDERITE M-AD 565 (for pH adjustment)
- BONDERITE M-AD 339 L (for fluoride addition if needed)

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.

Application:

Modification of the following data may be necessary due to specific needs of the phosphating line.

Operating Conditions:

Total acid, points	3.2 to 9.6
pH	4.5 to 5.5
Temperature, °C	40 to 65
Time for the spray process, min	2 to 3
Spray pressure, bar	1 to 2

Bath make-up:

Fill the bath with water and heat it to operating temperature. Add with running circulating pump the correct amount of BONDERITE M-FE 3955. Please note that BONDERITE M-FE 3955 generates foam when the spray equipment starts working at temperatures below 40 °C.

Remarks:

A BONDERITE M-FE 3955 bath with a concentration of 10 g/L in deionized water has a pH-value of 3.0. The pH-value depends on the concentration and the hardness of the water.

With addition of BONDERITE M-AD 565 the pH-value increases. At the same time, the "total acid" pointage decreases.

The correct amount of BONDERITE M-AD 565 has to be determined on site. A start pH-value of 4.5 to 4.8 is recommended.

Bath Monitoring:

The BONDERITE M-FE 3955 bath solution is controlled by the following analysis.

Titration of Total Acid:

- Pipette a 10 mL sample into a 300 mL beaker and dilute it with 50 mL deionized water.
- Add 3 to 5 drops of Phenolphthalein Indicator.
- Titrate with 0.1 N Sodium Hydroxide (NaOH) until the solution turns from colorless to a permanent pink color.
- The mL of 0.1 N sodium hydroxide consumed indicates the total acid value in points.

It is also possible to titrate the "total acid" with a pH-electrode. The consumption of ml 0.1 N sodium hydroxide until a pH-value of 8.5 is the "total acid" pointage.

Replenishment:

The bath is replenished with BONDERITE M-FE 3955 according to the Total Acid value.

To increase Total Acid by 1 point, add 3.1 kg or 2.4 L BONDERITE M-FE 3955 for each 1,000 L of bath.

After Treatment:Water rinsing:

After phosphating, the work is thoroughly rinsed with water at ambient temperatures for 20 to 40 sec. 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.

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.

General Maintenance:

In the operation of the process, a small quantity of sludge will be 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.

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.

Precautionary measurements:

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 3955.

Equipment:

Process tanks and housings may be fabricated from mild steel plate, however, equipment life will be greatly extended by using stainless steel.

In case of using BONDERITE M-AD 339 L (Fluoride additive) it is necessary to use stainless steel or plastic-laminated steel. In all cases approved welding techniques must be used.

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, Viton (TM) or Teflon (TM).

Chemical feed pump parts and other elastomers which may come into contact with the concentrated replenishing chemical should be Buna-N, Hypalon (TM), Viton (TM) or Teflon (TM).

Materials for analysis:"Total acid" with indicator:

Pipette 10 mL (2)
Erlenmeyer-flask 300 mL (2)
Burette 25 mL (2)
Distilled water
0.1 % alcoholic solution of Phenolphthaleine
0.1 N Sodium hydroxide solution
Dropping bottle 25 mL (2)
Pipette filler

"Total acid" with pH-electrode:

Beaker 200 mL (2)
Magnetic stirrer
Stirring device
pH-meter
Dosing unit (Dosimat)
Two pieces of the glass equipment is recommended because of the risk of cracking.

Classification:

Please refer to the corresponding **Material Safety Data**

Sheets for details on:

Hazards identification
Transport information
Regulatory information

Storage:

Recommended Storage Temperature	0 to 40°C
Shelf-life, months	36



ADDITIONAL INFORMATION**Disclaimer**

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Reference 1.0