

BONDERITE M-MN 4901 IT

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PRODUCT DESCRIPTION

BONDERITE M-MN 4901 IT provides the following product characteristics:

Technology	Metal Pre-Treatment
Product Type	Phosphating products for metals
Application	Conversion coating

BONDERITE M-MN 4901 IT is a liquid one-pack material designed to produce on ferrous material a microcrystalline conversion coating made of Manganese and Iron phosphates whose thickness is ranging from 3 to 10 microns.

The phosphate layer texture is specifically suitable as an excellent anti-wear coating.

The product is thin, compact and highly resistant; it produces a layer with variable thickness depending on the material it is applied to and the pre-treatment conditions.

Due to the high absorbent power of the generated layer to oils and lubricants, BONDERITE M-MN 4901 IT can be used as protective agent against corrosion.

BONDERITE M-MN 4901 IT is in compliance with UNI 4716 and MIL-P- 16232 C regulations.

Application Areas:

BONDERITE M-MN 4901 IT is used in spray- and spray/immersion processes. It must be combined with a suitable cleaning booster.

BONDERITE M-MN 4901 IT is used by immersion at a temperature ranging from 93 to 98°C (without reaching the boiling point).

The treatment time depends on the material to treat and the surface condition and it is normally ranging from 3 to 15 minutes.

The conversion process generates hydrogen bubbles and it is necessary to wait until this phenomenon stops to take out the treated materials from the bath.

In any case the treatment time can't be higher than 15 minutes.

Our Technical Service will define, case by case, the best operating conditions and the best cycle according to the plant and the material to treat.

The phosphate layer quality depends on the correct execution of the pre-treatment cycle.

In fact the steel pieces have to be previously pre-treated to remove every pollutants like oils, rust, dirt etc.

For the cleaning it is advisable to treat the surface with

emulsifiable solvents and then rinse accurately with water.

For the removal of oxides and rust, it is possible to use mechanical means such as blasting or sanding.

The use of alkaline products and pickling solutions requires an activation phase immediately before the phosphatising phase.

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:

- Fill the operating tank with tap water to 4/5 of the final volume and heat up to 90 °C.
- Add 160 kg of BONDERITE M-MN 4901 IT for each 1,000 L tank volume.
- Mix to a complete homogeneity.
- Fill the bath to the final level and heat up to operating temperature.
- Make the controls and (when necessary) the required adjustments.

Bath Control:

Periodically control the bath by determination of Total Acid points, Free Acid points, Ratio TA/FA and Fe++ value as described below.

Total Acid:

- Pipette 10 mL of working bath into a 100 or 250 mL flask and add 30 mL of DI water.
- Add 4 to 6 drops of Phenolphthalein Indicator (0.3% hydro-alcoholic solution).
- Under slight agitation titrate with 0.1 N Sodium Hydroxide (NaOH) solution until the colour turns from colourless to pink stably for at least >20 seconds.

The mL of 0.1 N NaOH solution used for the titration corresponds to Total Acid points.

A standard bath made up at 160 g/L concentration has a TA point value of 60.

Free Acid (periodical control):

- Pipette 10 mL of working bath into a 250 mL flask and add 30 mL of DI water.
- Add 3 to 4 drops of Methylorange Indicator (0.1% hydro-alcoholic solution).
- Under slight agitation titrate with 0.1 N Sodium Hydroxide

(NaOH) solution until the colour turns from red to yellow-orange.

The mL of 0.1 N NaOH solution used for the titration correspond to Free Acid points.
A standard bath make up at 160 g/L concentration has a FA value of 10.

Ratio TA/FA:

For a standard bath should range from 5 to 6. The optimal ratio has to be chosen case by case, depending on the treated material.

Fe ++

If present, the Fe++ can be titrated as following:

- Pipette 10 ml bath into a 250 mL beaker and dilute with the same amount of DI water.
- Add 10 mL 50 % sol. of Sulphuric Acid (H₂SO₄).
- Titrate with 0.1 N KMnO₄ (Potassium Permanganate) until the pink colour is stable for a time >15 seconds.

The mL of 0.1 N KMnO₄ x 0.56 give the Fe++ content in g/L.

Replenishment:

The bath has to be periodically controlled (at least twice a day) and has to be maintained at the concentration value fixed during the start up phase.

Total Acid

In case the Total Acid value decrease add 2.7 kg of BONDERITE M-MN 4901 IT for each missing point and for each 1,000 L bath.

We suggest to make frequent (or possibly continuous) replenishing addition, to keep the initially fixed T.A value more consistent.

Free Acid:

The F.A. value should remain in the fixed values autonomously.

Its trend to increase can be caused by overheating or by maintaining the bath at temperature without treatments.

In this case add small amounts of BONDERITE M-AD 3140 (ie to decrease 1 point the FA value add 0.6 kg of BONDERITE M-AD 3140 for each 1,000 L of bath).

If the F.A. tend to decrease can be due to low working temperature or to an excess of sludge.

Elimination of Fe++

The optimal concentration of Fe⁺⁺ ranges from 2 to 3 g/L.
In case of excessive presence of Fe⁺⁺ is necessary to decrease it by its oxidation to Fe³⁺ (for example using air injections during the working stops) which sediment as sludge.

Caution:

1. The phosphatising tank should be made of stainless steel (ie AISI 316).
2. The tank bottom should be cone shaped to get an easier

collection of hydrolytic sludge, which have to be periodically removed.

3. The tank internal heating system has to be set in a vertical lateral position to avoid sludge deposits.

4. Keep the bath clean by periodically removing of the deposited sludge at the bottom of the tank.

5. Keep the bath surface free from any floating pollutant as oil etc.

6. Whenever there are bath losses (ie for de-sludging operations) use BONDERITE M-MN 4901 IT at the make up concentration.

7. The pieces coming out of the phosphatising bath has to be immediately rinsed with plenty of cold water to avoid powdering.

8. BONDERITE M-MN 4901 IT can convert even alloyed steel when the total alloying metal content is lower than 0.5%.

9. Slight differences in the product appearance do not affect its performances.

10. BONDERITE M-MN 4901 IT bath is acidic and can cause irritation and burning of the skin's eyes. Suitable clothing is therefore recommended.

11. The bath and its rinse require a sewage treatment before unloading.

Classification:

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

Hazards identification

Transport information

Regulatory information

Storage:

Process Component	Recommended Storage Temperature, °C	Shelf life, months (in unopened original packaging)
BONDERITE M-MN 4901 IT	4 - 35	24



ADDITIONAL INFORMATION**Disclaimer****Note:**

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Reference 0.1