BONDERITE

Technical Data Sheet

BONDERITE M-ZN 4702 X

Known as Granodraw 4702 IT
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PRODUCT DESCRIPTION

The BONDERITE M-ZN 4702 X Process provides the following product characteristics:

Technology	Metal Pretreatment
Product Type	Phosphating products for metals
Application	Cold Forming
Process components:	BONDERITE M-ZN 4702 MU X BONDERITE M-ZN 4702 R X BONDERITE M-AD 3080

BONDERITE M-ZN 4702 X is a liquid Zinc Phosphate product designed to produce a medium/high conversion coating on steel material to ease cold forming operations (cold extrusion, drawing of wire, stamping and deep drawing).

Specific additives contained in the product guarantee a thin, strong microcrystalline coating layer even on material with alow surface reactivity.

Application Areas:

BONDERITE M-ZN 4702 X is used as a conversion step in typical immersion pre-treatment cycles were the steel pieces have been previously pre-treated to remove any surface pollutants like oils, rust etc.

The material to be treated should be immersed in the bath suspended on iron hooks or in iron baskets. (Note: ensure that only ferrous metals are used in the process).

The quality of the conversion layer is strictly dependent on the quality of the pretreatment cycle.

It is essential to remove from the metal surface any kind of oil, dirt, powder, rust and oxides before the phosphatising process, by suitable cleaning and/or pickling steps.

The use of a suitable activating product before phosphatising is suggested when a very fine crystalline phosphate coating, able to stand hard working conditions, is required.

Composition

BONDERITE M-ZN 4702 MU X	for the make up of the bath
BONDERITE M-ZN 4702 R X	for the replenishment of the bath
BONDERITE M-AD 3080	accelerator

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, for 1,000 L:
For 1,000 L of bath use the following products:

BONDERITE M-ZN 4702 MU X	~220 kg
BONDERITE M-AD 3080	~1 kg

- Fill the operating tank with clean tap water to 3/4 of the final volume.
- Add BONDERITE M-ZN 4702 MU X.
- Mix to a complete homogeneity.
- Heat to the operating temperature and fill up the tank.
- Make the controls and (when necessary) the required adjustments.
- Before the start up add 1 kg BONDERITE M-AD 3080 (dissolved 50 % in water) for each 1,000 L bath volume.

Operating Data:

Temperature, °C	45 to 55
Treatment time, minutes	5 to 10*

* Depending on the required C.W.

Bath Monitoring:
The working bath is run through the control of the following parameters (for a standard 220 g/L solution):

Total Acid, points	60
Free Acid, points	8
Fisher Points	36
TA/FA Ratio	1.4 to 2.1

Total Acid:

- Transfer a 10 mL sample into a 250 mL beaker and add 30 to 50 mL of dIistilled water.
- Add about 20 mL of Hehn Reactive and 5 to 10 drops of Phenolphthalein Indicator (1% alcoholic solution).
- Under slight agitation titrate with 0.1 N Sodium Hydroxide (NaOH) solution until the colour turns from colourless to pink.

The mL of 0.1 N NaOH solution used for the titration is the Total Acid value.

Free Acid:

- Transfer 10 mL of working bath into 100 mL flask and add 30 to 50 mL of DI water.
- Add 5 to 10 drops of Bromophenol Blue Indicator (0.04 % alcoholic solution) or 5 to 10 drops of Methyl Orange Indicator (aqueous solution).
- Titrate under slight agitation with 0.1 N Sodium Hydroxide (NaOH) solution until the colour turns from yellow to blue (Bromophenol Blue Indicator) or from orange to yellow (Methyl Orange Indicator).

The mL of 0.1 N NaOH solution used for the titration is the

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Free Acid value.

Fischer Points:

- Transfer a 10 mL sample into a 250 mL beaker and add 30 to 50 mL of DI water.
- Add 50 to 60 mL of Potassium Oxalate solution (25 %) and 5 to 10 drops of Phenolphthalein.
- Titrate with 0,1 N Sodium Hydroxide until it turns to persistent pink colour.

The mL of 0.1 N Sodium Hydroxide required give the Fischer Points.

Fe^{++} concentration:

- Transfer a 10 mL sample into a 250 mL beaker and dilute with 10 mL of distilled water.
- Add 10 mL of 50 % Sulphuric Acid (H_2SO_4).
- Titrate with 0,1 N Potassium Permanganate ($KMnO_4$) until it acquires a permanent pink colour.
- Fe^{++} concentration is found with the following formula:

Fe^{++} concentration g/L = A * 0.56
where A = mL of 0,1 N Potassium Permanganate

Bath replenishment:
Total acid concentration slowly decrease during the production process.
When the concentration is lower than the initial fixed value add 2.1 kg of BONDERITE M-ZN 4702 R X 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 as possible.

Equipment:
The tank and the heat exchanges should be made of stainless steel or anti-acid material, e.g. polypropylene.
The tank bottom should be cone-shaped to get an easier removal of the settled sludges.
The heat exchanges should be installed away from the sludge settling area inside the tank.

Operational Recommendations:

- Keep the Fe^{2+} concentration in the range suggested by the Henkel Technical Service and fixed at the make up pahse. When the concentration exceeds the range:
  - discard a part of the bath;
  - add water to adjust the volume to the operating level;
  - control the Total Acid and the Fe^{2+} concentration;
  - adjust the Total Acid by adding 3.3 kg of BONDERITE M-ZN 4702 MU X for each 1,000 L of bath and for each Total Acid missing point.
- The temperature of the bath should be maintained in the suggested range.
- If the temperature exceeds 80°C, cool the bath under 60°C as soon as possible, then add 1 kg of BONDERITE M-AD 3080 (dispersed in water) for each 1,000 L of bath.
- Rinse thoroughly the material with cold water immediately after the treatment with BONDERITE M-ZN 4702 X.

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-ZN 4702 MU X	- 5 to 40	36
BONDERITE M-ZN 4702 R X	-5 to 40	36
BONDERITE M-AD 3080	5 to 50	36

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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