BONDERITE

Technical Data Sheet

# BONDERITE M-PP 866 R

Known as AQUENCE 866
July 2017

## PRODUCT DESCRIPTION

BONDERITE M-PP 866 R provides the following product characteristics:

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| **Technology** | Coating |
| **Product Type** | Autophoretic coating |
| **Application** | Immersive coating of steel substrates |
| Process components: | |
| BONDERITE M-PP 866 R | Replenisher |
| BONDERITE M-AD 300 | Starter |
| BONDERITE M-AD 35 | Activator |
| BONDERITE M-AD 24 OX | Oxidizer |

BONDERITE M-PP 866 R is used to produce a smooth, black organic coating on ferrous metal surfaces.
The water based coating is deposited uniformly on the metal surface and it is able to coat even recessed or partially enclosed surfaces.
The process provides low cure coatings with good corrosion resistance, solvent resistance, adhesion, flexibility and hardness without the use of solvents or heavy metals.

## 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 each 100 L bath add:

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| BONDERITE M-PP 866 R | 13.4 kg = 11.3 L |
| BONDERITE M-AD 300 | 5.3 kg = 5 L |
| Deionized Water | 83.7 L |

Note:

For coating chemically active metal surfaces, the coating bath is operated with fluorides, measured with a fluoride meter (Lineguard® 101), in a working range of 220 ± 70 microamperes.
For less active surfaces, such as steel sheets, add 0.4 L of BONDERITE M-AD 35 for each 100 L of bath to increase the fluorides to 250 ± micro amps.
The process is run with the following working parameters:

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| Redox-value | 375 ± 25 mV |
| Active Fluorides | 125 to 300 |
| (with Fluoride Meter) | microamperes |
| Total Solids | 5.0 to 7.0% |
| Titration of BONDERITE M-AD 300 | 36 mL, max. |
| Temperature | 20 to 22°C |

Products used in the process are listed below:

BONDERITE M-PP 866 R
BONDERITE M-AD 300
BONDERITE M-AD 35
BONDERITE M-AD 24 OX

**Surface Preparation:**
Cleaning:

It is essential that every piece is cleaned from any soil, smut, grease, oil, rust and ionic contaminants before coating with BONDERITE M-PP 866 R. In some cases may be required an acid cleaning operation. Our Representative will recommend the proper type of cleaning product and operating temperature for the processing line.

Water Rinsing:

After cleaning, the metal must be thoroughly rinsed with plenty of water. The rinse should be continuously renewed to avoid contaminants to heap on.

Deionized Water Rinsing:

Before the coating bath it is required a final rinse with deionized water to remove any residual ionic contaminant.

**Treating with BONDERITE M-PP 866 R:**
Build-up:

Add 1 to 2 inches of deionized water into the tank.
For each 100 litres of final bath volume add 13.4 kg (11.3 L) of BONDERITE M-PP 866 R while adding deionized water then stir carefully without generating foam.
While mixing, add more deionized water to bring the bath to 2/3 of final volume.
Add 5.3 kg (5 L) of BONDERITE M-AD 300 for each 100 litres of bath.
Finally, add sufficient water to bring the solution up to the operating level.
Slowly agitate for approximately 2 hours and check all bath parameters.
Add BONDERITE M-AD 35 or BONDERITE M-AD 24 OX or BONDERITE M-PP 866 R as necessary to adjust levels.

Operating parameters:

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| Time | 1.5 min |
| Temperature | 20 to 22°C |
| Application | immersion |

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**Bath Control:**
Note: always use a pipette filler.
The BONDERITE M-PP 866 R bath is controlled in the plant by Redox Potential measurement, Lineguard® 101 meter measurement, Total Solids determination and Titration of BONDERITE M-AD 300.

Redox potential Control:

The redox potential is constantly monitored with appropriate instrument and electrodes.
The standard value is maintained by additions of BONDERITE M-AD 24 OX.
The frequency of additions depends on the amount of pieces processed per time unit and bath volume.
Our Technical Service will recommend the most suitable range of Redox Potential for the specific process.
If manual additions are necessary, add very carefully the additive and add 0.4 litres of additive for each 100 m³ of metal processed.

Fluoride measurement:

Monitor the value every 2 hours to maintain the fixed initial value in the correct range.
The frequency of additions depends on the amount of pieces processed per time unit and bath volume.
To raise the value by about 100 microamperes, add 0.4 L of BONDERITE M-AD 35 for each 100 L of bath.
The use of Lineguard 101 Fluoride meter is advised.
Contact Our Technical Service for any question about the appropriate equipment.

Total Solids:

The solids content is measured daily by the following method:
On a scale with 1.0 mg precision, weigh a small aluminium tray. Record the measurement as A value. Add about 3 mL of bath into the tray. Quickly re-weigh the tray + bath sample and record the measurement as C value.
Place the sample tray with bath into an oven set at 100°C for 60 minutes. Remove the tray and allow to cool to room temperature. Weigh again the tray and record the value as B value.

$$\text{Calculate the \% total solids: } \frac{(B - A)}{(C - A)} \times 100$$

**Run 2 tests with the method above and average the results.**

To increase the Total Solids by 0.1%, add 0.23 L of BONDERITE M-PP 866 R for each 100 L of bath volume.

Titration of BONDERITE M-AD 300:

Starter Titration is done once per shift by following method:

- Pipette 10 mL solution into a clean 250 mL Erlenmeyer-flask.
- Add 25 mL test solution 32 (18 % Hydrchloric acid).
- Heat to boiling under extract. Maintain until completely coagulated, let it cool to room temperature and fill with DI water to 100 mL.
- Add test solution 35 (65% Ammoniumacetate) in 1 mL steps until colour changes to slight salmon (approx. 10 to 20 mL is required).
- Add 1 mL Indicator 22 (16% Salicylic acid) and mix for 1 minute, the solution changes to dark burgundy.
- Titrate with Titration solution 86 (0.01 M EDTA) under agitation until the colour changes to yellow. The colour should maintain yellow for minimum 30 sec.
- Consumption of EDTA in mL is recorded as: Starter Titration.

While processing steel, the content of iron in the bath continously increases as seen by Starter Titration.
Therefore per 100 m² Steel surface an amount of 12 to 32.5 L bath solution needs to be removed.
This depend on substrate and process parameters.
Alternatively an IONGUARD IEX unit can be used.
Please refer to HENKEL technical service for details.

**Testing Apparatus:**
1.0 l Test solution 35 (65% Ammoniumacetate in DI water)
1.0 l Test solution 22 (16% Salicylic acid, 60.6 % DI-water, 23.4% Isopropanol)
2.0 l Test solution 86 (0.01 M EDTA)
2.0 l Test solution 32 (hydrochloric acid, 1:1)
Indicator 30 (Barium Diphenylamine Sulfonate)
pH/millivolt Meter
Redox (ORP) combination probe
Pipette Filler (Rubber bulb)
Lineguard 101 Fluoride Meter (from HST)
Beaker, 250 mL
Burette Assembly, automatic, 25 mL
Flask, Erlenmeyer, 250 mL
Graduated cylinder, 25 mL
Graduated cylinder, 50 mL
Hot plate
Pipette, 5/10/25 mL measuring
Thermometer
Weighing tray, aluminium, disposable

**Replenishment:**
Whenever a portion of bath is discarded or lost, the volume should be restored at the initial proportion of chemicals and water except for BONDERITE M-AD 300 which must not be added.

**After Treatment:**
Water Rinsing:

After the treatment, rinse the pieces in tap water to remove drips and superficially held portions of bath from the coated surface. The rinse should be continuously overflowed to not become excessively contaminated.

Reaction Rinses:

Following the dip tap water rinse, execute a dip reaction rinse. Reaction Rinse additives can vary depending on specific requirements in the performance properties of the cured coating. Contact Our Technical Service for advices.

Cure of Coatings:

The typical cure for BONDERITE M-PP 866 R coatings requires a metal temperature of 93 to 104°C for 15 to 20 minutes. The proper application should be examined case by case.

**Particular Cautions:**
An annual transfer of BONDERITE M-PP 866 R bath to an acceptable container is recommended to examine the integrity of the tank.
Parts and debris which may have fallen into the bath should

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be removed.
Slight differences in product appearance do not affect its efficiency or operating performances.

The tank for BONDERITE M-PP 866 R bath should be coated with B.F. Goodrich TriFlex® rubber. All piping for handling either the bath or the replenishment should be PVC.

Pumps for either the bath or the replenishment should be of Wilden M-8 diaphragm-type, with polypropylene or Teflon™ diaphragm, balls and seats.

Consider possible variations of speed agitation and working temperature. Heat exchanger coils for bath temperature maintenance should also be in coated stainless steel AISI 316.

The use of automatic equipment for process control and components feeding is advisable to promote consistent quality and controlled costs.

**Storage:**

BONDERITE M-PP 866 R freezes at 0°C.

Freezing is detrimental to the product. BONDERITE M-AD 300 freezes at -2°C.

Freezing is not detrimental to the product (whenever it freezes heat it to room temperature).

It is recommended to store all products indoor and at a temperature above +10°C.

This product has a shelf-life of 12 months.

**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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