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| Salt trailer | ZM 110 |
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Scope:

| | | | |
|---------------------|---------------------|--------------------------|------------------|
| Material: | Carbon steel | Exposure category | C5 |
| Environment: | Coastal environment | Standard | ISO 12944-2:2018 |

Surface Preparation:

| | | | |
|---------------------------------|--|---------------|--|
| Surface Pre-preparation: | Fresh waterjetting @ minimum 700 bars or fresh water cleaning @ 150 bars with chloride remover | | |
| Surface Cleanliness: | Blast cleaning to SA 2.5 | ISO 8501:2007 | |
| Surface Profile: | Medium G R _{y5} | ISO 8503:2017 | |
| Surface Salt Levels: | ≤ 40 mg/m ² | ISO 8502:2017 | |
| Surface dedusting | ≤ Class 2 | ISO 8502-3 | |

System A: Internal surface of the trailer - Zinga Unique with water saturation

| Product | Application Type | Volume Solids (%) | Required DFT (μm) | Indicated WFT undiluted (μm) | Theoretical Spreading Rate (m ² /kg) | Application Method | Solvent | Overcoat Time after touch dry (Hrs) | | |
|--------------|------------------|-------------------|-------------------|------------------------------|---|--------------------|------------------|-------------------------------------|------------|------------|
| | | | | | | | | 10°C | 15°C | 20°C |
| ZINGA | S/C + F/C | 58 | 120-150* | 200 – 260*** | 1.8 | A / S / B** | Zingasolv | 2.0 | 1.5 | 1.0 |

*Application in maximum 2 layers
 **For stripe coating only round brush
 ***WFT is depending on dilution rate

Application Type Key: **M/C** = Mist Coat, **F/C** = Full Coat, **S/C** = Stripe Coat

Application Method Key: **A** = Airless Spray, **S** = Conventional Spray, **R** = Roller, **B** = Brush



System B: External surface of the trailer - Zinga duplex

| Product | Application Type | Volume Solids (%) | Required DFT (µm) | Indicated WFT undiluted (µm) | Theoretical Spreading Rate (m ² /kg) ^a /(m ² /L) ^b | Application Method | Thinner | Indicative Overcoat Time after touch dry (Hrs) | | |
|---------------|------------------|-------------------|-------------------|------------------------------|--|--------------------|------------|--|------|------|
| | | | | | | | | 10°C | 15°C | 20°C |
| ZINGA | S/C + F/C | 58 | 60 | 105** | 3.62 ^a | A / S / B* | Zingasolv | 6.0 | 5.0 | 4.0 |
| Zingaceram PU | M/C - F/C | 55 | 80 | 150** | 6.9 ^b | A / S | PU Thinner | 8.0 | 7.0 | 6.0 |

**For stripe coating only round brush
**WFT is depending on dilution rate*

Application Type Key: **M/C** = Mist Coat, **F/C** = Full Coat, **S/C** = Stripe Coat

Application Method Key: **A** = Airless Spray, **S** = Conventional Spray, **R** = Roller, **B** = Brush

Notes on this Specification:

1. General:

- a. Please use this specification in conjunction with the appropriate Technical Data Sheets and MSDS.
- b. Application Conditions: please see the Technical Data Sheet for details of minimum temperatures, humidity etc. For optimum performance the surface should be completely dry and the **Sa 2.5 cleanliness** standard strictly adhered to.
- c. All surfaces to be coated must be thoroughly cleaned and degreased as per above in the 'Surface Preparation' table and clause 2.
- d. To obtain the optimum performance and protection levels, the surface must be completely dry and it must have the minimum degree of cleanliness of SA 2.5 / SSPC-SP10 / NACE 2 within the blast-profile range of R_{y5} Medium G.
- e. All surfaces shall be prepared in accordance with ISO 8501-3 Table 1, minimum P2. **All sharp edges must be radiused to a minimum of 2 - 3 mm prior to any blasting work.** This is considered as 'best practice' on all steel work.
- f. A Bresle test must be conducted to ensure the levels are below 40 mg/m².
- g. Drying times will be affected by temperatures, humidity and ventilation conditions.
- h. Measurements of DFT should only be taken when the coating is fully cured, as false readings can be experienced.

- i. The above tables for coverage etc. are for guidance only.
- j. A report of atmospheric conditions during application, indicating steel temperature, ambient temperature, dew temperature and humidity will be included in the final report.

2. **Pre-cleaning:**

- a. All steel surfaces must be cleaned prior to blasting. This can be done either by fresh waterjetting at a pressure of minimum 700 bars (70 MPa) or freshwater cleaning at minimum 150 bars (15 MPa) in combination with a salt remover e.g. CHLOR*RID® or HoldTight.

3. **Welds:**

- a. We recommend to do all welding and grinding before any surface preparation has been performed.
- b. Where welding operations, welding repairs or welding modifications have been carried out, all welds must be thoroughly inspected for blow-holes, undercutting, misses etc. and any flaws must be made good before proceeding.
- c. All weld-spatter must be completely removed to avoid 'shadowing' during blast-cleaning and coating operations. Where necessary, these areas can be smoothed over with a P36 or P60 sanding-disc prior to commencing any blast-cleaning work.
- d. If silicone anti-spatter spray has been used on any of the welded steelwork, these areas must be thoroughly cleaned off with acetone before proceeding with any other operations.
- e. If any products have been used to test the welds, the residues of these products must be removed as recommended by the manufacturer.
- f. HAZ are known to have a higher hardness and therefore may yield a lower blast profile. This can typically be solved by grinding away 100 – 200 µm of the steel prior to final blasting.

4. **Blast-cleaning:**

- a. The blast-profiles must conform to R_{y5} medium G. All blast-cleaning must be done to a cleanliness standard of **Sa 2.5** / SSPC-SP10 / NACE 2.
- b. Attention must be paid to all welds, inside angles, drilled-hole circumferences, brackets, bolts and fittings plus all edges.
- c. All blast-cleaned surfaces must be well blown-down or vacuumed before proceeding with the Zinga application process.
- d. Where the surfaces are slurry-blasted, the steelwork must be allowed to dry before application of the Zinga.

5. De-dusting:

- a. All blast-cleaned surfaces must be well blown-down or vacuumed before proceeding with the ZINGA application process.
- b. The de-dusting must produce a result less than or equal to cleanliness class 2 (ISO 8502-3) on each blast-cleaned piece.
- c. Complex welds and those with deep internal angles should be vacuumed out.
- d. Where the surfaces are vapour-blasted, the steelwork must be allowed to dry thoroughly and must be de-dusted as per the above result before the application of the ZINGA.

6. Stripe coating:

- a. Stripe-coating shall be done to the standard SSPC-PAG 11 before the general application of Zinga or the appearance of flash rust or any other form of contamination.
- b. All sharp edges, around brackets and fittings, drilled-hole circumferences and internals, inside angles, bolt-heads and weld seams must be stripe-coated by brush. Special attention must be paid to the welds along the rubbing strakes.
- c. Outside angles and edges must be stripe-coated using a brush.
- d. The ZINGA stripe-coating must be allowed to flash-off for a minimum of 15 - 20 minutes @ 20°C before proceeding with application of the main coat onto adjacent surfaces.
- e. Dilute ZINGA with at least 5% ZINGASOLV for stripe coating.
- f. During application of the main coating, the stripe-coats must be fully overlapped with the general coating.
- g. Where the humidity is very high and there is a danger of flash-rust occurring before application of the full coating of ZINGA, then this coating must be carried out first, followed by the stripe-coatings 20 – 30 minutes @ 20°C after the full coating is touch dry.
- h. If any flash-rust appears, this will have to be removed by water-jetting at 300 - 500 bars pressure. Where this is not possible, then the affected area/s shall be re-blasted and/or cleaned off with the help of a Bristle Blaster before application of the ZINGA.

7. ZINGA application:

- a. All coatings must be applied according to the acceptance criteria (see below)
- b. For dilution rates for the application of ZINGA, please see the Technical Data Sheet.

8. Water saturation

- a. The technique of water saturation implies that fresh water should be sprayed at very low pressure like a mist on the last ZINGA application until the ZINGA is completely saturated with water. Saturation of the coating can only be obtained by wetting all surfaces several times until no more water is absorbed by the coating. The colour will be uniformly dull grey.
- b. Apply the water 4 hours after touch dry of the last coat.

9. Mist coating (Zingaceram PU):

- a. The ZINGA layer must be mist-coated with Zingaceram PU in such a way to form a very thin and continuous film to seal the zinc layer.
- b. Never apply the mist coat with a brush
- c. The mist coat must be applied after **4-6 hours after the ZINGA layer has become touch-dry** (depending on atmospheric conditions).
- d. Mist coats must be applied in the range of 30 - 40 µm DFT. Where spraying with airless equipment, a smaller spray tip must be used in order to obtain a light sealer-coat. This could be 015'-017'.

10. Full coating (Zingaceram PU):

- a. 2 hours after the mist coat is touch-dry, the final coat of Zingaceram PU can be applied in one pass to obtain 80 µm DFT without exceeding a DFT of 120 µm.
- b. Dilution rates for the application of Zingaceram PU must be done as per the Technical Data Sheet.
- c. Curing times must be respected according to the TDS of the Zingaceram PU.

11. Thickness measurements:

- a. WFT thicknesses should be measured according ISO 2808 (Method 1A – Wet Comb).
- b. Preferably use a Magnetic induction gauge (Method 7C – ISO 2808) to measure the dry film thickness of the coating.
- c. Use a sampling plan according ISO 19840 including difficult zones i.e. welds, internal angles, holes, nuts, bolts,...
- d. According to ISO 8503-1, the surface profile is defined as 'medium'. Therefore, **a correction value of 25 µm must be used**. Correction-factor normally only used when calibrating the paint gauge on smooth steel surfaces. Calibration may also be done on the blasted profile.

12. Acceptance criteria (80/20 rule):

In order to have a successful system, both of the following criteria must be followed:

a. according to ISO 19840 (80/20 rule):

The arithmetic mean of all DFT's shall be equal to or greater than the NDFT. Individual dry-film thicknesses between 80 % of the NDFT and the NDFT are acceptable provided that the number of these measurements is less than 20 % of the total number of individual measurements taken.

b. According to SSPC PA2 - 9: compliance with the maximum specified thicknesses, level 4:

According to the SSPC PA2 Level 4, this states that the maximum acceptable thicknesses must be lower than 150% of the specified values.

13. Important notes:

- a. The application of all the products mentioned in these documents must be done in strict accordance with the appropriate manufacturer's instructions and specifications. The information on this sheet is merely indicative and is given to the best of our knowledge based on practical experience and testing. The conditions or methods of handling, storage, use or disposal of the product cannot be controlled by us and are therefore outside our responsibility. For these and other reasons we retain no liability in case of loss, damage or costs that are caused by or that are linked in any way to the handling, storage, use or disposal of the product.
- b. The coverage rates shown are theoretical and are for guideline purposes only.
- c. ZINGA is sensitive to solvents, and prolonged exposure can lead to the breakdown of the surface section of the ZINGA layer. Care should be taken when over-coating ZINGA with solvent based products to ensure that the manufacturers recommended DFT's are not exceeded and curing times are respected.

- d. Tie-coats and top-coats which are applied too heavily can lead to solvent entrapment and subsequent cohesion failure within the top of the zinc layer.
- e. As part of a good maintenance programme, all coating work should be inspected during the first year after application, and once every three years thereafter. Any damages incurred during transportation or launching etc. must be made good as per the original specification as soon as possible.
- f. Before any work is carried out, the Zingametall technical department must be consulted in order to clarify any points or concerns raised in this specification document or in any of the associated Technical Data Sheets, MSDS, and any other relevant documents.
- g. Datasheets must be available to all applicators and others who request it.
- h. Only the most recent technical sheets in English from the Zingametall company are valid.
- i. No liability can be accepted for any failures resulting from the incorrect application of any part of the recommended coating system.