



ZINGAMETALL



COATING SPECIFICATION FOR CORROSION PROTECTION OF LUFENG POWER STATION

ZINGA FILM GALVANISING SYSTEM

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1. Scope

This Specification defines the technical requirements for the execution of corrosion protection by means of the galvanic protective coating ZINGA for the external protection of structures at Lufeng Power Station.

2. Reference documents

The reference documents listed below form an integral part of this General Specification. Unless otherwise stipulated, the applicable version of these documents, including relevant appendices and supplements, is the latest revision published at the EFFECTIVE DATE of the CONTRACT.

2.1. Standards

SSPC – AB1	Mineral and slag abrasives
SSPC – AB3	Ferrous metallic abrasives
SSPC – SP1	Solvent cleaning
SSPC – SP14	Industrial blast-cleaning practice
SSPC – PA G 11	Stripe-coating
ASTM D 4940	Standard Test Method for Conductimetric Analysis of Water Soluble Ionic Contamination of Blasting Abrasives.
ASTM D 4417	Standard Test Methods for Field Measurement of Surface Profile of Blast Cleaned Steel.
ISO 2808	Paints and varnishes – Determination of film thickness
ISO 4628	Paints and varnishes – Evaluation of degradation of coatings – designation of quantity and size of defects, and of intensity of uniform changes in appearance.
ISO 8501 – 1	Preparation of steel substrates before application of paints and related products. Visual assessment of surface cleanliness. Part 1: Rust grades and preparation grades of uncoated steel substrates and of steel substrates after overall removal of previous coatings
ISO 8501 – 2	Preparation of steel substrates before application of paints and related products. Visual assessment of surface cleanliness. Part 2: Visual assessment of surface cleanliness
ISO 8502 – 1 to 4	Preparation of steel substrates before application of paints and related products. Tests for the assessment of surface cleanliness.
ISO 8502 – 6	Preparation of steel substrates before application of paints and related products. Tests for the assessment of surface cleanliness. Part 6: extraction of soluble contaminants for analysis-The Bresle method
ISO 8502 – 9	Preparation of steel substrates before application of paints and related products. Tests for the assessment of surface cleanliness. Part 9: Field method for the conductometric determination of water-soluble salts
ISO 8503 – 4	Preparation of steel substrates before application of paints and related products. Surface profile of abrasive blast-cleaned steel. Part 4: Method of the calibration of the ISO surface profile and for the determination of the surface profile.
ISO 8503 – 5	Preparation of steel substrates before application of paints and related products. Surface roughness characteristics of blast-cleaned steel substrates. Part 5: Replica tape method for the determination of the surface profile
ISO 11127 – 7	Preparation of steel substrates before application of paints and related products. Test methods for non-metallic blast-cleaning abrasives Part 7: Determination of water-soluble chlorides
ISO 19840	Paints and varnishes – Corrosion protection of steel structures by protective paint systems – Measurement of, and acceptance criteria for, the thickness of dry films on rough surfaces.

Table 1 - Standards



2.2. Company documents

TDS ZINGA	Technical Data Sheet ZINGA – General information on the Film Galvanising System ZINGA; Chemical and physical properties, application data, surface preparation, and systems.
TDS Zingasolv	Technical Data Sheet Zingasolv – General information on the solvent Zingasolv; Chemical and physical properties, application data, surface preparation, and systems.

Table 2 - Company documents

3. Definitions

3.1 Hold Points and Witness Points

- Witness Point (W)

A witness point is a point in a coating activity where an inspection must take place. The contractor or relevant client QC personnel shall be formally notified in writing, by e-mail or by SMS of the inspection at least 24 hours in advance for a most accurate schedule) and will normally attend the inspection.

Nevertheless, the contractor needs to include a schedule of inspections in weekly meetings.

On a case by case basis, the inspection witnessing may be waived at the discretion of the client QC personnel. In this case, the witness inspection may proceed without his / her attendance.

However, inspection data must be recorded and submitted for review and approval. All waivers will be given in writing prior to inspection execution (jointly approved by contractor and client) via written instruction, e-mail or SMS.

- Hold Point (H)

A Hold Point is a point in a coating activity where formal written notification is given of an inspection (24 hours in advance notice is for most accurate scheduling) and work shall not proceed past this point until the inspection is performed.

Nevertheless, the contractor needs to include schedule of inspections in weekly meetings. Mandatory attendance is required at hold-point inspections, and work cannot proceed until the current work has been signed off by the relevant QC personnel.

4. Structure

- The structure to be coated is a power-station that will be constructed using mild-steel beams and an exterior cladding material.

5. Geographical location

- The structure will be situated in Lufeng, which is a geographical C5-M atmospheric exposure region within the Guangdong Province, on the South China Sea coastline.

6. Environmental aspects

- It is essential that all coating and solvent handling and the method of application is conducted in such a manner as to not disturb or cause any harm whatsoever to the local environment.
- The contractor shall use a containment appropriate to the type of coating application being used, and it must be capable of containing any spillage or overspray that may occur. Procedures and protective measures must be in place at all times to ensure that no coating material or solvent will ever enter any local water source or cause any harm to any plant-life, soil or flora and fauna.



- Waste generated during maintenance works (paint waste, spent abrasive, etc.) shall be categorised according to local regulatory constraints and affiliate Waste Management Plan. Disposal options shall be defined depending on anticipated quantities to be generated, contaminants content, and available waste disposal infrastructures (reprocessing & recycling, incineration, hazardous/non hazardous waste landfill, etc.).

7. Coating system

7.1 General

- The coating system to be used throughout the structural elements will be ZINGA applied in two layers of 90 µm DFT. For extensive technical information, consult TDS ZINGA.

7.2 Coating description

- The coating is a one-component organic zinc-rich material and is diluted with solvent naphtha.

7.3 Physical data

Components	- Zinc powder - Aromatic hydrocarbons - Binder
Density	2,67 kg/dm ³ (±0,06 Kg/dm ³)
Solid content (undiluted)	- 80% by weight (±2%) - 58% by volume (±2%) according to ASTM D2697
Type of thinner	Zingasolv
Flash point	≥ 40°C - 60°C
Pot life	Unlimited
VOC	474 g/L (EPA Method 24) (=178 g/kg) measured by SMI, Inc.

Table 3 - Physical data of ZINGA

7.4 Manufacturer

7.4.1 Company information

Zingametall bvba
Rozenstraat 4,
Industriepark
Eke 9810
Belgium

Telephone: (0032) – 9385 – 6881 Fax: (0032) - 9385 – 5869

Web: www.zinga.eu Mail: bruno@zinga.be

7.4.2 Local distributor

Primo Corporation (Shanghai) Ltd.
Rm 1202, 12/F, International Trade & Commerce Plaza
118 Xinling Road, WaiGaoQiao Free Trade Zone
Shanghai 200137
People's Republic of China

Tel (86 21) - 5490 - 2111; Fax (86 21) - 6408 - 6675

Email: primo@zinga.cn; gordon.chan@zinga.cn



7.4.3 Certificates

- Description of material
- Vendor's Product code
- Manufacturer's batch number
- Date of manufacture
- Quantity in batch

7.5 Storing and sampling of paint

- All coatings for this project must be purchased as soon as practicable before the commencement of the project.
- All coatings and solvents must be delivered to site in the manufacturer's original containers. Where this has not happened, all affected containers must be removed from site immediately. [HOLD POINT]
- All labels and seals used on the containers must be intact on arrival at the project site [WITNESS POINT]
- The exteriors of all containers shall not show any signs of exposure to heat or weathering or to any other influences that may indicate incorrect storage of the containers at any point. [WITNESS POINT]
- Drums in which any coating material is stored must be kept in a cool and secure place. [HOLD POINT]
- At any point during the progression of the project, the Inspector can take a sample of the coating being used and forward it to the Superintendent for testing. If any doubt exists as to the quality of any consignment of the coating material, such material shall not be used until it has been tested and found fit-for-purpose. [WITNESS POINT]

7.6 Coating system chart

- Table 4 shows an overview of the coating system being used

Layers in system	Product	V/S %	DFT (µm)	WFT (µm)	Theoretical spread rate m ² /kg	Solvent
First layer	ZINGA	58*	90	155*	2.4	Zingasolv
Second layer	ZINGA	58*	90	155*	2.4	Zingasolv

Table 4- Overview of the coating system

*Undiluted

8. Certification of personnel

8.1 Operators

- Operators shall be individually certified by an approved organization (ACQPA, FROSIO, etc.).

8.2 Scaffolders

- Operators shall be individually certified by an approved organization (Conform, Setho, etc.).

8.3 Inspectors

- Inspectors shall be individually certified by an approved organization (ACQPA, FROSIO, NACE International minimum level 2 with peer review, etc.).

9. Steel quality

- To ensure good performance of the protective coating, all steel components being incorporated into a permanent structure should be shown to comply with the EU Directive on Construction Products (CPD89/106/EEC).

10. Handling

- ZINGA should be thoroughly mixed before use.
- For a 25 kg container, this means stirring with an industrial mixer for at least 5 minutes. The content should be transferred to an empty container after mixing. The residue is mixed with Zingasolv (0,5 – 1 L) and mixed again. This is added to the other content. If the containers are not used for a prolonged period of time (e.g. during lunch break), the containers should be mixed again to ensure no Zinc settlement occurs.

[WITNESS POINT]

11. System chart

Table 5: This shows an overview of the steel preparation system

Step no.	Action	Method	Purpose
1	Pre-preparation	Visual inspection + wash down	Remove contamination
2	Salt Check	Conductivity Test	Check contamination
3	Preparation	Blast-clean all surfaces of the steelwork	Cleanliness / profile
4	Dedusting	By appropriate means	Cleanliness

Table 5 - Overview of steel preparation system



12. Surface preparation

12.1 Pre-preparation of the iron-work

- Every face of all steel sections must be inspected visually before blast-cleaning commences, and those faces displaying surface contaminations must be washed down by a method that will totally remove such contaminations, including contaminations resulted from fabrication, e.g. spatters.
[HOLD POINT]
- Special attention must be paid to areas surrounding bolt-heads, rivets, brackets and other fittings that sit above the level of the iron's surface.

12.2 Surface salt test

- At different points of the surface (depending of the angle of the surface – to ensure a representative area is tested), a surface-salt test should be carried out to ensure that any chlorides present are at levels below 40 mg/m².
This sampling must be carried out in accordance with ISO 8502-6 and testing according to ISO 8502-9 (conductivity test).
[HOLD POINT]
- Where surface-salt levels exceed 40 mg/m², the surfaces will have to be jetted and the salt levels will have to be measured again.

12.3 Blast cleaning

12.3.1 General

- The Contractor must ensure that the equipment brought to site is in full working order.
[WITNESS POINT]
- All the relevant safety equipment must be on site, and must be fully operational.
- All protective clothing must be in full working order and in good repair.
- All personnel involved with blast-cleaning operations must wear the correct respiratory and facial protection at all times, and must wear the correct gloves and coveralls/suits and appropriate footwear.

12.3.2 Abrasives

- All abrasives must comply with SSPC-AB1 grade 3, which is a mix of abrasive particles that will produce surface profiles in the range of 51 – 89 µm.
Where Type I (mineral) or Type II (slag) abrasives are used, the NACE inspector on site must check that the profile-range of the blasted structures always falls within 50 – 70 µm on all faces at all times.
[HOLD POINT]
- Abrasives must be stored in a location that shelters them from the weather.
[WITNESS POINT]
- All abrasives will be kept dry and free from any contamination. Before the use of a new batch of abrasives, a salt test should be carried out to ensure that any chlorides present are at levels below 40 mg/m², preventing salt contamination is inflicted on the steel by abrasive blasting.
This testing must be carried out in accordance with ISO 11127 or ASTM D 4940.
[HOLD POINT]
- Disposal of all abrasives must be done in accordance with local bye-laws.



12.3.3 Blast-profiles and cleanliness

- All blast-profiles shall fall inside the range of 50 – 70 μm @110-130 PPI (peaks per inch) according to ISO 8503. Measurement according to ASTM 4417, using an electronic or analogue measurement gauge. [HOLD POINT]
- The profiles must be of a saw-tooth pattern and have sharp peaks.
- The profiles must be free of embedded blast-media and any contamination. [WITNESS POINT]
- The cleanliness of the overall surface must be in accordance with SA 2.5 standards - ISO 8501-1. [HOLD POINT]

12.3.4 Measurements

- After each section has been blast-cleaned, spot measurements must be taken at an average of three spot readings per square metre. One spot reading is the average of three readings taken inside an area measuring 100 mm x 100 mm. [HOLD POINT]
- Where the surface is badly pitted or uneven and a profile gauge cannot be used, the testing for profile-depths must be carried out using pressure-sensitive tape of the correct grade. The recorded tapes must be signed and logged in the daily log sheets. [WITNESS POINT]
- For trusses and girders there must be an average of three spot readings per square metre. Random readings must be taken and must include all flanges, webs and mid-sections. [WITNESS POINT]

12.4 Dedusting

- All dedusting should be performed with appropriate means to achieve adequate cleanliness.
- The cleanliness should be class 1 (according to ISO 8502-3). Extra care for dedusting should be taken when recycled grit is used. [HOLD POINT]

13. ZINGA application

13.1 General

- The Contractor shall obtain from the paint manufacturers full instructions for the application and safe use of the specified coating materials. Coating application shall be by brush, roller or spray as directed or as appropriate to the specific application.
- The spraying equipment being used (airless) and the relevant settings, adjustments and set-ups must satisfy the requirements of the coating manufacturer /supplier (see TDS ZINGA). [WITNESS POINT]
- The Contractor shall ensure that the applicators have had a chance to read the manufacturer's instructions (TDS ZINGA and TDS Zingasolv) prior to the commencement of any painting activities, and ensure that those instructions are complied with at all times. [HOLD POINT]
- All coating work shall be carried out in a neat and workmanlike manner, using the relevant application methods. The coating shall be applied in such a manner as to produce a smooth and uniform layer across all the surfaces being treated. [WITNESS POINT]

13.2 Safety

- The Contractor shall ensure that all personnel working with coating materials and solvents have been supplied with, and wear, the correct type of face mask with organic filters that is certified to the EC dictate for FPS 20,



plus nitrile gloves or other approved rubber painting gloves, and other personal protective equipment as specified by the coating manufacturer.

- All safety equipment must be maintained in good order before and during coating application operations, and the safety and respiration equipment of the painter shall be checked to ensure that they are in working order at all times.
- A mask with the appropriate filters shall be worn by all personnel involved in brushing and rolling applications of the coating.

13.3 Number of coats and total film thickness

- The ZINGA coating system will consist of two layers, regardless of the application method used. Each coat will be applied at a wet-film thickness of 155 µm. This will give a dried film of 90 µm DFT. The total film-build after two coats are applied will be 180 µm DFT above the peaks of the roughness.
- The second layer of ZINGA should be applied within a 2 to 3 hour period after touch dry. In any case, the second layer of ZINGA must be applied within the same day of application of the first layer to avoid inter-layer contamination.

[HOLD POINT]

13.4 Method of application

13.4.1 Stripe coat

- To ensure a good coating coverage of sharp edges, fillet-welds, drilled-hole circumferences, outside angles and cut-ends, these should be stripe-coated with a brush **before the first spray application**.
- Dilute the ZINGA coating with 5% by volume with Zingasolv (e.g. add 0,5 L of Zingasolv to a 25 kg ZINGA container) and mix thoroughly (see 10. Handling).
- Use a brush with natural hair (natural bristle) to cover all sharp edges, fillet-welds, drilled-hole circumferences, outside angles and cut-ends and allow to dry for 2 hours at 20°C. Make sure every steel part that is difficult to reach by spray, receives a stripe coat.

[WITNESS POINT]

[WITNESS POINT]

[HOLD POINT]

13.4.2 Airless spray

- All surfaces should be coated with ZINGA using airless spray gun.
- The application of the first layer should be within a reasonable timeframe after blasting (maximum 4 hours). **The formation of flash rust should be avoided at all cost.**
- Dilute the ZINGA coating with 5 to 10% by volume with Zingasolv (e.g. add 0,5-1,0 L of Zingasolv to a 25 kg ZINGA container) and mix thoroughly (see 10. Handling).
- Test applications should be performed to determine optimal pressure at the nozzle and right nozzle opening in order to achieve adequate ZINGA layer thicknesses. The pressure at the nozzle will be around 150 bars with a nozzle between 0.017 and 0.031 inches. Increased pressure with an equal nozzle size, will give a much smoother ZINGA finish.

[WITNESS POINT]

[HOLD POINT]

[WITNESS POINT]

[WITNESS POINT]

13.5 Coating thickness measurements

- All measurements should be performed according to ISO 2808



13.5.1 Wet Film Thickness

- To increase a dry film thickness within acceptance criteria (see 13.6 Coating application rule), the wet film thickness (WFT) of the coating should be monitored as much as possible.
- The WFT is measured preferably by using a comb gauge (method 1A – ISO 2808).

13.5.1.1 Method

- Ensure that the teeth are clean and not worn or damaged. Place the comb gauge onto the flat specimen surface such that the teeth are normal to the plane of the surface. Allow sufficient time for the coating to wet the teeth prior to removing the gauge.
- In the case of specimens curved in a single plane, the comb gauge shall be placed in position parallel to the axis of curvature.
- The result of the thickness measurement depends on the time of measurement. The thickness should therefore be measured as soon as possible after application.
- The applicator should learn the relationship between the greatest gap reading of the tooth wetted by the coating material (the wet-film thickness) and the resulted dry film thickness as explained theoretically below in order to obtain more accurate dry film thicknesses and avoid rejection of the steel member because of over or under application of ZINGA.

13.5.1.2 WFT to DFT

- To calculate the final dry film thickness, the following formula is used:

$$DFT = \frac{WFT \times sbv}{100}$$

- To calculate wet film thickness, the following formula is used:

$$WFT = \frac{DFT \times 100}{sbv}$$

- sbv = solid by volume. The volume that is taken by the solid part of the coating (in %).
This is dependent on the dilution of the coating. For airless spray, the dilution is between 5 and 10% (in v).
- Therefore, in order to achieve a dry film thickness of 90 µm DFT (per layer), the **theoretical** measured WFT thickness should be:

$$WFT = \frac{90 \times 100}{58} = 155 \mu\text{m}$$

[WITNESS POINT]

- This value is indicative and should be used as a guideline.
- To measure the WFT **of a second layer** of ZINGA, it is advised to apply a layer of ZINGA on a glass plate, next to the structure. This will allow more correct determination of the second layer thickness, as the two layers blend together after application.

[WITNESS POINT]

13.5.2 Dry Film Thickness

- Preferably use a Magnetic induction gauge (method 7C – ISO 2808) to measure the dry film thickness of the coating.
- Place the instrument on the coating so that it is perpendicular to the coating. Calculate the film thickness from the change in the magnetic flux.
- The range for the dry-film thickness of each coat is 90 – 100 µm NDFT. [WITNESS POINT]
- The range for the total system is 180 – 250 µm NDFT [HOLD POINT]
- Particular attention shall be paid to obtaining this film thickness around all corners, edges, on inside angles, bolt-heads, brackets, nuts and other fittings or components.
- The initial coating to all of the above areas is to be applied by brush prior to the main coating to obtain a film thickness within the specified range. [WITNESS POINT]
- The dry film thickness of the coating will be checked by an inspector for quality assurance purposes. [HOLD POINT]
- Number of measurements is defined in 13.6 Coating application rule.

13.6 Coating application rules

- Coating application rules should be according to ISO 19840

13.6.1 Sampling plan

- The sampling plan defines the number of measurements to be taken in an inspection area. The structure should be divided into individual inspection areas, of around 100 m².
- The minimum number of randomly taken measurements to be taken for verifying the dry-film thickness on inspection areas is given in Table 7.

Area/length of inspection area (in m ²)	Minimum number of measurements	Maximum number of measurements allowed to be repeated (see 6.3)
up to 1	5	1
above 1 to 3	10	2
above 3 to 10	15	3
above 10 to 30	20	4
above 30 to 100	30	6
above 100	add 10 for every additional 100 m ² or 100 m or part thereof	20% of the minimum number of measurements

Tabel 6 - Sampling plan

- Each difficult area, e.g. stiffeners, brackets, supports, attached piping, shall have additional random measurements taken appropriate to its area in accordance with Table 7, over and above the random measurements in the inspection area.
- Measurements on the dry film shall only be taken after instrument accuracy has been checked in accordance with the instrument manufacturer's instructions.

[WITNESS POINT]

- Following completion of a series of measurements, and preferably during the measurements, the adjustment of the instrument shall be re-verified. If this is not in accordance with the specifications, the results of the measurements shall be rejected. The calibration of the instruments shall be performed on a smooth surface in order to use the correction values as mentioned in 13.6.2.
- When, during a series of measurements, an individual dry-film thickness value does not meet a criterion (13.6.3 Acceptance criteria), a repeated measurement not more than 10 mm from the point of the first measurement shall be carried out. The first value shall then be rejected and replaced by the result of the repeated measurement. This new measurement will then be the individual dry-film thickness. If this individual dry-film thickness does not meet the criterion, it shall not be replaced. For maximum numbers of repeated measurements within an inspection area see Table 7. The number of replaced measurements shall be indicated in the test report.

[HOLD POINT]

- The sampling plan shall be completed even if values do not meet the criteria, unless otherwise agreed.
- Particular attention shall be paid to obtaining this film thickness around all corners, edges, on inside angles, bolt-heads, brackets, nuts and other fittings or components.

13.6.2 Correction values

- According to ISO 8503-1, the surface profile is defined as 'medium'. Therefore, a correction value of 25 µm should be used where the gauge was calibrated on a smooth steel surface.
- The correction value shall be subtracted from the individual reading to give the individual dry-film thickness in micrometres.
- The correction value is applied once to every reading, no matter if the coating consists of a single layer or multiple layers.

13.6.3 Acceptance criteria

- For the acceptance of an inspection area, the following criteria shall be fulfilled:
 - a. the arithmetic mean of all the individual dry-film thicknesses shall be equal to or greater than the nominal dry-film thickness (NDFT); For this project, **NDFT = 180 µm DFT.**
 - b. all individual dry-film thicknesses shall be equal to or above 80 % of the NDFT; For this project, **all readings must be ≥ 144 µm DFT. No readings must be below 144 µm DFT.**
 - c. 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;
 - d. all individual dry-film thicknesses shall be less than or equal to the specified maximum dry-film thickness. For this project, the maximum dry film thickness is 250 µm DFT.
- **To conclude, 80% of measurements must be between 180 µm and 250 µm DFT. 20% of measurements are allowed to be between 144 and 250 µm DFT.**

- If the acceptance criteria above are not met, the inspection area shall be rejected.

[HOLD POINT]

- The dry film thickness of the coating will be checked by an inspector for quality assurance purposes.

13.6.4 Defective painting by the contractor

- Any coating work that is found to be in an unsatisfactory condition by the Inspector, because of faulty paints, improper degreasing, blast-cleaning or application or any other cause whatsoever, shall be removed back to bare



metal SA 2.5 according to ISO 8501-2, and the coating system must be re-applied as per the original specification.

[HOLD POINT]

- If there are any visible areas of rust on any section of the structure, the coating system in these areas must be removed completely back to bare metal and the affected areas re-blasted and re-coated as per the original specification.
- [HOLD POINT]
- A “section” is defined as “any single face of any single component within the structure”. All re-cleaning, re-blasting and re-coating shall be done in accordance with the original specification and must be carried out to the complete satisfaction of the Inspector.

13.7 Conditions during application

13.7.1 Assessment

- All painting activities must be performed in good light conditions. If applications are performed during the night, good lighting should be installed.
- [WITNESS POINT]
- No painting activities must be done if Relative Humidity surpasses 95%.
No painting activities can take place if the temperature of the steel surfaces are not 3°C above the dew-point.
- [HOLD POINT]
- Where there is doubt about the ambient conditions and the dew-point, the Contractor must ensure that measurements of relative humidity % and ambient temperature are recorded along with the dew-point temperatures every hour in order to calculate the minimum surface temperature of the iron surfaces for coating.
- [WITNESS POINT]
- This information will be used to calculate the point at which the 3°C separation is no longer possible, and all painting procedures must cease.
- When high wind conditions exist there is a danger of dust and contamination entering the surface of the zinc coating. Also a lot of overspray can occur. Ensure the painting is sealed off.
- [WITNESS POINT]
- No painting activities must be carried out where the surface is wet or dusty (cfr. Dew point).
- [WITNESS POINT]

13.7.2 Controlled conditions

- Consideration can be given to the contractor when wishing to tent-in the structure if it is necessary to control temperatures, dust, overspray, rain, dew and other factors that will facilitate carrying out the coating work to a high standard.

14. Miscellaneous

- The ZINGA coating will dry to a light-grey colour, but will change in colour with time as it weathers. The final appearance of the surface patination will depend on the location of the structure and how soon the zinc layer is exposed to rain and condensation, but it must be borne in mind that this is a purely cosmetic appearance and in no way whatsoever impacts on the strength or performance of the coating system.
- The only solvent to be used with ZINGA on this project is Zingasolv, which is based on solvent naphtha. This will be used for diluting ZINGA for spray and brush applications, and it must be used in strict accordance with the manufacturer’s recommendations (see TDS Zingasolv).
Dilution rates by the method of application.

[WITNESS POINT]

15. Checks, inspection and acceptance

15.1 Checks

- Throughout the duration of the work, Contractor's Quality Control department shall check the following points and record the results in its daily quality control report.
 - Construction quality:
 - Rounding of corners, sharp edges to 2 mm radius minimum
 - Form, quality and continuity of welds.
 - Surface preparation quality:
 - Grade of cleanliness: Sa 2,5 according to ISO 8501
 - Cleanliness: no grease or oil, dust level 1 maximum according to ISO 8502-3
 - Anchoring profile: medium G according to ISO 8503.
 - Contamination including chlorides: according to ISO 8502-6 and ISO 8502-9, 40 mg/m² maximum.
 - Climatic conditions for application all measured before the work commences and twice per shift and when the ambient conditions are obviously changing):
 - temperature of substrate at least 3°C above dew point
 - Maximum humidity 95% RH
 - Weather conditions.
 - State of curing of ZINGA layer.
 - Interval between coats (in accordance with product datasheets).
 - Wet film thickness for each coat immediately after application.
 - Number of coats, DFT of each coat and of the final system according to ISO 2808 and ISO 19840.
 - Appearance and colour.
 - Visual inspection results: no defects such as "orange peel", cracking, bubbling, pinholes, runs and sags, blistering, etc.

15.2 Inspection test plan

- An inspection test plan including all the points in section 15.1 shall be prepared and submitted to both the customer and the coating fabricant. The Inspection Test Plan shall clearly indicate frequency of testing for each check.

15.3 Provisional acceptance

- Before provisional acceptance, Company shall check that all the inspections set out in subsection 15.1 have been carried out and that all the results are satisfactory.

15.4 Final acceptance

- Upon completion of all ZINGA coating application work, per each/any finished and assembled section or series of sections on the final building site, a joint inspection of Work by the Customer and by the Contractor shall be carried out before issuance of the FINAL ACCEPTANCE CERTIFICATE "Free of visible defects" for coating works.

16. Guarantees

- The Warranty Period as mentioned in article 7 – Guarantees of Quality – of the Contract for "Supervision & Inspection of Anti-Corrosion Coating on Structural Steelwork of Plant Construction, Main & Auxiliary Equipment" will be covered by separate contracts supplied by the Contractor to the Principal
- The Contractor will cover the following scope of guarantee:
 - Corrosion if exceeding rust degree Ri 2 according to standard ISO 4628-3 or the equivalent in a similar standard (ASTM, ESAP, ...)
 - Blistering, cracking, flaking and detachment as a result of visible corrosion activity only.



- The warranty period shall commence on the date of acceptance "free of visible defects" of the coating works, per each/any finished and assembled section or series of sections on the final building site, by the inspector of the Contractor or by the independent inspector of the insurer of the Contractor, whichever date shall first occur.
- The Commencement date of guarantee of any section or series of sections will be stated in the final acceptance report of the inspector of the Contractor.

17. Document authors

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