(TRANSNET 286)

Transnet Pipelines

Specification for Painting of Manifold Piping and Ancillary Equipment

Specification No PL 407

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1. SCOPE

1.1 The Scope of work provides for the coating of the Corrosion Protection System on Manifold Piping and Ancillary Equipment.

In all cases where specifications require abrasive blast cleaning as a method of surface preparation, this procedure shall remove defects to existing paintwork and corrosion product.

1.2 This specification indicates by description the quality of surface preparation and the quality and type of coatings desired. Any substitutions shall be subject to the Engineer's written approval.

1.3 In the event of conflict between this specification and the manufacturer's recommendations the differences shall be resolved before any work is done.

2. STANDARDS AND SPECIFICATIONS

The following standards and specifications shall apply to this contract :

2.1 Abrasive for Blast cleaning SABS 064/79.

2.2 Code of Practice for the preparation of steel surfaces for coating SABS 064/79.

2.3 Cleanliness of Blast-cleaned steel for painting SABS 769.

2.4 European Scale of Degrees of Rusting.

2.5 Swedish Code of Practice SIS 055900/1967.

3. QUALITY ASSURANCE PROVISIONS

3.1 Materials

Different brands or manufactured materials shall not be mixed in any coating system.

All paints, primers, solvents and detergents shall be products bearing the SABS mark.

Paint which has livered, gelled or which cannot be mixed to a smooth paint, shall not be used. Paint older than 12 months shall not be used unless written permission from the Engineer has been obtained.

3.2 Guarantee

3.2.1 Guarantee Period

The Contractor and Manufacturer shall undertake to guarantee that the Corrosion Protection System used and applied in terms of this Contract will perform to an RE2 standard (European Scale of Degrees of Rusting) for a minimum period as specified in the general document.

Should any area be found by the Engineer not to comply to the abovementioned RE2 standard within the said period, the Contractor shall undertake to immediately rectify the defective area at their own expense to the original specification. The affected area is then again guaranteed for the remainder of the period.

3.2.2 Workmanship Guarantee

The criteria governing good workmanship shall be proper surface preparation and cleanliness, uniformity of film thickness and a neat appearance free of blisters, bubbles, craters, sags, runs, lap marks and unnecessary brush marks.

3.3 Coating Application

3.3.1 Coatings shall not be applied when the surrounding air temperature is below 7°C, or 9°C on a falling thermometer unless specifically approved by the Engineer. Painting shall not be permitted in foggy or damp weather. No application shall be conducted on metal surfaces less than 5°C. above Dew Point or where relative humidity exceeds 85%. No coatings shall be applied when the temperature of the substrate exceeds 45°C. Paint shall be applied only when wind does not interfere with the method used or where sand and dust can be blown onto wet paint.

3.3.2 All materials shall be evenly applied to form a smooth continuous, unbroken coating, free from sags, runs and other paint film defects. The lapping of successive coatings shall be carried out in such a way that the pattern of the coating does not reveal the lap areas. No two successive coatings shall have laps in the same place.

3.3.3 All ingredients in any container shall be thoroughly mixed by mechanical means or using a flat bladed spatula before use, and shall be agitated at regular intervals during application.

Paint shall be strained after mixing. When mixing two-pack Primer Coating, the zinc/aluminium dust shall be added in portions to the binder and mixed intimately by stirring before the next portion is added. The mixed paint shall be sieved through a 250 micro metre sieve to remove undispersed solids.

3.3.4 The type and quantities of thinner and quantities used shall comply with the manufacturer's recommendations. Dilution shall not exceed 5% by volume without the written authority of the Manufacturer.

3.3.5 Damaged paint areas shall be cleaned, "feathered back" rust spots removed and spot priming carried out such that the patch painting extends 25mm beyond the damaged areas.

3.3.6 All edges, corners, bolt holes and cut ends which are to be painted shall receive the specified dry film thickness of paint. Such areas should be stripe painted below the overall application of the coating.

3.3.7 On concealed surfaces or back-to-back angles, polyurethane sponges may be used for the coating application. These areas are to be completely coated.

3.3.8 Special attention shall be given to crevices and edges to ensure complete coverage and uniform paint thickness. Each coat of the system shall be applied uniformly over the specified areas. Runs, sags and drips shall be avoided. The coats shall be free from pinholes, bubbling, holidays or any other film defects. Prior to the application of a coat, any damage or defect in a previous coat shall be repaired by the Contractor to the satisfaction of the Engineer. (See section 3.3.6 above)

3.3.9 Brushes and rollers shall be of a quality and style that will enable proper application of the coatings.

3.3.10 Spray equipment used shall be suitable for high quality work, shall be capable of properly atomising the material, and shall be equipped with suitable pressure regulators and gauges. The air caps, needles and nozzles shall be those recommended by the manufacturer of the coating being sprayed. Coatings shall be applied in uniform layers.

3.3.11 The coating manufacturer's recommendations with respect to overcoating times and curing cycles shall be strictly adhered to.

3.3.12 Each coat of paint in any paint system shall be of a distinctly different colour. Top coat colour is to conform in all instances to Transnet requirements.

3.3.13 Paint shall not remain in painter's pots or spray pots over-night. Unused material shall be returned to the original container or a clean container and the lid replaced. Mixed two-pack paint shall be discarded when gelling or separation commences and/or when pot life has expired.

4. INSPECTION AND PHASE CLEARANCE

4.1 Inspection and Acceptability

The Engineer retains the right to inspect each/any phase of the corrosion protection works. However, the responsibility for

acceptability of each phase of the work shall remain with the Contractor.

4.2 Inspection of Surface Quality

The surface quality shall be checked prior to acceptance for coating in terms of rounded edges, weld profiles, chamfered corners, freedom from weld spatter and any other relevant items.

4.3 Inspection of Surface Preparation

Inspections during the cleaning operations shall be made by the Engineer who will also inspect and approve the surface preparation prior to the application of the coating system.

4.4 Inspection of Film Thickness

4.4.1 The Engineer retains the right to check the wet and dry film thickness of each coat and of the total coating system as specified. If it is found that insufficient coating thickness has been achieved the Contractor will be instructed to apply further coats at his own expense.

4.4.2 Thickness testing shall be carried out by using a suitable electronic non-destructive thickness testing instrument. In the case of dispute the Permascope fully electronic instrument shall be the unit of final determination.

4.4.3 A minimum of 90% of all thicknesses measured shall comply with the requirements of the specification. A maximum tolerance of 10% on specification will be allowed on the balance of the measured thicknesses. Any coatings not complying with these requirements will be rejected.

4.4.4 Where the coating system is such that excessive coating thickness is undesirable, the Engineer may instruct the Contractor to remove the coating system and re-apply to the correct thickness at no cost to Transnet.

4.4.5 The Contractor will ensure that application of materials is according to manufacturer's instructions and according to the paint standard as specified.

5. GENERAL SPECIFICATIONS

5.1 Surface Preparation for Manifold Piping and Ancillary Equipment

5.1.1 General

5.1.1.1 Surface preparation (abrasive blast cleaning or wire-brushing) will be decided on site by the Engineer and Contractor.

5.1.1.2 The condition of the substrate prior to painting shall be as specified for each separate coating system.

5.1.1.3 No painting shall be applied over any surface containing traces of grit, grease, oil, flaking paintwork, rust or millscale or corrosion products of any kind.

5.1.1.4 All surfaces to be coated shall be free of moisture.

5.1.1.5 All traces of oil, soluble salts and corrosive airborne contaminants shall be thoroughly washed from the surface prior to painting. Suitable cleaning or de-greasing fluids are to be used for cleaning surfaces to be painted and specified generic materials are to be utilised.

5.1.1.6 In the case of site painting, intercoat washing will be carried out between all coats as and when required by the Engineer.

5.1.2 Abrasive Blast Cleaning (See 5.1.1.1)

5.1.2.1 Note:

The standard of blast cleaning shall be in accordance with the Swedish Code of Practice SIS 055900/1967.

5.1.2.2 All welds shall be free of slag, slag inclusions and pinholes.

5.1.2.3 Adjacent areas shall be free of weld spatter.

5.1.2.4 All oil and grease deposits shall be removed prior to blast cleaning by the use of approved degreasing agents. In this regard special attention shall be paid to drillings, bolt holes, etc.

5.1.2.5 Abrasive blasting shall be carried out using equipment suitably designed for this purpose and operated by experienced personnel.

All air receivers, moisture traps and pressurised equipment used for abrasive blasting or spray painting, shall comply with the statutory regulations.

5.1.2.6 No blast cleaning shall take place during inclement weather conditions i.e. during precipitation due to rainy conditions or when the relative humidity exceeds 85%.

5.1.2.7 All air used for blast cleaning shall be free of all oil contents. Suitable moisture traps shall be incorporated in air lines to ensure that air is dry.

5.1.2.8 Abrasives for blast cleaning shall comply with the requirements of SABS 064. Where sand is used it shall be free of all traces of Chlorides, Sulphates and Clay contents.

5.1.2.9 In all cases, after blast cleaning the surfaces shall be blown clean of all blast media and dust. Should surfaces become contaminated with oil, grease, rust of other deposits before coating they will be re-cleaned and re-blasted.

5.1.2.10 The anchor pattern profiles created by blast cleaning shall comply with the following:

FINISH TYPE	MINIMUM PROFILE	MAXIMUM PROFILE
Sa 2.5	50 micrometers	75 micrometers

5.1.2.11 All blast cleaned surfaces shall be coated with Inorganic Zinc Primer (within a period of four (4) hours after completion of blast cleaning). Under no circumstances shall blast cleaned surfaces be left uncoated overnight.

Note::

Blast cleaned surfaces that do not comply with the specification shall be re-blasted to conform to the standard at no additional charge.

5.1.3 Wire Brushing (See 5.1.1.1)

Prior to wire brushing, all welds shall be free of slag, slag inclusions and pinholes.

5.1.3.2 Adjacent areas shall be free of weld spatter.

5.1.3.3 All oil and grease deposits shall be removed prior to wire brushing by the use of approved degreasing agents. In this regard, special attention shall be paid to drillings and bolt holes.

5.1.3.4 Following the degreasing, as described above, all surfaces under this category shall be scraped and wire brushed to remove all loose rust, scale and deleterious matter followed by sandpapering the existing paint with medium (80) sandpaper to feather sharp edges, remove chalking and provide a key.

5.1.3.5 The Contractor may utilise hand wire brushing provided the required standard of finish is achieved. Where necessary, mechanical brushing shall be used.

5.1.3.6 The surfaces shall finally be blown clean, using dry, oil-free compressed air to remove dust and loose matter. The finish shall be in accordance with the Swedish Code of Practice SIS 055900-1967. Grade St.2

5.1.3.7 All wire brush cleaned or partially cleaned surfaces shall be coated with aluminium filled epoxy mastic. No wire brush cleaned surfaces will be left uncoated overnight.

5.2 Alternatives

Contractors and manufacturers may submit quotations for alternative material, application methods and surface preparation to those covered by this specification, provided that they are suitable for the purpose specified and are generally in accordance with this specification.

5.3. Amendments to Specification

This specification may be amended without prior notice.

6. CORROSION PROTECTION / PAINTING SPECIFICATIONS

6.1 Notes

The following specific notes should be read in conjunction with the relevant specifications :

(a) Where Ethyl based inorganic zinc is specified this must conform to the limits below :

Percentage zinc in dry film : 86% min (by weight)

Theoretical solids content of mixed material : 79%min (by weight)

The material chosen shall be able to be overcoated with further coats of the same type without loss of adhesion or surface defects.

(b) All coatings in any specified paint system shall be supplied from the paint system source. No mixing of different manufacturers brands will be permitted.

(c) When abrasive blasting all equipment which can be damaged by the said process must be adequately protected.

7. DETAILED SCHEDULE OF SPECIFICATION APPLICATIONS

ITEM/AREA	DESCRIPTION	SCHEDULE	PAGE μ
Manifold Equipment	Piping and Ancillary	A	A-8
Manifold Equipment	Piping and Ancillary	B	A-9

7.1 Application Schedule A (Abrasive Blast cleaning)

Description

Coating system for Pipework and Ancillary Equipment.

Surface Preparation

Dry Abrasive Blast-clean to near white metal in accordance with grade Sa 2.5 of Swedish Specification SIS 055900 - 1967 to obtain a surface profile of 50 - 75 microns.

PRIMER	D.F.T. (microns)
Inorganic Zinc	75

FINAL COAT (Except for Stair Treads and Gangways)

FINAL COAT	D.F.T. (microns)
Polyurethane	50

Colour: As specified

TOTAL D.F.T. 125

FINAL COAT TO STAIR TREAD TOPS AND GANGWAYS

Polyurethane to achieve anon skid finish	D.F.T.(microns)
	75

Colour: As specified

7.2 Application Schedule B (Wire brush Cleaning)

DESCRIPTION

Coating system for Pipework and Ancillary Equipment.

SURFACE PREPARATION

Wire brush cleaning in accordance with the Swedish Code of Practice SIS 055900-1967. Grade ST2

PRIMING

SELF PRIMING, HIGH BUILD COAT	D.F.T. (microns)
Aluminium filled Epoxy Mastic	75

FINAL COAT (Except for Stair Treats and Gangways)

Colour: As specified	D.F.T. (microns)
Aliphatic polyurethane	50

TOTAL D.F.T. 125

FINAL COAT TO STAIR TREAT TOPS AND GANGWAYS

Polyurethane	D.F.T. (microns)
non skid finish	75

Colour : As specified

Notes:

1. This specification shall be read in conjunction with relevant sections of the document covering the preparation, coat application, inspection and general requirements.
2. Inorganic zinc and aluminium filled Epoxy Mastic to be applied by agitated pressure spray only.

3a. Inorganic zinc primer to be allowed to cure at least 12 hours at 25°C prior to overcoating.

3b. Aluminium filled Epoxy Mastic to be allowed to cure at least 24 hours at 24°C prior to overcoating.

4. Prior to application of the final coat, all welds will be strip painted with a aluminium filled Epoxy Mastic coat. This strip will overlap the weld by 25mm on either side.

AS WITNESSES

1. _____ _____

TENDERER DATE

2. _____ _____

TENDERED DATE

AS WITNESSES

1. _____ _____

TRANSNET PIPELINES DATE

2. _____ _____

TRANSNET-PIPPELINES DATE