
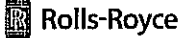
 <b>Agip KCO</b>  	ORIGINATING COMPANY: <b>ABB PS&amp;S SpA - Rolls-Royce PLC</b>	DOCUMENT NUMBER: <b>KE01-B4-000-AR-V-PR-0072-000</b>			
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**ABSTRACT:**

The procedure covers the technical requirements for surface preparation, method of application, inspection and materials to be used for Barge No.8.

**48007- ED - M- 03**

<input type="checkbox"/>	<b>I</b>	ACCEPTED FOR INFORMATION ONLY. SUBMIT RUSSIAN TRANSLATION IF REQUIRED
<input type="checkbox"/>	<b>R</b>	RETURNED WITH COMMENTS. REVISE & RESUBMIT FOR FURTHER REVIEW
<input type="checkbox"/>	<b>U</b>	UNACCEPTABLE- MAJOR COMMENTS. REVISE & RESUBMIT FOR FURTHER REVIEW. WORK SHALL NOT PROCEED IN THE AFFECTED AREAS UNTIL COMMENTS ARE RESOLVED.
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<input type="checkbox"/>	<b>T</b>	RUSSIAN TRANSLATION ACCEPTED – NO COMMENTS.
<b>REVIEWING ENGINEER'S NAME (PRINT), SIGNATURE &amp; DATE:</b> NAME: _____ SIGN: _____ DATE: _____		

REV	DATE	REASON FOR ISSUE	PREPARE	CHECKED	APPROVED
P02	15.07.2005	General revision after comments received from AGIP	L.Dimech	F. Del Sarto	F.Sarcinelli
P01	26.04.2005	FIRST ISSUED	L.Dimech	F. Del Sarto	G.D'Inca

Rev.	Para.	Revision Description
P01 P02		First Issue General revision after comments received from AGIP
Hold No.	Para.	Description of Hold
	7.9	Piping coating specification still to be defined





**Malta Shipyards**

# **SURFACE PREPARATION and PAINT APPLICATION PROCEDURE**

**BARGE N<sup>o</sup>. 8**

No. 48007-ED-M-03

Rev. 1

Date: 26/ 06/ 2005

Page 2 of 19

## **Contents**

### **1.0 Scope**

### **2.0 Applicability**

### **3.0 Reference Document**

### **4.0 Abbreviations**

### **5.0 General**

### **6.0 Procedure**

6.1 General Conditions

6.2 Surface Preparation

6.3 Mechanical and Power Tooling

6.4 Paint Application

6.5 Remedial Touch Up

### **7.0 Coating Systems**

7.1 Coating System N<sup>o</sup>.1 : External Barge Hull Surface Above Waterline – Excluding Deck

7.2 Coating System N<sup>o</sup>.2 : External Barge Hull Surface Below Waterline

7.3 Coating System N<sup>o</sup>.3 : Internal Barge –Excluding Ballast Tanks

7.4 Coating System N<sup>o</sup>.4 : Ballast Tanks

7.5 Coating System N<sup>o</sup>.5 : Barge Main Deck And Walkways

7.6 Coating System N<sup>o</sup>.6 : Buildings – Wall and Stairs

7.7 Coating System N<sup>o</sup>.7 : Escape Routes

7.8 Coating System N<sup>o</sup>.8 : Pipe Rack

7.9 Coating System N<sup>o</sup>.9: Piping

### **8.0 General Repair**

8.1 General

8.2 Insufficient Thickness

8.3 Excessive Thickness

8.4 Other Defects



**Malta Shipyards**

## **SURFACE PREPARATION and PAINT APPLICATION PROCEDURE**

**BARGE N<sup>o</sup>. 8**

No. 48007-ED-M-03

Rev. 1

Date: 26/ 06/ 2005

Page 3 of 19

8.5 Repairs to Zinc Coated Surfaces

### **9.0 Inspection And Testing**

9.1 Quality Control Inspection - Standard Requirements

9.2 Pre-Blast Cleaning Inspection (Release Acceptance)

9.3 During Blast Cleaning Inspection

9.4 Post-Blast Cleaning Inspection

9.5 Quality Control of Prepared and Coated Surfaces

### **10.0 Documentation**

### **11.0 Annexes**

### **12.0 Attachments**



Malta Shipyards

## **SURFACE PREPARATION and PAINT APPLICATION PROCEDURE**

**BARGE N° 8**

No. 48007-ED-M-03

Rev. 1

Date: 26/ 06/ 2005

Page 4 of 19

### **Title: SURFACE PREPARATION and PAINT APPLICATION PROCEDURE**

#### **1.0 Scope**

The scope of this procedure is to cover the technical requirements for surface preparation, method of application, inspection and materials to be used for Barge No.8.

#### **2.0 Applicability**

This procedure is applicable for the coating of Barge No.8 hull structure, top side steel structures and piping.

The following items and areas are not to be coated:

- Equipment supplied finish coated with an approved system
- Equipment chrome plating or nickel plated, copper, brass, plastic and other similar surfaces
- Acoustic or textured ceiling materials
- Galvanised steel surfaces for interior service except where required for safety or identification purpose or for architectural or decorative treatment, unless the surface has been damaged
- Exposed threads, threaded bolt holes and flange mating surfaces
- Stainless steel surfaces (*unless operating over 50<sup>o</sup>C*)
- Sacrificial and impressed anodes and reference electrodes
- Moving parts such as valve spindles, delicate machinery and machined surfaces
- Push buttons and switches
- Instrument and electrical items such as glass faced pressure gauges, light fittings, cables, instrument panels etc
- Name plates, TAG plates and code stampings
- Fibre reinforced plastic items



Malta Shipyards

## SURFACE PREPARATION and PAINT APPLICATION PROCEDURE

**BARGE N° 8**

No. 48007-ED-M-03

Rev. 1

Date: 26/ 06/ 2005

Page 5 of 19

### 3.0 Reference Documents

#### 3.1 Reference Standards

ISO 8501 Part 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 removal of previous coatings.
ISO 8501 Part 1/Supplement 1994	Representative photographic examples of the change of appearance imparted to steel when blast cleaned with different abrasives
ISO 8501 Part 2	Preparation of steel substrates before application of paints and related products. Visual assessment of surface cleanliness – Part 2: Preparation grades of previously coated steel substrates after localized removal of previous coating
ISO 8501 Part 3	Preparation of steel substrates before application of paints and related products. Visual assessment of surface cleanliness – Part 3: Preparation grades of welds, cut edges and other area with surface imperfections
ISO 8502 Part 3	Preparation of steel substrates before application of paints and related products. Tests for the assessment of surface cleanliness. Part 3: Assessment of dust on steel surfaces prepared for painting (pressures sensitive tape method)
ISO 8502 Part 4	Preparation of steel substrates before application of paints and related products. Tests for the assessment of surface cleanliness. Part 4: Guidance on the estimation of the probability of condensation prior to paint application.
ISO 8502 Part 6	Preparation of steel substrates before application of paints and related products. Tests for the assessment of surface cleanliness. Part 6: Sampling of soluble impurities on surfaces to be painted – The Bresle method
ISO 8502 Part 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 conduct metric determination of water soluble salts.



**Malta Shipyards**

## **SURFACE PREPARATION and PAINT APPLICATION PROCEDURE**

**BARGE N<sup>o</sup>. 8**

No. 48007-ED-M-03

Rev. 1

Date: 26/ 06/ 2005

Page 6 of 19

ISO 8503 Part 1	Preparation of steel substrates before application of paints and related products. Surface roughness characteristics of blast-cleaned steel substrates. Part 1: Specification and definitions for ISO surface profile comparators for the assessment of abrasive blast- cleaned surfaces.
ISO 8503 Part 2	Preparation of steel substrates before application of paints and related products. Surface roughness characteristics of blast-cleaned steel substrates. Part 2: Method for the grading of surface profile of abrasive blast cleaned steel – Comparator procedure.
ISO 8504 Part 1	Preparation of steel substrates before application of paints and related products. Surface preparation methods. Part 1: General principles
ISO 8504 Part 2	Preparation of steel substrates before application of paints and related products. Surface preparation methods. Part 2: Abrasive blast cleaning.
ISO 8504 Part 3	Preparation of steel substrates before application of paints and related products. Surface preparation methods. Part 3: Hand and power tool cleaning.
ISO 4624	Paints and varnishes – Pull-off test for adhesion
ISO 3549	Zinc dust pigment for paints. Specifications and test methods
SSPC-PA 2	Measurement of dry coating thickness with magnetic gauges
SSPC-SP 1	Solvent cleaning
ASTM D3359	Measuring adhesion by tape test
NACE RP0188	Recommended practice for discontinuity (holiday) testing of protective coatings
NACE RP0287	Field Measurement of Surface Profile of Abrasive Blast Cleaning Steel Surfaces Using a Replica Tape
Norsok Standard M-501	Surface preparation and protective coating
RAL 840 HR	Deutschen Normen Ausschuss





**Malta Shipyards**

## **SURFACE PREPARATION and PAINT APPLICATION PROCEDURE**

**BARGE N° 8**

No. 48007-ED-M-03

Rev. 1

Date: 26/ 06/ 2005

Page 7 of 19

### 3.2 Associated Documents

- Doc. No. 48007-QA-P-05      Inspection and Test Plan
- *Doc. No. 48007-QA-P-09      Calibration Procedure*
- AGIP KCO Doc. No. KE01.00.000.KD.V.SS.0001.000      Specification for Surface Preparation & External Coating
- Paint Manufacturers` Data Sheets

### 4.0 **Abbreviations**

- NDE      Non-Destructive Examination
- WFT      Wet Film Thickness
- DFT      Dry Film Thickness
- R/Min      Minimum re-coating interval
- R/Max      Maximum re-coating interval

### 5.0 **General**

In general, all bulk structural materials (plates and profiles) will be supplied in a black condition.

All steel plates and profiles for the Barge Hull structure will be blasted to SA 2½ and coated with weldable Hempel Shop Primer ZS 15890, Colour – Grey / 19840 to a DFT of 25 and 40 microns as per suppliers recommendations. Steel profiles for the top side steel structure of the barge need not to be shop primed prior to fabrication.

Following completion of welding and acceptance of NDE and dimensional control, all blocks and steel structures for top sides will be re-blasted / blasted to SA 2½ and the approved coating systems as per this procedure shall be applied. *No paint shall be applied in way of the erection seam.*

The selected coating manufacturer for this project is International Marine Coatings. The current (most recent edition) of the manufacturer's technical product data sheets are attached to this procedure.

### 6.0 **Procedure**

#### 6.1 General Conditions

Surface Preparation and Coating Application

- For the abrasive blast cleaning of carbon steel, copper slag shall be used.



## SURFACE PREPARATION and PAINT APPLICATION PROCEDURE

No. 48007-ED-M-03

Rev. 1

Date: 26/ 06/ 2005

Page 8 of 19

### BARGE N<sup>o</sup>. 8

- Abrasive agents for cleaning shall be sharp, angular, clean, dry and free from contaminants. Expendable abrasive material shall not contain more than 2 percent by weight of ferrous oxide ( $\text{Fe}_2\text{O}_3$ ) or cuprous oxide ( $\text{CuO}$ ). The abrasive shall be of a suitable size to produce the required cleanness and surface blast profile (specified herein). Cast iron or malleable iron shot shall not be used. The blasted surface shall be free of visible residues and embodiments. The moisture content of material delivered in bags or bulk shall not exceed 0.5% (in weight). The conductivity of the soluble salts in the abrasive shall not exceed  $200\mu\text{s}/\text{cm}$  (micro siemens per centimeter). An analysis of the abrasive shall be performed to ensure suitability of the abrasive.
- If for whatever reason spot blasting is not safe or not practical then, mechanical cleaning as per Swedish Standard SSPC ST3 (power tool cleaning) shall be carried out. After power tool cleaning, surface shall be needle gunned to provide sufficient roughness (anchor pattern) so that paint adheres properly.
- For areas being blast cleaned that are only partially completed, a working edge of at least 100mm shall be left unprimed / uncoated. For surfaces that shall later be welded, the coating shall be applied only up to 100mm each side of the weld location.
- Paint application shall not proceed when:
  - a. The weather forecast indicates that conditions will become unsuitable.
  - b. When the steel / substrate temperature is less than  $3\text{ }^{\circ}\text{C}$  above the Dew Point.
  - c. When the ambient temperature is above  $40\text{ }^{\circ}\text{C}$
  - d. When the relative humidity is in excess of 85%.
  - e. When the substrate temperature is higher than the maximum permissible limit for that product intended for application as notified by the paint manufacturer.
  - f. The specific standard of surface preparation has not been achieved (i.e. standard or cleanliness, removal of contamination, unsuitable surface profile / roughness etc.)
  - g. A release note is not received from client before grit blasting operations.
- In accordance with good painting practice, all edges, welds both (hand and machine), corners, scallops, bolt holes etc. shall be stripe coated (by brush only) after priming and in between each successive full coat. Stripe coating shall be carried out internally on barge hull structure and on the top side steel structures.
- Areas of converging structural / piping / supporting steel work shall be painted by using multiple brush coats if such areas would otherwise result in over application, dry / overspray, sagging or other paint application related problems.
- All surface preparation and coating inspection equipment must bear a valid certificate of accuracy / calibration.



**Malta Shipyards**

## **SURFACE PREPARATION and PAINT APPLICATION PROCEDURE**

**BARGE N<sup>o</sup>. 8**

No. 48007-ED-M-03

Rev. 1

Date: 26/ 06/ 2005

Page 9 of 19

### 6.2 Surface Preparation

#### a. Steelwork

- All sharp edges shall be ground off to a minimum of 2.0 millimeters radius.
- All welding spatter and slag shall be removed.
- All corner cut-outs shall be cleaned of all weld and burn slag.
- Any undercuts / blowholes to welds requiring re-welding shall be done prior to grit blasting.
- All plate laminations shall be removed with a grinding machine before grit blasting.
- All welding and burning in confined spaces or adjacent areas to confined spaces shall be completed prior to commencement of grit blasting.
- All temporary welding lugs, brackets, etc. shall be removed. After removal, such areas shall be ground to provide a smooth surface, and subject to NDE Inspection. This will also apply to any other areas of damage, which may have occurred during erection.
- It will be ensured that no welds have sharp edges.
- All oil residues, contaminants etc. shall be removed from surfaces with a non-fatty solvent.

#### b. Blasting

- *Abrasive blast clean all surfaces to Swedish Standard SIS 05 5900: Sa 2½ (equivalent to SSPC-SP10 or ISO 8501-1 Sa 2½.) with a surface profile within the range 30-85 microns by either the shot blasting treatment line or open manual blast cleaning using copper slag abrasive.*
- Rust scale, mill scale, foreign matter and soluble salts are to be removed from the surface, in accordance with ISO Sa 2½. This includes the complete removal of existing shop primer. All scallop edges, lightening holes and internal surfaces of hatch coaming, back or return edges are to be taken into account.
- Care shall be taken to ensure that the areas on bottom covered by temporary support tubes are taken into the blasting schedule.
- After completion of each blasting operation, cleaning will be carried out followed by inspection of blast standard. This includes also the blasting profile, level of chloride contamination (max 6uS/cm<sup>2</sup>, which is approx. 20mg/m<sup>2</sup>) and removal of grit adhering to steel surfaces.
- On acceptance of blast standard, final cleaning shall be carried out by stiff fibre brushing and finally vacuum cleaning.
- Scaffolding and tank fittings shall be clean and free from spent abrasive.



## SURFACE PREPARATION and PAINT APPLICATION PROCEDURE

No. 48007-ED-M-03

Rev. 1

Date: 26/ 06/ 2005

Page 10 of 19

### BARGE N<sup>o</sup>. 8

#### 6.3 Mechanical and Power Tooling

Power Tooling shall only be done:

- When vacuum blast is not possible due to access.
- Only with written permission of client and on a case by case basis.
- Acceptable standard is ST 3 according to ISO 8504-3.

After power tooling the cleaned surface shall be needle gunned to provide a sufficient roughness so that the paint will adhere properly.

#### 6.4 Paint Application

##### a. General

When paint application is being carried out by means of Airless Gun Spray, the area shall be protected in such a way that over spray cannot effect other areas. *Paint operators shall be qualified by sample test plates.*

##### b. Application of Shop Primers on New Steel

When shop priming new steels before fabrication, the steel shall be grit blasted to Sa 2½ (ISO 8501-1) and shop primed with Hempel Shop Primer ZS 15890.

- The minimum DFT for shall not be less than 25µm.
- The maximum DFT shall not exceed 40µm.
- Shop-primed steel, which is corroded due to a low film thickness, or mechanical damage will be rejected, totally re-blasted to Sa 2½ standard and fully re-coated to specification standard for the contractor's account.
- Application of shop primers must be held in strict accordance with the Paint Manufacturer's Technical Datasheet.
- Shop primed material shall be stored and handled in such a way that unnecessary damage to the paint will not occur.
- Prior to the application of the full coating system, all shop primed steel structures shall be degreased by solvent (when required), cleaned and blasted to Sa 2½ to remove the shop primer.

##### c. Application of Coating System

- Painting application shall be in accordance with manufacturers data sheet and this specification.
- Paint shall be applied free of sagging, inclusions and shall be equally applied over the surface.
- The application of any paint shall be in the presence of a supervisor and QC Inspector who will be responsible for preparation and application during the work .



**Malta Shipyards**

## **SURFACE PREPARATION and PAINT APPLICATION PROCEDURE**

**BARGE N<sup>o</sup>. 8**

No. 48007-ED-M-03

Rev. 1

Date: 26/ 06/ 2005

Page 11 of 19

- Minimum and maximum interval times between coats shall be consistent with the Manufacturers Data Sheets and with the application and inspection principles.
- Stripe coats shall be applied between each layer and applied on the following areas :
  - *Corner edges* and inside surface of holes.
  - Free edges.
  - Welded Seams.
  - Areas where airless spray application cannot be executed.
- The drying times as stated in manufacturers data sheets shall be adhered to each full layer as well as for the stripe coat.

#### d. Coating Thickness

The coating systems are detailed in section 7.0 and the nominal dry film thickness (DFT) is given for each coat. The DFT of any coat shall not be greater than 40% above nor 10% below the nominal value specified.

The minimum dry film thickness (MDFT) is the acceptance thickness for the total applied coating system, based on a 95% probability of this value being exceeded by any individual measurement. In practice, this requires statistical records to be maintained of thickness measurements.

#### e. Multi Coat Systems

Intervals between coats shall be kept to the minimum complying with the manufacturer's recommendations at the prevailing temperature in order to avoid contamination between coats. Any contamination between coats shall be removed.

Zinc silicate and zinc rich epoxy primers shall be tie-coated or overcoated within a maximum of seven (7) days unless specific approval has been given by the client to extend this period.

### 6.6 Remedial Touch Up

Any rework of damaged paint coatings, either newly applied or existing, shall be carried out to a standard and quality matching this specification and paint manufacturer's Technical Data Sheets or specification's.

The time of delay between damage and repair of a painted area shall be as short as possible. The intact surrounding paint at damaged area shall be sand papered for an area of approximately 5 – 10 cm to perform a good adhesion.



## SURFACE PREPARATION and PAINT APPLICATION PROCEDURE

### BARGE N<sup>o</sup>. 8

No. 48007-ED-M-03  
 Rev. 1  
 Date: 26/ 06/ 2005  
 Page 12 of 19

### 7.0 Coating Systems

#### 7.1 Coating System N<sup>o</sup>.1 : External Barge Hull Surface Above Waterline – Excluding Deck

Product Name	Colour	W.F.T.	D.F.T.	R/Min	R/Max
Epoxy Primer Intergard 269	Red	106µm	50µm	Refer to Manufacturers Data Sheet	
Glass Flake Epoxy Interzone 505	--	444µm	400µm		
Polyurethane Finish Interthane 990	Ral 7030	132µm	75µm		
<b>Total Dry Film Thickness: 525µm</b>					

#### 7.2 Coating System N<sup>o</sup>.2 : External Barge Hull Surface Below Waterline

Product Name	Colour	W.F.T.	D.F.T.	R/Min	R/Max
Epoxy Primer Intergard 269	Red	106µm	50µm	Refer to Manufacturers Data Sheet	
Glass Flake Epoxy Interzone 505	---	444µm	400µm		
Antifouling Tie coat Intergard 263	Ral 7030	131µm	75µm		
Intersmooth Self Polishing 460 SPC	Ral 7030	187µm	75µm		
<b>Total Dry Film Thickness: - 600µm</b>					

#### 7.3 Coating System N<sup>o</sup>.3 : Internal Barge –Excluding Ballast Tanks

Product Name	Colour	W.F.T.	D.F.T.	R/Min	R/Max
Epoxy Primer Zinc Rich Interzinc 52	Grey	127µm	75µm	Refer to Manufacturers Data Sheet	
Epoxy Intergard 475HS	Ral 1015	156µm	125µm		
<b>Total Dry Film Thickness: - 200µm</b>					

#### 7.4 Coating System N<sup>o</sup>.4 : Ballast Tanks

Product Name	Colour	W.F.T.	D.F.T.	R/Min	R/Max
Epoxy Primer Intergard 269	Red	106µm	50µm	Refer to Manufacturers Data Sheet	
Epoxy Interseal 670HS	Grey	183µm	150µm		
Epoxy Interseal 670HS	Ral 1015	183µm	150µm		
<b>Total Dry Film Thickness: - 350µm</b>					



**SURFACE PREPARATION and PAINT APPLICATION PROCEDURE**

**BARGE N° 8**

No. 48007-ED-M-03

Rev. 1

Date: 26/ 06/ 2005

Page 13 of 19

**7.5 Coating System N°.5 : Barge Main Deck And Walkways**

Product Name	Colour	W.F.T.	D.F.T.	R/Min	R/Max
Epoxy Primer Zinc Rich Interzinc 52	Grey	102µm	60µm	Refer to Manufacturers Data Sheet	
Modified Epoxy Interzone 954		471µm	400µm		
Silica Aggregate 132	----	----	----		
Polyurethane Finish Interthane 990	Ral 6021	132µm	75µm		
<b>Total Dry Film Thickness: - 535µm</b>					

**7.6 Coating System N°.6 : Buildings – Wall and Stairs**

Product Name	Colour	W.F.T.	D.F.T.	R/Min	R/Max
Epoxy Primer Zinc Rich Interzinc 52	Grey	127µm	75µm	Refer to Manufacturers Data Sheet	
Epoxy Intergard 475HS	Ral 1015	250µm	200µm		
Polyurethane Finish Interthane 990	* See Note	132µm	75µm		
<b>Total Dry Film Thickness: 350µm</b>					

\* **Note:** Wall Panels will be received on site in final coat Ral 9010: Buildings: Ral 2004

**7.7 Coating System N°.7 : Escape Routes**

Product Name	Colour	W.F.T.	D.F.T.	R/Min	R/Max
Epoxy Primer Zinc Rich Interzinc 52	Grey	102µm	60µm	Refer to Manufacturers Data Sheet	
Modified Epoxy Interzone 954		3530µm	3000µm		
Silica Aggregate 132	----	----	----		
Polyurethane Finish Interthane 990	Ral 9005	132µm	50µm		
<b>Total Dry Film Thickness: - 3110µm</b>					

**7.8 Coating System N°.8 : Pipe Rack**

Product Name	Colour	W.F.T.	D.F.T.	R/Min	R/Max
Epoxy Primer Intergard 269	Red	106µm	50µm	Refer to Manufacturers Data Sheet	
Glass Flake Epoxy Interzone 505		444µm	400 µm		
Polyurethane Finish Interthane 990	Orange 2004	132µm	75µm		
<b>Total Dry Film Thickness: 525µm</b>					



**SURFACE PREPARATION and PAINT APPLICATION PROCEDURE**

**BARGE N° 8**

No. 48007-ED-M-03  
 Rev. 1  
 Date: 26/ 06/ 2005  
 Page 14 of 19

7.9 **Coating System N°.9 : Piping**

Product Name	Colour	W.F.T.	D.F.T.	R/Min	R/Max
					Refer to Manufacturers Data Sheet

**Notes:**

1. Remove dust and abrasive residues prior to start of painting by blowing with dry, clean and oil free compressed air..
2. In accordance with good painting practice and as per client's specification all welds, edges, nut, bolts and areas where spray cannot be executed shall be stripe coated in between each coat.
3. Draft marks shall be painted in contrasting colour
4. Silica aggregate shall be included in the upper layer of the final coat on Barge Deck and Escape Routes Body.
5. Method of Application shall be as follows:
  - Touch Up / Stripe Coats - By Brush only
  - Full Coats – Airless Spray (Brush application may be used for confined / awkward access areas).

**N.B.** The paint manufacturer's recommendations for storage, mixing, thinning, induction time and application as noted on their recent product data sheets shall be followed unless otherwise notified.

- R/Min: Minimum re-coating interval – As per Manufacturers Data Sheet
- R/Max: Maximum re-coating interval – As per Manufacturers Data Sheet
- W.F.T.: Wet Film Thickness (measured in microns).
- D.F.T.: Dry Film Thickness (measured in microns).
- Thinner: States type of thinner to be used if necessary and the maximum recommended dilution by volume.

**8.0 General Repair**

8.1 General

Repair of defective areas shall be accomplished in the same manner as the original coating system in regard to surface preparation prior to recoating. *Test panel will be done on site.*





Malta Shipyards

## **SURFACE PREPARATION and PAINT APPLICATION PROCEDURE**

**BARGE N<sup>o</sup>. 8**

No. 48007-ED-M-03

Rev. 1

Date: 26/ 06/ 2005

Page 15 of 19

Epoxy coating which have aged to the point where further application may give rise to intercoat adhesion problems, shall be sweep blasted after cleaning prior to further coating. Approval for this work shall be obtained from the client.

### 8.2 Insufficient Thickness

In the event that a completely coated surface is found to have insufficient coating thickness, this surface may receive an additional coat or coats until the specific thickness is achieved. Surfaces to receive additional coating shall be properly cleaned of all foreign matter or contaminants and prepared as recommended by the Paint Manufacturer.

### 8.3 Excess Thickness

In the event that a coated surface is found to have excessive thickness, it shall be brought to Client's attention who will decide on the appropriate action to be taken. Acceptance by Client of excessive thickness will be considered only if the measured thickness is confirmed by the Paint manufacturer in writing as not being detrimental to the satisfactory service life and performance of the coating system and if testing demonstrates that there is no loss in system or intercoat adhesion.

### 8.4 Other Defects

Defects such as misses, incorrect colour, gloss level and poor hiding power shall be repaired by applying additional coating as required.

Defects such as poor finish, texture, sagging, runs, dry spray and over-spray shall be removed by abrading the film to remove the defect and then applying additional coating as required.

Defects such as poor adhesion, pinholes, holidays and cracking shall be completely removed by blast cleaning to substrate and reapplying the complete system.

### 8.5 Repairs to Zinc Coated Surfaces

Where repairs are required to zinc rich epoxy primer, either with or without topcoats, the following procedure shall be followed:

- Mechanical clean the surface to the appropriate surface preparation.
- Apply 70 microns DFT zinc-rich two-pack epoxy primer in two coats.
- Apply topcoats as required to achieve original system thickness. Overcoating may be permitted before complete curing of the zinc rich epoxy provided that all volatile material has evaporated.

**It shall be noted that the above procedure is for repairs only. Under no circumstances shall this procedure be used in place of original coating system**



Malta Shipyards

## SURFACE PREPARATION and PAINT APPLICATION PROCEDURE

BARGE N<sup>o</sup>. 8

No. 48007-ED-M-03

Rev. 1

Date: 26/ 06/ 2005

Page 16 of 19

### 9.0 Inspection And Testing

#### 9.1 Quality Control Inspection - Standard Requirements

Contractor's quality control inspector / coating manufacturer's inspector shall have a current certificate of qualification to the NACE International Coating Inspector Training and Certificate Program or equivalent.

All testing equipment used shall have a valid calibration certification.

#### 9.2 Pre-Blast Cleaning Inspection (Release Acceptance)

- Confirm that all weld spatter, slag, burrs etc. have been ground smooth by others.
- Confirm that all wax crayon, dye penetrant, oil, grease or other contaminants have been removed by solvent / alkali cleaning / high pressure fresh water washing.
- Client shall prepare and issue fully signed Release Notes for each item to be blasted and coated. No blasting and coating shall commence until full written approval from client is received.

#### 9.3 During Blast Cleaning Inspection

- During blast cleaning confirm that the correct abrasive is being used.
- Check on a random basis (*minimum once every day*), the compressed air pressure (for sandblasters) and the air quality (check to ensure air is dry and free from oil).

#### 9.4 Post-Blast Cleaning Inspection

- Check and record type / size of abrasive used.
- Check and record surface profile *via testex tape (minimum three per day) and also via Surface profile gauge (min. five per day)*.
- The required surface profile of blasted substrates is to be verified and results are to be recorded in the Painting Inspection Reports.
- An electronic gauge shall be used to determine the blasting profile.
- Check *minimum once a day* for presence of soluble salts / chloride contamination prior to coating of any blasted surface. The maximum permissible limit for chloride level shall be equivalent to 20mg/m<sup>2</sup>. If higher reading is found then entire surface shall be washed down with fresh water until the level is found acceptable. Following wash down the surface shall be reblasted.
- Check standard of surface preparation / cleanliness.
- Check that all surfaces have been properly prepared and have been cleaned to remove dust / abrasive residues. Mark up areas not to standard for immediate or later repair.



## **SURFACE PREPARATION and PAINT APPLICATION PROCEDURE**

### **BARGE N° 8**

No. 48007-ED-M-03

Rev. 1

Date: 26/ 06/ 2005

Page 17 of 19

- Check surface roughness.
- Measure and Record: Wet, Dry and Substrate Temperatures. Calculate Dew Point and Relative Humidity.
- Check weather forecast conditions (*min. four times daily*) likely for the duration of the paint application and drying period.

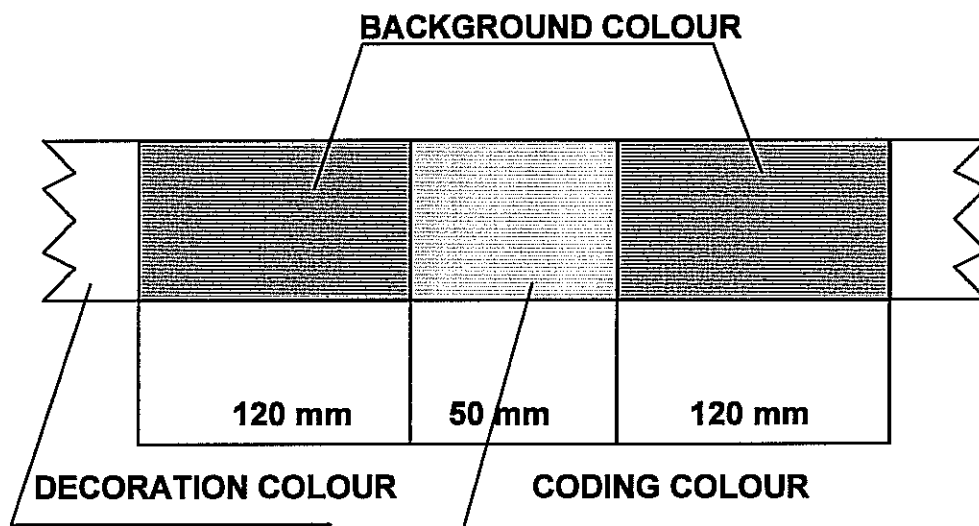
#### 9.5 Quality Control of Prepared and Coated Surfaces

A routine quality control inspection shall be performed before and during paint application. Typical checks shall be as follows:-

- Take regular wet film thickness readings during application where appropriate.
- Record dry film thickness of each applied coat of paint.
- Record any visible defects, pinholes, runs, sags, excessive dry / over spray etc.
- Check coating is through dry (and cured for zinc silicate).
- Check adhesion between coats *using cross cut tape test*.
- Check adhesion on final coats *using pull off test*.
- *Check holiday testing (required for tanks and outside barge hull structure)*
- Record over coating times for each coat.
- Record weather / substrate conditions before, during and after application of each coat including:
  - Wet Bulb Temperature
  - Dry Bulb Temperature
  - Substrate Temperature
  - Relative Humidity
  - Dew Point
- Check that stripe coating, rubbing down and washing down has been performed where appropriate
- Check that two component paints are correctly and fully mixed. Partially mixing of a set is not permitted.
- Check that all paints are thoroughly stirred before use.
- Record type of thinner, batch number and quantity (by volume) used.
- Record batch numbers from each product / component used.

## 10.0 Color Coding of Piping

*The commodity transported inside each pipe shall be identified by the combination of a background colour and a coding colour, by application of coloured bands (painted or adhesive tapes) compatible with the underneath coating. The colour bands shall be applied in accordance with Figure 1. The colour coding of the bands shall be in accordance with Table 1.(Annex 1)*



**Figure 1   Colour Bands**

*The bands shall be applied where identification of the fluid is most important, i.e. on pipes around equipment, machineries and near valves.*

## 11.0 Documentation

All inspections and measurements taken shall be reported in the Painting Inspection Report (Annex 2).

## 11.0 Annexes

- *Piping Identification colors - Annex 1*
- *Painting Inspection Report - Annex 2*



**Malta Shipyards**

## **SURFACE PREPARATION and PAINT APPLICATION PROCEDURE**

**BARGE N<sup>o</sup>. 8**

No. 48007-ED-M-03

Rev. 1

Date: 26/ 06/ 2005


Page 19 of 19


### **12.0 Attachments**

- International Marine Coatings – Thinners/Cleaners/Miscellaneous
- International Marine Coatings – Intergard 269 Epoxy Primer / Tie coat International
- International Marine Coatings – Interzone 505 Glass Flake Epoxy
- International Marine Coatings – Interthane 990 Polyurethane Finish
- International Marine Coatings – Intergard 263 Epoxy Tie Coat
- International Marine Coatings – Intersmooth 460SPC
- International Marine Coatings – Interzone 954 Modified Epoxy
- International Marine Coatings – Interzinc 52 Epoxy Zinc-Rich
- International Marine Coatings – Intergard 475HS Epoxy
- International Marine Coatings – Interseal 670HS Surface Tolerant Epoxy

Table 1. Piping Identification Colours

COMMODITY CODE	FLUID	BACKGROUND COLOUR	CODING COLOUR
AB	Breathing Air	Blue 5017	-
AD	Amine Drain	Orange 2004	Black 9004
AM	Amine	Violet 4005	Yellow 1023
BW	Boiler Feed Water	Green 6024	Red 3020
CA	Compressed Air	Blue 5017	Red 3020
CD	Closed Drain	Orange 2004	Red 3020
CH	Chemicals	Violet 4005	Brown 8016
CM	Cooling Medium	Yellow 1023	Aluminium 9006
CS	Caustic Soda	Violet 4005	Orange 2004
DW	Potable Water	Green 6024	Orange 2004
FD	Fuel Oil/Diesel	Brown 8016	-
FF	Fire Foam	Red 3020	-
FG	Fuel Gas	Yellow 1023	-
FW	Fire Water	Red 3020	Green 6024
GA	Acid Gas	Yellow 1023	Violet 4005
GR	Refrigeration Gas	Blue 5017	Yellow 1023
GY	Glycol	Violet 4005	Blue 5017
HC	HP Condensate	Yellow 1023	Brown 8016
HD	Hot Oil Drain/Heating Medium Drain	Orange	Red 3020
HM	Heating Medium	Yellow 1023	Red 3020
HS	HP Steam	Red 3020	-
IA	Instrument Air	Blue 5017	Red 3020
LC	LP Condensate	Yellow 1023	Brown 8016
LD	Lube Oil	Yellow 1023	Blue 5017
LR	Refrigeration Liquid	Blue 5017	Yellow 1023
LS	LP Steam	Red 3020	-
ML	Methanol	Violet 4005	Black 9005
OS	Oil (Sludge)	Brown 8016	Yellow 1023
OW	Oily Water Sewer/Open Drain	Orange 2004	Black 9005
PA	Process Air	Blue 5017	Red 3020
PL	LPG (Sour)	Yellow 1023	Black 9005
PM	Sweet LPG	Yellow 1023	Green 6024
PO	Product Oil	Yellow 1023	Brown 8016
PW	Produced Water	Green 6024	Yellow 1023
RG	Raw Gas	Yellow 1023	Black 9005
RO	Raw Oil	Brown 8016	Yellow 1023
RS	Sewage Raw	Orange 2004	Black 9005
RW	Raw Water/Technical Water	Green 6024	Violet 4005
SA	Sulphuric Acid	Violet 4005	Red 3020
SD	Sludge (Sewage)	Orange 2004	Black 9005
SL	Liquid Sulphur	Violet 4005	Red 3020
SO	Slop Oil	Brown 8016	Yellow 1023
SW	Sea Water	Green 6024	Black 9005
TG	Treated Gas (Sweet)	Yellow 1023	Blue 5071
TS	Treated Sewage	Orange 2004	Black 9005
TW	Demin Water	Green 6024	Brown 8016
UA	Plant/Utility Air	Blue 5017	Red 3020
UN	Nitrogen	Blue 5017	Yellow 1023
UW	Utility Water	Green 6024	Blue 5017
WF	Well Fluid	Brown 8016	Yellow 1023
WW	Waste Water	Green 6024	Brown 8016

 <b>Malta Shipyards</b>	<b>PAINT INSPECTION REPORT</b>  <b>QUALITY DEPARTMENT</b>		IITP Ref. No.: 48007-QA-P-05				
			Item Block No: N				
			Report No.: PR-				
			Date:				
<b>Project:</b>		<b>BARGE No. 8 – PROJECT 48007</b>		Sheet: 1 of 2			
<b>Inspector Name:</b>		<b>P.C. N°:</b>		<b>Qualification:</b>			
G. CLEWS		502296		ICORR LVL1/2			
<b>Client Specification Compliance:</b>		<b>Procedure Reference:</b>		<b>Coating System:</b>			
14035-919100-001-0-PF		48007-ED-M-03					
<b>Description of Item Treated:</b>							
<b>Location:</b>		<b>WorkShop</b> <input type="checkbox"/>		<b>Dock</b> <input type="checkbox"/>			
				<b>Release Note N°s:</b> N/A			
<b>Material:</b>		<b>Black Steel</b> <input type="checkbox"/>		<b>As Welded</b> <input type="checkbox"/>			
				<b>As Welded &amp; Erected</b> <input type="checkbox"/>			
				<b>Vessel / Pipe(Int.)</b> <input type="checkbox"/>			
<b>Activity Performed:</b>				<b>Date:</b> ____/____/____			
<b>Equipment Used:</b>		<b>Wheelabrator</b> <input type="checkbox"/>		<b>Blast Machine</b> <input type="checkbox"/>			
				<b>Pencil Blast</b> <input type="checkbox"/>			
				<b>Orbital Blast</b> <input type="checkbox"/>			
<b>Hand W/Brush</b> <input type="checkbox"/>		<b>Power Brush</b> <input checked="" type="checkbox"/>		<b>Disc Grinder</b> <input type="checkbox"/>			
				<b>Needle Gun</b> <input type="checkbox"/>			
				<b>Hand Sanding</b> <input type="checkbox"/>			
<b>After Cooler</b> <input type="checkbox"/>		<b>Power Sander</b> <input type="checkbox"/>		<b>H.P. WaterPump</b> <input type="checkbox"/>			
				<b>H.P. Washer</b> <input type="checkbox"/>			
				<b>Steam Cleaner</b> <input type="checkbox"/>			
<b>Ambient Condition:</b>		<b>Time Hrs</b>	<b>Air Temp °C</b>	<b>Wet Bulb °C</b>	<b>% Relative Humidity</b>	<b>Steel Temp °C</b>	<b>Dew Point °C</b>
Before Blasting							
Continue Blasting							
Before Spray							
Finish Spray							
<b>Surface Preparation Performed:</b>						<b>TESTEX HERE</b>	
<b>Preparation Standard:</b> (ISO 8501-1) Sa 2.5							
<b>Soluble Salt Test:</b> (ISO 8502-6)						<b>TESTEX HERE</b>	
<b>Air Quality:</b>							
<b>Abrasive Type:</b> Copper Slag						<b>TESTEX HERE</b>	
<b>Surface Profile:</b>							
<b>Cleanliness:</b> (ISO 8502-3)							

 <b>Malta Shipyards</b>	<b>PAINT INSPECTION REPORT</b>  <b>QUALITY DEPARTMENT</b>				ITP Ref. No.: 48007-QA-P-05		
					Item Block No: N		
					Report No.: PR -		
					Date:		
<b>Project:</b> BARGE No. 8 – PROJECT 48007				Sheet: 2 of 2			
Supplier: INTERNATIONAL				Coating Application: Brush <input type="checkbox"/> Roller <input type="checkbox"/>		Airless Spray <input type="checkbox"/> Conv. Spray <input type="checkbox"/>	
<b>Product Name:</b>	<b>Coat. N°.</b>	<b>Batch N°.</b>	<b>Colour</b>	<b>Shelf Life</b>	<b>Pot Life</b>	<b>Induction Time</b>	
<b>Curing Agent:</b>							
<b>Thinner:</b>							
<b>Specified Wft:</b>	<b>Recorded W.F.T.</b>						
<b>Elcometer DFT Gauge</b>	<b>Model:</b> 345 FS	<b>Serial N°:</b> KB 2962-104		<b>Calibration Date:</b> 26/04/2005	<b>Printout Report N°:</b>		
<b>Film Thickness Test:</b>	<b>Min. D.F.T.</b>	<b>Max. D.F.T.</b>	<b>Average D.F.T.</b>		<b>Litres Used</b>		
<b>Specified D.F.T</b>							
<b>Recorded D.F.T.</b>							
<b>Number of readings:</b>	Under:	Over:			<b>Results:</b>		
<b>Additional Test Performed :</b>			<b>Report N°s:</b> N/A		<b>Date:</b> / /		
<b>X –Cut tape test :</b>			<b>Result:</b>				
<b>Adhesion Test (Pull Off) :</b> N/A							
<b>Holiday Detection Test :</b> N/A							
<b>Test Plate Made :</b> N/A			<b>I.D. N°s:</b>				
<b>Remarks / Comments:</b>							
<b>MS Paint Inspector</b>	<b>MS QA/QC Dept.</b>	<b>Paint Supplier</b>		<b>Client / Third Party</b>			
<b>Name:</b> G. Clews	<b>Name:</b>	<b>Name:</b>		<b>Name:</b>			
<b>Signature:</b>	<b>Signature:</b>	<b>Signature:</b>		<b>Signature:</b>			
<b>Date:</b>	<b>Date:</b>	<b>Date:</b>		<b>Date:</b>			