Reference No.	**CME-TMS-309**
Version	**5**
Operative Date	**14.11.2022**
Status	**Live**
Prepared by	**Paul Curran**
Checked by	**Seamus Costello**
Approved by	**Peter Smyth**

CME DEPARTMENT

TECHNICAL MANAGEMENT STANDARD

CME-TMS-309

ROLLING STOCK PAINT.

This CME Department Standard is mandatory.

The principles in this Standard are approved by the Head of Department and therefore constitute mandatory standard practices, which apply throughout the CME Department.

Signed **Chief Mechanical Engineer**

This Standard, along with all CME Department Standards is on the CME Website. Electronic copies of the CME Department Standards are controlled and live. Holders of printed copies of the Standard are responsible themselves for ensuring that they have the most up to date version as appropriate.

This is a Controlled Document, as presented on-line.
It is Uncontrolled if printed, unless identified as a

"Controlled Copy".

(as per CME-QMS-002 Manual)

Contents

Standard Revision History:

When amending a standard, the changes made should be summarised in the table below.

Issue Number	Date of Issue	Summary of Changes
1.0	December 2008	Initial Release
2.0	July 2010	Standard changed to the latest CME format.
3.0	25.10.2017	General definitions in section 2 deleted and replaced by a reference to definitions in CME-SMS-001. Section 4.1 (Terminology) moved to section 2. HS_RST_TSI_2008/232/CE 7.1.4 replaced by Commission Regulation No. 1302/2014, 7.1.2.3 in the definition for Upgrade, paragraph 2.3 Manager Standards and Design Office in paragraph 3.4 replaced with Manager Drawing & Design Office. Paragraphs 1.3.2, 4.4.2.1, 4.5.2.1, 4.9.4.1, 4.15.6, 4.16.6.8, 4.16.6.9, 4.16.7.2 and 4.16.7.7 amended, references to other paragraphs changed. Paragraph 4.3.1.1 amended, word 'carbon' added. Paragraph 4.3.1.2 amended, steel thickness ☐ 2.5mm removed. Paragraph 4.4.1.2 amended, alloy thickness ☐ 2.5mm removed, reference to standard SIS 055900 removed. Paragraph reference in 4.8.1.2 and 4.9.2.4 changed. Changed section 4.17.
4.0	14.04.2022	General accountabilities & responsibilities removed and replaced with a reference to CME-SMS-001. Paragraph 4.12.1 updated, B.S.6853 1999 replaced by BS EN 45545-2. Table in 4.13.1 amended, BS 3900: Part G5 replaced by BS EN ISO 2813, I.S., BS 3900: Part E2 replaced by I.S. EN ISO 1518-1 and BS 3900:Part G5 replaced by I.S. EN ISO 2812-1.
5.0	14.11.2022	Changes to 4.3.1.3, 4.4.1.3. 4.8.2.3, new paragraph 4.8.2.2, 4.8.2.5. Removed original paragraphs 4.8.2.4 and 4.8.2.5. Sections 4.8.3 and 4.8.4 complete re-write. 4.10 bogie frame & 4.16 partial re-write. Changes are made to come in line with the modern way of painting.

1 Policy, Scope and Principles

1.1 Policy

1.1.1 This standard defines the painting process technical requirements for all IÉ rolling stock.

1.2 Scope

1.2.1 This standard shall apply to all new IÉ Rolling Stock types and also if relevant upgrades are to be performed to existing vehicles.

1.3 Principles

1.3.1 This Standard has been developed to provide a specification for all new build, modified and overhauled rolling stock to be designed, operated and maintained to.

1.3.2 Sections 4.16 and 4.17 do not apply for new vehicle builds.

2 Definitions

2.1 The Definitions for the CME Technical Management System are described in the CME Safety Management System Standard CME-SMS-001.

2.2 The following definitions listed below are specific to this CME Standard.

2.3 **Upgrade** - Modifications that necessitate reassessment of a vehicle design. IÉ uses Commission Regulation No. 1302/2014, 7.1.2.3 as guidance in this area.

3 Accountabilities and Responsibilities

3.1 The full listing of CME Management Accountabilities & Responsibilities is shown in CME Safety Management System Standard CME-SMS-001.

3.2 The following Accountabilities & Responsibilities are specific to this CME Standard.

3.3 **Manager Drawing & Design Office.**

3.3.1 The Manager Drawing and Design Office is accountable for the staff in the drawing and design section and is responsible for delivering correct documentation that will ensure Bogie/Wheelset Safety and Rolling Stock Safety.

Implementation

4.1 Operating Environment

4.1.1 The paint system performance level shall be appropriate for the Iarnród Éireann operating environment and the climatic conditions listed below.

4.1.2 The rolling stock is designed for minimum service duration of thirty years. The rolling stock operates at a maximum service speed of 160 Km/per hour. All paint thickness stated are in a dry film state.

4.1.3 Temperature:

4.1.3.1 Minimum ambient temperature –20°C

4.1.3.2 Maximum ambient temperature +35°C

4.1.4 Humidity:

4.1.4.1 Minimum humidity 10%

4.1.4.2 Maximum humidity 100%

4.2 Painting Bay Environment

4.2.1 Temperature:

4.2.1.1 Minimum temperature +15°C

4.2.2 Humidity:

4.2.2.1 Maximum humidity 75%

4.2.3 The paint production record must document both parameters.

4.3 Preparation of Steel Sections, Sheets and Plates

4.3.1 Treatment of Sheet Metal and Profiles:

4.3.1.1 All carbon steel sections and sheets shall be degreased with an appropriate solvent.

4.3.1.2 Steel sections and sheets shall be Corundum or shot blasted to Swedish Standard SIS 055900 Grade Sa 2 1/2.

4.3.1.3 Immediately after blasting, dry blow to remove dust and use a vacuum machine to extract the residual dust. Apply a weldable two-component primer coat to a thickness that covers the blast profile by 10μm minimum.

4.3.1.4 All material must be stored in an area sheltered from the weather directly after priming.

4.3.2 Treatment of Inaccessible Structural Sections:

4.3.2.1 Anticorrosion protection of inaccessible structural sections to be made by the pulverisation of a wax-based corrosion inhibitor.

4.3.2.2 The inhibitor is to be applied through holes appropriately placed in order to guarantee 100% internal surface coverage.

4.3.2.3 As soon as application of the inhibitor is complete the holes are to be sealed with a plastic plug.

4.4 Preparation of Aluminium Alloy Sections, Sheets and Plates

4.4.1 Treatment of Aluminium Alloy Sheets and Profiles:

4.4.1.1 All alloy sections and sheets shall be degreased with an appropriate solvent.

4.4.1.2 Alloy sections and sheets shall be sanded by hand or swept blasted with sand to achieve a fine grain finish.

4.4.1.3 Immediately after blasting, dry air blow to remove dust and use a vacuum machine to extract the residual dust. Apply a weldable two-component primer coat to a thickness that covers the blast profile by 10μm minimum.

4.4.2 Treatment of Inaccessible Aluminium Alloy Sections:

4.4.2.1 Refer to Section 4.3.2

4.5 Preparation of Stainless Steel Sections, Sheets and Plates

4.5.1 Treatment of Stainless Steel Sheets and Profiles:

4.5.1.1 All stainless steel sections and sheets shall remain untreated unless otherwise advised.

4.5.1.2 All material must be stored in an area sheltered from the weather.

4.5.2 Treatment of Inaccessible Stainless Steel Sections:

4.5.2.1 Refer to Section 4.3.2

4.6 Preparation and Treatment of Wooden Parts

4.6.1 All wooden parts shall be supplied having previously under gone the appropriate treatment for the area of application.

4.6.2 After cleaning and removal of dust a coat of sealant/primer must be applied to surfaces to a thickness of 50μm.

4.6.3 Surfaces where adhesives will be applied must remain free from any sealant/primer.

4.6.4 All wooden parts must be stored in an area sheltered from the weather.

4.7 Rolling Stock Components and Subassemblies

4.7.1 After completing the assembly of components and subassemblies the deteriorated areas, welds etc., must be cleaned and dressed by methods such as disc grinding/sanding etc.

4.7.2 Unprotected areas must have a weldable two-component primer coat to a thickness between 10μm-15μm applied.

4.7.3 An anticorrosion coating must protect inaccessible areas, following assembly.

4.7.4 Sections that are intermittently fixed (welded, permanent mechanical fixings etc.) such as e.g. overlap joints must be protected with an appropriate sealant.

4.8 Locomotives, Multiple Units and Carriages Paint Process

4.8.1 Carbody Structure (Steel):

4.8.1.1 Exterior bodyshell must be Corundum or shot blasted to Swedish Standard SIS 055900 Grade Sa 2 1/2.

4.8.1.2 For general surface preparation see Section 4.3.

4.8.2 Carbody Structure (Stainless Steel):

4.8.2.1 The exterior bodyshell (including the roof) must be washed down with an appropriate solvent.

4.8.2.2 Wash by water until a pH value between 6.0-7.0 has been obtained.

4.8.2.3 Exterior bodyshell (excluding the roof) must be sanded down with P 120- P 180 sandpapers.

4.8.2.4 Apply degreasing/chemical conversion coating.

4.8.2.5 Dry with cloth to remove degreasing agent

4.8.3 Bodysides and Car Ends:

4.8.3.1 Apply a polyester filler paste as required to achieve a final flatness of 1mm per metre.

4.8.3.2 The maximum permitted thickness of filler at any specific point is 1500μm.

4.8.3.3 Sand down with P 120-P 180 sand papers.

4.8.3.4 Remove all traces of dust by dry air blowing and vacuum machine.

4.8.3.5 Apply degreasing agent that is compatible with the painting products to remove any remaining dust.

4.8.3.6 Apply anticorrosive two-component epoxy primer without chromates to a thickness between 50μm-75μm. Standard 2 coats to obtain required thickness

4.8.3.7 Inspect body for any imperfections and repair if necessary. Prime any areas that have been repaired.

4.8.3.8 Apply a high build polyurethane base to a thickness between 40μm-80μm. Standard 2 coats to obtain required thickness

4.8.3.9 Apply a single coat of two-component aliphatic polyurethane enamel to a thickness between 35μm-40μm.

4.8.4 Exterior Roof:

4.8.4.1 Apply a polyester filler paste as required to achieve a final flatness of 1mm per metre.

4.8.4.2 The maximum permitted thickness of filler at any specific point is 1500μm.

4.8.4.3 Sand down with P 120-P 180 sand papers.

4.8.4.4 Remove all traces of dust by dry air blowing and vacuum machine.

4.8.4.5 Apply degreasing agent that is compatible with the painting products to remove any remaining dust.

4.8.4.6 Apply anticorrosive two-component epoxy primer without chromates to a thickness between 50μm-75μm. Standard 2 coats to obtain required thickness

4.8.4.7 Inspect body for any imperfections and repair if necessary. Prime any areas that have been repaired.

4.8.4.8 Apply a high build polyurethane base to a thickness between 40μm-80μm. Standard 2 coats to obtain required thickness

4.8.4.9 Apply a single coat of two-component aliphatic polyurethane enamel to a thickness between 35μm-40μm.

4.8.5 Polyester/Phenolic Exterior Parts:

4.8.5.1 Only visible surfaces are to be painted.

4.8.5.2 Surfaces to be dry sanded with grade P180-P320 sandpaper.

4.8.5.3 Wash down all surfaces to be painted with a cleansing solvent that is compatible with the material.

4.8.5.4 Apply a coat of two-component zinc phosphate epoxy primer to a thickness between 50μm-75μm.

4.8.5.5 Correct any minor discrepancies using polyester filler paste to achieve a final flatness of 1mm per metre.

4.8.5.6 The maximum permitted thickness of filler at any specific point is 1500μm.

4.8.5.7 Apply a single coat of high build polyurethane base to a thickness between 80μm-100μm.

4.8.5.8 Apply a single coat of two-component aliphatic polyurethane enamel to a thickness between 35μm-40μm.

4.8.6 Underframe:

4.8.6.1 Remove all traces of dust by dry air blowing and vacuum machine.

4.8.6.2 Apply a coat of two-component zinc phosphate epoxy primer to a thickness between 50μm-75μm.

4.8.6.3 Apply one coat of a water-based sound proofing paint to a thickness of 1500μm.

4.8.7 Carbody Interior:

4.8.7.1 Remove all traces of dust by dry air blowing and vacuum machine.

4.8.7.2 Apply a single coat of anticorrosive two-component epoxy primer without chromates to a thickness between 50μm-75μm.

4.8.7.3 Apply one coat of a water-based sound proofing paint to a thickness of 1000μm.

4.8.8 Interior paint process for supports:

4.8.8.1 Apply a single coat of anticorrosive two-component epoxy primer without chromates to a thickness between 50μm-75μm.

4.8.8.2 Apply a single coat of two-component aliphatic polyurethane enamel to a thickness between 35μm-50μm.

4.8.9 Piping:

4.8.9.1 Steel piping:

4.8.9.1.1 After forming or bending of pipes all steel piping shall be de-scaled mechanically and then degreased with an appropriate solvent.

4.8.9.1.2 Remove all dust by dry air blowing the material.

4.8.9.1.3 Seal open ends of piping with plastic caps.

4.8.9.1.4 Apply a single coat of anticorrosive two-component epoxy primer without chromates to a thickness between 50μm-75μm.

4.8.9.1.5 Apply a single coat of two-component aliphatic polyurethane enamel to a thickness between 35μm-50μm.

4.8.9.2 Copper piping:

4.8.9.2.1 Copper piping to remain unpainted.

4.8.9.3 Stainless steel piping:

4.8.9.3.1 Stainless steel piping to remain unpainted.

4.8.10 Battery Box:

4.8.10.1 Corundum or shot blasted to Swedish Standard SIS 055900 Grade Sa 2 1/2.

4.8.10.2 Remove all traces of dust by dry air blowing and vacuum machine.

4.8.10.3 Apply a single coat of anticorrosive two-component epoxy primer without chromates to a thickness between 50μm-75μm.

4.8.10.4 Apply two coats of an epoxy anti-acid type finishing paint to a thickness of 35μm-50μm.

4.9 Freight Vehicle Paint Process

4.9.1 Surface Preparation:

4.9.1.1 The quality grade of the metal work prior to initiating paint process shall be 04 according to SFS 8145.

4.9.1.2 All contamination (oil, grease etc.) must be removed from steel surfaces prior to commencing the centrifugal abrasive cleaning process.

4.9.1.3 All surfaces must be dry before commencing the centrifugal abrasive cleaning process.

4.9.2 Centrifugal Abrasive Cleaning:

4.9.2.1 All steel surfaces to be painted must be centrifugal blast-cleaned with an abrasive to grade Sa 2 according to Standard SFS-ISO 8501-1.

4.9.2.2 Abrasive material must be dry and free from grease and other contaminates.

4.9.2.3 All steel surfaces after the centrifugal abrasive cleaning process must be deformed and rough all over with no glossy, even surfaces remaining.

4.9.2.4 Visually examine the material to confirm achievement of 4.9.2.3

4.9.3 Cleaning Process after Assembly:

4.9.3.1 All impurities resulting from the welding process, (splatter, slag etc.), must be removed by brushing and/or chipping.

4.9.3.2 Remove all grease/oil and other impurities by use of an appropriate cleaning solution. Penetrating liquids and other water-borne substances are to be removed by water cleansing to Standard SFS-EN ISO 12944-4.

4.9.3.3 The entire assembly is to be blast cleaned to grade Sa 2 1/2. The surface profile roughness is medium G 2-3 SFS-ISO 8503-2.

4.9.3.4 All contaminates (steel grit, dust etc.) must be removed by dry air blowing, vacuum machine and brush.

4.9.4 Paint System:

4.9.4.1 The priming must be carried out within 16 hours of the completion of the cleaning process (see Section 4.9.3).

4.9.4.2 Apply a single coat of a two-pack solvent borne epoxy primer to a thickness of 70μm.

4.9.4.3 Apply a single coat of a semi-gloss, two- pack epoxy topcoat to a thickness of 60μm.

4.10 Bogie Paint Process

4.10.1 Main Frame:

4.10.1.1 Remove all grease/oil and other impurities by use of an appropriate cleaning solution. Penetrating liquids and other water-borne substances are to be removed by water cleansing to Standard SFS-EN ISO 12944-4.

4.10.1.2 The main frame and its welded components are to be Corundum or shot blasted to Swedish Standard SIS 055900 Grade Sa 2 1/2.

4.10.1.3 Remove all traces of dust by dry air blowing and vacuum machine.

4.10.1.4 Apply anticorrosive chromate-free two-component epoxy primer to a thickness between 80μm-120μm. Number of coats dependant on the product being used.

4.10.1.5 Apply polyurethane finishing coat to a thickness between 40μm-80μm. . Number of coats dependant on the product being used.

4.10.1.6 No paint to be applied to machine surfaces.

4.10.2 Secondary Fix Steel Components:

4.10.2.1 Remove all grease/oil and other impurities by use of an appropriate cleaning solution. Penetrating liquids and other water-borne substances are to be removed by water cleansing to Standard SFS-EN ISO 12944-4.

4.10.2.2 The steel components are to be Corundum or shot blasted to Swedish Standard SIS 055900 Grade Sa 2 ½.

4.10.2.3 Remove all traces of dust by dry air blowing and vacuum machine.

4.10.2.4

4.10.2.5 Apply anticorrosive chromate-free two-component epoxy primer to a thickness between 80μm-120μm. Number of coats dependant on the product being used.

4.10.2.6 Apply polyurethane finishing coat to a thickness between 40μm-60μm. Number of coats dependant on the product being used.

4.10.3 Wheel-Set (Wheel, Disk Brake and Axle Box):

4.10.3.1 Remove all grease/oil and other impurities by use of an appropriate cleaning solution. Penetrating liquids and other water-borne substances are to be removed by water cleansing to Standard SFS-EN ISO 12944-4.

4.10.3.2 The varnish on the brake discs (if any) must be scoured.

4.10.3.3 Remove all traces of dust by dry air blowing and vacuum machine.

4.10.3.4 Apply anticorrosive chromate-free two-component epoxy primer to a thickness between 80μm-120μm. Number of coats dependant on the product being used. (**Axle Box <u>ONLY</u>**).

4.10.3.5 Apply polyurethane finishing coat to a thickness between 40μm-60μm. Number of coats dependant on the product being used. (**Axle Box <u>ONLY</u>**).

4.10.4 Axle:

4.10.4.1 Remove all traces of dust by dry air blowing and vacuum machine.

4.10.4.2 Wash down all surfaces to be painted with a cleansing solvent.

4.10.4.3 Remove all traces of dust by dry air blowing and vacuum machine.

4.10.4.4 Apply two coats of a single component corrosion- resistant water-borne coating to a thickness between 30μm-40μm per coat.

4.10.4.5 No paint to be applied to machine surfaces.

4.10.5 Primary Suspension Coil Springs

4.10.5.1 The spring's entire surface must be covered with a phosphate solution.

4.10.5.2 Degrease the spring surface with an appropriate cleansing solvent.

4.10.5.3 Wash down surfaces with clean water.

4.10.5.4 Wash down surfaces with demineralised water.

4.10.5.5 Wash down surfaces with a non-chromic passivating wash (Zirconium Salts).

4.10.5.6 Apply one coat of two-component epoxy paint.

4.10.6 Secondary Suspension Coil Springs

4.10.6.1 The spring's entire surface must be covered with a phosphate solution.

4.10.6.2 Degrease the spring surface with an appropriate cleansing solvent.

4.10.6.3 Wash down surfaces with clean water.

4.10.6.4 Wash down surfaces with demineralised water.

4.10.6.5 Wash down surfaces with a non-chromic passivating wash (Zirconium Salts).

4.10.6.6 Apply one coat of two-component epoxy paint.

4.11 Protection against Galvanic Corrosion

4.11.1 The vehicle manufacturer shall submit documentation of the specific processes implemented and the products utilised to counteract any possible galvanic corrosion.

4.12 Fire Performance

4.12.1 The paint process must achieve a Category 1b classification as defined in BS EN 45545-2.

4.13 Paint Process Specification

4.13.1 The standard paint processes shall, as a minimum, comply with the following specifications:

Test	Specification
Measurement of specular gloss of non-metallic paint films at 20°, 60° and 85°	BS EN ISO 2813
Scratch test	I.S. EN ISO 1518-1
Determination of resistance to humidity (cyclic condensation)	BS 3900:Part F2 / BS EN ISO 6270
Determination of resistance to liquids. General methods.	I.S. EN ISO 2812-1
Paints and varnishes. Cross cut test.	BS EN ISO 2409
Paints and varnishes. Bend test (Cylindrical mandrel).	BS EN ISO 1519
Paints and varnishes. Falling-weight test.	BS EN ISO 6272
Paints and varnishes. Chipping resistance.	ASTM D 3170
Salt spray fog.	ASTM B 117
Persoz pendulum damping.	BS EN ISO 1522

4.14 Colour Matching

4.14.1 All proposed colours must be to CIE LAB Illuminant D65 and have a ΔE value ≤ 1.

4.15 Test Samples and Documents

4.15.1 Test panels, hazard data sheets and technical data sheets shall be submitted in quadruple by the paint supplier through the vehicle builder to the Iarnród Éireann Chief Mechanical Engineers Department for approval.

4.15.2 The paint supplier must be accredited with ISO 9001.

4.15.3 The dimensions of the test panels must be 150mm x 105mm x 1mm with a 10mm radius at the corners. On the reverse side of the test panel there must be printed an internationally recognised colour identification code, the manufacturer's identification code, manufacturer's batch code and the date the test panel was produced. An area for I.É. use must also be provided on the reverse of the test panel with the words 'Approved' and 'Date' in a column format and a space beside each to accommodate a signature. The test panel must be supplied within its own cardboard pocket with a circular window at the front enabling viewing of the test panels finished surface.

4.15.4 The vehicle manufacturer shall supply documentation indicating, step-by-step, the procedures implemented in the painting process.

4.15.5 The vehicle manufacturer shall also supply documentation indicating, step-by-step, the procedures required, in the event of damage, to return the finish to its previous condition.

4.15.6 Before commencing manufacture of the vehicle components, subassemblies, structural sections etc. the vehicle builder shall submit certified documentation demonstrating the achievement of the requirements stated in sections 4.12, 4.13 and 4.14 of this specification. The documentation must be supported by test results from accredited laboratories and/or verified by inspecting bodies.

4.15.7 I.É. reserves the right to be present at the tests required above. A minimum of fifteen calendar days written notice must be provided to the Chief Mechanical Engineers Department before commencement of the aforementioned tests.

4.15.8 I.É. reserves the right to inspect the first vehicle on completion of its paint process. I.É. shall be notified fifteen calendar days in advance of completion of the first vehicles paint process. Consecutive paint processes may commence before the inspection of the first vehicle but remains solely the vehicles builders' responsibility.

4.16 Painting Process for Existing Rolling Stock

4.16.1 Pre Wash

4.16.1.1 Steam clean vehicle bogies and under-frame using a traffic film remover to ensure all heavy contaminates have been removed before transferring the vehicle to the preparation bay.

4.16.2 Preparation Bay

4.16.2.1 Wash the vehicle body down with filtered canal water that is coupled to an automatic backup mains supply.

4.16.2.2 Using soft head coach brushes, clean the vehicle bodywork down with a biodegradable product. Allow to dry fully.

4.16.2.3 Visually inspect the vehicle surface for any discrepancies i.e. indentations and deformations.

4.16.2.4 All disc sanding equipment must be fitted with a vacuum extraction system.

4.16.2.5 Sand complete body with P120 sandpaper excluding the roof.

4.16.2.6 Any large deformed areas must be disc sanded down with P80 grade paper and a heavy-duty filler/stopper applied. Allow to fully cure before sanding.

4.16.2.7 Sand all heavy-duty filler/stopper with the appropiate grade sand paper finishing in P180 minimum.

4.16.2.8 Apply a top-filler over the heavy-duty filler/stopper and any other minor discrepancies. Allow to fully cure before sanding.

4.16.2.9 Fine disc all filled areas to a smooth finish with 320 light grade paper.

4.16.3 Masking

4.16.3.1 Mask the areas to be protected, as per livery drawings, with tape and plastic masking.

4.16.4 Exterior Body Priming

4.16.4.1 Primer must be mixed and blended in accordance with the paint manufacturer's instructions.

4.16.4.2 Apply Primer in accordance with the paint manufacturers recommendations.

4.16.4.3 The spray booth must be preheated until the body temperature is 3 degrees celcius above dew point, when the spray booth is at 20 degrees celsius.

4.16.4.4 Bake in accordance of the paint manufacturers requirements.

4.16.4.5 When baking time has elapsed, the heat must be turned off and the cooling fans activated for approximately 5 minutes.

4.16.5 Spray Painting

4.16.5.1 There are two paint processes employed in the spraying of the various vehicles. These processes are either a solid colour process or a base coat and clear process. The process utilized depends foremost upon the number of colours in the livery and the time assigned to paint the vehicle.

4.16.6 Solid Colour Spray Painting

4.16.6.1 The solid colour must be mixed and blended in accordance with the paint manufacturer's instructions.

4.16.6.2 Apply solid paint in accordance with the paint manufacturers recommendations.

4.16.6.3 Bake in accordance with the paint manufacturers requirements.

4.16.6.4 When baking time has elapsed, the heat must be turned off and the cooling fans activated for approximately 5 minutes.

4.16.6.5 Strike out the livery as per drawing and mask the areas to be protected.

4.16.6.6 Apply the second colour in accordance with the paint manufacturers recommendations.

4.16.6.7 Bake in accordance with the paint manufacturers requirements.

4.16.6.8 If additional colours are required repeat instructions 4.16.6.1 - 4.16.6.6.

4.16.6.9 Unmask the vehicle.

4.16.6.10 Apply all decals, signage and vinyl strips.

4.16.7 Base Coat and Clear Spray Painting

4.16.7.1 Base coat and clear process must be completed within a timeframe set out by the paint manufacturer.

4.16.7.2 The base coat and clear system must be mixed and blended in accordance with the paint manufacturer's instructions.

4.16.7.3 Apply the first base coat colour, in accordance with the paint manufacturers requirements as per livery drawing. Each coat is sprayed over the previous coat while still in its wet state, (Wet on Wet).

4.16.7.4 Strike out the livery as per drawing and mask the areas to be protected.

4.16.7.5 Apply the second colour, in accordance with the paint manufacturers requirements as per livery drawing. Each coat is sprayed over the previous coat while still in its wet state, (Wet on Wet).

4.16.7.6 Follow instructions 4.16.7.3 - 4.16.7.4 if additional colours are required.

4.16.7.7 Only unmask the painted areas on the vehicle.

4.16.7.8 Apply lacquer in accordance with the paint manufacturers requirements. Each coat is sprayed over the previous coat while still in its wet state, (Wet on Wet).

4.16.7.9 Bake in accordance with the paint manufacturers requirements.

4.16.7.10 When baking time has elapsed, the heat must be turned off and the cooling fans activated for approximately 5 minutes.

4.16.7.11 Unmask the vehicle.

4.16.7.12 Apply all decals, signage and vinyl strips in accordance with the paint manufacturers specifications.

4.16.8 Finishing Bay

4.16.8.1 Hand painting details are as follows;

4.16.8.2 Apply a single component polyurethane paint, as per livery drawings, to areas that were unaffected by the spray process e.g. door edges, door rubbers, safety strips etc.

4.16.8.3 All step-boards to be treated as per drawing instructions.

4.16.8.4 Toilets and Vestibules must be washed down with soap and water before being rubbed down with light wet emery and dry paper (320 medium grade or 220 light grade). Apply a single component polyurethane paint as per drawings.

4.16.8.5 Interior walls and ceilings must be rubbed down with light wet emery and dry paper (320 medium grade or 220 light grade). Apply a synthetic undercoat and allow to dry. Rub down lightly with light wet emery and dry paper (320 medium grade or 220 light grade) before applying a synthetic finishing coat of paint.

4.16.8.6 Seat frames must be cleaned down using a suitable solvent before applying a synthetic finishing coat of paint.

4.16.8.7 Table edges with timber moulding must be rubbed down with light wet emery and dry paper (320 medium grade or 220 light grade) and apply a synthetic finishing coat of paint.

4.16.8.8 Spray painting of the interior may be required for some vehicles. Refer to drawing instructions.

4.16.8.9 All decals and logos must be fitted as per drawing instructions. Apply decals according to manufacturer's recommendations.

4.17 Colours for Existing Rolling Stock: See Livery Diagrams.

End of Standard