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Transport Infrastructure Ireland

## TII Publications



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# Quality Assurance Scheme for Paints and Similar Protective Coatings

**DN-STR-03007**  
June 2014

## About TII

Transport Infrastructure Ireland (TII) is responsible for managing and improving the country's national road and light rail networks.

## About TII Publications

TII maintains an online suite of technical publications, which is managed through the TII Publications website. The contents of TII Publications is clearly split into 'Standards' and 'Technical' documentation. All documentation for implementation on TII schemes is collectively referred to as TII Publications (Standards), and all other documentation within the system is collectively referred to as TII Publications (Technical). This system replaces the NRA Design Manual for Roads and Bridges (NRA DMRB) and the NRA Manual of Contract Documents for Road Works (NRA MCDRW).

## Document Attributes

Each document within TII Publications has a range of attributes associated with it, which allows for efficient access and retrieval of the document from the website. These attributes are also contained on the inside cover of each current document, for reference. For migration of documents from the NRA and RPA to the new system, each current document was assigned with new outer front and rear covers. Apart from the covers, and inside cover pages, the documents contain the same information as previously within the NRA or RPA systems, including historical references such as those contained within NRA DMRB and NRA MCDRW.

## Document Attributes

<b>TII Publication Title</b>	<i>Quality Assurance Scheme for Paints and Similar Protective Coatings</i>
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## NRA DMRB and MCDRW References

For all documents that existed within the NRA DMRB or the NRA MCDRW prior to the launch of TII Publications, the NRA document reference used previously is listed above under 'historical reference'. The TII Publication Number also shown above now supersedes this historical reference. All historical references within this document are deemed to be replaced by the TII Publication Number. For the equivalent TII Publication Number for all other historical references contained within this document, please refer to the TII Publications website.

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**Quality Assurance Scheme for  
Paints and Similar Protective  
Coatings**

**June 2014**

**Summary:**

This Standard gives details, guidance and describes the operation of the quality assurance scheme for paints and similar protective coatings, used in the protection of steelwork for road structures against corrosion and includes the Manual of Paints for Structural Steelwork at Appendix A.

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**VOLUME 2 ROAD STRUCTURES:  
DESIGN  
(SUBSTRUCTURES AND  
SPECIAL STRUCTURES)  
MATERIALS**

**SECTION 4 PAINTS AND OTHER  
PROTECTIVE  
COATINGS**

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**PART 1**

**BD 35/14**

**QUALITY ASSURANCE SCHEME FOR  
PAINTS AND SIMILAR PROTECTIVE  
COATINGS**

**Contents**

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1. Introduction
2. Quality Assurance Scheme
3. Description of Manual of Paints
4. Testing of Contract Paint Samples
5. References
6. Enquiries

Appendix A - Manual of Paints for Structural Steelwork

Appendix B - Additional Test Clauses to BS 3900

Appendix C - Standards Referenced in Appendix A

# 1. INTRODUCTION

## General

- 1.1. The advice and requirements in this standard are given on the basis that the works will be executed in accordance with the NRA Manual of Contract Documents for Roadworks. Products conforming to equivalent standards and specification of other Members States of the European Economic Area (EEA) or a State which is party to a relevant agreement with the European Union and tests undertaken in other Member States of the EEA or a State which is party to a relevant agreement with the European Union will be acceptable in accordance with the terms of Clause 104, Series 100 (NRA MCDRW).

## Scope

- 1.2. This standard gives details, guidance and describes the operation of the quality assurance scheme for paints and similar protective coatings used in the protection of steelwork for road structures against corrosion. The Manual of Paints for Structural Steelwork at Appendix A provides data on paints and similar materials for use in the National Roads Authority's painting contracts.

## Implementation

- 1.3. This Standard shall be used forthwith for all schemes currently being prepared provided that, in the opinion of the National Roads Authority, this would not result in significant additional expense or delay progress. Designers must confirm its application to particular schemes with the Structures Section of the National Roads Authority.

## 2. QUALITY ASSURANCE SCHEME

### General

- 2.1. The quality assurance scheme for paints requires paint manufacturers to obtain a NSAI Agrément Certificate or equivalent for their products before offering paints for use on National Roads Authority contracts. Equivalence must be demonstrated to the satisfaction of the Employers Representative and must be approved in writing. BBA HAPAS Roads and Bridges Certificates administered by the British Board of Agrément (BBA) under the UK Highways Authorities' Product Approval Scheme (HAPAS) will be acceptable for use on National Roads Authority contracts.
- 2.2. The quality assurance scheme for paints comprises the following:
  - (i) Certification of paints. Certification of paints ensures that only paints that give the required level of corrosion protection are used in the protection of steelwork for road structures;
  - (ii) Testing of 'A' and 'B' paint samples taken from paint supplied to works (as specified within Series 1900 of the NRA MRDRW) must be undertaken by the appointed independent testing authority which shall be CREST (Centre for Research in Engineering Surface Technology), FOCAS Institute, DIT Kevin St, Dublin 8, or an equivalent testing authority in any member state of the European Community as agreed with the National Roads Authority. Testing shall be carried out in accordance with Chapter 4 to ensure compliance with the certified formulations.
- 2.3. The certification of paint materials includes the review of manufacturers' formulations and assessment of paint samples by the BBA to ensure they comply with the performance requirements stated in the BBA HAPAS document 'Guideline for the Assessment and Certification of Paints and Similar Protective Coatings'. If an equivalent certification scheme for a paint product is proposed, equivalence must be demonstrated to the satisfaction of the Employer's Representative and must be approved in writing.

### NSAI Agrément and BBA HAPAS Roads and Bridges Certificates of Paint Products

- 2.4. Copies of BBA HAPAS Roads and Bridges Certificates for those paint products that have gained approval can be obtained from the BBA website: [www.bbacerts.co.uk](http://www.bbacerts.co.uk). Where available, NSAI Agrément certificates can be obtained from the NSAI website: [www.nsai.ie](http://www.nsai.ie). Certification of all paint products must be submitted to the Employer's Representative for approval prior to any use.

### Additional Test Clauses to BS 3900

- 2.5. Appendix B provides details of additional tests that shall be carried out in the assessment of the performance of paints where applicable.

### **Permitted Paints for Use on National Roads Authority Schemes**

- 2.6. The paints permitted for use by the National Roads Authority on road schemes are listed in the Manual of Paints for Structural Steelwork within Appendix A. The paints are used in various protective systems, the details of which are described in Series 1900 (NRA MCDRW). All paints supplied for National Roads Authority Schemes must be labelled in accordance with the current Chemical Act (CLP Regulation) Regulations and the Construction Products Regulations, and shall have a current NSAI Agrément Certificate, BBA HAPAS Roads and Bridges Certificate or equivalent.

### **Introduction of New Paint Products**

- 2.7. Manufacturers who wish to supply new paint products to National Roads Authority contracts must obtain a NSAI Agrément Certificate, BBA HAPAS Roads and Bridges Certificate or equivalent for their products before offering their products for use on National Roads Authority contracts.

### **Arrangements for Specifying Protective Systems for New Works Painting**

- 2.8. Protective systems for bridges and other road structures, including steel in bridge bearings, CCTV masts, cantilever masts and steel lighting columns and bracket arms, are detailed in Series 1900 (NRA MCDRW). Details for protective coatings are conveyed to tenderers through contract-specific Appendices, based on the Series NG 1900 Appendices (NRA MCDRW).

### **Arrangements for Specifying Protective Systems for Maintenance Painting**

- 2.9. Protective systems for maintenance painting are detailed in Series 1900 (NRA MCDRW), clauses 1970 to 1984 inclusive. Details for protective coatings are conveyed to tenderers through contract-specific Appendices, based on Series NG 1900 Appendices (NRA MCDRW). NRA standard requirements on the maintenance painting of steelwork is defined within NRA BD 87.



## 3. DESCRIPTION OF THE MANUAL OF PAINTS

### Standard Terminology

3.1. Paints are described in the Manual of Paints for Structural Steelwork within Appendix A using standard terminology to enable paints to be described in generic terms and without specifying trade names. It is used for the Registered Description in Paint Item Sheets and in Series 1900, and may be used in Paint Data Sheets to convey the following information:

- (i) Name of Pigment: where a pigment provides inhibitive or structural properties it is named, e.g. Micaceous Iron Oxide (MIO), Zinc Phosphate. Where pigments provide colour, opacity or act as extenders etc. the pigments are not named.
- (ii) Type of Medium: the type of medium is described, e.g. Polyurethane, Polysiloxane, Epoxy.
- (iii) Use: i.e. Blast Primer, Primer, Undercoat or Finish. A description may be given where the material is suited to a specific use, e.g. maintenance, internal, adhesion promoter.
- (iv) The first coat only in a paint system is described as a Blast Primer or Primer, all subsequent intermediate coats are described as Undercoats, the last coat being the Finish. A dual purpose paint may be described, e.g. 'Undercoat or Finish'. The type of finish may be described, e.g. sheen, gloss.
- (v) Component: to convey the number of components that make up the material, e.g. 'single component' or 'two pack' may be described.
- (vi) Other: Other descriptions may be given to reflect specific properties, e.g. moisture cured, extended cure, high build.

### Item Sheets

3.2. The Manual of Paints for Structural Steelwork within Appendix A provides details for paints in the Item sheets. Each Item sheet gives:

- (i) a description of the paint;
- (ii) its colour;
- (iii) its use;
- (iv) its dry film thickness range;
- (v) its build and method of application;
- (vi) an outline composition;

3.3. The Manual of Paints for Structural Steelwork Item sheets does not provide information on the selection of suitable paint systems for new construction or maintenance of existing structures.

## **4. TESTING OF CONTRACT PAINT SAMPLES**

### **Standard Testing Arrangements**

- 4.1. Requirements for the testing of paint samples for new works contracts are given in Series 1900 (NRA MCDRW) and advice is given in Series NG 1900 (NRA MCDRW).
- 4.2. Requirements for the testing of paint samples for maintenance painting contracts are given in Series 1900, clauses 1970 to 1984 inclusive (NRA MCDRW) and advice is given in Series NG 1900, clauses NG 1970 to NG 1984 inclusive (NRA MCDRW).

## 5. REFERENCES

### Normative References

NRA Manual of Contract Documents for Roadworks, Specification for Road Works Volume 1 (MCDRW) – Series 100, Clause 104

Chemicals Act (CLP Regulation) Regulations 2011 (S.I. No. 102 of 2011)

Construction Products Regulation (305/2011)

### Informative References

NRA Manual of Contract Documents for Roadworks, Specification for Road Works Volume 1 (NRA MCDRW 1) – Series 1900

NRA Manual of Contract Documents for Roadworks, Specification for Road Works Volume 2 (NRA MCDRW 2) – Series NG1900

BS 3900 – Methods of test for paints

## 6. ENQUIRIES

- 6.1 All technical enquiries or comments on this document or any of the documents listed as forming part of the NRA DMRB should be sent by e-mail to [infoDMRB@nra.ie](mailto:infoDMRB@nra.ie), addressed to the following:

Head of Network Management, Engineering Standards & Research  
National Roads Authority  
St Martin's House  
Waterloo Road  
Dublin 4



.....  
Pat Maher  
Head of Network Management,  
Engineering Standards & Research

# APPENDIX A    MANUAL OF PAINTS FOR STRUCTURAL STEELWORK

## CONTENTS

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1    Health and Safety	A/1
2    Abbreviations	A/1
3    Item Sheets	A/3 – A/24

# 1. HEALTH AND SAFETY

The Manual of Paints for Structural Steelwork describes materials that may be injurious to health if adequate precautions are not taken. The manual refers only to technical suitability of the materials described. Those involved in the specification or design of works using these materials, and those involved in the manufacture, supply or use of these materials are not absolved from complying with their statutory health and safety obligations.

# 2. ABBREVIATIONS

NOTE 1: All paint products shall be classified as single-component or two-pack product.

NOTE 2: Under BUILD AND METHOD OF APPLICATION

- 'HB' = High Build (dft: above 75  $\mu\text{m}$  per coat)
- 'NB' = Normal Build (dft: between 50 and 75  $\mu\text{m}$  per coat)
- 'LB' = Low Build (dft: below 50  $\mu\text{m}$  per coat)
- 'B' = Apply by brush
- 'AS' = Apply by airless spray

### 3. ITEM SHEETS

<b>Item No. 109</b>		
<b>1.</b>	REGISTERED DESCRIPTION:	Zinc Rich Epoxy Blast Primer (two-pack)
<b>2.</b>	COLOURS:	Grey or tinted grey
<b>3.</b>	USE:	Quick drying blast primer
<b>4.</b>	DRY FILM THICKNESS (dft in $\mu\text{m}$ ):	Dft range: As described in manufacturer's data sheet
<b>5.</b>	BUILD AND METHOD OF APPLICATION:	LB or NB/ AS or B*
<b>6.</b>	OUTLINE COMPOSITION:	
	i). Pigment Volume Concentration (%):	As described in manufacturer's declared formulation
	ii). Pigment:	To include zinc dust to IS EN ISO 3549:2002, minimum 80% by weight in dry film, as described in the manufacturer's declared formulation
	iii). Medium:	Epoxy resin with separately packed polyamine or polyamide cure agent, as described in the manufacturer's declared formulation
	iv). Volatile:	As described in manufacturer's declared formulation
	v). Mixing Properties:	As described in manufacturer's declared formulation

\*May be brush applied to small areas and used for 'touch in' repairs to scratched or mechanically damaged galvanised coatings on steel components.

<b>Item No: 110</b>				
1.	REGISTERED DESCRIPTION:	Zinc Phosphate Epoxy Blast Primer/Sealer(two-pack)		
2.	COLOURS:	As the manufacturer's declared colour given with reference to BS 4800 and/or BS 381C where appropriate		
3.	USE:	Extended durability Blast Primer		
4.	DRY FILM THICKNESS (dft in $\mu\text{m}$ ):	Dft range: as described in the manufacturer's data sheet		
5.	BUILD AND METHOD OF APPLICATION:	LB/B or AS (B to small areas only)		
6.	OUTLINE COMPOSITION:			
	(i) Pigment volume concentration (%):	As described in the manufacturer's declared formulation		
	(ii) Pigment:	Zinc Phosphate ('BS 5193 : 1991, ISO 6745 : 1990'):	minimum 65%	As described in the manufacturer's declared formulation
		Extenders and anti-settling agents:	to 100%	
	(iii) Medium:	Epoxy resin together with a separately packed polyamide activator:	As described in the manufacturer's declared formulation	
	(iv) Volatile:	As described in the manufacturer's declared formulation		
	(v) Mixing Properties:	As described in the manufacturer's declared formulation		



<b>Item No: 111</b>				
1.	REGISTERED DESCRIPTION:	Zinc Phosphate High Build Quick Drying Epoxy Blast Primer (two-pack)		
2.	COLOURS:	As the manufacturer's declared colour given with reference to BS 4800 and/or BS 381C where appropriate		
3.	USE:	Extended durability quick drying blast primer		
4.	DRY FILM THICKNESS (dft in $\mu\text{m}$ ):	Dft range: as described in the manufacturer's data sheet		
5.	BUILD AND METHOD OF APPLICATION:	HB/AS (small areas by B)		
6.	OUTLINE COMPOSITION:			
	(i) Pigment volume concentration (%):	As described in the manufacturer's declared formulation		
	(ii) Pigment:	Zinc Phosphate ('BS 5193 : 1991, ISO 6745 : 1990'):	minimum 35%	As described in the manufacturer's declared formulation
		Extenders and anti-settling agents:	to 100%	
	(iii) Medium:	Epoxy resin together with a separately packed Polyamide/amine adduct activator with suitable accelerator:	As described in the manufacturer's declared formulation	
	(iv) Volatile:	As described in the manufacturer's declared formulation		
	(v) Mixing Properties:	As described in the manufacturer's declared formulation		

<b>Item No: 112</b>			
1.	REGISTERED DESCRIPTION:	MIO High Build Quick Drying Epoxy Undercoat/Finish (two-pack)	
2.	COLOURS:	As the manufacturer's declared colour given with reference to BS 4800 and/or BS 381C where appropriate	
3.	USE:	Undercoat or finish	
4.	DRY FILM THICKNESS (dft in $\mu\text{m}$ ):	Dft range: as described in the manufacturer's data sheet	
5.	BUILD AND METHOD OF APPLICATION:	HB/AS	
6.	OUTLINE COMPOSITION:		
	(i) Pigment volume concentration (%):	As described in the manufacturer's declared formulation	
	(ii) Pigment:	MIO (IS EN ISO 1248 :2008, COR 2009):	minimum 80%
		Extenders and anti-settling agents:	to 100%
	(iii) Medium:	Epoxy resin together with a separately packed Polyamide/amine adduct activator with suitable accelerator:	As described in the manufacturer's declared formulation
	(iv) Volatile:	As described in the manufacturer's declared formulation	
	(v) Mixing Properties:	As described in the manufacturer's declared formulation	

<b>Item No: 113</b>			
1.	REGISTERED DESCRIPTION:	Water based epoxy primer for blast cleaned internal surfaces (two-pack)	
2.	COLOURS:	As the manufacturer's declared colour given with reference to BS 4800 and/or BS 381C where appropriate	
3.	USE:	A water based epoxy primer for anti-corrosive protection of steel surfaces prepared by blast cleaning. For internal use only.	
4.	DRY FILM THICKNESS (dft in $\mu\text{m}$ ):	Dft range: as described in the manufacturer's data sheet	
5.	BUILD AND METHOD OF APPLICATION:	HB/B or AS	
6.	OUTLINE COMPOSITION:		
	(i) Pigment volume concentration (%):	As described in the manufacturer's declared formulation	
	(ii) Pigment:	Colouring pigments to give full opacity at Data Sheet film thickness:	As described in the manufacturer's declared formulation
		Exterior grade barrier pigments and anti-settling agents:	
	(iii) Medium:	Modified amine adduct solution with additives to improve pigment wetting, foam control and 'in-can' stability:	As described in the manufacturer's declared formulation
		Separately packed low molecular weight epoxy resin:	As described in the manufacturer's declared formulation
	(iv) Volatile:	As described in the manufacturer's declared formulation	
	(v) Mixing Properties:	As described in the manufacturer's declared formulation	

<b>Item No: 114</b>		
1.	REGISTERED DESCRIPTION:	Water based epoxy undercoat/sheen finish for internal use (two-pack)
2.	COLOURS:	As the manufacturer's declared colour given with reference to BS 4800 and/or BS 381C where appropriate
3.	USE:	A water based epoxy undercoat/sheen finish for application on to suitably primed steel surfaces. For internal use only.
4.	DRY FILM THICKNESS (dft in $\mu\text{m}$ ):	Dft range: as described in the manufacturer's data sheet
5.	BUILD AND METHOD OF APPLICATION:	HB/B or AS
6.	OUTLINE COMPOSITION:	
	(i) Pigment volume concentration (%):	As described in the manufacturer's declared formulation
	(ii) Pigment:	Colouring pigments to give full opacity at Data Sheet film thickness:
		Exterior grade barrier pigments and anti-settling agents:
		to 100%
	(iii) Medium:	As described in the manufacturer's declared formulation
		Modified amine adduct solution with additives to improve wetting, foam control and 'in-can' stability:
		As described in the manufacturer's declared formulation
		Separately packed low molecular weight epoxy resin:
	(iv) Volatile:	As described in the manufacturer's declared formulation
	(v) Mixing Properties:	As described in the manufacturer's declared formulation

<b>Item No: 115</b>			
1.	REGISTERED DESCRIPTION:	High Build Aluminium Epoxy Maintenance Primer for abraded surfaces (two-pack)	
2.	COLOURS:	As the manufacturer's declared colour given with reference to BS 4800 and/or BS 381C where appropriate	
3.	USE:	A high build modified surface tolerant epoxy primer (two-pack) to provide improved adhesion and flexibility when applied to suitably prepared steelwork and existing aged coatings	
4.	DRY FILM THICKNESS (dft in $\mu\text{m}$ ):	Dft range: as described in the manufacturer's data sheet	
5.	BUILD AND METHOD OF APPLICATION:	HB/B or AS	
6.	OUTLINE COMPOSITION:		
	(i) Pigment volume concentration (%):	As described in the manufacturer's declared formulation	
	(ii) Pigment:	Aluminium paste (65% minimum solids):	(15% $\pm$ 5%)
		Exterior quality pigments and anti-settling agents:	to 100%
	(iii) Medium:	Modified epoxy resin together with a separately packed Polyamide/amine adduct activator with suitable accelerator:	As described in the manufacturer's declared formulation
	(iv) Volatile:	As described in the manufacturer's declared formulation	
	(v) Mixing Properties:	As described in the manufacturer's declared formulation	

Item No: 116				
1.	REGISTERED DESCRIPTION:	High Build Epoxy Maintenance Undercoat for abraded surfaces (two-pack)		
2.	COLOURS:	As the manufacturer's declared colour given with reference to BS 4800 and/or BS 381C where appropriate		
3.	USE:	A high build modified surface tolerant epoxy undercoat (two-pack) to provide improved adhesion and flexibility when applied to suitably prepared aged coatings and newly applied primer		
4.	DRY FILM THICKNESS (dft in $\mu\text{m}$ ):	Dft range: as described in the manufacturer's data sheet		
5.	BUILD AND METHOD OF APPLICATION:	HB/B or AS		
6.	OUTLINE COMPOSITION:			
	(i) Pigment volume concentration (%):	As described in the manufacturer's declared formulation		
	(ii) Pigment:	Rutile Titanium Dioxide (IS EN ISO 591-1 : 2000)	minimum 35%	As described in the manufacturer's declared formulation
		Extenders, colouring pigments and anti-settling agents:	to 100%	
	(iii) Medium:	Modified epoxy resin together with a separately packed Polyamide/amine adduct activator with suitable accelerator:	As described in the manufacturer's declared formulation	
	(iv) Volatile:	As described in the manufacturer's declared formulation		
	(v) Mixing Properties:	As described in the manufacturer's declared formulation		

<b>Item No: 121</b>			
1.	REGISTERED DESCRIPTION:	Extended Cure Epoxy MIO (two-pack), Primer, Undercoat and/or finish	
2.	COLOURS:	As the manufacturer's declared colour given with reference to BS 4800 and/or BS 381C where appropriate	
3.	USE:	MIO epoxy with improved adhesion characteristics for treatment of hot dip galvanised steel surfaces	
4.	DRY FILM THICKNESS (dft in $\mu\text{m}$ ):	Dft range: as described in the manufacturer's data sheet	
5.	BUILD AND METHOD OF APPLICATION:	HB/AS (small areas by B)	
6.	OUTLINE COMPOSITION:		
	(i) Pigment volume concentration (%):	As described in the manufacturer's declared formulation	
	(ii) Pigment:	MIO (IS EN ISO 1248: 2008, COR 2009):	minimum 80%
		Extenders and anti-settling agents:	to 100%
	(iii) Medium:	Modified epoxy resin together with a separately packed Polyamide/amine adduct curing agent:	As described in the manufacturer's declared formulation
	(iv) Volatile:	As described in the manufacturer's declared formulation	
	(v) Mixing Properties:	As described in the manufacturer's declared formulation	

<b>Item No: 123</b>				
1.	REGISTERED DESCRIPTION:	High Build Glass Flake Epoxy Undercoat (two-pack)		
2.	COLOURS:	As the manufacturer's declared colour given with reference to BS 4800 and/or BS 381C where appropriate		
3.	USE:	Undercoat for blast cleaned steel new construction		
4.	DRY FILM THICKNESS (dft in $\mu\text{m}$ ):	Dft range: as described in the manufacturer's data sheet		
5.	BUILD AND METHOD OF APPLICATION:	HB/AS (stripe coats and small repairs only by brush)		
6.	OUTLINE COMPOSITION:			
	(i) Pigment volume concentration (%):	As described in the manufacturer's declared formulation		
	(ii) Pigment:	'C' type glass flake (nominal size 300 $\mu\text{m}$ or less):	to 100%	As described in the manufacturer's declared formulation
		Extenders, anti-settling agents, and coloured pigments:		
	(iii) Medium:	Epoxy resin together with a separately packed polyamide adduct or polyamine activator:	As described in the manufacturer's declared formulation	
	(iv) Volatile:	As described in the manufacturer's declared formulation		
(v) Mixing Properties:	As described in the manufacturer's declared formulation			



<b>Item No: 155</b>																														
1.	REGISTERED DESCRIPTION:	'T' Wash adhesion promoter																												
2.	COLOURS:	As the manufacturer's declared colour given with reference to BS 4800 and/or BS 381C where appropriate																												
3.	USE:	Mordant wash to promote substrate adhesion properties of coating systems for hot dip galvanized steel. 'T' wash only is not a protective coating																												
4.	DRY FILM THICKNESS (dft in $\mu\text{m}$ ):	Not applicable																												
5.	BUILD AND METHOD OF APPLICATION:	LB/B																												
6.	OUTLINE COMPOSITION:	Typical Composition (by weight) <table style="width: 100%; border-collapse: collapse;"> <tbody> <tr> <td style="width: 60%;">Phosphoric Acid</td> <td style="width: 20%;"></td> <td style="width: 20%;"></td> </tr> <tr> <td>1.7 SG:</td> <td style="text-align: right;">9.0%</td> <td></td> </tr> <tr> <td>Propylene Glycol</td> <td></td> <td></td> </tr> <tr> <td>Methyl Ether:</td> <td style="text-align: right;">16.5%</td> <td></td> </tr> <tr> <td>Methylated</td> <td></td> <td></td> </tr> <tr> <td>Spirit/I.P.A.:</td> <td style="text-align: right;">16.5%</td> <td></td> </tr> <tr> <td>Water:</td> <td style="text-align: right;">57.0%</td> <td></td> </tr> <tr> <td>Copper Carbonate</td> <td></td> <td></td> </tr> <tr> <td>(Commercial):</td> <td style="text-align: right;">1.0%</td> <td></td> </tr> </tbody> </table>	Phosphoric Acid			1.7 SG:	9.0%		Propylene Glycol			Methyl Ether:	16.5%		Methylated			Spirit/I.P.A.:	16.5%		Water:	57.0%		Copper Carbonate			(Commercial):	1.0%		As described in the manufacturer's declared formulation
Phosphoric Acid																														
1.7 SG:	9.0%																													
Propylene Glycol																														
Methyl Ether:	16.5%																													
Methylated																														
Spirit/I.P.A.:	16.5%																													
Water:	57.0%																													
Copper Carbonate																														
(Commercial):	1.0%																													

<b>Item No: 157</b>			
1.	REGISTERED DESCRIPTION:	Adhesion promoting primer (single-component)	
2.	COLOURS:	As the manufacturer's declared colour given with reference to BS 4800 and/or BS 381C where appropriate	
3.	DRY FILM THICKNESS (dft in $\mu\text{m}$ ):	Dft range: as described in the manufacturer's data sheet	
4.	USE:	To promote substrate adhesion properties of coating systems for hot dip galvanised steel, aluminium and stainless steel surfaces  The primer only is not a protective coating	
5.	BUILD AND METHOD OF APPLICATION:	LB/AS or B	
6.	OUTLINE COMPOSITION:		
	(i) Pigment volume concentration (%):	As described in the manufacturer's declared formulation	
	(ii) Pigment:	Anti-corrosive pigments, inert extenders, colouring, pigments and anti-settling agents:	As described in the manufacturer's declared formulation
	(iii) Medium:	Solvent-borne PVB/ epoxy resin blend:	As described in the manufacturer's declared formulation
	(iv) Volatile:	As described in the manufacturer's declared formulation	

<b>Item No: 159</b>				
1.	REGISTERED DESCRIPTION:	Aluminium Epoxy Sealer/Primer (two-pack)		
2.	COLOURS:	As the manufacturer's declared colour given with reference to BS 4800 and/or BS 381C where appropriate		
3.	USE:	Sealer/Primer for aluminium metal spray coverage		
4.	DRY FILM THICKNESS (dft in $\mu\text{m}$ ):	Dft range: as described in the manufacturer's data sheet		
5.	BUILD AND METHOD OF APPLICATION:	LB/AS or B		
6.	OUTLINE COMPOSITION:			
	(i) Pigment volume concentration (%):	As described in the manufacturer's declared formulation		
	(ii) Pigment:	Non-Leafing aluminium:	(98% to 99%)	As described in the manufacturer's declared formulation
		Fugitive red dye or synthetic red oxide:	(1% to 2%)	
	(iii) Medium:	Epoxy Resin together with a separately packed Polyamide Resin activator:	As described in the manufacturer's declared formulation	
	(iv) Volatile:	As described in the manufacturer's declared formulation		
(v) Mixing Properties:	As described in the manufacturer's declared formulation			

<b>Item No: 160</b>			
1.	REGISTERED DESCRIPTION:	Red Oxide Moisture Cured Polyurethane Primer/Blast Primer (single-component)	
2.	COLOURS:	As the manufacturer's declared colour given with reference to BS 4800 and/or BS 381C where appropriate	
3.	USE:	Primer/Blast Primer for blasted steel surface for maintenance or new works when the relative humidity is greater than 75% but for use in circumstances when the dew point has not been reached	
4.	DRY FILM THICKNESS (dft in $\mu\text{m}$ ):	Dft range: as described in the manufacturer's data sheet	
5.	BUILD AND METHOD OF APPLICATION:	LB/AS or B	
6.	OUTLINE COMPOSITION:		
	(i) Pigment volume concentration (%):	As described in the manufacturer's declared formulation	
	(ii) Pigment:	Red Oxide (IS EN ISO 1248: 2008, COR 2009):	minimum 20%
		Extenders and anti-settling agents:	to 100%
		Aluminium pigment not permitted	
	(iii) Medium:	Aromatic polyisocyanate and water scavenger:	As described in the manufacturer's declared formulation
	(iv) Volatile:	Aliphatic and/or Aromatic hydrocarbons:	As described in the manufacturer's declared formulation

<b>Item No: 162</b>			
1.	REGISTERED DESCRIPTION:	MIO Moisture Cured Polyurethane Undercoat/Finish (single-component)	
2.	COLOURS:	As the manufacturer's declared colour given with reference to BS 4800 and/or BS 381C where appropriate	
3.	USE:	Undercoat for maintenance and new works when the relative humidity is greater than 75% but for use in circumstances when the dew point has not been reached	
4.	DRY FILM THICKNESS (dft in $\mu\text{m}$ ):	Dft range: as described in the manufacturer's data sheet	
5.	BUILD AND METHOD OF APPLICATION:	NB or HB/B or AS	
6.	OUTLINE COMPOSITION:		
	(i) Pigment volume concentration (%):	As described in the manufacturer's declared formulation	
	(ii) Pigment:	MIO (IS EN ISO 1248:2008, COR 2009):	minimum 40%
		Extenders, tinting pigments and anti-settling agents:	to 100%
		Aluminium pigment not permitted	
	(iii) Medium:	Aromatic polyisocyanate and water scavenger:	As described in the manufacturer's declared formulation
	(iv) Volatile:	Aliphatic and/or Aromatic hydrocarbons:	As described in the manufacturer's declared formulation

<b>Item No: 164</b>		
1.	REGISTERED DESCRIPTION:	Moisture Cured Polyurethane Finish (single-component)
2.	COLOURS:	As the manufacturer's declared colour given with reference to BS 4800 and/or BS 381C where appropriate
3.	USE:	Semi-gloss finish for maintenance or new work when the relative humidity is greater than 75% but for use in circumstances when the dew point has not been reached
4.	DRY FILM THICKNESS (dft in $\mu\text{m}$ ):	Dft range: as described in the manufacturer's data sheet
5.	BUILD AND METHOD OF APPLICATION:	LB/B or NB/AS
6.	OUTLINE COMPOSITION:	
	(i) Pigment volume concentration (%):	As described in the manufacturer's declared formulation
	(ii) Pigment:	Rutile Titanium Dioxide (IS EN ISO 591-1 : 2000) and tinting pigments:
		Exterior quality extenders and anti-settling agents:
		Aluminium pigment not permitted
	(iii) Medium:	Aliphatic polyisocyanate and water scavenger:
	(iv) Volatile:	Aliphatic and/or Aromatic hydrocarbons:

<b>Item No. 167</b>		
1.	REGISTERED DESCRIPTION:	Epoxy Acrylic Finish (two-pack)
2.	COLOURS:	As the manufacturer's declared colour given with reference to BS 4800 and/or BS 381C where appropriate
3.	USE:	As a decorative semi-gloss finish for new works or maintenance
4.	DRY FILM THICKNESS (dft in $\mu\text{m}$ ):	Dft range: As described in the manufacturer's data sheet.
5.	BUILD AND METHOD OF APPLICATION:	NB / AS or B*
6.	OUTLINE COMPOSITION:	
	i). Pigment Volume Concentration (%):	As described in manufacturer's declared formulation
	ii). Pigment:	Rutile Titanium Dioxide (IS EN ISO 591-1:2000) and tinting pigments as described in the manufacturer's declared formulation
	iii). Medium:	Carboxy functional styrene acrylic with separately packed liquid epoxy resin cure agent, as described in the manufacturer's declared formulation
	iv). Volatile:	As described in manufacturer's declared formulation.
	v). Mixing Properties	As described in manufacturer's declared formulation.

\* May be brush applied to small areas only

<b>Item No: 168</b>				
1.	REGISTERED DESCRIPTION:	Polyurethane (two-pack) Gloss Finish		
2.	COLOURS:	As the manufacturer's declared colour given with reference to BS 4800 and/or BS 381C where appropriate		
3.	USE:	Gloss Finish for new works or maintenance		
4.	DRY FILM THICKNESS (dft in $\mu\text{m}$ ):	Dft range: as described in the manufacturer's data sheet		
5.	BUILD AND METHOD OF APPLICATION:	LB/B or NB/AS		
6.	OUTLINE COMPOSITION:			
	(i) Pigment volume concentration (%):	As described in the manufacturer's declared formulation		
	(ii) Pigment:	Rutile Titanium Dioxide (IS EN ISO 591-1 : 2000) and tinting pigments:	to 100%	As described in the manufacturer's declared formulation
		Exterior quality extenders and anti-settling agents:		
		Aluminium pigment not permitted		
	(iii) Medium:	Hydroxyl functional acrylic/aliphatic poly isocyanate curing agent:	As described in the manufacturer's declared formulation	
	(iv) Volatile:	As described in the manufacturer's declared formulation		
(v) Mixing Properties:	As described in the manufacturer's declared formulation			



<b>Item No: 169</b>				
1.	REGISTERED DESCRIPTION:	Polyurethane (two-pack) Semi-Gloss Finish		
2.	COLOURS:	As the manufacturer's declared colour given with reference to BS 4800 and/or BS 381C where appropriate		
3.	USE:	Semi-gloss finish for new works or maintenance		
4.	DRY FILM THICKNESS (dft in $\mu\text{m}$ ):	Dft range: as described in the manufacturer's data sheet		
5.	BUILD AND METHOD OF APPLICATION:	NB/B or HB/AS (small areas by B)		
6.	OUTLINE COMPOSITION:			
	(i) Pigment volume concentration (%):	As described in the manufacturer's declared formulation		
	(ii) Pigment:	Rutile Titanium Dioxide (IS EN ISO 591-1 : 2000) and tinting pigments:	to 100%	As described in the manufacturer's declared formulation
		Exterior quality extenders and anti-settling agents:		
		Aluminium pigment not permitted		
	(iii) Medium:	Hydroxyl functional acrylic/aliphatic poly isocyanate curing agent:	As described in the manufacturer's declared formulation	
(iv) Volatile:	As described in the manufacturer's declared formulation			
(v) Mixing Properties:	As described in the manufacturer's declared formulation			

<b>Item No: 185</b>				
1.	REGISTERED DESCRIPTION:	Organic Modified Polysiloxane (two-pack) Gloss Finish		
2.	COLOURS:	As the manufacturer's declared colour given with reference to BS 4800 and/or BS 381C where appropriate		
3.	USE:	Gloss Finish for new works or maintenance		
4.	DRY FILM THICKNESS (dft in $\mu\text{m}$ ):	Dft range: as described in the manufacturer's data sheet		
5.	BUILD AND METHOD OF APPLICATION:	NB/B or HB/AS		
6.	OUTLINE COMPOSITION:			
	(i) Pigment volume concentration (%):	As described in the manufacturer's declared formulation		
	(ii) Pigment:	Rutile Titanium Dioxide (IS EN ISO 591-1 : 2000) or other exterior quality tinting pigments:	As described in the manufacturer's declared formulation	
		Exterior quality extenders and anti-settling agents:		to 100%
	(iii) Medium:	Organic Modified Polysiloxane:	As described in the manufacturer's declared formulation	
	(iv) Volatile:	Aliphatic/Aromatic Hydrocarbons:	As described in the manufacturer's declared formulation	
(v) Mixing Properties:	As described in the manufacturer's declared formulation			
7.	ADDITIONAL TESTING REQUIREMENTS:	Flexibility (Conical mandrel test): 'IS EN ISO 6860:2006, BS 3900-E11: 2006'. After 1 month ambient cure at 23°C and 50( $\pm$ 5)% relative humidity. No cracking or disbondment beyond 20mm from small radius.		

<b>Item No: 200</b>			
1.	REGISTERED DESCRIPTION:	Grease Paint Penetrating Primer	
2.	COLOURS:	Tint contrasting to undercoat sufficient to show application	
3.	USE:	Penetrating primer for use with item 201	
4.	DRY FILM THICKNESS (dft in $\mu\text{m}$ ):	Dft range: as described in the manufacturer's data sheet	
5.	BUILD AND METHOD OF APPLICATION:	B (AS for internal surfaces of lighting columns and other difficult access situations)	
6.	OUTLINE COMPOSITION:		
	(i) Pigment volume concentration (%):	As described in the manufacturer's declared formulation	
	(ii) Pigment:	As described in the manufacturer's declared formulation	
	(iii) Medium:	Calcium soap of oxidised petroleum, hydrocarbon resins and de-watering agent:	As described in the manufacturer's declared formulation
	(iv) Volatile:	White spirit or SBP solvents:	As described in the manufacturer's declared formulation

Item No: 201			
1.	REGISTERED DESCRIPTION:	Grease Paint Undercoat/Finish	
2.	COLOURS:	As the manufacturer's declared colour given with reference to BS 4800 and/or BS 381C where appropriate	
3.	USE:	Undercoat and Finish over penetrating primer	
4.	DRY FILM THICKNESS (dft in $\mu\text{m}$ ):	Dft range: as described in the manufacturer's data sheet	
5.	BUILD AND METHOD OF APPLICATION:	HB/B or AS	
6.	OUTLINE COMPOSITION:		
	(i) Pigment volume concentration (%):	As described in the manufacturer's declared formulation	
		Rutile Titanium Dioxide (IS EN ISO 591-1 : 2000) or other exterior quality and tinting pigments:	100% As described in the manufacturer's declared formulation
	(iii) Medium:	Calcium soap of oxidised petroleum wax:	As described in the manufacturer's declared formulation
	(iv) Volatile:	White spirit or SBP solvents:	As described in the manufacturer's declared formulation

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## APPENDIX B ADDITIONAL TEST CLAUSES TO BS 3900

### B1 Application and Appearance

#### i. Airless spray grade

A single coat of paint shall be applied using the size and pressures recommended in the paint manufacturer's data sheet to a 300 mm x 300 mm or larger, burnished steel panel.

The paint shall be applied to give the wet film thickness stated in the paint manufacturer's data sheet.

The film shall be allowed to dry for 24 hours in a vertical position at a temperature of  $23^{\circ} \pm 2^{\circ}\text{C}$  and shall be free from cracking, cratering, pinholing, rivelling, sagging, bittiness, cissing or other surface defects.

#### ii. Brushing grade

A single coat of paint shall be applied to a 300 mm x 300 mm, or larger, burnished steel panel to give the wet film thickness stated in the paint manufacturer's data sheet or, where the wet film thickness is not given, the maximum dry film thickness stated in the paint manufacturer's data sheet.

The film shall be allowed to dry for 24 hours in a vertical position at a temperature of  $23^{\circ}\text{C} \pm 2^{\circ}\text{C}$  and shall be free from cracking, cratering, rivelling, sagging, bittiness, cissing or other surface defects.

### B2 Overcoating

A single coat of paint shall be applied to a 300 mm x 300 mm, or larger, burnished steel panel to give the wet film thickness stated in the paint manufacturer's data sheet.

After air drying at  $23^{\circ}\text{C} \pm 2^{\circ}\text{C}$  for the period of time stated in the paint manufacturer's data sheet, the paint shall be overcoated with the next coat in the system. The second coat of paint shall be applied at the wet film thickness stated in the paint manufacturer's data sheet or, where the wet film thickness is not stated, the maximum dry film thickness stated in the paint manufacturer's data sheet.

The combined paint coats shall be free from any wrinkling, rivelling or other surface defect caused by overcoating the first coat of paint with the second coat of paint.

## **APPENDIX C      STANDARDS REFERRED TO IN APPENDIX A**

BS 381C : 1996 Specification of colours for identification, coding and special purposes  
IS EN ISO 6860: 2006, BS 3900-E11: 2006 Paints and varnishes. Bend test (conical mandrel)  
IS EN ISO 1248: 2008, COR 2009 Iron oxide pigments – Specifications and methods of tests  
BS 4800: 2011 Schedule of paint colours for building purposes  
BS 5193: 1991, ISO 6745: 1990 Specification for zinc phosphate pigments for paints  
IS EN ISO 591-1: 2000 Titanium dioxide pigments for paints. Specifications and methods of test  
IS EN ISO 3549: 2002 Zinc dust pigments for paints – Specifications and test methods





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