Design Manual for Roads and Bridges

Highway Structures & Bridges
General information

CG 303
Quality assurance scheme for paints and similar protective coatings

(formerly BD 35/14)

Revision 0

Summary
This document gives details of the quality assurance scheme for paints and similar protective coatings that are used to protect steelwork in highway structures against corrosion.

Application by Overseeing Organisations
Any specific requirements for Overseeing Organisations alternative or supplementary to those given in this document are given in National Application Annexes to this document.

Feedback and Enquiries
Users of this document are encouraged to raise any enquiries and/or provide feedback on the content and usage of this document to the dedicated Highways England team. The email address for all enquiries and feedback is: Standards_Enquiries@highwaysengland.co.uk

This is a controlled document.

Contents

Release notes

Version	Date	Details of amendments
0	Feb 2019	CG 303 replaces BD 35/14. The full document has been re-written to make it compliant with the new Highways England drafting rules.

Foreword

Publishing information

This document is published by Highways England.

This document supersedes BD 35/14, which is withdrawn.

Contractual and legal considerations

This document forms part of the work specification. It does not purport to include all the necessary provisions of a contract. Users are responsible for applying all appropriate documents applicable to their contract.

Introduction

Background

The content of this document is based on that of BD 35/14, re-written to make it compliant with the new Highways England drafting rules.

Assumptions made in the preparation of the document

The assumptions made in GG 101 [Ref 1.N] apply to this document.

Mutual Recognition

Where there is a requirement in this document for compliance with any part of a "British Standard" or other technical specification, that requirement may be met by compliance with the Mutual Recognition clause in GG 101 [Ref 1.N].

Abbreviations

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Abbreviation	Definition
BBA	BBA British Board of Agrément
HAPAS	Highway Authority Product Approval Scheme
MCHW 1	Manual of Contract Documents for Highway Works Volume 1
MCHW 2	Manual of Contract Documents for Highway Works Volume 2

1. Scope

Aspects covered

1.1 This document gives details of the quality assurance scheme for paints and similar protective coatings that shall be used to protect steelwork in highway structures against corrosion.

NOTE 1 *Appendix A describes the Manual of Paints for Structural Steelwork.*

NOTE 2 *Appendix B provides details of additional tests that can be carried out in the assessment of the performance of paints.*

Implementation

1.2 This document shall be implemented forthwith on all schemes involving the use of paints and similar protective coatings to protect steelwork in highway structures against corrosion on the Overseeing Organisations' motorway and all-purpose trunk roads according to the implementation requirements of GG 101 [Ref 1.N].

Use of GG 101

1.3 The requirements contained in GG 101 [Ref 1.N] shall be followed in respect of activities covered by this document.

2. Quality assurance scheme

2.1 Paints and similar protective coatings supplied for use in the Overseeing Organisation's works for protecting steelwork in highway structures shall comply with the quality assurance scheme for paints and similar protective coatings.

NOTE *The quality assurance scheme comprises:*

1) *certification of paints through a BBA HAPAS product approval scheme, BBA Guidelines No 12 [Ref 1.I] or an approved equivalent scheme (the BBA HAPAS scheme is administered by the BBA under HAPAS on behalf of all the United Kingdom Overseeing Organisations);*
2) *testing of 'A' and 'B' paint samples taken from paint supplied to works (the testing of the paint samples is undertaken by the Overseeing Organisation).*

3. Permitted paints for use in an Overseeing Organisation's works

3.1 The paints permitted for use by the Overseeing Organisation for protecting steelwork in highway structures shall be selected from those listed in the Manual of Paints for Structural Steelwork in Appendix A.

NOTE 1 *The paints are used in various protective systems, the details of which are described in Series 1900 of SHW [Ref 4.I] (MCHW 1) for new works, and Series 5000 of the SHW [Ref 5.I] (MCHW 1) for maintenance works.*

NOTE 2 *The protective systems are conveyed to tenderers through contract-specific appendices based on Series NG 1900 [Ref 6.I] Appendix 19/1 (MCHW 2) for new works, and Series NG 5000 [Ref 3.I] Appendix 50/1 (MCHW 2) for maintenance works.*

3.2 All paints supplied for the works must be labelled in accordance with The Chemicals (Hazard Information and Packaging for Supply) Regulations 2009, SI 2009 No. 716 [Ref 2.N].

4. Paint certification

4.1 All paints supplied for the works shall have a current BBA HAPAS Roads and Bridges Certificate or an approved equivalent.

NOTE 1 *The quality assurance scheme for paints requires paint manufacturers to obtain a BBA HAPAS Roads and Bridges Certificate or an approved equivalent for their paint products, confirming certification to a paint material Item Number from the Manual of Paints for Structural Steelwork in Appendix A.*

NOTE 2 *The requirements for obtaining BBA HAPAS certification of paint products are described in BBA Guidelines No 12 [Ref 1.I] for the Assessment and Certification of Paints..*

NOTE 3 *The certification of paint materials includes the review of paint manufacturers' formulations and the assessment of the performance of paint samples by the BBA to ensure they comply with the performance requirements stated in the BBA HAPAS document BBA Guidelines No 12 [Ref 1.I] for the Assessment and Certification of Paints.*

4.1.1 Details of additional tests that may be carried out in the assessment of the performance of paint samples can be found in Appendix B.

NOTE 1 *A cross reference to these tests is made in the BBA Guidelines No 12 [Ref 1.I] for the Assessment and Certification of Paints.*

NOTE 2 *Copies of BBA HAPAS Roads and Bridges Certificates for those paint products that have gained approval can be obtained from the BBA website [Ref 12.I] www.bbacerts.co.uk.*

5. Introduction of new paint products

5.1 Manufacturers who wish to supply new paint products for use in the Overseeing Organisation's works shall obtain a BBA HAPAS Roads and Bridges Certificate or an approved equivalent for their products before offering their products for use.

6. Testing of 'A' and 'B' paint samples

6.1 The testing of 'A' and 'B' paint samples for new works contracts shall be undertaken in accordance with the requirements given in Series 1900 of SHW [Ref 4.I] (MCHW 1).

6.2 The testing of 'A' and 'B' paint samples for maintenance painting contracts shall be undertaken in accordance with the requirements given in Series 5000 of the SHW [Ref 5.I] (MCHW 1).

7. Normative References

The following documents, in whole or in part, are normative references for this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

Ref 1.N	Highways England. GG 101, 'Introduction to the Design Manual for Roads and Bridges'
Ref 2.N	Legislation.gov.uk. SI 2009 No. 716, 'The Chemicals (Hazard Information and Packaging for Supply) Regulations 2009'

8. Informative References

The following documents are informative references for this document and provide supporting information.

Ref 1.I	BBA/HAPAS. BBA Guidelines No 12, 'Guidelines Document for the Assessment and Certification of Paints '
Ref 2.I	BSI. BS EN ISO 1248, 'Iron oxide pigments. Specifications and method of test.'
Ref 3.I	Highways England. Series NG 5000, 'Manual of Contract Documents for Highway Works Volume 2 - Notes for Guidance on the Specification for Highway Works. Series NG 5000 - Maintenance Painting of Steelwork'
Ref 4.I	Highways England. Series 1900 of SHW, 'Manual of Contract Documents for Highway Works, Volume 1 Specification of Highways Works, Series 1900, Protection of Steelwork against Corrosion'
Ref 5.I	Highways England. Series 5000 of the SHW , 'Manual of Contract Documents for Highway Works, Volume 1 Specification of Highways Works, Series 5000, Maintenance painting of steelwork'
Ref 6.I	Highways England. Series NG 1900, 'Manual of Contract Documents for Highway Works. Volume 2 - Notes for Guidance on the Specification for Highways Works. Series NG 1900 Protection of Steelwork against Corrosion'
Ref 7.I	BSI. BS EN ISO 6860: BS 3900-E11, 'Paints and varnishes. Bend test (conical mandrel)'
Ref 8.I	BSI. BS 4800, 'Schedule of paint colours for building purposes'
Ref 9.I	BSI. BS 381C, 'Specification for colours for identification, codes and special purposes'
Ref 10.I	BSI. BSI 5193:1991, ISO 6745:1990, 'Specification for zinc phosphate pigments in paint'
Ref 11.I	BSI. BS EN ISO 591-1: 2000, 'Titanium dioxide pigments for paints. Specifications and test methods.'
Ref 12.I	BBA. BBA website, 'www.bbacerts.co.uk'
Ref 13.I	BSI. BS EN ISO 3549: 2002, 'Zinc dust pigments for paints. Specifications and test methods.'

Appendix A. Manual of paints for structural steelwork

A1 Description of the manual of paints

A1.1 Item sheets

The manual of paints for structural steelwork provides details for paints in the item sheets. Each item sheet gives the item number and:

1) a description of the paint;
2) its colour;
3) its use;
4) its dry film thickness range;
5) its build and method of application;
6) an outline composition.

The item sheets do not provide information on the selection of suitable paint systems for new construction or the maintenance of existing structures.

A1.2 Standard terminology

Paints are described in the manual of paints for structural steelwork using standard terminology to enable paints to be described in generic terms and without specifying trade names. The standard terminology is used for the registered description in paint item sheets and in MCHW 1 Series 1900 of SHW [Ref 4.I] and Series 5000 of the SHW [Ref 5.I], and may be used in paint data sheets to convey the following information:

1) 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.
2) type of medium: the type of medium is described, e.g. polyurethane, polysiloxane, epoxy,
3) 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. NOTE: 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.
4) Component: to convey the number of components that make up the material, e.g. 'single component', 'two pack'.
5) Other: Other descriptions may be given to reflect specific properties, e.g. moisture cured, extended cure, high build.

A1.3 Item sheet abbreviations

General

'dft' = dry film thickness (measured in μm)

Under BUILD AND METHOD OF APPLICATION

1) 'HB' = High Build (dft: above 75 μm per coat)
2) 'NB' = Normal Build (dft: between 50 and 75 μm per coat)
3) 'LB' = Low Build (dft: below 50 μm per coat)
4) 'B' = Apply by brush
5) 'AS' = Apply by airless spray. NOTE: Application by airless spray should be in accordance with the manufacturer's recommendations.

A1.4 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 detail 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.

A2 Manual of paints for structural steelwork - Item Sheet

Table A.1 Item Sheet 109

Item No: 109		
1.	REGISTERED DESCRIPTION:	Zinc Rich Epoxy Blast Primer (two-pack)
2.	COLOURS:	Grey or tinted grey
3.	USE:	Quick drying blast primer
4.	DRY FILM THICKNESS (dft in μm):	Dft range: As described in the manufacturer's data sheet
5.	BUILD AND METHOD OF APPLICATION:	LB or NB/ AS or B*
6.	OUTLINE COMPOSITION:	
	(i) Pigment volume concentration (%):	As described in the manufacturer's declared formulation
	(ii) Pigment:	To include zinc dust to BS EN ISO 3549: 2002 [Ref 13.I], 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 the manufacturer's declared formulation
	(v) Mixing Properties	As described in the 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.		

Table A.2 Item Sheet 110

Item No: 110				
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 [Ref 8.I] and/or BS 381C [Ref 9.I] where appropriate		
3.	USE:	Extended durability Blast Primer		
4.	DRY FILM THICKNESS (dft in μm):	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 BSI 5193:1991, ISO 6745:1990 [Ref 10.I]	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		

Table A.3 Item Sheet 111

Item No: 111				
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 [Ref 8.I] and/or BS 381C [Ref 9.I] where appropriate		
3.	USE:	Extended durability quick drying blast primer		
4.	DRY FILM THICKNESS (dft in μm):	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 BSI 5193:1991, ISO 6745:1990 [Ref 10.I]	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		

Table A.4 Item Sheet 112

<table>
<tr><td colspan="6">Item No: 112</td></tr>
<tr><td>1.</td><td>REGISTERED DESCRIPTION:</td><td colspan="4">MIO High Build Quick Drying Epoxy Undercoat/Finish (two-pack)</td></tr>
<tr><td>2.</td><td>COLOURS:</td><td colspan="4">As the manufacturer's declared colour given with reference to BS 4800 [Ref 8.I] and/or BS 381C [Ref 9.I] where appropriate</td></tr>
<tr><td>3.</td><td>USE:</td><td colspan="4">Undercoat or finish</td></tr>
<tr><td>4.</td><td>DRY FILM THICKNESS (dft in μm):</td><td colspan="4">Dft range: As described in the manufacturer's data sheet</td></tr>
<tr><td>5.</td><td>BUILD AND METHOD OF APPLICATION:</td><td colspan="4">HB/AS</td></tr>
<tr><td rowspan="6">6.</td><td colspan="5">OUTLINE COMPOSITION:</td></tr>
<tr><td>(i) Pigment volume concentration (%):</td><td colspan="4">As described in the manufacturer's declared formulation</td></tr>
<tr><td rowspan="2">(ii) Pigment:</td><td>MIO BS EN ISO 1248 [Ref 2.I]</td><td>minimum 80%</td><td rowspan="2">As described in the manufacturer's declared formulation</td></tr>
<tr><td>Extenders and anti-settling agents:</td><td>to 100%</td></tr>
<tr><td>(iii) Medium:</td><td>Epoxy resin together with a separately packed Polyamide/amine adduct activator with suitable accelerator:</td><td colspan="2">As described in the manufacturer's declared formulation</td></tr>
<tr><td>(iv) Volatile:</td><td colspan="3">As described in the manufacturer's declared formulation</td></tr>
<tr><td>(v) Mixing Properties</td><td colspan="3">As described in the manufacturer's declared formulation</td></tr>
</table>

Table A.5 Item Sheet 113

<table>
<tr><td colspan="5">Item No: 113</td></tr>
<tr><td>1.</td><td colspan="2">REGISTERED DESCRIPTION:</td><td colspan="2">Water based epoxy primer for blast cleaned internal surfaces (two-pack)</td></tr>
<tr><td>2.</td><td colspan="2">COLOURS:</td><td colspan="2">As the manufacturer's declared colour given with reference to BS 4800 [Ref 8.I] and/or BS 381C [Ref 9.I] where appropriate</td></tr>
<tr><td>3.</td><td colspan="2">USE:</td><td colspan="2">A water based epoxy primer for anti-corrosive protection of steel surfaces prepared by blast cleaning. For internal use only</td></tr>
<tr><td>4.</td><td colspan="2">DRY FILM THICKNESS (dft in μm):</td><td colspan="2">Dft range: As described in the manufacturer's data sheet</td></tr>
<tr><td>5.</td><td colspan="2">BUILD AND METHOD OF APPLICATION:</td><td colspan="2">HB/B or AS</td></tr>
<tr><td rowspan="6">6.</td><td colspan="4">OUTLINE COMPOSITION:</td></tr>
<tr><td colspan="2">(i) Pigment volume concentration (%):</td><td colspan="2">As described in the manufacturer's declared formulation</td></tr>
<tr><td rowspan="2">(ii) Pigment:</td><td colspan="2">Colouring pigments to give full opacity at Data Sheet film thickness:</td><td rowspan="2">As described in the manufacturer's declared formulation</td></tr>
<tr><td>Exterior grade barrier pigments and anti-settling agents:</td><td>to 100%</td></tr>
<tr><td rowspan="2">(iii) Medium:</td><td>Modified amine adduct solution with additives to improve pigment wetting, foam control and 'in-can' stability:</td><td colspan="2" rowspan="2">As described in the manufacturer's declared formulation</td></tr>
<tr><td>Separately packed low molecular weight epoxy resin:</td></tr>
<tr><td colspan="2">(iv) Volatile:</td><td colspan="2">As described in the manufacturer's declared formulation</td></tr>
<tr><td colspan="2">(v) Mixing Properties</td><td colspan="2">As described in the manufacturer's declared formulation</td></tr>
</table>

Table A.6 Item Sheet 114

<table>
<tr><td colspan="5">Item No: 114</td></tr>
<tr><td>1.</td><td colspan="2">REGISTERED DESCRIPTION:</td><td colspan="2">Water based epoxy undercoat/sheen finish for internal surfaces (two-pack)</td></tr>
<tr><td>2.</td><td colspan="2">COLOURS:</td><td colspan="2">As the manufacturer's declared colour given with reference to BS 4800 [Ref 8.I] and/or BS 381C [Ref 9.I] where appropriate</td></tr>
<tr><td>3.</td><td colspan="2">USE:</td><td colspan="2">A water based epoxy undercoat/sheen finish for application on to suitably primed steel surfaces.
For internal use only</td></tr>
<tr><td>4.</td><td colspan="2">DRY FILM THICKNESS
(dft in μm):</td><td colspan="2">Dft range: As described in the manufacturer's data sheet</td></tr>
<tr><td>5.</td><td colspan="2">BUILD AND METHOD OF APPLICATION:</td><td colspan="2">HB/B or AS</td></tr>
<tr><td rowspan="6">6.</td><td colspan="4">OUTLINE COMPOSITION:</td></tr>
<tr><td colspan="2">(i) Pigment volume concentration (%):</td><td colspan="2">As described in the manufacturer's declared formulation</td></tr>
<tr><td rowspan="2">(ii) Pigment:</td><td>Colouring pigments to give full opacity at Data Sheet film thickness:</td><td rowspan="2">to 100%</td><td rowspan="2">As described in the manufacturer's declared formulation</td></tr>
<tr><td>Exterior grade barrier pigments
and anti-settling agents:</td></tr>
<tr><td rowspan="2">(iii) Medium:</td><td>Modified amine adduct solution with additives to improve wetting, foam control and 'in-can' stability:</td><td colspan="2" rowspan="2">As described in the manufacturer's declared formulation</td></tr>
<tr><td>Separately packed low molecular weight epoxy resin:</td></tr>
<tr><td colspan="2">(iv) Volatile:</td><td colspan="2">As described in the manufacturer's declared formulation</td></tr>
<tr><td colspan="2">(v) Mixing Properties</td><td colspan="2">As described in the manufacturer's declared formulation</td></tr>
</table>

Table A.7 Item Sheet 115

<table>
<tr><td colspan="6">Item No: 115</td></tr>
<tr><td>1.</td><td colspan="2">REGISTERED DESCRIPTION:</td><td colspan="3">High Build Aluminium Epoxy Maintenance Primer for abraded surfaces (two-pack)</td></tr>
<tr><td>2.</td><td colspan="2">COLOURS:</td><td colspan="3">As the manufacturer's declared colour given with reference to BS 4800 [Ref 8.I] and/or BS 381C [Ref 9.I] where appropriate</td></tr>
<tr><td>3.</td><td colspan="2">USE:</td><td colspan="3">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</td></tr>
<tr><td>4.</td><td colspan="2">DRY FILM THICKNESS (dft in μm):</td><td colspan="3">Dft range: As described in the manufacturer's data sheet</td></tr>
<tr><td>5.</td><td colspan="2">BUILD AND METHOD OF APPLICATION:</td><td colspan="3">HB/B or AS</td></tr>
<tr><td rowspan="6">6.</td><td colspan="5">OUTLINE COMPOSITION:</td></tr>
<tr><td colspan="2">(i) Pigment volume concentration (%):</td><td colspan="3">As described in the manufacturer's declared formulation</td></tr>
<tr><td rowspan="2">(ii) Pigment:</td><td>Aluminium paste (65% minimum solids):</td><td>(15% ± 5%)</td><td rowspan="2">As described in the manufacturer's declared formulation</td></tr>
<tr><td>Exterior quality pigments and anti-settling agents:</td><td>to 100%</td></tr>
<tr><td colspan="2">(iii) Medium:</td><td>Modified epoxy resin together with a separately packed Polyamide/amine adduct activator with suitable accelerator:</td><td colspan="2">As described in the manufacturer's declared formulation</td></tr>
<tr><td colspan="2">(iv) Volatile:</td><td colspan="3">As described in the manufacturer's declared formulation</td></tr>
<tr><td colspan="2">(v) Mixing Properties</td><td colspan="3">As described in the manufacturer's declared formulation</td></tr>
</table>

Table A.8 Item Sheet 116

<table>
<tr><td colspan="5">Item No: 116</td></tr>
<tr><td>1.</td><td>REGISTERED DESCRIPTION:</td><td colspan="3">High Build Epoxy Maintenance Undercoat for abraded surfaces (two-pack)</td></tr>
<tr><td>2.</td><td>COLOURS:</td><td colspan="3">As the manufacturer's declared colour given with reference to BS 4800 [Ref 8.I] and/or BS 381C [Ref 9.I] where appropriate</td></tr>
<tr><td>3.</td><td>USE:</td><td colspan="3">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</td></tr>
<tr><td>4.</td><td>DRY FILM THICKNESS (dft in μm):</td><td colspan="3">Dft range: As described in the manufacturer's data sheet</td></tr>
<tr><td>5.</td><td>BUILD AND METHOD OF APPLICATION:</td><td colspan="3">HB/B or AS</td></tr>
<tr><td rowspan="6">6.</td><td colspan="4">OUTLINE COMPOSITION:</td></tr>
<tr><td>(i) Pigment volume concentration (%):</td><td colspan="3">As described in the manufacturer's declared formulation</td></tr>
<tr><td rowspan="2">(ii) Pigment:</td><td>Rutile Titanium Dioxide BS EN ISO 591-1: 2000 [Ref 11.I]</td><td>minimum 35%</td><td rowspan="2">As described in the manufacturer's declared formulation</td></tr>
<tr><td>Extenders, colouring pigments and anti-settling agents:</td><td>to 100%</td></tr>
<tr><td>(iii) Medium:</td><td>Modified epoxy resin together with a separately packed Polyamide/amine adduct activator with suitable accelerator:</td><td colspan="2">As described in the manufacturer's declared formulation</td></tr>
<tr><td>(iv) Volatile:</td><td colspan="3">As described in the manufacturer's declared formulation</td></tr>
<tr><td>(v) Mixing Properties</td><td colspan="3">As described in the manufacturer's declared formulation</td></tr>
</table>

Table A.9 Item Sheet 121

Item No: 121				
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 [Ref 8.I] and/or BS 381C [Ref 9.I] where appropriate		
3.	USE:	MIO epoxy with improved adhesion characteristics for treatment of hot dip galvanised steel surfaces		
4.	DRY FILM THICKNESS (dft in μm):	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 BS EN ISO 1248 [Ref 2.I]	minimum 80%	As described in the manufacturer's declared formulation
		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		

Table A.10 Item Sheet 123

<table>
<tr><td colspan="5">Item No: 123</td></tr>
<tr><td>1.</td><td>REGISTERED DESCRIPTION:</td><td colspan="3">High Build Glass Flake Epoxy Undercoat (two-pack)</td></tr>
<tr><td>2.</td><td>COLOURS:</td><td colspan="3">As the manufacturer's declared colour given with reference to BS 4800 [Ref 8.I] and/or BS 381C [Ref 9.I] where appropriate</td></tr>
<tr><td>3.</td><td>USE:</td><td colspan="3">Undercoat for blast cleaned steel in new construction</td></tr>
<tr><td>4.</td><td>DRY FILM THICKNESS (dft in μm):</td><td colspan="3">Dft range: As described in the manufacturer's data sheet</td></tr>
<tr><td>5.</td><td>BUILD AND METHOD OF APPLICATION:</td><td colspan="3">HB/AS (stripe coats and small repairs only by brush)</td></tr>
<tr><td rowspan="7">6.</td><td colspan="4">OUTLINE COMPOSITION:</td></tr>
<tr><td>(i) Pigment volume concentration (%):</td><td colspan="3">As described in the manufacturer's declared formulation</td></tr>
<tr><td rowspan="2">(ii) Pigment:</td><td>'C' type glass flake (nominal size 300 μm or less):</td><td></td><td>As described in the manufacturer's declared formulation</td></tr>
<tr><td>Extenders, anti-settling agents, and coloured pigments:</td><td>to 100%</td><td></td></tr>
<tr><td>(iii) Medium:</td><td>Epoxy resin together with a separately packed polyamide adduct or polyamine activator:</td><td colspan="2">As described in the manufacturer's declared formulation</td></tr>
<tr><td>(iv) Volatile:</td><td colspan="3">As described in the manufacturer's declared formulation</td></tr>
<tr><td>(v) Mixing Properties</td><td colspan="3">As described in the manufacturer's declared formulation</td></tr>
</table>

Table A.11 Item Sheet 155

Item No: 155			
1.	REGISTERED DESCRIPTION:	'T' Wash adhesion promoter	
2.	COLOURS:	As the manufacturer's declared colour given with reference to BS 4800 [Ref 8.I] and/or BS 381C [Ref 9.I] 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 μm):	Not applicable	
5.	BUILD AND METHOD OF APPLICATION:	LB/B	
6.	OUTLINE COMPOSITION:		
		Typical Composition (by weight) 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

Table A.12 Item Sheet 157

Item No: 157			
1.	REGISTERED DESCRIPTION:	Adhesion promoting primer (single-component)	
2.	COLOURS:	As the manufacturer's declared colour given with reference to BS 4800 [Ref 8.I] and/or BS 381C [Ref 9.I] where appropriate	
3.	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	
4.	DRY FILM THICKNESS (dft in μm):	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:	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	

Table A.13 Item Sheet 159

Item No: 159				
1.	REGISTERED DESCRIPTION:	Aluminium Epoxy Sealer/Primer (two-pack)		
2.	COLOURS:	As the manufacturer's declared colour given with reference to BS 4800 [Ref 8.I] and/or BS 381C [Ref 9.I] where appropriate		
3.	USE:	Sealer/Primer for aluminium metal spray coverage		
4.	DRY FILM THICKNESS (dft in μm):	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		

Table A.14 Item Sheet 160

Item No: 160				
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 [Ref 8.I] and/or BS 381C [Ref 9.I] 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 μm):	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 BS EN ISO 1248 [Ref 2.I]	minimum 20%	As described in the manufacturer's declared formulation
		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	

Table A.15 Item Sheet 162

<table>
<tr><td colspan="5">Item No: 162</td></tr>
<tr><td>1.</td><td>REGISTERED DESCRIPTION:</td><td colspan="3">MIO Moisture Cured Polyurethane Undercoat/Finish (single-component)</td></tr>
<tr><td>2.</td><td>COLOURS:</td><td colspan="3">As the manufacturer's declared colour given with reference to BS 4800 [Ref 8.I] and/or BS 381C [Ref 9.I] where appropriate</td></tr>
<tr><td>3.</td><td>USE:</td><td colspan="3">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</td></tr>
<tr><td>4.</td><td>DRY FILM THICKNESS (dft in μm):</td><td colspan="3">Dft range: As described in the manufacturer's data sheet</td></tr>
<tr><td>5.</td><td>BUILD AND METHOD OF APPLICATION:</td><td colspan="3">NB or HB/B or AS</td></tr>
<tr><td rowspan="6">6.</td><td colspan="4">OUTLINE COMPOSITION:</td></tr>
<tr><td>(i) Pigment volume concentration (%):</td><td colspan="3">As described in the manufacturer's declared formulation</td></tr>
<tr><td rowspan="3">(ii) Pigment:</td><td>MIO BS EN ISO 1248 [Ref 2.I]</td><td>minimum 40%</td><td rowspan="2">As described in the manufacturer's declared formulation</td></tr>
<tr><td>Extenders, tinting pigments and anti-settling agents:</td><td>to 100%</td></tr>
<tr><td colspan="2">Aluminium pigment not permitted</td></tr>
<tr><td>(iii) Medium:</td><td>Aromatic polyisocyanate and water scavenger:</td><td colspan="2">As described in the manufacturer's declared formulation</td></tr>
<tr><td>(iv) Volatile:</td><td>Aliphatic and/or Aromatic hydrocarbons:</td><td colspan="2">As described in the manufacturer's declared formulation</td></tr>
</table>

Table A.16 Item Sheet 164

Item No: 164				
1.	REGISTERED DESCRIPTION:	Moisture Cured Polyurethane Finish (single-component)		
2.	COLOURS:	As the manufacturer's declared colour given with reference to BS 4800 [Ref 8.I] and/or BS 381C [Ref 9.I] 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 μm):	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 BS EN ISO 591-1: 2000 [Ref 11.I] and tinting pigments:		As described in the manufacturer's declared formulation
		Exterior quality extenders and anti-settling agents:	to 100%	
		Aluminium pigment not permitted		
	(iii) Medium:	Aliphatic 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	

Table A.17 Item Sheet 167

Item No: 167		
1.	REGISTERED DESCRIPTION:	Epoxy Acrylic Finish (two-pack)
2.	COLOURS:	As the manufacturer's declared colour given with reference to BS 4800 [Ref 8.I] and/or BS 381C [Ref 9.I] where appropriate
3.	USE:	As a decorative semi-gloss finish for new works or maintenance
4.	DRY FILM THICKNESS (dft in μm):	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 the manufacturer's declared formulation
	(ii) Pigment:	Rutile Titanium Dioxide BS EN ISO 591-1: 2000 [Ref 11.I]) 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 the manufacturer's declared formulation
	(v) Mixing Properties	As described in the manufacturer's declared formulation
*May be brush applied to small areas only		

Table A.18 Item Sheet 168

<table>
<tr><td colspan="5">Item No: 168</td></tr>
<tr><td>1.</td><td>REGISTERED DESCRIPTION:</td><td colspan="3">Polyurethane (two-pack) Gloss Finish</td></tr>
<tr><td>2.</td><td>COLOURS:</td><td colspan="3">As the manufacturer's declared colour given with reference to BS 4800 [Ref 8.I] and/or BS 381C [Ref 9.I] where appropriate</td></tr>
<tr><td>3.</td><td>USE:</td><td colspan="3">Gloss Finish for new works or maintenance</td></tr>
<tr><td>4.</td><td>DRY FILM THICKNESS (dft in μm):</td><td colspan="3">Dft range: As described in the manufacturer's data sheet</td></tr>
<tr><td>5.</td><td>BUILD AND METHOD OF APPLICATION:</td><td colspan="3">LB/B or NB/AS</td></tr>
<tr><td rowspan="7">6.</td><td colspan="4">OUTLINE COMPOSITION:</td></tr>
<tr><td>(i) Pigment volume concentration (%):</td><td colspan="3">As described in the manufacturer's declared formulation</td></tr>
<tr><td rowspan="3">(ii) Pigment:</td><td colspan="2">Rutile Titanium Dioxide BS EN ISO 591-1: 2000 [Ref 11.I] and tinting pigments:</td><td rowspan="2">As described in the manufacturer's declared formulation</td></tr>
<tr><td>Exterior quality extenders and anti-settling agents:</td><td>to 100%</td></tr>
<tr><td colspan="3">Aluminium pigment not permitted</td></tr>
<tr><td>(iii) Medium:</td><td>Hydroxyl functional acrylic/aliphatic poly isocyanate curing agent:</td><td colspan="2">As described in the manufacturer's declared formulation</td></tr>
<tr><td>(iv) Volatile:</td><td colspan="3">As described in the manufacturer's declared formulation</td></tr>
<tr><td>(v) Mixing Properties</td><td colspan="3">As described in the manufacturer's declared formulation</td></tr>
</table>

Table A.19 Item Sheet 169

Item No: 169				
1.	REGISTERED DESCRIPTION:	Polyurethane (two-pack) Semi-Gloss Finish		
2.	COLOURS:	As the manufacturer's declared colour given with reference to BS 4800 [Ref 8.I] and/or BS 381C [Ref 9.I] where appropriate		
3.	USE:	Semi-gloss finish for new works or maintenance		
4.	DRY FILM THICKNESS (dft in μm):	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 BS EN ISO 591-1: 2000 [Ref 11.I] and tinting pigments:		As described in the manufacturer's declared formulation
		Exterior quality extenders and anti-settling agents:	to 100%	
		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		

Table A.20 Item Sheet 185

Item No: 185				
1.	REGISTERED DESCRIPTION:	Organic Modified Polysiloxane (two-pack) Gloss Finish		
2.	COLOURS:	As the manufacturer's declared colour given with reference to BS 4800 [Ref 8.I] and/or BS 381C [Ref 9.I] where appropriate		
3.	USE:	Gloss Finish for new works or maintenance		
4.	DRY FILM THICKNESS (dft in μm):	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 BS EN ISO 591-1: 2000 [Ref 11.I] 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): BS EN ISO 6860: BS 3900-E11 [Ref 7.I] After 1 month ambient cure at 23ºC and 50 (±5)% relative humidity. No cracking or disbondment beyond 20mm from small radius.		

Table A.21 Item Sheet 200

Item No: 200			
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 μm):	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

Table A.22 Item Sheet 201

Item No: 201				
1.	REGISTERED DESCRIPTION:	Grease Paint Undercoat/Finish		
2.	COLOURS:	As the manufacturer's declared colour given with reference to BS 4800 [Ref 8.I] and/or BS 381C [Ref 9.I] where appropriate		
3.	USE:	Undercoat and Finish over penetrating primer		
4.	DRY FILM THICKNESS (dft in μm):	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 BS EN ISO 591-1: 2000 [Ref 11.I] 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	

Appendix B. Additional test clauses

B1 Application and appearance

B1.1 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°C ± 2°C and shall be free from cracking, cratering, pinholing, rivelling, sagging, bittiness, cissing or other surface defects.

B1.2 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°C ± 2°C and shall be free from cracking, cratering, rivelling, sagging, bittiness, cissing or other surface defects.

B2 Minimum overcoating time

B2.1 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°C ± 2°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.

When dry 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.

Notification

This document was notified in draft to the European Commission in accordance with Technical Standards and Regulations Directive 2015/1535/EU.