

Reference	NR/L3/CIV/039
Issue	5
Publication date	7 th March 2009
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Level 3

Specification for the assessment and certification of protective coatings and sealants

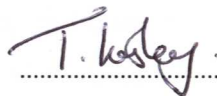
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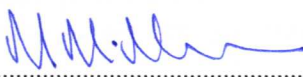
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Issue record

Issue	Date	Comments
1	December 2009	RT/CE/C/002: <i>Application and reapplication of protective treatments to Railtrack infrastructure</i> [Issue 4: February 2004.]

Compliance

This Network Rail standard shall be complied with by Network Rail and its Contactors from 5th December 2009.

When this Specification is implemented it is permissible for projects, which have formally completed GRIP Level 4, to continue to comply with the issue of any relevant Network Rail standards current when GRIP Level 4 was reached and not to comply with requirements contained herein.

Reference documentation

Network Rail standards

[NR/GN/CIV/002](#): *The use of protective coatings and sealants.*

[NR/L3/CIV/040](#): *Specification for the use of protective coatings systems.*

[NR/L3/CIV/041](#): *Waterproofing systems for Underline Bridge decks.*

British Standards

- BS 245: 1976 *Specification for mineral solvents (white spirit and related hydrocarbon solvents) for paints and other purposes.*
- BS 381C: 1996 *Specification for colours for identification, coding and special purposes.*
- BS 476-6: 1989 *Fire tests on building materials and structures. Method of test for fire propagation for products.*
- BS 476-7: 1997 *Fire tests on building materials and structures. Method of test to determine the classification of the surface spread of flame of products.*
- BS 476-20: 1987 *Fire tests on building materials and structures. Method for determination of the fire resistance of elements of construction (general principles).*
- BS 476-21: 1987 *Fire tests on building materials and structures. Methods for determination of the fire resistance of loadbearing elements of construction.*
- BS 950-1: 1967 *Specification for artificial daylight for the assessment of colour. Illuminant for colour matching and colour appraisal.*
- BS 1062 *[Various parts and dates of issue]*
- BS 1336: 1971 *Specification for knotting.*
- BS 2869: 2006 *Fuel oils for agricultural, domestic and industrial engines and boilers. Specification.*

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BS 3900-A8: 1986, BS 6664-1: 1986, ISO 1516- 1981	<i>Methods of test for paints. Tests on liquid paints (excluding chemical tests). Test for flash/no flash (closed cup equilibrium method).</i>
BS 3900-A10: 1998, ISO 3233: 1998	<i>Methods of test for paints. Tests on liquid paints (excluding chemical tests). Determination of percentage volume of non-volatile matter by measurement of the density of a dried coating.</i>
BS 3900-B4: 1986, ISO 6503: 1984	<i>Methods of test for paints. Tests involving chemical examination of liquid paints and dried paint films. Determination of total lead in paints and similar materials.</i>
BS 3900-B5: 1986, ISO 6713: 1984	<i>Methods of test for paints. Tests involving chemical examination of liquid paints and dried paint films. Preparation of acid extracts from liquid paints or coating powders.</i>
BS 3900-D8: 1986, ISO 7724-1: 1984	<i>Methods of test for paints. Optical tests on paint films. Determination of colour and colour difference: principles.</i>
BS 3900-D9: 1986, ISO 7724-2: 1984	<i>Methods of test for paints. Optical tests on paint films. Determination of colour and colour difference: measurement.</i>
BS 3900-D10: 1997, ISO 7724-3: 1984	<i>Methods of test for paints. Determination of colour and colour difference. Calculation by CIELAB (ISO/DIS 7724-3) Part 3: Calculation of colour differences by CIELAB.</i>
BS 3900-E7: 1974	<i>Methods of test for paints. Resistance to impact (falling ball test).</i>
BS 3900-F2: 1973	<i>Methods of test for paint. Durability tests on paint films. Determination of resistance to humidity (cyclic condensation).</i>
BS 3900-F6: 1976	<i>Methods of test for paint. Durability tests on paint films. Notes for guidance on the conduct of natural weathering test.</i>
BS 4800: 1989	<i>Paint colours for building purposes.</i>
BS 6319-2: 1983	<i>Testing of resin and polymer/cement compositions for use in construction. Method for measurement of compressive strength.</i>
BS 6319-3: 1990	<i>Testing of resin and polymer/cement compositions for use in construction. Methods for measurement of modulus of elasticity in flexure and flexural strength.</i>
BS 6319-7: 1985	<i>Testing of resin and polymer/cement compositions for use in construction. Method for measurement of tensile strength.</i>
BS 6853: 1999	<i>Code of practice for fire precautions in the design and construction of passenger carrying trains.</i>
BS 6923: 1988	<i>Method for calculation of small colour differences.</i>

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BS EN 927-3: 2000	<i>Paints and varnishes. Coating materials and coating systems for exterior wood. Natural weathering test.</i>
BS EN 1097-1: 1996	<i>Tests for mechanical and physical properties of aggregates. Determination of the resistance to wear (micro-Deval).</i>
BS EN 1097-8: 2000	<i>Tests for mechanical and physical properties of aggregates. Determination of the polished stone value.</i>
BS EN 12206-1: 2004	<i>Paints and varnishes. Coating of aluminium and aluminium alloys for architectural purposes. Coatings prepared from coating powder.</i>
BS EN 12329: 2000	<i>Corrosion protection of metals. Electrodeposited coatings of zinc with supplementary treatment on iron or steel.</i>
BS EN 12330: 2000	<i>Corrosion protection of metals. Electrodeposited coatings of cadmium on iron or steel.</i>
BS EN 12476: 2000	<i>Phosphate conversion coatings of metals. Method of specifying requirements</i>
BS EN 13438: 2005	<i>Paints and varnishes. Powder organic coatings for galvanized or sherardised steel products for construction purposes.</i>
BS EN 13501-1: 2007	<i>Fire classification of construction products and building elements. Classification using data from reaction to fire tests.</i>
BS EN 29117: 1992, ISO 9117: 1990	<i>Methods of test for paints. Tests associated with paint film formation. Paints and varnishes. Determination of through-dry state and through-dry time. Method of test.</i>
BS EN ISO 868: 2003	<i>Plastics and ebonite. Determination of indentation hardness by means of a durometer (Shore hardness).</i>
BS EN ISO 1461: 1999	<i>Hot dipped galvanized coatings on fabricated iron and steel articles. Specifications and test methods.</i>
BS EN ISO 1513: 1995, BS 3900-A2: 1993	<i>Paints and varnishes. Examination and preparation of samples for testing.</i>
BS EN ISO 1516: 2002, BS 2000- 491: 2002	<i>Method of test for petroleum and its products. Determination of flash/no flash. Closed cup equilibrium method</i>
BS EN ISO 1517: 1995, BS 3900-C2: 1994	<i>Paints and varnishes. Surface-drying test. Ballotini method.</i>
BS EN ISO 1518: 2001	<i>Paints and varnishes. Scratch test.</i>
BS EN ISO 2063: 2005	<i>Thermal spraying. Metallic and other inorganic coatings. Zinc, aluminium and their alloys.</i>

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- BS EN ISO 2409: *Paints and varnishes. Cross-cut test.*
2007, BS 3900-E6:
2007
- BS EN ISO 2808: *Paints and varnishes. Determination of film thickness.*
2007, BS 3900-C5:
2007
- BS EN ISO 2811-1: 2001, BS 3900-A19: 1998 *Paints and varnishes. Determination of density. Pycnometer method.*
- BS EN ISO 2812-1: 2007 *Paints and varnishes. Determination of resistance to liquids. Immersion in liquids other than water.*
- BS EN ISO 2813: 2000 *Paints and varnishes. Measurement of specular gloss of non-metallic paint films at 20°, 60° and 85°.*
- BS EN ISO 2814: 2006, BS 3900-D4: 2006 *Paints and varnishes. Comparison of contrast ratio (hiding power) of paints of the same type and colour.*
- BS EN ISO 2884-1: 2006, BS 3900-A7-1: 2006 *Paints and varnishes. Determination of viscosity using rotary viscometers. Cone-and-plate viscometer operated at a high rate of shear.*
- BS EN ISO 3231: 1998, BS 3900-F8: 1993 *Paints and varnishes. Determination of resistance to humid atmospheres containing sulfur dioxide.*
- BS EN ISO 3251: 2008 *Paints, varnishes and plastics. Determination of non-volatile matter content.*
- BS EN ISO 3549: 2002 *Zinc dust pigments for paints. Specifications and test methods.*
- BS EN ISO 3668: 2001, BS 3900-D1: 1998 *Paints and varnishes. Visual comparison of the colour of paints.*
- BS EN ISO 4624: 2003, BS 3900-E10: 2003 *Paints and varnishes. Pull-off test for adhesion.*
- BS EN ISO 6860: 2006, BS 3900-E11: 2006 *Paints and varnishes. Bend test (conical mandrel).*
- BS EN ISO 8501-1: 2007 *Preparation of steel substrates before application of paints and related products. Visual assessment of surface cleanliness. Rust grades and preparation grades of uncoated steel substrates and of steel substrates after overall removal of previous coatings.*
- BS EN ISO 9001: 2000 *Quality management systems. Requirements.*

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- BS EN ISO 9002: 1994 *Quality systems. Model for quality assurance in production, installation and servicing.*
- BS EN ISO 9227: 2006 *Corrosion tests in artificial atmospheres. Salt spray tests.*
- BS EN ISO 9514: 2005 *Paints and varnishes. Determination of the pot life of multicomponent coating systems. Preparation and conditioning of samples and guidelines for testing.*
- BS EN ISO 10601: 2008 *Micaceous iron oxide pigments for paints. Specifications and test methods.*
- BS EN ISO 11507: 2007, BS 3900-F16: 2007 *Paints and varnishes. Exposure of coatings to artificial weathering. Exposure to fluorescent UV lamps and water.*
- BS EN ISO 11600: 2003 *Building construction. Jointing products. Classification and requirements for sealants.*
- BS EN ISO 11890-1: 2001, BS 3900-A23: 2000 *Paints and varnishes. Determination of volatile organic compound (VOC) content. Difference method.*
- BS EN ISO 12944-2: 1998 *Paints and varnishes. Corrosion protection of steel structures by protective paint systems. Classification of environments.*
- BS EN ISO 12944-6: 1998 *Paints and varnishes. Corrosion protection of steel structures by protective paint systems. Laboratory performance test methods.*
- BS EN ISO 16862: 2006 *Paints and varnishes. Evaluation of sag resistance.*

Other standards

- ASTM D4541-02 *Standard test method for pull-off strength of coatings using portable adhesion testers.*
- TX 772188340RAL 840 HRÜ2 *Übersicht über die RAL - Farbendes Farbregisters RAL 840 HR mit ihren Hilfsbezeichnungen.*

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Other publications

Control of Substances Hazardous to Health Regulations (1999). (COSHH).

Fire protection for structural steel in buildings. Association of Specialist Fire Protection (ASFP), Steel Construction Institute, Fire Test Study Group. 3rd Edition. (June 2004).

Road Note 27 - Portable skid resistance. Transport and Road Research Laboratory.

Specification for a quality label for paint, lacquer and powder coatings on aluminium for architectural applications. Qualicoat. 11th Edition. (April 2006).

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Comments

The applicability and content of this standard will be reviewed on a regular basis. Written comments on the accuracy and utility of this standard will be taken into account when assessing the need for a new issue of the standard; such comments should be sent to the Principal Policy and Assurance Engineering (Civil Engineering) at 40 Melton Street, London NW1 2EE.

Reference note

This standard is to be used in conjunction with [NR/GN/CIV/002](#): *The use of protective coatings and sealants* and [NR/L3/CIV/040](#): *Specification for the use of protective coatings systems*.

The Item Numbers of the material types defined in this suite of standards are referenced as **5.1.7** (for example): see Appendix A. For ease of use, the same information on protective coating systems is provided in Appendixes of [NR/L3/CIV/039](#) and [NR/L3/CIV/040](#). The protective coating systems defined in this suite of standards are referenced as **N1** (for example).

The standards governing the application and testing of protective coatings are subject to frequent change. Where necessary, the latest version of the standards listed in the Reference documentation (above) shall be followed.

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1 Purpose

The purpose of this Specification is to define the requirements for the assessment, certification, registration and specification of protective coatings and sealants for use on Network Rail's infrastructure.

The prime reason for applying and reapplying protective coatings and sealants is to preserve the infrastructure so that it provides the required service life in the most cost-effective manner. However, there are cases where the colour of the Final coat has to comply with regulations that govern the safe operation of the railway and/or to satisfy aesthetic requirements.

2 Scope

This Specification applies to the use of protective coatings and sealants to new and existing Network Rail's infrastructure, except for rails and other track components.

This Specification covers the use of paints, other coatings, surface treatments, complete coating systems and sealants for the corrosion protection and fire protection of structural steelwork (but excluding metal coatings that are not part of a duplex system), and for the protection of timber, concrete, and masonry structures. This Specification does not cover the preservation of timber by impregnation.

Ideally, the performance data for a protective coating product/system will indicate that a protective coating system will provide a nominal 25 year service to its first maintenance. Usually such evidence would be obtained (at least in part) from the results of accelerated ageing tests. However, products and systems that had been tested under the 3000 hours (15 years) protocol under RT/CE/S/039 (RT98) may continue to be used (see 8).

This Specification does not cover the waterproofing of bridge decks; such work is covered by [NR/L3/CIV/041](#): *Waterproofing systems for Underline Bridge decks*.

Only materials compliant with the requirements of this Specification, and registered in Products and Drawings database (PADS) as being so, shall be used on Network Rail's infrastructure. Furthermore, such materials shall be applied in accordance with the manufacturer's recommendations or as otherwise directed by Network Rail. Instructions and recommendations for the selection, preparation and application of protective coating systems are provided in [NR/L3/CIV/040](#): *Specification for the use of protective coating systems*, and in [NR/GN/CIV/002](#): *The use of protective coatings and sealants*.

3 Definitions

Contractor

A company or organisation contracted directly or via a sub-contract to Network Rail.



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Engineer

A nominated representative of Network Rail assigned to the contract/project.

Independent Test House (ITH)

An organisation that has expert knowledge and testing capability for the Waterproofing System, and which is independent of the manufacturing industry and is accredited by the United Kingdom Accreditation Service (UKAS), or equivalent European body, for the tests it undertakes.

MIO: Micaceous Iron Oxide

Principal Independent Test House (PITH)

The organisation appointed by the Manufacturer of the Waterproofing System to supervise the test programme and undertake most of the tests on the System. The PITH shall have expert knowledge and testing capability for the Waterproofing System, be independent of the manufacturing industry, and be accredited by the United Kingdom Accreditation Service (UKAS), or equivalent European body, for the tests it undertakes.

Specialist Group

A panel of Engineers and industry specialists convened to oversee and review the registration of products in PADS; respond to technical queries on coatings, tests etc; and provide advice on the specification of coating systems for particular contracts.

4 Types of materials and protective coating systems

The types of material recognised by this Specification are described in Appendix A: specific requirements for each type are provided in that Appendix.

Details of protective coating systems for use on new and existing structural steelwork, other fabricated steel items and ironwork are given in Appendixes B and C.

Details of protective coating systems for use on timber structures are given in Appendix D.

Details of protective coating systems for use on masonry and concrete structures are given in Appendix E.

5 Coating systems for iron and steel substrates (excluding powder coatings and metallic coatings)

5.1 Outline of procedure

The assessment and certification procedure shall be undertaken in four stages;

Stage 1 - Assessment of Applicant's data

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Stage 2 - Laboratory testing

Stage 3 - Certification

Stage 4 - Monitored exposure trial

An Applicant can withdraw from the procedure at any time.

If at any time during an assessment the PITH considers that the information provided by the Applicant is inadequate or unsatisfactory, the Applicant shall be notified directly.

Where an Applicant submits for assessment a product that has various formulations with regard to the base or activator and/or which can be applied using various techniques, the PITH (where necessary, following consultation with the Specialist Group) shall define the number of Certificates required and the range of tests to be performed to allow acceptance of the various options.

A Certificate shall only be issued following the successful completion of Stages 1 and 2 and, where necessary, the establishment of the requirements for Stage 4. The details of Stage 4 will be determined through the assessment stage. The performance of a coating system will be monitored whilst a Certificate is current.

5.2 Stage 1: Assessment of Applicant's data

An Applicant shall submit to the PITH the information listed in 1 to 4 below. The Applicant's contract with the PITH shall include provision for this information to be checked and verified. Following its acceptance by the PITH, the information shall form the basis of the assessment.

- 1 Fundamental information;
 - details of Applicant,
 - type of materials - including product formulations as defined on Form F1 (Appendix F),
 - colour range and gloss level,
 - hazard classification,
 - VOC content,
 - packaging,
 - shelf life - including details of storage trials,
 - details of current exposure trials and of the arrangements for monitoring them,
 - information on the previous use and performance of the material - including details of sites,
 - product data sheet - with date of issue and/or issue number,
 - product health and safety data sheet - with date of issue and/or issue number.
- 2 Quality System, including;

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- organisational structure, responsibilities, procedures, processes and resources for implementing quality management, registration to BS EN ISO 9001 or an equivalent standard.
- 3 Quality Plan, including;
- details of production and control procedures, and materials, such as,
 - type, source and characteristics of all materials,
 - controls applied to raw materials, manufacturing process and the finished product,
 - type and specification of the binder.
- 4 Recommendations for application;
- limitations on ambient environmental conditions,
 - limitations on the condition of the substrate,
 - preparation of the surface of the substrate,
 - procedures,
 - equipment,
 - storage conditions,
 - overcoating times for a range of temperatures.

The Applicant shall provide sufficient details with their submitted test data to demonstrate that the products tested are equivalent and traceable to that currently produced and supplied.

The Applicant's instructions and recommendations shall include all necessary information on the safe (and unsafe) use of the products.

Where a product contains a hazardous substance (that is, one that falls within the scope of the COSHH Regulations) the Applicant shall supply all relevant health and safety data on that substance. No formal assessment of the suitability of these data, in terms of the COSHH or other Regulations, shall be undertaken by the PITH, but they shall be referred to by the PITH, and their subcontractors, when formulating safe handling and testing procedures.

Applicants may submit additional information on the properties of a coating system, such as its fire classification, and its resistance and/or sensitivity to various chemicals, solvents and graffiti.

5.3 Stage 2: Laboratory testing

5.3.1 General

Samples supplied for testing shall be traceable to the Applicant's source of production.

Test specimens shall be prepared by the PITH (or ITH) in accordance with the manufacturer's recommendations.

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Laboratory tests shall be conducted in accordance with the methods defined in Appendix **G**. Each of these tests, and those undertaken in Stage 4, shall be conducted by a laboratory that has UKAS or equivalent accreditation for that test (see **5.4**).

Test No.7 (see Table **G1**) shall only be undertaken where there is evidence that the product contains one or more of the substances listed there.

5.3.2 Material and performance testing

Testing shall be conducted in accordance with the relevant test methods defined in Tables **G1** to **G3**.

The tests described in Tables **G2** and **G3** shall be performed on coatings applied in accordance with BS EN ISO 12944-6 to steel panels which have a minimum thickness of 4 mm. Where approval for the use of the coating system on another substrate is sought (for example, on galvanized steel and spray-applied metal surfaces) the appropriate tests in Tables **G2** and **G3** shall be undertaken on coated panels of that substrate. Likewise, where approval is sought for the use of a coating system on a steel surface prepared by a particular method that is not in accordance with BS EN ISO 12944-6 (for example, by manual means, power tools or water blasting) the appropriate tests in Tables **G2** and **G3** shall be conducted on panels that have been prepared using that particular method. It should be noted that coating systems applied to a manually or power tool prepared steel surface will be deemed to provide a 15 year life, rather than the 25 year life deemed to be provided on a blast-cleaned surface.

The tests given in Table **G4** shall be undertaken to verify claims regarding the fire classification, chemical resistance, and the anti-graffiti properties of a coating system.

5.3.3 Stage 3: Certification

Where the results of the tests undertaken on a protective coating system meet the requirements of this Specification then, following the establishment of a monitored exposure trial for Stage 4, the PITH will issue a certificate defining the details of (a) what was tested, and (b) the compliance requirements that were met. The certificate shall describe the system, the conditions of its use, and its likely performance for particular defined in-service conditions.

The route to final Certification is described in **8** and Appendix **H**.

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5.3.4 Stage 4: Monitored exposure trial

Natural weathering tests, based on BS 3900-F6, shall be carried out when the Applicant is unable to demonstrate through documentation or actual performance that the protective coating system will satisfy the service life claimed for locations classified as C4 or C5 by BS EN ISO 12944-2.

Steel fabrications (manufactured in accordance with Figure **G1** of Appendix **G**) shall be used to assess the natural weathering performance of a coating system. These fabrications shall be prepared and coated by the Applicant in accordance with the declared specification; the preparation and coating works shall be monitored and confirmed by the PITH (or an ITH).

The coated specimen shall be dried at $23^{\circ} \pm 2^{\circ}\text{C}$ for a minimum of 7 days before exposure. The exposure site shall be agreed with the Specialist Group. The exposure test shall be controlled/ supervised by the PITH. The test is to be continued for the service life of the system as declared by the Applicant and/or while the Certificate is extant. The bottom half of the fabrication is to be washed annually to remove guano and other contaminants. The PITH shall examine the fabrication for evidence of degradation and breakdown of the coating system (for example, by cracking, splitting, chalking and discolouration) and for signs of corrosion: the examinations shall be undertaken some 6 months, 12 months and annually following installation at the exposure site.

When failure of the coating system is observed, other evidence on the durability of the system will be sought and the validity of the Certificate shall be reviewed.

5.4 Quality requirements for test data

The PITH shall accept test data submitted by independent laboratories (ITH) that have UKAS accreditation, or equivalent, for the particular test(s). The ITH shall submit a copy of their UKAS, or equivalent, schedule of tests to the Specialist Group or PITH as requested. Test data from an independent overseas laboratory that holds equivalent national accreditation for the specific test(s) shall be accepted where there is a reciprocal agreement between UKAS and the national accreditation authority of the country in question.

Where one or other of the above conditions are not met, other data supplied in support of an assessment (for example, background information and test data on the base or generic material), may be accepted following review by the PITH, and/or the Specialist Group.

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However, (a) it is impractical to require accreditation for tests that are subjective in nature, and (b) uneconomic to insist on accreditation for some other tests. Accordingly, accreditation is not required for tests 2, 6, 8, 9, 10, 11, 15, 16 and 28 as defined in Appendix G.

6 Coatings systems for use on non metallic substrates

6.1 General

In most cases, verifiable test data supplied by the manufacturer will be acceptable for protective coating systems for use on timber, concrete and masonry.

6.2 Coating systems for timber

It is unnecessary to provide performance test data for coatings that are used for internal decorative purposes only.

A coating system for use on external timber (external being defined as not being in a controlled environment) shall have a durability of at least 5 years as demonstrated by testing in accordance with BS EN 927-3.

Although it is preferable for test data to be gathered and supplied by an organisation independent of the manufacturer, data from a BS EN ISO 9001/9002 registered company may be accepted where such data can be verified.

The coating systems shall be tested on Douglas Fir and Parana Pine test pieces, and on test pieces of any other timber species specified by the manufacturer. The moisture content of the test pieces shall be between 12 and 18%.

Knotting shall comply with the requirements of BS 1336.

6.3 Coating systems for concrete and masonry

It is unnecessary to provide performance test data for coatings that are used for internal decorative purposes only.

A coating system for use on concrete or masonry (including brick, natural surfaces and Portland cement renders) shall be tested in accordance with the relevant part(s) of BS 1062.

Although it is preferable for test data to be gathered and supplied by an organisation independent of the manufacturer, data from a BS EN ISO 9001/9002 registered company may be accepted where such data can be verified. Certification issued by the BBA is acceptable, provided that the certificate defines the details of the testing regime.

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The test data shall verify that the coating system has a durability of at least 10 years for the in-service environment.

Protective coatings for external surfaces, and internal use for which performance test data are required, shall be water-based products applied in two or more coats over a primer coat. These coatings shall be flexible and able to accommodate cracking of the substrate.

7 Testing of Sealants and miscellaneous products

7.1 Sealants

Independent test data shall be available to verify that the selected Sealant is compliant with BS EN ISO 11600. (For general use, Sealants will be Construction Sealants (F) Class 25 or Class 20 as specified in that standard.)

Sealants for use with protective coating systems shall be suitable for application by gunning (without adjustment) to form an even continuous bead, which does not slump, shrink, or separate. The curing period shall be as declared by the manufacturer.

Sealants shall be compatible with the substrate and the relevant protective coating, and be overcoatable by a coating compliant with this Specification. The overcoating time shall be declared by the manufacturer.

Sealants shall show no loss of adhesion or cohesion across joints up to the maximum width declared by the manufacturer. The Sealant shall be shown to be fully compatible with the backing strip used to control the depth of application.

Sealants shall be available in black, white and a range of colours.

The requirements for Sealants in this Specification do not apply to those used for general joinery works and similar works - such as sealing around doors and windows.

7.2 Organic powder coatings

The test methods used to demonstrate compliance with the performance requirements for the powder organic coatings, and the finish to such coatings, shall be in accordance with BS EN 12206-1 when applied to aluminium, and to BS EN 13438 when applied to galvanized steel.

Coatings approved to Qualicoat Class 1 are also acceptable.

Independent test data shall be provided to verify that performance meets the appropriate standard.

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7.3 Metallic coatings

Metallic coatings that form part of a protective coating system shall comply with one of other of the relevant standard;

- BS EN 12329: *Corrosion protection of metals. Electrodeposited coatings of zinc with supplementary treatment on iron or steel.*
- BS EN 12330: *Corrosion protection of metals. Electrodeposited coatings of cadmium on iron or steel.*
- BS EN 12476: *Phosphate conversion coatings of metals. Method of specifying requirements,*
- BS EN ISO 1461: *Hot dipped galvanized coatings on fabricated iron and steel articles. Specifications and test methods.*
- BS EN ISO 2063: *Thermal spraying. Metallic and other inorganic coatings. Zinc, aluminium and their alloys.*

7.4 Anti-slip surfaces

The dry film thickness of an anti-slip product applied in liquid form shall be sufficient to secure the aggregate particles of the surfacing. Furthermore, such products shall be suitable for application using the manufacturer's recommended method(s) without adjustment. The manufacturer shall declare the initial set time and drying times for trafficking of the surfacing by foot.

Anti-slip products applied as a film shall be supplied in rolls, strips or tiles. When applied in accordance with the manufacturer's recommendations such products shall remain adherent to the substrate for their defined service life under the expected in-service conditions.

Anti-slip products shall be compatible with the applied protective coating system.

Anti-slip surfaces shall comply with the applicable requirements given in the tables in Appendixes **B** to **E** and with TRL Road Note 27.

7.5 Resistance to chemicals and contaminants

Where it is necessary to verify the resistance of a coating system to chemicals and contaminants (including products used for repair of damaged coatings) the system shall be tested in accordance with Appendix **G** Test 27 and be shown to be resistant to the following;

- chemicals (of recognised analytical quality) as specified in BS EN ISO 12944-6,
- diesel fuel to BS 2869,

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- guano (ammonia of 20% concentration may be considered to be a suitable substitute),
- glysophate weed killers,
- hydraulic fluid,
- petrol.

The manufacturer may declare that the protective coating system is intended to be resistant to other contaminants such as oils, bitumen and cleaning agents such as those used for carriage washing. In such cases, tests shall be undertaken to verify such resistance.

7.6 Resistance to graffiti

Protective coatings, including any to be used for the repair of damaged coatings, declared by the manufacturer to be resistant to graffiti shall meet the requirements of Appendix G Test 28.

7.7 Fire resistance

Protective coatings, including any to be used for repair of damaged coatings, which the manufacturer declares are suitable for application in sub surface Stations and other locations where fire resistant systems are required, shall have properties defined in Appendix G Test 26.

Protective coating systems that are used to maintain the structural integrity of the structure in case of fire shall be capable of providing protection to the substrate for a period not less than that specified. Tests shall be undertaken in accordance with BS 476-20, BS 476-21, and the requirements given in *Fire protection for structural steel in buildings* [‘The Yellow Book’] shall be followed on the sizes and thickness of sections applicable to the system.

Systems for use on external steelwork, complying with N18 in Appendix B, shall meet the performance requirements as defined in Appendix G.

8 Certification

Manufacturers of products and systems that were registered in PADS and had been tested under RT/CE/S/039 (RT98) under the 5000 hours (25 years) protocol may apply for transfer of certification following successful completion of any additional testing not undertaken for original registration but required by this Specification.

Similarly, manufacturers of products and systems that were registered in PADS and had been tested under RT/CE/S/039 (RT98) under the 3000 hours (15 years) protocol may apply for transfer of certification following successful completion of any additional testing not undertaken for original registration but required by this Specification. Such transfers would gain certification

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indicating a 15 year life expectancy rather than the 25 year life expectancy required for coating systems to be fully compliant with this Specification.

The route to achieve final Certification is further described in Appendix H: that Appendix provides a copy of the PADS registration form, and guidance on (a) how this form should be completed, and (b) how the data in PADS may be changed.

A copy of the certificate issued by the PITH shall be provided to Serco Railtest Ltd, so that details of the protective treatment can be listed in PADS. Through registration, a number in the series 28/98xxxx will be allocated to the product/system. Serco Railtest Ltd will only accept certificates of compliance from a PITH (and/or ITH) who can demonstrate accreditation by UKAS, or a similarly recognised overseas test house, for the relevant tests.

In addition to the information shown on the certificate of compliance, the following information on coatings shall also be provided to Serco Railtest Ltd;

- size of the container in which each component coat of the system is to be supplied,
- shelf life,
- an indication of the product weight (per container),
- available colours,
- details of any distribution network or stockist when the coating is not supplied directly.

A Certificate issued by a PITH (and the PADS registration) shall have an unlimited validity provided that manufacture (including all related and relevant processes) of the product, or all the products that constitute a system;

- is maintained at or above the levels which have been assessed and found to be satisfactory,
- continues to be quality controlled (under an BS EN ISO 9001/9002 Quality System) and audited,
- remains in accordance with the requirements of this Specification.

During the period of validity of a Certificate minor changes to the product may be accepted, provided they have no effect on its technical properties or performance. Any proposed change shall be notified to the PITH: the Specialist Group may wish to evaluate the significance of a change before it is introduced. At 5-year intervals following the completion of the certification process, the holder of the Certificate shall confirm in writing to the PITH that no changes to formulation have been made, or that all such changes have been accepted by the PITH and/or the Specialist Group.

In the event of the holder of the Certificate going into liquidation, the Certificate will be suspended, and it may be withdrawn altogether.