STANDARDS AUSTRALIA/STANDARDS NEW ZEALAND

RECONFIRMATION

OF
AS/NZS 1580.457.1:1996
Paints and related materials—Methods of test
Method 457.1: Resistance to natural weathering

RECONFIRMATION NOTICE

Technical Committee CH-003 has reviewed the content of this publication and in accordance with Standards Australia procedures for reconfirmation, it has been determined that the publication is still valid and does not require change.

Certain documents referenced in the publication may have been amended since the original date of publication. Users are advised to ensure that they are using the latest versions of such documents as appropriate, unless advised otherwise in this Reconfirmation Notice.

Approved for reconfirmation in accordance with Standards Australia procedures for reconfirmation on 30 May 2013.

Approved for reconfirmation in New Zealand on behalf of the Standards Council of New Zealand on 26 August 2013.

The following are represented on Technical Committee CH-003:

Australasian Corrosion Association
Australian Paint Approval Scheme
Australian Paint Manufactures' Federation
Australian Pipeline Industry Association
Institution of Professional Engineers New Zealand
Master Painters New Zealand Association
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Australian/New Zealand Standard®

Paints and related materials—Methods of test

Method 457.1: Resistance to natural weathering

PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee CH/3 on Paints and Related Materials to supersede the 1988 edition of AS 1580.457.1.

The objective of the Standard is to provide a procedure for determining the durability of a coating by above ground exposure to natural weathering at appropriate sites. This edition incorporates the revised classification of exposure sites adopted in the 1994 edition of AS/NZS 2312 which was based on ISO 9223.

The terms 'normative' and 'informative' have been used in this Standard to define the application of the appendix to which they apply. A 'normative' appendix is an integral part of a Standard, whereas an 'informative' appendix is only for information and guidance.

METHOD

1 SCOPE This Standard describes a procedure for determining the durability of a coating or coating system by above ground exposure to natural weathering in a specified orientation at an appropriate site or sites.

2 REFERENCED DOCUMENTS The following documents are referred to in this Standard:

AS*		
1580	Paints and related materials—Methods of tests	
1580.101.1	Method 101.1:	Air drying conditions
1580.101.3	Method 101.3:	Standard procedure for stoving
1580.104.1	Method 104.1:	Recommended materials for test panels
1580.481.1.1	Method 481.1.1:	Coatings—Exposed to weathering—General appearance
1580.481.1.2	Method 481.1.2:	Coatings—Exposed to weathering—Discolouration (including bronzing)
1580.481.1.3	Method 481.1.3:	Coatings—Exposed to weathering—Degree of dirt collection
1580.481.1.4	Method 481.1.4:	Coatings—Exposed to weathering—Degree of dirt retention (after washing)
1580.481.1.5	Method 481.1.5:	Coatings—Exposed to weathering—Change in gloss

* Also harmonized in New Zealand.

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AS

1580.481.1.6	Method 481.1.6:	Coatings—Exposed to weathering—Degree of erosion
1580.481.1.7	Method 481.1.7:	Coatings—Exposed to weathering—Degree of checking
1580.481.1.8	Method 481.1.8:	Coatings—Exposed to weathering—Degree of cracking
1580.481.1.9	Method 481.1.9:	Coatings—Exposed to weathering—Degree of blistering
1580.481.1.10	Method 481.1.10:	Coatings—Exposed to weathering—Degree of flaking and peeling
1580.481.1.11	Method 481.1.11:	Coatings—Exposed to weathering—Degree of chalking
1580.481.1.12	Method 481.1.12:	Coatings—Exposed to weathering—Degree of colour change
1580.481.1.13	Method 481.1.13:	Coatings—Exposed to weathering—Degree of fungal or algal growth
1580.481.3	Method 481.3:	Exposed to weathering—Degree of corrosion of coated metal substances

2311 The painting of buildings

AS/NZS

2310 Glossary of paint and painting terms

2312 Guide to the protection of iron and steel against exterior atmospheric corrosion

NZS

7703 The painting of buildings

3 DEFINITION For the purpose of this Standard the definitions in AS/NZS 2310 and that below apply.

3.1 Flap—cover plate, usually hinged, which has been designed to secure a panel to the test rack.

4 PRINCIPLE Test panels are coated and dried or cured, then placed on a test rack at a selected testing site. After the nominated exposure period, the test panels are removed from the test rack and assessed by the appropriate methods.

5 EXPOSURE SITE The exposure site may be in any location mutually agreed between interested parties.

Depending upon the generic paint type and qualities under appraisal, the classification of exposure site may be in terms of one or all of the following—

(a) climatic influences on paint films (refer AS 2311 and Appendix A or NZS 7703);

NOTES:

1 Reference should also be made to Appendix A when preparing to classify any site, but the aim should be to make a simple assignment wherever possible.

2 The classification in Appendix A is for guidance only and should not be considered in any other way.

(b) corrosivity of the site to mild steel (refer AS/NZS 2312 and Appendix B);

(c) intensity of incident solar radiation (refer Appendix C); and

(d) miscellaneous parameters. These may include specific chemical pollutants or airborne dusts to variously cause physical or chemical changes in the coating or substrate (refer Appendix D).

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6 EXPOSURE RACK

6.1 General The design, dimensions and materials of construction of the exposure rack shall be left to the discretion of the testing authority, provided that conditions given below (Clauses 6.2 to 6.8) are observed.

Racks with flaps are acceptable providing that materials used in the construction, coating or attachment of the flaps—

(a) are chemically inert so as not to contribute to the performance of the coatings;

(b) do not freely chalk; and

(c) do not produce ions such as those of zinc or copper, which could interfere with the performance of the coatings under test.

6.2 Position of rack Racks shall be located so that the immediate, surrounding area is not a source of quantities of windblown abrasive particles.

6.3 Orientation of panels Unless otherwise specified, the test panels shall be exposed facing true North and at the angle specified for one of the following designated categories:

Category 1: At 45 $\pm 2^1/_2°$ to horizontal—generally used for testing house paints and industrial coatings for gloss, chalking and colour change measurements.

Category 2: At latitude angle (±1°)—used by some motor vehicle manufacturers for testing exterior automotive paints.

NOTE: This orientation is also used for conducting 'under-glass' testing of automotive paints.

Category 3: At 5 ±1° to horizontal—generally used for testing automotive paints.

NOTE: This orientation is also used for conducting 'under-glass' testing of automotive paints.

Category 4: At other specified angle to the horizontal.

NOTES:

1 Factors influencing the selection of 45° to the horizontal, facing North, as the standard exposure orientation are outlined in Appendix C. For particular purposes, other exposure orientations may be used, for example, vertical facing South, 5° facing North or similar.

2 The difference between magnetic north and true north may be determined by referring to the appropriate government body.

6.4 Freedom of panels from shadow Test panels shall be free from shadow during all but the first 2 h after sunrise and the last 2 h before sunset, at the winter solstice.

6.5 Height of panels The bottom edge of test panels shall be not less than 600 mm from the ground.

6.6 Drainage of panels The rack shall be so designed that any water which falls on the test panels or rack shall drain away quickly and shall not flow onto other test panels.

6.7 Soundness of construction The rack shall be capable of withstanding high winds without sustaining damage to itself and to the test panels exposed upon it.

6.8 Protection and maintenance of rack The area including the exposure rack shall be protected against vandalism. It shall be well drained and adequately maintained to prevent the growth of vegetation in the immediate vicinity of the exposure rack (refer Clause 6.4).

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7 PANEL SPECIFICATIONS

7.1 Test panels

7.1.1 *Materials* Materials for test panels should be selected from those recommended in AS 1580.104.1.

7.1.2 *Dimensions* Dimensions shall be as follows:

(a) *Standard panels* Test panels shall be flat and rectangular, and of minimum size 300 mm × 150 mm when used for paint system integrity tests.

NOTE: Where metal panels are used the recommended length is 300 mm (minimum) and the width 100 mm (nominal).

(b) *Non-standard panels* Notwithstanding the requirements of Clause 7.1.2(a), the procedures described in this test method may otherwise be applied to test panels of other shapes and dimensions, provided that the limitations imposed by these parameters are considered in the interpretation of the results.

7.1.3 *Preparation* Test panels shall be prepared in accordance with the prescribed procedures.

Unless otherwise specified, the back of the test panel shall be suitably sealed, and the front and edges coated with test paint. It shall then be dried by the appropriate methods. Where edge effects are detrimental to the outcome of the test, each edge and the area within 1 cm from each edge on both the back and front of the panel shall be sealed with a suitable durable coating.

If the panel is to be identified by hand stamping, this shall be done in a manner which does not affect the performance of the panel during subsequent tests.

Where a specification requires corrosion of the substrate to be evaluated, the panel shall be scored in accordance with AS 1580.481.3, so as to expose a strip of substrate of minimum length 50 mm, and nominal width 1 mm.

7.2 Reference panel

7.2.1 *Materials* Unless otherwise specified, reference panels shall be constructed of the same material as the test panels.

7.2.2 *Dimensions* Where visual assessment is required, the reference panel shall have minimum dimensions of 150 mm × 80 mm.

NOTE: It is generally desirable that the shape and dimensions approximate that of the test panel(s).

7.2.3 *Preparation* The reference panel shall be prepared at the same time as the test panel and in accordance with Clause 7.1.3. It shall then be stored either—

(a) indoors, under normal room conditions—out of direct sunlight but not in the dark, and freely ventilated; or

(b) in a freezer, at a temperature of less than −15°C,

whichever is appropriate.

NOTE: Some coatings, e.g. oxidizing alkyd coatings, yellow under condition (a) and should therefore be stored under condition (b).

8 PROCEDURE The procedure shall be as follows:

(a) Coat panels with the test paint(s) to the prescribed film thickness by the appropriate method.

(b) Dry or cure under conditions specified by the paint manufacturer or as specified in AS 1580.101.1 or AS 1580.101.3, as appropriate.

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