STANDARDS AUSTRALIA/STANDARDS NEW ZEALAND

RECONFIRMATION

OF
AS/NZS 1580.204.1:1998
Paints and related materials—Methods of test
Method 204.1: Fineness of grind

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.

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The following are represented on Technical Committee CH-003:

Australasian Corrosion Association
Australian Paint Approval Scheme
Australian Paint Manufactures' Federation
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Australian/New Zealand Standard®

Paints and related materials—Methods of test

Method 204.1: Fineness of grind

PREFACE

This Standard was prepared by the Joint Standards Australia/New Zealand Committee CH/3, Paints and Related Materials, to supersede AS 1580.204.1—1990.

The objective of this Standard is to provide a procedure for determining the fineness of grind using a gauge block and scraper. This method is the same as that of the previous edition; however, the viewing procedure is clarified.

As in the previous edition, the interpretation of the point at which the reading is taken has been left to the operator's discretion, however the location at which the reading is to be taken is specified. This should ensure that the results from operators using this method are comparable.

The term 'informative' has been used in this Standard to define the application of the appendix to which it applies. An 'informative' appendix is only for information and guidance.

METHOD

1 SCOPE This Standard describes a procedure for determining the fineness of grind of paints and related materials.

The method is applicable to most types of paints and related materials, but care is required to obtain reliable results when the fineness of grind is less than 20 µm. Particular caution is required when interpreting readings of less than 10 µm.

NOTE: This method is designed for use by operators with good eyesight or corrected vision.

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

AS
1580 Paints and related materials—Methods of test
1580.102.1 Method 102.1: Sampling procedure

AS/NZS
1580.103.1 Method 103.1: Examination and preparation of samples for testing

3 DEFINITIONS For the purpose of this Standard, the definitions below apply.

3.1 Fineness of grind—the reading, in micrometres, obtained on a standard gauge under specified conditions of test, indicating the depth of the gauge at which discrete solid particles in the product are first readily discernible.

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3.2 Working gauge block—a gauge block used for routine testing of fineness of grind in production control or finished product testing.

4 PRINCIPLE A small sample of material to be tested is placed in the deep end of the tapered groove on a graduated test block. Using a scraper, the excess material is drawn towards the shallow end of the groove in a nominated time. The filled groove is examined to determine the point of first appearance of product with a predominantly speckled appearance, and the corresponding gauge graduation is taken as the fineness of grind.

5 APPARATUS

5.1 Gauge block—consisting of a block of hardened steel typically 175 mm long, 65 mm wide and 13 mm thick calibrated in accordance with Appendix A.

NOTE: Steel gauges of the approximate dimensions stated are suitable for the test, but other gauges giving equivalent results may be used.

5.2 Scraper—consisting of a single or double-edged steel blade approximately 90 mm long, 40 mm wide and 6 mm thick.

NOTE: Steel scrapers of the approximate dimensions stated are suitable for the test, but other scrapers that give equivalent results with acceptable gauges may be used.

6 SAMPLE AND SAMPLE PREPARATION A representative sample of the product shall be taken as specified in AS 1580.102.1 and prepared in accordance with the procedures described in AS/NZS 1580.103.1.

7 PROCEDURE

7.1 General The test should be conducted out of the direct path of strong air draughts. Lighting conditions should be such that the pattern of the test sample in the groove is readily visible when viewed by a person with good eyesight or corrected vision.

NOTE: High ambient temperatures in conjunction with delays in conducting the test may cause difficulties in application of the sample and determining a reading, particularly with rapid-drying products.

7.2 Determination The procedure shall be as follows:

(a) Place the gauge block on a flat, horizontal, non-slippery surface and wipe clean immediately before use.

(b) Pour a small quantity of test sample into the deep end of the groove until it just overflows the groove. Ensure that the poured sample is free of entrapped air.

(c) Using both hands, grasp the scraper between the thumbs and forefingers and place its edge in contact with the surface of the gauge, across the deep end of the groove. Ensure that the straight section of the scraper's working edge spans the gauge block.

(d) While holding the scraper perpendicular to the gauge surface and at right angles to the length of the groove, draw it over the surface of the gauge, at a uniform rate, to a point beyond the zero mark of the groove. Complete this step in 1 s to 2 s.

Ensure that sufficient pressure has been exerted on the scraper to fill the groove with the test sample and remove any surplus material.

(e) Within a period of 3 s (see Note 1), inspect the draw-down and view the gauge from the side with the line of vision at right angles to the long dimension of the groove (see Note 2).

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NOTES:

1 To enable completion of a determination within 3 s, it may be necessary to carry out a preliminary trial to establish the approximate position of the first appearance of a predominantly speckled surface. Results of preliminary trials are to be disregarded.

2 The most suitable viewing angle is between 20° and 30° to the surface of the gauge block.

3 The accuracy of this test depends upon the eyesight of the viewer. The test should only be performed by persons using normal or corrected vision.

Determine the position along the groove where the test sample first shows a predominantly speckled appearance. Note the position where the sample contains approximately 5 to 10 particles within a band 3 mm wide and identify the two graduations enclosing that band. Estimate the position of the upper end of the 3 mm band, relative to the larger of the enclosing graduations, and record this as the fineness of grind (see Figures 1 and 2). If necessary, refer to the calibration graph to obtain the corrected reading.

Disregard any isolated specks that may appear prior to the position where the predominantly speckled appearance begins.

(f) If the rheology of the sample is such that a smooth surface is not obtained after draw-down, add a *minimal* quantity of appropriate solvent/binder to the sample by hand-stirring, and repeat the test. Report any such actions in the test report.

(g) Carefully clean the gauge and scraper with an appropriate solvent immediately after the determination.

8 PRECISION In an interlaboratory trial which involved 42 laboratories investigating two paints, the precision data presented in Table 1 were obtained.

The absolute difference between two single results, found on an identical test material by one operator using the same apparatus within the minimum practical time consistent with separate tests, will equal or exceed the repeatability on average not more than one in 20 cases in the normal and correct operation of the method.

The absolute difference between two single and independent results, found by two operators working in different laboratories on identical test material, will exceed the reproducibility on average not more than once in 20 cases in the normal and correct operation of the method.

Results obtained shall be considered suspect if the values of the precision data exceed those given in Table 1.

TABLE 1

REPEATABILITY AND REPRODUCIBILITY

Paint identification	Mean fineness of grind µm	Repeatability (*r*)	Reproducibility (*R*)
White undercoat (solvent-borne)	38	2	11
White gloss (solvent-borne)	13	2	10

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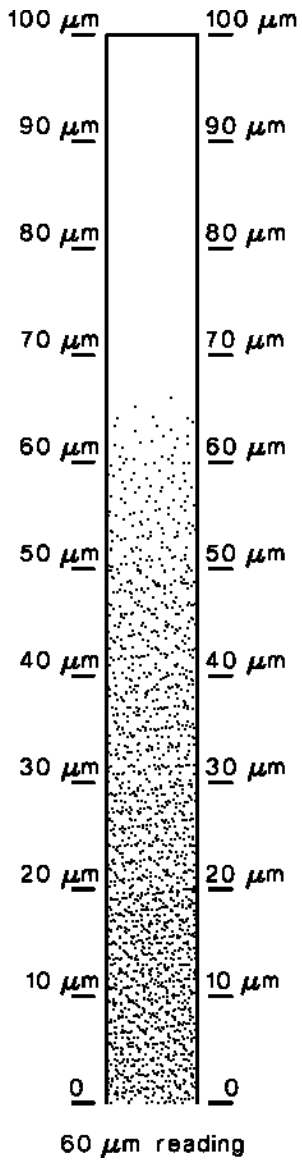

FIGURE 1 TYPICAL READINGS ON A GAUGE SHOWING A FINENESS OF GRIND READING OF 60 µm

9 REPORT The test report shall include the following information:

(a) Unambiguous description and identification of the product.

(b) The range of depth of the gauge block used.

(c) The fineness of grind, in micrometres.

(d) Name of test laboratory, date of test and report number.

(e) Whether the test sample has been diluted with solvent/binder and, if so, identification of the solvent/binder and the extent of the dilution.

(f) Reference to this Australian/New Zealand Standard, i.e. AS/NZS 1580.204.1.

(g) Any deviations from this test method.

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