

STANDARDS AUSTRALIA

RECONFIRMATION

OF

AS 4459.7—1999

Methods of sampling and testing ceramic tiles

Method 7: Determination of resistance to surface abrasion for glazed tiles

RECONFIRMATION NOTICE

Technical Committee BD-044 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 21 January 2016.

The following are represented on Technical Committee BD-044:

Australian Industry Group
Australian Stone Advisory Association
Australian Tile Council
Ceramic Tile Manufacturers Association of Australia
Institute of Building Consultants
Master Builders Australia
Master Glazed Wall & Floor Tile Layers Association of SA
Plastics and Chemicals Industries Association
Property Council of Australia
Surface Coatings Association Australia

NOTES

Australian Standard™

Methods of sampling and testing ceramic tiles**Method 7: Determination of resistance to surface abrasion for glazed tiles**

[ISO title: Ceramic tiles, Part 7: Determination of resistance to surface abrasion for glazed tiles]

PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee BD/44, Fixing of Ceramic Tiles.

This Standard is technically equivalent to and is reproduced from ISO 10545-7:1996, *Ceramic tiles, Part 7: Determination of resistance to surface abrasion for glazed tiles*.

This Standard is the result of consensus among the representatives on the Joint Committee that it be produced as an Australian Standard.

Appendix ZA details variations to ISO 10545-7:1996 to suit local conditions. Explanation for the basis of these variations are as follows:

- (a) A note has been added to Clause 1 to reflect the fact that this test method is often used to test unglazed tiles.
- (b) A note has been added to Clause 4 to indicate that the variability that sometimes occurs in the sizing of the abrasive can be tolerated.
- (c) Clause 5.2 has been modified to minimize any variability that may arise from non-uniformity of the viewing box.
- (d) Clause 7 has been modified to adopt accepted viewing practices, to correct a typographical error, to adopt an alternate method of checking the abrasive load, and to permit reporting of pertinent information.
- (e) Appendix ZB provides an alternate abrasive load checking method due to deficiencies and difficulties with the specified method.

The term ‘normative’ has been used in this Standard to define the application of the appendix to which it applies. A ‘normative’ appendix is an integral part of a Standard.

For the purpose of this Australian Standard, the ISO/IEC text should be modified as follows:

- (a) *Terminology* The words ‘Australian Standard’ should replace the words ‘International Standard’ wherever they appear.
- (b) *Decimal marker* A full point should be substituted for a comma where it appears as a decimal marker.
- (c) *References* The references to International Standards should be replaced by references to the following Australian/New Zealand Standards or Australian Standards:

*Reference to International Standard
or other Publication*

ISO

8486	Bonded abrasives—Grain size analysis—Designation and determination of grain size distribution
8486-1	Part 1: Macrogrits F4 to F220
10545	Ceramic tiles
10545-14	Part 14: Determination of resistance to stains

Australian/New Zealand Standard

AS/NZS

4518	Bonded abrasives—Determination and designation of grain size distribution
4518.1	Part 1: Macrogrits F4 to F220
AS	
4459	Methods of sampling and testing ceramic tiles
4459.14	Part 14: Determination of resistance to stains

METHOD

1 Scope

This part of ISO 10545 specifies a method for determining the resistance to surface abrasion of all glazed ceramic tiles used for floor covering.

2 Normative reference

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 10545. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 10545 are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 8486-1:—¹⁾, *Bonded abrasives — Grain size analysis — Designation and determination of grain size distribution — Part 1: Macrogrits F 4 to F 220*.

ISO 10545-14:1995, *Ceramic tiles — Part 14: Determination of resistance to stains*.

3 Principle

Determination of the abrasion resistance of the glaze of tiles by rotation of an abrasive load on the surface and assessment of the wear by means of visual comparison of abraded test specimens and non-abraded tiles.

4 Abrasive load

The total load on each test specimen shall consist of

70,0 g	of steel balls of diameter 5 mm;
52,5 g	of steel balls of diameter 3 mm;
43,75 g	of steel balls of diameter 2 mm;
8,75 g	of steel balls of diameter 1 mm;
3,0 g	of white fused aluminium oxide of grain size F 80 according to ISO 8486;
20 ml	of deionized or distilled water.

1) To be published (Revision of ISO 8486:1986)

5 Apparatus

5.1 Abrasion apparatus (see figure 1), consisting of a steel case with an inbuilt electrical drive connected to a horizontal supporting plate with positions for test specimens of dimensions at least 100 mm × 100 mm. The distance between the centre of the supporting plate and the centre of each position shall be 195 mm. There shall be equal distances between each adjacent position. The supporting plate shall rotate at 300 r/min with an eccentricity, e , of 22,5 mm so that every part of each test specimen describes a circular motion of diameter 45 mm. The test specimens are held down with the aid of metal holders which are provided with rubber seals (see figure 2). The internal diameter of the holders is 83 mm, thus providing a test area of about 54 cm². The thickness of the rubber is 9 mm and the height of the space under the holder is 22,5 mm.

The apparatus switches off automatically after completion of a present number of revolutions.

The supporting plate with holders and test specimens shall be covered during operation.

A suitable apparatus of another description may be used, provided it gives the same results as those obtained with the apparatus described below.

5.2 Apparatus for visual assessment (see figure 3), consisting of a viewing box equipped with fluorescent lighting of colour temperature 6 000 K to 6 500 K placed vertically above the surface to be observed providing 300 lx illuminance. The dimensions of the box shall be 61 cm × 61 cm × 61 cm and the inner faces shall be painted a neutral gray. The light source is screened to avoid direct viewing.

5.3 Drying oven, capable of being operated at (110 + 5) °C.

5.4 Balance (if mass loss is required).

6 Test specimens

6.1 Types of test specimens

Test specimens shall be representative of the sample. Where tiles have different colours or decorative effects in parts of the surface, care should be taken to include all the distinctive parts.

The usual facial dimensions of test specimens are 100 mm x 100 mm. Test specimens with smaller facial dimensions shall be fastened close together on a suitable supporting material. Edge effects at the narrow joints shall be ignored.

6.2 Number of test specimens

Eleven test specimens are required. In addition, eight test specimens are required for the visual assessment.

The procedure requires one test specimen for each state of abrasion, and subsequently an additional three test specimens to check the result at the visual-failure point.

6.3 Preparation

The glazed surfaces of the test specimens shall be clean and dry.