

Australian/New Zealand Standard®

Textile floor coverings—Tests and measurements

Method 4: Determination of surface pile mass above the substrate

PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee TX/9 on Carpets. In Australia, the Standard supersedes AS 2111.4—1990, *Methods of test for textile floor coverings, Method 4: Method for the determination of surface pile mass above substrate*.

In this edition the method of pre-treating samples has been changed and changes have been made to clarify the procedure, in particular, the calculations.

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.

FOREWORD

The surface pile mass above the substrate provides a useful index of the total pile mass and density of the textile floor covering. It also enables the comparison of all types of textile floor covering, irrespective of the method of manufacture.

METHOD

1 SCOPE This Standard describes the procedure for determining the mass per unit area of surface pile, which can be cut from above the substrate of a textile floor covering.

The surface pile mass per unit area can be expressed at its equilibrium condition or in terms of clean conditioned mass at agreed commercial allowances.

The method is applicable to most textile floor coverings having a pile. The method, however, is not suitable for accurately assessing the surface pile mass of pile floor coverings which do not have a clearly defined planar interface between pile and substrate.

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

AS

2001 Methods of test for textiles

2001.1 Method 1: Conditioning procedures

2119 Method for sampling and cutting specimens of textile floor coverings for testing

2454 Textile floor coverings—Terminology

BS

1752 Specification for laboratory sintered or fritted filters including porosity grading

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3 DEFINITIONS For the purpose of this Standard, the definitions given in AS 2454 apply.

4 PRINCIPLE The mass of a specimen of known area is determined before and after the surface pile has been cut from it. The surface pile mass per unit area is calculated by difference.

The result may be expressed at its equilibrium condition or a separate sample may be tested after removal of moisture and water soluble matter in the pile and the result corrected for agreed commercial allowances.

5 REAGENT

5.1 General requirements Unless otherwise specified, distilled water or water of equivalent purity shall be used.

5.2 Wetting agent Nonyl (C9–11) alcohol ethoxylate 6 mol of ethylene oxide (Teric 9A6) or equivalent.

6 APPARATUS The following apparatus is required:

- (a) *Rule* A rule graduated in millimetres.
- (b) *Scissors* A pair of scissors or other suitable means of cutting a test specimen.
- (c) *Cutting die* A cutting die of known area not less than 225 cm².
- (d) *Balance* A balance capable of determining a mass to 0.001 g.
- (e) *Band knife machine* A mechanical horizontal band knife, leather-slitting machine with continuously adjustable height.

NOTE: While the preferred apparatus is the band knife machine, hand held clippers or a sharp blade (e.g. a scalpel) may be used to obtain an approximation of the surface pile mass. Results using these will generally be lower. However, for manufacturing quality control purposes, a relationship between the methods can generally be established.

- (f) *Conditioning apparatus* A means of producing and maintaining a standard atmosphere as specified in AS 2001.1.
- (g) *Sintered glass crucibles** Glass filter crucibles with sealed-in sintered disc filters of porosity grade 1 complying with BS 1752 and provided with either ground-glass stoppers or watch glass covers. Any other apparatus giving identical results may be used.
- (h) *Weighing bottles**
- (i) *Ventilated oven** An oven for drying specimens at 105 ± 3°C.
- (j) *Desiccator** A desiccator containing self-indicating silica gel.

7 SAMPLES AND TEST SPECIMENS

7.1 Sampling The sample and the test specimens shall be selected and prepared in accordance with the requirements of AS 2119.

7.2 Number and area The specimens shall conform to the following:

- (a) Cut at least four rectangular specimens, with the sides parallel and at right angles to the selvages of about 200 mm × 200 mm, or of an area representative of the fabric design if this is larger than 200 mm × 200 mm.

* Only required if surface pile mass per unit area is to be corrected for agreed commercial allowance.

- (b) If the corrected surface pile mass per unit area is required, cut three additional rectangular specimens 50 mm × 100 mm for determination of allowances to be made for moisture content and water extractable matter of the pile.

7.3 Preparation Preconditioning of the sample according to AS 2001.1 is required to be carried out prior to conditioning the specimens in the Standard atmosphere as specified in AS 2001.1 by laying them out flat and singly with the use surface uppermost. Condition them for a minimum of 24 h or until they reach moisture equilibrium.

For the purpose of this Standard, moisture equilibrium is considered to have been reached when successive weighings at 2 hourly intervals show no progressive change in mass greater than 0.25 percent.

The test shall be conducted in the Standard atmosphere as specified in AS 2001.1.

8 PROCEDURE The procedure for all tests shall be as follows:

- (a) Determine the mass (m_1) in grams, of each test specimen accurately to ± 0.01 g.
- (b) Determine the area (A_1) in square metres, of each test specimen from the means of four evenly spaced measurements made on the back, for length and width, to the nearest mm.
- (c) Insert each test specimen with the backing uppermost through the shearing apparatus in Clause 6(e) and allow the specimen to pass freely through the machine. Continue repeating the process with the knife height being set progressively lower until it is as low as possible without damaging the substrate. At each setting used, insert the specimen into the machine several times, each time in a different direction. After each process brush the pile upright.

NOTES:

- 1 Some backing fabrics (e.g. non-wovens) complicate end point determination.
 - 2 Care should be taken not to damage the primary backing of a tufted carpet which has an uneven application of backing components. Any specimen which cannot be shorn evenly in an area large enough to accommodate the cutting die mentioned in Clause 6(c) should be discarded and replaced with a new specimen. In some carpets the backstitch can be extracted by the shearing process. Where this occurs, treat as above for damage to tufted carpets.
 - 3 Penetration of backing components can be a problem which is not always solved by taking other samples. Methods are available for estimation of surface pile mass in the event of some backing component penetration into the pile. The accuracy of these methods has not been established.
- (d) After shearing use the cutting die and cut a piece from each test specimen selected from the least damaged areas, avoiding damaged edges.
 - (e) Recondition each cut piece of shorn floorcovering as described in Clause 7.3. Determine the exact area (A_2) in square metres as described in Step (b) or from the mean of 2 diameters measured at right angles if using a circular die.
 - (f) Determine the mass (m_2) in grams, of each cut piece of shorn floorcovering to ± 0.01 g.

9 CORRECTION FOR AGREED COMMERCIAL ALLOWANCE

9.1 General If results are required at an agreed commercial allowance, the procedures given in Clause 9.2 shall be followed.

9.2 Procedure The procedure shall be as follows:

- (a) Subsample the test specimens prepared in accordance with Clauses 7.2(b) and 7.3 to provide at least 2×10 g specimens of shorn pile fibre. Weigh each specimen to an accuracy of ± 0.01 g (m_3).