

BS EN 994:2012



BSI Standards Publication

Textile floor coverings — Determination of the side length, squareness and straightness of tiles

bsi.

...making excellence a habit.™

National foreword

This British Standard is the UK implementation of EN 994:2012. It supersedes BS EN 994:1996 which is withdrawn.

BSI, as a member of CEN, is obliged to publish EN 994:2012 as a British Standard. However, attention is drawn to the fact that during the development of this European Standard, the UK committee voted against its approval as a European Standard.

The UK committee is concerned that this standard may not adequately describe test methods used to measure squareness. UK users can consult BS 5921:1980 for further guidance on determining squareness in textile floor coverings, as it is considered that BS 5921:1980 provides more information and precision of measurement than EN 994 in this area.

The recently adopted BS EN ISO 24342:2012, *Resilient and textile floor-coverings - Determination of side length, edge, straightness and squareness of tiles*, also provides guidance on this subject.

However, users should be aware that EN 994 is included as a normative reference in several EN standards, including BS EN 1307 and BS EN 13297:2007, and compliance with it offers a presumption of conformity that does not apply to BS EN ISO 24342:2012 or BS 5921:1980.

The UK participation in its preparation was entrusted to Technical Committee PRI/3/60, Textile & Resilient Floor Coverings.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

© The British Standards Institution 2012. Published by BSI Standards Limited 2012

ISBN 978 0 580 74935 3

ICS 59.080.60

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 29 February 2012.

Amendments issued since publication

Date	Text affected
------	---------------

EUROPEAN STANDARD

EN 994

NORME EUROPÉENNE

EUROPÄISCHE NORM

January 2012

ICS 59.080.60

Supersedes EN 994:1995

English Version

Textile floor coverings - Determination of the side length, squareness and straightness of tiles

Revêtements de sol textiles - Détermination de la longueur
des arêtes, de l'équerrage et de la rectitude des dalles

Textile Bodenbeläge - Bestimmung der Länge und
Geradheit der Kanten und der Rechtwinkligkeit von Fliesen

This European Standard was approved by CEN on 20 November 2011.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents

Page

Foreword.....	3
1 Scope	4
2 Normative references	4
3 Principle	4
4 Apparatus	4
4.1 Length	4
4.1.1 Measurement device	4
4.1.2 Support plate	4
4.1.3 Rigid plate	4
4.2 Squareness	4
4.2.1 Precision square	4
4.2.2 Flat surface	5
4.2.3 Rigid plate	5
4.2.4 Shims	5
5 Sampling and preparation of test specimens	5
6 Conditioning	5
7 Test method	5
7.1 Length	5
7.2 Squareness and straightness	5
8 Calculation and expression of results	7
8.1 Length	7
8.2 Straightness and squareness	7
9 Test report	7

Foreword

This document (EN 994:2012) has been prepared by Technical Committee CEN/TC 134 “Resilient, textile and laminate floor coverings”, the secretariat of which is held by BSI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by July 2012, and conflicting national standards shall be withdrawn at the latest by July 2012.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 994:1995.

The following is a list of significant technical changes between this European Standard and the previous edition:

- the text has been technically revised,
- Figure 1 and Figure 3 have been revised, and
- the normative references have been updated.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

1 Scope

This European Standard specifies a method for determining the length and straightness of the edges and the squareness of floor coverings in the form of right-angled tiles.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN ISO 139:2005, *Textiles – Standard atmospheres for conditioning and testing (ISO 139:2005)*

3 Principle

The plane dimensions of a tile are measured at different points for each direction. In addition, at each corner of the tile the maximum deviation from the right angle is measured.

4 Apparatus

4.1 Length

4.1.1 Measurement device

Device which can be used to measure a dimension to an accuracy of 0,05 mm such as a slide gauge, comparator table with stop or an opto-electronic system.

4.1.2 Support plate

Flat support plate, on to which the test specimen is placed for measurement. It shall be slightly bigger than the test specimen.

4.1.3 Rigid plate

Rigid metal or glass plate, slightly smaller than the tile or any other device which can be used to hold the tile flat during measurement.

4.2 Squareness

4.2.1 Precision square

Precision square or any other device, for example an opto-electronic system which can be used to measure a right angle or angular deviation to an accuracy of at least 0,2 mm. If a square is used, it shall meet the following requirements:

- a) The length of one of the straight edges shall be at least equal to the largest dimension of the tile to be checked, the second straight edge being not greater than $\frac{2}{3}$ of this dimension;
- b) The linearity error of the straight edges shall be less than or equal to 0,01 mm;
- c) The angular error shall be less than or equal to 0,02 mm at 300 mm.

4.2.2 Flat surface

Flat surface as described in 4.1.2.

4.2.3 Rigid plate

Rigid plate as described in 4.1.3.

4.2.4 Shims

Set of shims, including 0,2 mm to 2,0 mm shims.

5 Sampling and preparation of test specimens

Take at least five tiles from each sample to represent the test specimens. If the sample comprises a pack of tiles, ensure that the first and last tiles are not used as test specimens.

6 Conditioning

Condition the tiles in the standard atmosphere for testing textiles as defined in EN ISO 139 for at least 24 h.

Conduct the tests in this atmosphere.

7 Test method

7.1 Length

Hold the test specimen flat using, the rigid plate described in 4.1.3. Measure the distance between the edges parallel to the direction of manufacture, then between the edges perpendicular to the direction of manufacture, in at least two different points.

If a different device is used, proceed as appropriate.

7.2 Squareness and straightness

Place the tile with its back against the flat support plate.

Place one edge of test specimen against a straight edge of the square or appropriate device and slide it until it makes contact with the other straight edge, then position the rigid plate without moving the tile.

Select the thickest shim which can be easily inserted between the second straight edge of the square and the end of the edge of the tile to evaluate the squareness deviation (see Figures 1 and 2). Find the thickest shim which can easily be inserted at any point between the second straight edge of the square and the tile to evaluate the straightness of the edges (see Figure 3).

Repeat this procedure for the three other test specimen edges.

If a different device is used, proceed as appropriate.

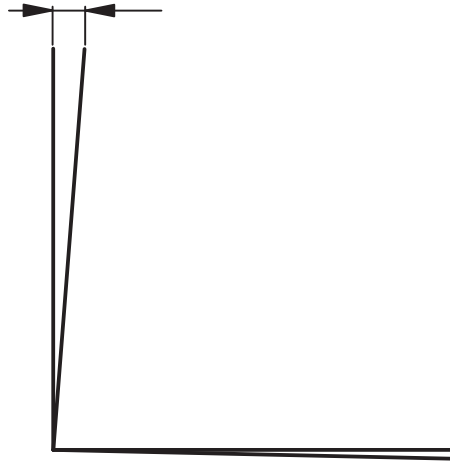


Figure 1 — Squareness

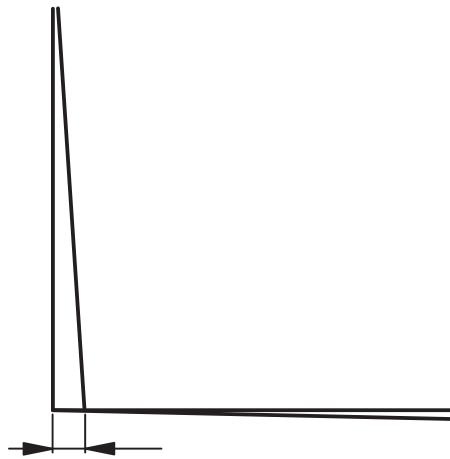


Figure 2 — Squareness

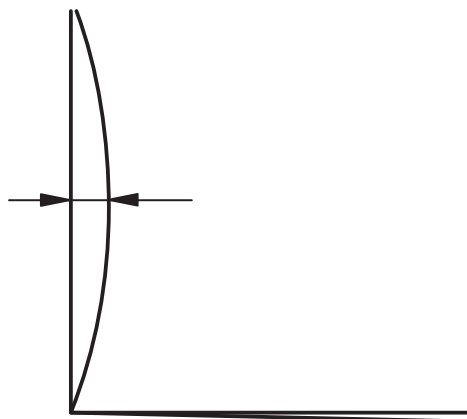


Figure 3 — Straightness

8 Calculation and expression of results

8.1 Length

For each tile and direction, calculate the average of the measurements taken. Express the length of the edge by the result obtained in millimetres to one decimal place.

8.2 Straightness and squareness

Express the maximum deviation for each edge of each tile in millimetres to an accuracy of 0,05 mm.

- a) For the end of the edge for squareness;
- b) At any point of the edge for straightness.

Note the biggest deviation of a) or b) for each side.

Calculate the determined maximum deviation (in mm) for squareness and straightness in percentage from the nominal side length of the tile (in mm) by the following formula:

$$D = ((M / N) \times 100\%)$$

where

D is deviation in %

M is maximum deviation in mm

N is nominal tile dimension in mm

9 Test report

The test report shall include the following information:

- a) reference to this European Standard, i.e. EN 994:2012;
- b) complete identification of the product tested, including the type, origin, manufacturer's reference numbers;
- c) details of the sample;
- d) number of test specimens (tiles) submitted for testing;
- e) average general length for each direction;
- f) difference between the smallest and largest average length for each direction;
- g) value of the deviation for each edge of each tile and if this relates to squareness or straightness;
- h) any deviation from this standard which is likely to have affected the results.

British Standards Institution (BSI)

BSI is the national body responsible for preparing British Standards and other standards-related publications, information and services.

BSI is incorporated by Royal Charter. British Standards and other standardization products are published by BSI Standards Limited.

About us

We bring together business, industry, government, consumers, innovators and others to shape their combined experience and expertise into standards-based solutions.

The knowledge embodied in our standards has been carefully assembled in a dependable format and refined through our open consultation process. Organizations of all sizes and across all sectors choose standards to help them achieve their goals.

Information on standards

We can provide you with the knowledge that your organization needs to succeed. Find out more about British Standards by visiting our website at bsigroup.com/standards or contacting our Customer Services team or Knowledge Centre.

Buying standards

You can buy and download PDF versions of BSI publications, including British and adopted European and international standards, through our website at bsigroup.com/shop, where hard copies can also be purchased.

If you need international and foreign standards from other Standards Development Organizations, hard copies can be ordered from our Customer Services team.

Subscriptions

Our range of subscription services are designed to make using standards easier for you. For further information on our subscription products go to bsigroup.com/subscriptions.

With **British Standards Online (BSOL)** you'll have instant access to over 55,000 British and adopted European and international standards from your desktop. It's available 24/7 and is refreshed daily so you'll always be up to date.

You can keep in touch with standards developments and receive substantial discounts on the purchase price of standards, both in single copy and subscription format, by becoming a **BSI Subscribing Member**.

PLUS is an updating service exclusive to BSI Subscribing Members. You will automatically receive the latest hard copy of your standards when they're revised or replaced.

To find out more about becoming a BSI Subscribing Member and the benefits of membership, please visit bsigroup.com/shop.

With a **Multi-User Network Licence (MUNL)** you are able to host standards publications on your intranet. Licences can cover as few or as many users as you wish. With updates supplied as soon as they're available, you can be sure your documentation is current. For further information, email bsmusales@bsigroup.com.

BSI Group Headquarters

389 Chiswick High Road London W4 4AL UK

Revisions

Our British Standards and other publications are updated by amendment or revision.

We continually improve the quality of our products and services to benefit your business. If you find an inaccuracy or ambiguity within a British Standard or other BSI publication please inform the Knowledge Centre.

Copyright

All the data, software and documentation set out in all British Standards and other BSI publications are the property of and copyrighted by BSI, or some person or entity that owns copyright in the information used (such as the international standardization bodies) and has formally licensed such information to BSI for commercial publication and use. Except as permitted under the Copyright, Designs and Patents Act 1988 no extract may be reproduced, stored in a retrieval system or transmitted in any form or by any means – electronic, photocopying, recording or otherwise – without prior written permission from BSI. Details and advice can be obtained from the Copyright & Licensing Department.

Useful Contacts:

Customer Services

Tel: +44 845 086 9001

Email (orders): orders@bsigroup.com

Email (enquiries): cservices@bsigroup.com

Subscriptions

Tel: +44 845 086 9001

Email: subscriptions@bsigroup.com

Knowledge Centre

Tel: +44 20 8996 7004

Email: knowledgecentre@bsigroup.com

Copyright & Licensing

Tel: +44 20 8996 7070

Email: copyright@bsigroup.com



...making excellence a habit.™