
Textile floor coverings — Guidelines for installation and use on stairs

*Revêtements de sol textiles — Lignes directrices pour la mise en
oeuvre et l'utilisation sur les escaliers*

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 219, *Floor coverings*.

This second edition cancels and replaces the first edition (ISO 13746:2000), which has been technically revised.

The main changes compared to the previous edition are as follows:

- this document has been aligned with EN 1307:2014+A3:2018, Annex C;
- a reference to ISO 1766, ISO 12951 and ISO 4919 has been added.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

Although the aspect of suitability of carpets for use on stairs is worldwide, different countries have approached its solution from different perspectives, e.g. not guaranteeing carpets on stairs, recommending that carpets be periodically moved on stairs, accepting that the wear life on stairs can be half that in the equivalent flat location, use of proprietary stair nosings, etc.

Associated with some of these perspectives is tacit acceptance of test methods, although no universal test method exists to predict the property for all carpet types.

In order to define the perspectives more closely, ISO/TC 38/SC 12 (the then responsible TC) circulated a questionnaire to its participating experts. From the replies, it became apparent that problems with carpets on stairs can be centred on three different characteristics:

- wear to the backing, particularly on stair nosings;
- tuft loss;
- appearance retention on the treads.

The problem is further complicated by the fact that some countries suggest movement to even out wear and appearance changes, and also that the use and type of underlay play an important part in the subsequent performance of the carpet on stairs.

Over the years, in practice, EN 1307 proved to be satisfying on the issue of suitability of carpets for use on stairs, so it was decided to bring this guideline in line with its Annex C.

For all the above reasons, it was agreed that, until test methods can be developed to cover all eventualities, this document would be developed as guidelines for the installation and use of textile floor coverings on stairs.

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Textile floor coverings — Guidelines for installation and use on stairs

1 Scope

This document provides recommendations for the installation and use of textile floor coverings on stairs for both residential/domestic and contract/commercial purposes. It covers all products composed of textile material with a pile or non-pile use surface including the use of such products in tile form.

This document is applicable only to carpets that are intended to be installed without the use of protective stair nosings. For carpets that are intended to be installed using protective stair nosings, the overall use class determines the stair suitability.

NOTE 1 The use of stair nosings/edgings in public areas is often the subject of local bye-laws and legislations.

NOTE 2 In many split-level dwellings, a room can have one or two steps between different levels. This situation differs from a stairway in several important respects:

- the steps are usually wider and therefore traffic intensity in any one place is usually lower;
- the carpet can be bent over steps in either the machine direction or the across-machine direction. On a stairway, it is normal practice to lay the carpet with the pile lying down the stairs.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

ISO 2424, *Textile floor coverings — Vocabulary*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 2424 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

3.1

stair nosing

junction of the top edge of the riser and the forward edge of the tread

3.2

protective stair nosing

prefabricated, decorative, angled retaining strip made from metal, vinyl, wood, etc., used to eliminate the need to bend the carpet over the *stair nosing* (3.1), thereby extending the life of the carpet

3.3

crotch

junction of the lower edge of the riser with the rearmost edge of the stair-tread

4 Criteria for the assessment of stair suitability

4.1 General

The following general recommendations for the installation and use of textile floor coverings on stairs should be taken in account:

- Foam backed carpets can be used on stairs if recommended by the manufacturer. Because of the problem of fitting such carpets to stairs, it is preferable that they be totally adhered.
- When carpet tiles are used on stairs, protective stair nosings should be used.
- Special care should be taken in the selection of carpet underlays/carpet cushion to be used on stairs in both domestic/residential and contract/commercial installations since stairs represent one of the most demanding areas of use. In order to prevent premature wear, woven carpets with sewn seams should be used in conjunction with a carpet underlay/carpet cushion which does not allow the seams to be raised prominent above the general surface level. Thicker, high density underlays help the carpet to resist wear over stair nosings.

4.2 Pile carpets

For pile textile floor coverings, the thickness of the pile above the substrate measured according to ISO 1766 should be ≤ 12 mm.

NOTE Thicker carpets can be potential tripping hazards.

If the backing can be seen on a new, unused piece of the carpet when bent at 90° over a $(12,5 \pm 1)$ mm radius, as long as the visible backing is not part of the design, the carpet should be deemed to be unsuitable.

The appearance of each specimen is tested according to ISO 12951, test B and assessed using at least three independent assessors according to the characteristics given in [Tables 1](#) or [2](#). At least 3 out of 4 samples should fulfil the criteria as listed below.

Carpets showing a pile loss of more than 3 tufts when assessed in accordance with [Table 1](#) or [Table 2](#) should be tested and classified according to the pile withdrawal force test given in [Table 3](#).

Carpets fulfilling the following criteria are deemed to classify for occasional stair use:

- spun yarn;
- minimum 50 % natural fibres;
- installed on underlay with a work of compression of (175 ± 25) J/m²;
- overall use class minimum 22;
- fulfilling the minimum criteria for pile withdrawal in [Table 3](#).

Table 1 — Suitability of loop pile

Suitability	Criteria
Not suitable	Extreme changes at the area of the stair edge, e.g.: — destroyed primary backing, foam or secondary backing; — visible backing, as long as this is not part of the design; — more than 3 fully broken loops; — cob webbing with a fibre length of 15 mm or more.
Suitable for occasional use	Moderate changes at the area of the stair edge: — not more than 3 broken loops over the whole width; — cob webbing with a fibre length of 5 mm to 15 mm; — moderate pattern changes at the stair edge compared to areas of the test specimen exposed to the flat treatment with the Lisson Tretrad; — carpets showing pile loss (more than 3) are tested and classified according to the pile withdrawal force test (ISO 4919 and Table 3); — minimum use class 22.
Suitable for intensive use	Minor changes at the area of the stair edge: — limited filament destruction (no broken loops); — cob webbing with a fibre length less than 5 mm; — minor pattern changes at the stair edge compared to areas of the test specimen exposed to the flat treatment with the Lisson Tretrad; — carpets showing pile loss (more than 3) are tested and classified according to the pile withdrawal force test (ISO 4919 and Table 3); — minimum use class 31.

Table 2 — Suitability of cut pile

Suitability	Criteria
Not suitable	Extreme changes at the area of the stair edge, e.g.: — destroyed primary backing, foam or secondary backing; — visible backing by wear to backing on more than 3 piles or by tufting out of more than 3 piles.
Suitable for occasional use	Moderate changes at the area of the stair edge: — moderately more important loss of yarn twist or ply twist compared to areas of the test specimen exposed to the flat treatment with the Lisson Tretrad; — partial loss of filaments; — moderate change in pattern and/or contrast at the stair edge compared to areas of the test specimen exposed to the flat treatment with the Lisson Tretrad; — carpets showing pile loss (more than 3) are tested and classified according to the pile withdrawal force test (ISO 4919 and Table 3); — minimum use class 22.
Suitable for intensive use	Minor changes at the area of the stair edge: — slightly more important loss of yarn twist or ply twist compared to areas of the test specimen exposed to the flat treatment with the Lisson Tretrad; — no visible loss of filaments; — minor change in pattern and/or contrast at the stair edge compared to areas of the test specimen exposed to the flat treatment with the Lisson Tretrad; — carpets showing pile loss (more than 3) are tested and classified according to the pile withdrawal force test (ISO 4919 and Table 3); — minimum use class 31.

Table 3 — Recommendations for tuft bind

Use intensity	Woven carpets		Tufted carpets	
	Cut pile	Loop pile	Cut pile	Loop pile
Residential				
moderate	Not suitable	Not suitable	Not suitable	Not suitable
general	≥3 N	≥5 N	≥8 N	≥16 N
heavy	≥5 N	≥10 N	≥10 N	≥20 N
Commercial				
moderate	≥3 N	≥5 N	≥8 N	≥16 N
general	≥5 N	≥10 N	≥10 N	≥20 N
heavy	≥7 N	≥12 N	≥15 N	≥30 N

4.3 Flat needled floor covering

The appearance of each specimen is tested according to ISO 12951, test B and assessed using at least three independent assessors according to the characteristics given in [Table 4](#). At least 3 out of 4 samples should fulfil the criteria as listed below.

Table 4 — Suitability of flat needled floor covering

Suitability	Criteria
Not suitable	Extreme changes at the area of the stair edge: — destroyed primary backing, foam or secondary backing; — visible backing; — hairiness with average fibre length of more than 20 mm.
Suitable for occasional use	Moderate changes at the area of the stair edge: — hairiness with average fibre length of 20 mm or less; — moderate pattern changes at the stair edge compared to areas of the test specimen exposed to the flat treatment with the Lisson Tretrad; — minimum use class 22.
Suitable for intensive use	Minor changes at the area of the stair edge: — hairiness with average fibre length of 10 mm or less for fine fibre; — hairiness with average fibre length of 15 mm or less for coarse fibre; — minor pattern changes at the stair edge compared to areas of the test specimen exposed to the flat treatment with the Lisson Tretrad; — minimum use class 31.

4.4 Pile needled floor covering

The thickness of the pile above the substrate, according to ISO 1766, should be $\leq 12,0$ mm.

NOTE Thicker carpets can be potential tripping hazards.

The appearance of each specimen is tested according to ISO 12951, test B and assessed using at least three independent assessors according to the characteristics given in [Table 5](#). At least 3 out of 4 samples should fulfil the criteria as listed below.

Table 5 — Suitability of pile needled floor covering

Suitability	Criteria
Not suitable	Extreme changes at the area of the stair edge: — destroyed primary backing, foam or secondary backing; — visible backing; — cob webbing with a fibre length more of 15 mm or more.
Suitable for occasional use	Moderate changes at the area of the stair edge: — cob webbing with a fibre length of 5 mm to 15 mm; — moderate pattern changes at the stair edge compared to areas of the test specimen exposed to the flat treatment with the Lisson Tretrad; — minimum use class 22.
Suitable for intensive use	Minor changes at the area of the stair edge: — cob webbing with a fibre length of less than 5 mm; — minor pattern changes at the stair edge compared to areas of the test specimen exposed to the flat treatment with the Lisson Tretrad; — minimum use class 31.

4.5 Carpets without pile

If the backing can be seen on a new, unused piece of the carpet when bent at 90° over a $(12,5 \pm 1)$ mm radius, as long as the visible backing is not part of the design, the carpet should be deemed to be unsuitable.

The appearance of each specimen is assessed using at least three independent assessors according to the characteristics given in [Table 6](#). At least 3 out of 4 samples should fulfil the criteria as listed below.