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Textile floor coverings — Installation practices — General

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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).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: [Foreword - Supplementary Information](#)

The committee responsible for this document is ISO/TC 219, *Floor coverings*.

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Textile floor coverings — Installation practices — General

1 Scope

This International Standard sets out the requirements for installing textile floor coverings (carpets). It gives details of the work necessary in preparing subfloor surfaces together with the procedures that are to be adopted where textile floor coverings are laid over various types of subfloors and underlays and where subfloor heating units are installed.

NOTE This International Standard addresses needle insertion tufted, woven, fusion bonded, fibre bonded, knitted, non-woven, felted, and flocked textile floor coverings.

The objective of this International Standard is to provide the contractors, manufacturers, suppliers, and purchasers of textile floor coverings and others, for example, technical educators, with procedures to enable the provision of correctly installed textile floor coverings.

2 Normative references

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

ISO 1957, *Machine-made textile floor coverings — Selection and cutting of specimens for physical tests*

ISO 2424, *Textile floor coverings — Vocabulary*

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3 Terms and definitions

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

3.1

adhesive

substance that dries to a film capable of holding materials together by surface attachment. Applying adhesive to the floor is normally accomplished with a trowel, airless spray, or roller

3.2

adhesive transfer

degree of coverage and/or penetration of the applied *adhesive* (3.1) into the back of the carpet (when installing the carpet) while maintaining full coverage of the floor

Note 1 to entry: The degree of coverage can be influenced by adhesive type, method of installation, open assembly time, and other factors.

3.3

alkali

soluble substance with base properties and having a *pH* (3.11) greater than 7

3.4

bow

distortion visible as wavy or crooked lines when viewed across the carpet's width or length

3.5

contractor

firm or person authorized by the purchaser to carry out the laying of the textile floor covering

3.6

crotch

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

3.7

fill-out

installed length of textile floor covering of a width dimension less than its usable manufactured width

3.8

laitance

layer of material formed from the constituents of concrete which can collect on the surface soon after pouring

3.9

pattern bow

distortion visible as wavy or crooked pattern lines when viewed across the carpet width

3.10

pattern skew

distortion visible when the pattern on one side is slightly ahead of the pattern on the other side

Note 1 to entry: Skew or bias describes pattern squareness.

3.11

pH

value representing the concentration of hydrogen ions in gram equivalents per litre used to indicate the acidity or alkalinity (base) of a substance on a scale from 0 to 14 with 7 representing neutrality, numbers less than 7 increasing acidity, and numbers greater than 7 increasing alkalinity

Note 1 to entry: For laboratory and field testing of pH, distilled water should be used.

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3.12

plane (surface)

condition such that when a straightedge 3,0 m long is placed on the surface at any position, no part is more than 5 mm above or below the straightedge

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3.13

power stretcher (i.e. mechanical stretching device)

carpet installation tool used to stretch carpet for installation on the tack strip and consists of a pinned plate that grips the carpet, tubular extensions, a padded end used to brace against an opposing wall or other structure, and a lever system that multiplies the installer's applied stretching force

3.14

purchaser

principal to the contract or person authorized by the principal to superintend the work on his behalf

3.15

seam

joints or interface of two pieces of carpet by the use of various securing techniques in a carpet installation

3.16

seam adhesive

specifically formulated *adhesive* (3.1) for securing and protecting cut edges of carpet to be seamed

3.17

seam peaking

slight elevation of taped seams which usually renders the *seam* (3.15) more visible resulting from stretching of the carpet sometimes referred to as seam stress realignment

Note 1 to entry: Peaking is a natural and sometimes unavoidable condition and not the result of a manufacturing or installation defect.

Note 2 to entry: For additional information, refer to CRI Technical Bulletin – Peaking Seams in Stretch-In Carpet Installations.

3.18

seam sealing (edge sealing)

application of *seam adhesive* (3.16) to secure and protect cut edges of carpet to be seamed from edge ravelling and delamination

3.19

seaming tape

tape used for joining two sections of the carpet

Note 1 to entry: Hot-melt tape is pre-coated with a thermoplastic adhesive and *adhesives* (3.1) can be applied separately to other types of seaming tapes.

3.20

secondary backing

woven or non-woven fabric reinforcement laminated to the back of tufted carpet, usually with an *adhesive* (3.1), to enhance dimensional stability, strength, stretch resistance, and ease of handling

3.21

smooth (surface)

condition such that, when a straightedge 150 mm long is placed on the surface at any position, no part of it is more than 1 mm below the straightedge

3.22

stair nose

leading edge of a stair thread

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Note 1 to entry: For carpet installation, it is required that this edge be rounded.

3.23

subfloor

surface on which the textile floor covering or the underlay is to be laid (see [Figure 1](#))

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3.24

subfloor heating (underfloor heating)

any panel heating appliance or system whereby the subfloor structure is warmed intentionally for space heating purposes

3.25

trowel

hand implement used for metering and spreading *adhesive* (3.1) to the floor or other substrate

4 Materials

4.1 Textile floor coverings

Textile floor coverings shall comply with the requirements of the relevant International Standards. Where applicable, the textile floor covering referred to in this International Standard shall be suitable for use above subfloor heating where the temperature of the upper surface of the subfloor does not exceed 29 °C.

4.2 Underlays

4.2.1 Underlays

Unless the subfloor is substantially free from grooves, ridges, gaps, holes, and similar imperfections, the use of a hard underlay is recommended.

Where a hard underlay is used, the following requirements apply:

- a) the underlay shall have an estimated service life not shorter than that of the textile floor covering;
- b) the underlay shall be compatible with the textile floor covering and the adhesive(s) to be used;
- c) the underlay shall be non-staining, non-exuding, and sufficiently dense to withstand normal traffic load on the floor without becoming indented or deformed;
- d) the underlay shall be capable of being bonded to the subfloor in such a manner that the bonding is not affected by normal traffic loading;
- e) the underlay shall be non-shrinking to the extent that when the textile floor covering is laid, no evidence of gaps shall be visible;
- f) the maximum variation in length between the diagonals of underlay sheet shall not exceed 1,0 mm;
- g) for timber subfloors, the underlay shall be either reduced density hardboard flooring underlay or medium density fibreboard or medium density fibre cement sheet known to manufacturers as hard underlay.

NOTE Other products can be used if agreed between the contractor and the purchaser.

4.2.2 Soft underlays

The soft underlay shall have a service life no shorter than that of the textile floor covering in accordance with the recommendations of the underlay manufacturer and the carpet manufacturer. The requirements for soft underlays are detailed in [Annex E](#) of this International Standard.

In commercial applications, soft underlays shall have a total thickness not greater than 10 mm. For installation of soft underlays, see [6.7](#) and [6.8](#).

Carpet should never be laid over existing carpet and/or existing underlay as this can cause permanent damage to the new floor covering installation.

4.3 Adhesives

The choice of adhesives shall be made by consultation between the contractor and the manufacturer/supplier of the selected underlay, manufacturer/supplier of the textile floor covering, and the manufacturer/supplier of the adhesive and the purchaser shall be advised if requested.

Adhesives used shall be such that they ensure minimal hazardous risk to both personnel and property involved with the installation and site. Adhesives used shall be labelled in accordance with the regulations concerning occupational health and safety, poisons, dangerous goods, and transportation of dangerous goods.

Material Safety Data Sheets which should be easily obtainable from manufacturers of all chemical products should be provided on-site whenever adhesives are being used.

Where the relative humidity of the atmosphere in the building is 75 % or more, only adhesives suitable for such conditions shall be used. Any such adhesive shall be used in accordance with the instructions of the manufacturers of the textile floor covering and of the adhesive.

NOTE 1 In high humidity, condensation can form on the surface of the substrate and/or adhesive and prevent adhesion of the flooring.

Where subfloor heating units are installed, the adhesive shall be such that it is not affected adversely by the temperature at which the heating units are to be operated.

Where additives such as curing agents, parting agents, and surface treatments which can have a deleterious effect on an adhesive are present on the subfloor, the adhesive shall be isolated from the deleterious material/s with the use of appropriate trowelled-on compounds.

NOTE 2 Some curing agents might need to be removed by grinding or sanding. Some parting agents can be removed by washing with sugar soap, water blasting, and/or grinding.

4.4 Carpet gripper

The carpet gripper shall be constructed of five even thickness plywood layers.

The carpet gripper shall be constructed of sufficient pins and nails so as to withstand a minimum stretching force of 6 580 N over a 1 220 mm length.

5 Pre-Installation requirements

5.1 Site inspection and report — Commercial installations

5.1.1 Inspection by contractor

For textile floor coverings to be installed, a state of cleanliness for concrete/timber floors is required. Cleanliness of floors can require, as a minimum, sanding, grinding, power washing, wet/dry vacuuming, or similar.

If dry clean processes are used, remove all residual waste materials by vacuuming. If wet clean processes are used, ensure that the floors are dry enough to vacuum waste surface materials before installing the textile floor coverings.

The contractor shall obtain the site information on the subfloor outlined in [Annex A](#) and inspect the following:

- a) each of the relevant particulars required in [Annex A](#);
- b) whether any repairs to the subfloor are required and whether the surface of timber subfloors needs to be sanded;
- c) whether the surface of the subfloor requires cleaning to remove existing floor covering, any deleterious materials such as grease, oil, paint curing or parting agents, or any surface treatment which could adversely affect adhesion.

5.1.2 Report by contractor

If the contractor considers the subfloor under inspection to be unsuitable, the contractor shall submit a report in writing to the purchaser, and where appropriate, the builder.

The report shall state the following:

- a) whether the subfloor over which the floor covering is to be laid is in suitable condition;
- b) any and all conditions that, in the contractor's opinion, will affect the satisfactory execution of the installation work or impair the durability and serviceability of the textile floor covering or installation systems.

Where the contractor indicates that the subfloor is not in a suitable condition for laying of the floor coverings, the contractor shall specify reasons for the unsuitability of the subfloor.

Where the contractor indicates that removal or rectification work on the subfloor, doors, quads, or scotia moulding is needed, the contractor shall advise the purchaser that this work is the responsibility of others or as otherwise agreed.

5.2 Installation site — Residential installations

The contractor shall advise the purchaser, prior to installation, of the factors which can make the subfloor unsuitable to receive the new floor covering(s). Where the condition of the subfloor can be practically determined, the contractor shall advise the purchaser of necessary remedial work.

5.3 Exchange of information

5.3.1 General

The information to be exchanged between the contractor and the purchaser shall include advice as to whether the installation should be in accordance with the commercial or residential laying requirements of this International Standard.

Where, because of economics or aesthetics, compliance with parts of this International Standard are not practical, the contractor shall discuss the effects of non-compliance with the purchaser and reach an understanding on the effects of non-compliance.

5.3.2 Commercial installations

In addition to the information required to be provided by the contractor, elsewhere specified in this International Standard, there shall be consultation, preferably early in the design stage and generally throughout the whole course of the contract between all parties concerned with the work. Information to be exchanged shall include the following as applicable:

- a) site factors such as location, access, other contractors on site, unloading, hoisting and storage facilities, air conditioning, heating, lighting and power supply, floor loading, and security arrangements;
- b) building factors such as the nature of the building, assessment of type and density of traffic, particulars of corrosive conditions, or other potentially damaging conditions;
- c) specifications for or details of
 - 1) the floor structure,
 - 2) the damp-proof membrane and its location within the floor construction,
 - 3) screed curing and drying times,
 - 4) floor warming installations,
 - 5) underlays,
 - 6) adhesives and accessories including floor preservation treatments,
 - 7) textile floor coverings, including type, batch or rotation number, classification, supplier, dimensions, and repeat pattern size if applicable,
 - 8) subsequent maintenance of the textile floor covering, and
 - 9) finished floor level and permissible deviations;
- d) associated work including services embedded in or passing through the floor, skirtings and abutments, ducts, and junctions with other adjacent floorings;
- e) planning and procedures for the installation, i.e.
 - 1) adequate details of total area including landings and stairs,
 - 2) number of stair treads and landings where direction of seams or lay of the pile is outside normal practice, and

- 3) method of installation and seaming;
- f) details on the intended means of protection including the method of, and responsibility for, the protection of the stored textile floor covering and the completed work and fabric of the building;
- g) storage instructions: the textile floor covering shall be stored on a flat, clean, dry surface preferably suspended from the sub-floor, protected from soil, dust, and moisture. Heavy objects shall not be stacked on top of the carpet rolls and carpet rolls shall not be stacked more than three rolls high;
- h) contract information shall include particulars of the form and type of contract, whether the work is to be completed in any specific order or in sections, safeguarding against damage and theft, safety and health provisions, welfare facilities, air conditioning, heating, lighting and power supply, and insurance;
- i) a time schedule for the progress of the work in relation to other trades and services (see [Annex A](#));
- j) time lapse before use: where pressure sensitive adhesive, direct-stick or double-bond systems have been used, advice shall be given that concentrated foot and wheeled traffic should be avoided for 24 h after installation so that arrangements can be made for protection if avoidance is not possible;
- k) details of problems which might be expected to arise and where special consultation might be necessary, e.g. pattern matching;
- l) prior to the installation of the textile floor covering, the purchaser shall be informed of the floor covering plan setting out the details required by this clause. The floor covering plan shall include the following:
- 1) a scaled drawing or proportional sketch of the areas in which the installation shall take place;
 - 2) all dimensions necessary to the installation in accordance with this International Standard;
 - 3) all dimensions recorded in centimetres;
 - 4) all dimensions recorded in a manner that enables them to be read from the bottom-right hand corner;
 - 5) where possible, all dimensions recorded inside the scaled drawing or proportional sketch;
 - 6) the approximate position of all seams and cross joins;
 - 7) the manufacturer's description of the textile floor covering for the installation;
 - 8) the manufacturer's description of the underlay for the installation;
 - 9) the manufacturer's description of the accessories for the installation;
 - 10) so far as possible, a description of the condition of the subfloor;
 - 11) so far as possible, details of the subfloor preparation required to obtain a subfloor that complies with [5.4.2.3](#);
 - 12) the method of seaming to be used for the installation;
 - 13) the direction of pile lay, clearly identified.

5.3.3 Residential installations

The contractor shall provide the following:

- a) the manufacturer's description of the textile floor covering material to be installed;
- b) the manufacturer's description of the type of underlay to be used for the installation;

- c) where appropriate, a description of accessories and fittings;
- d) where the condition of the subfloor can be practicably determined by the contractor or where the contractor has previously advised the purchaser of necessary subfloor preparation, the nature of any work required to the subfloor.

The contractor shall provide the purchaser with the total quantity meterage and an assurance that the textile floor covering will be installed in accordance with this installation document.

5.4 Conditioning of floor coverings and subfloor

5.4.1 General

The following shall apply:

- a) before conditioning, textile floor covering and underlay materials shall be kept in a clean, dry, well-ventilated place and stored as specified in 5.3.2, g);
- b) before installation, the textile floor covering shall be allowed to come to the same temperature and relative humidity as the area where it is to be laid;
- c) the preferred ambient installation temperature in the area where the textile floor covering is to be laid shall be between 10 °C and 35 °C, but reference shall be made to the manufacturer's recommendation;
- d) the textile floor covering shall be installed only where relative humidity of the area does not exceed 75 % or fall below 30 %.

NOTE The optimum installation temperature is between 15 °C and 25 °C. Floor coverings installed outside this temperature range can experience variations in carpet tension.

Adequate ventilation and airflow should be maintained at all times before and after conditioning materials and adhesives and sub-floor preparation. For double-bond and pre-applied installations, see 6.7, c) for conditioning of soft underlay.

5.4.2 Commercial installations

5.4.2.1 Air-conditioned areas

Wherever possible, no underlay or textile floor covering shall be laid on the subfloor until the air-conditioning units have been in operation at normal operating temperature for at least seven days. During this period, the temperature should not be allowed to fall outside the textile floor coverings manufacturer's recommended limits. These conditions should be maintained during laying and for the next 72 h.

Where air-conditioning is to be installed, but is not yet operational, it is recommended that the room be maintained within the temperature range of 10 °C to 35 °C for seven days prior to and during installation and for the next 72 h.

Without such temperature control at this stage, subsequent movement of the subfloor, underlay, and textile floor coverings can occur.

5.4.2.2 Heating units

Where underfloor heating units are installed on or in the subfloor, the following shall apply:

- a) the heating units shall be turned on prior to laying the floor covering for a period sufficient to ensure that the moisture condition of the heated subfloor is such as will permit successful laying of the covering;

- b) the heating unit shall then be turned off to allow the subfloor to return to the temperature range recommended by the textile floor coverings manufacturer and soft underlay manufacturer before the laying is commenced;
- c) the heating units shall remain turned off during the laying and shall not be turned on until 48 h after the laying is completed in order to allow the adhesive to cure;
- d) heating units shall not be used to dry the concrete subfloor before the concrete is fully cured, e.g. one month after placing. The concrete shall be allowed to dry out slowly to minimize cracking.

Cyclic heating should be avoided during this period. Following curing, it is recommended that the lowest temperature setting be used and heating be maintained over a period of at least seven days to assist in lowering the moisture content.

5.4.2.3 Subfloor preparation

Before a floor coverings installation is commenced over a concrete subfloor or screed topping all subfloor, surfaces shall be dry, smooth, plane, sound, and clean (see [Annex A](#)). Dryness shall be considered satisfactory when relative humidity by the hygrometer test does not exceed 70 %.

NOTE For the determination of subfloor dryness, methods detailed in [Annex B](#) are recognized procedures.

When double-bond or direct-stick systems are used, porous subfloors shall be primed as recommended by the adhesive manufacturer.

5.4.3 Residential installations

Before the installation of the floor coverings is commenced, all subfloor surfaces shall be dry, smooth, plane, sound, and clean (see [Annex A](#)).

When double-bond or direct-stick systems are used, porous subfloors shall be primed as recommended by the adhesive manufacturer.

6 Installation methods

6.1 Planning, general layout, and dye batch continuity

The contractor shall give consideration to the general layout so that, where possible:

- a) seams run the length of the area;
- b) traffic runs along rather than across the seams;
- c) light from windows does not strike across seams;
- d) all pile faces away from the main source of incident light;
- e) all pile faces towards the main entry to the area of installation;
- f) on stairs, the pile lay runs towards the leading stair edge;
- g) selvedge seams are accurately aligned throughout the entire installation;
- h) textile floor coverings start within a full width on the door side;
- i) part width fill-outs are placed on the opposite side of the room from the door;
- j) textile floor coverings are accurately and closely fitted to all skirtings, architraves, and other perimeters;