
Bamboo floorings —

**Part 1:
Indoor use**

Planchers en bambou —

Partie 1: Utilisation en intérieur

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ISO 21629-1:2021

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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).

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For an explanation of 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 www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 296, *Bamboo and Rattan*.

A list of all parts in the ISO 21629 series can be found on the ISO website.

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.

Bamboo floorings —

Part 1: Indoor use

1 Scope

This document specifies the technical requirements and test methods for indoor bamboo flooring for internal use.

This document also specifies handling, storage, packaging and marking requirements.

It is applicable to unfinished and finished indoor bamboo flooring. This includes laminated bamboo flooring, bamboo scrimber flooring, bamboo - wood composite flooring, and flattened bamboo flooring.

2 Normative references

The following documents are referred to in the text in such a way that some or all 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 2409, *Paints and varnishes — Cross-cut test*

ISO 4586-2, *High-pressure decorative laminates (HPL, HPDL) — Sheets based on thermosetting resins (Usually called Laminates) — Part 2: Determination of properties*

ISO 7784-2, *Paints and varnishes — Determination of resistance to abrasion — Part 2: Method with abrasive rubber wheels and rotating test specimen*

ISO 9426, *Wood-based panels — Determination of dimensions of panels*

ISO 9427, *Wood-based panels — Determination of density*

ISO 15184, *Paints and varnishes — Determination of film hardness by pencil test*

ISO 16978, *Wood-based panels — Determination of modulus of elasticity in bending and of bending strength*

ISO 16979, *Wood-based panels — Determination of moisture content*

ISO 16983, *Wood-based panels — Determination of swelling in thickness after immersion in water*

ISO 17959, *General requirements for solid wood flooring*

3 Terms and definitions

For the purposes of this document, the terms and definitions 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 bamboo flooring**
assembled bamboo-based panel used as floor boards
- 3.2 finished indoor bamboo flooring**
bamboo flooring (3.1) with surface treatment such as coating, lacquering or oil-treatment
- 3.3 unfinished indoor bamboo flooring**
bamboo flooring (3.1) without surface treatment such as coating, lacquering or oil-treatment
- 3.4 laminated bamboo flooring**
flooring product made from laminated bamboo strips
- 3.5 bamboo scrimber flooring**
flooring product made of *bamboo scrimber* (3.8)
- 3.6 bamboo - wood composite flooring**
flooring made of bamboo as a surface layer and wood or wood-based panel as the core
- 3.7 flattened bamboo flooring**
flooring with surface layer made of flattened bamboo board
- 3.8 bamboo scrimber**
panel or lumber made of compressed bamboo fibre bundle strips or compressed bamboo fibre bundle sheet
- 3.9 flattened bamboo**
piece of bamboo culm pressed to level the surface
- 3.10 bamboo outer layer**
hard, compact sheath of bamboo culm which is exposed to the external environment
- 3.11 bamboo inner layer**
soft inside layer of the bamboo culm, serving as boundary to the hollow central portion of the culm
- 3.12 squareness**
the distance, δ_1 , between the panel edge and the side of the other arm of the square

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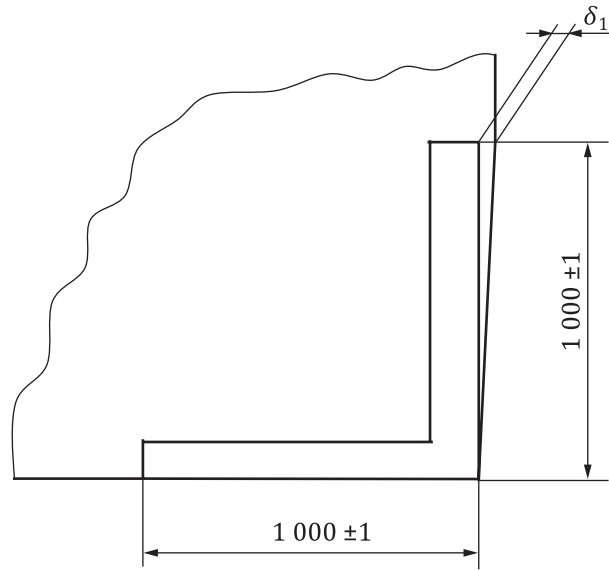


Figure 1 — Example of squareness

3.13

assembly gap

space between adjacent surfaces of assembled *bamboo flooring* (3.1)

3.14

decay

decomposition of bamboo by fungi or other micro-organisms resulting in softening, progressive loss of mass and strength, and often a change of texture and colour

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3.15

crack

lengthwise separation of the bamboo fibres caused chiefly by shrinkage in drying and / or mechanical damage

3.16

gap

opening on the face or bottom of the *bamboo flooring* (3.1) product

3.17

splinter

filament protrusion on the surface of *bamboo scrimber* (3.8)

3.18

blister

presence of trapped air underneath the coating of the *finished indoor bamboo flooring* (3.2) resulting to bubbles on the face of the product

3.19

swollen edge

strip thickening part around the paint film

4 Requirements

4.1 Appearance requirements

The material used for the bamboo flooring shall be free from physical damage, decay and insect attack. There will be variations from element to element, but the total impression of the installed floor shall show a homogeneous character.

Any part of the material that impedes preservation, bonding and finishing shall be removed entirely.

As bamboo is a natural material, colour variations may occur, also due to an effect of light over time.

Table 1 — Appearance requirements

Types of defects	Face layer			Sub layer(s)
	Laminated bamboo flooring	Bamboo scrimber flooring	Flattened bamboo flooring	
Bamboo outer layer	Not permitted		Permitted as long it's used as the face layer	Not permitted
Bamboo inner layer			Not permitted	Permitted if this does not impair the bonding strength between the strips and/or the layers of the bamboo flooring ^a
Splinters	Not permitted		Permitted as long as these splinters do not impair the use quality of the bamboo flooring ^b	
Cracks	Permitted for unfinished flooring as long as these cracks do not impair the wearing quality of the bamboo flooring ^c Not permitted for finished flooring		Permitted as long as these cracks do not impair the wearing quality of the bamboo flooring ^c	
Gaps	Permitted for unfinished flooring as long as these gaps do not impair the wearing quality of the bamboo flooring ^c Not permitted for finished flooring		Permitted as long as these gaps do not impair the wearing quality of the bamboo flooring ^c	
Blister	Diameter ≤0,5 mm; maximum 5 per sheet ^d			NA
Swollen edge	Permitted as it does not impair the installation precision ^d			

NOTE This table illustrates the appearance requirements for the face of indoor bamboo flooring.

^a If the bonding strength between the strips and/or the layers of the bamboo flooring is impaired by bamboo inner layer, they shall be removed.

^b If the use quality of the bamboo flooring is impaired by splinters, they shall be removed.

^c If the wearing quality of the bamboo flooring is impaired by cracks and/or gaps, they shall be filled.

^d Blister and swollen edge is inspected for the lacquered bamboo flooring.

4.2 Dimension requirements

Table 2 — Dimension requirements

Parameters	Test method	Common product dimensions		Requirements			
		450 ~ 2 400	≤1 500 >1 500	Laminated bamboo flooring	Bamboo scrim-bamboo flooring	Flattened bamboo flooring	Bamboo - wood composite flooring
Length (mm)	ISO 9426	450 ~ 2 400	≤1 500 >1 500		±0,5		
Width (mm)	ISO 9426	60 ~ 220			±0,2		
Thickness (mm)	ISO 9426	8 ~ 25		±0,3		±0,5	±0,3
Squareness (mm/m)	ISO 9426				≤0,2		
Spring (%)	ISO 9426	—			≤0,2		
Cup (%)	ISO 17959	convex			≤0,2		
Concave (%)		concave			≤0,2		
Bow (%)		convex		≤0,5	≤1,0	≤0,5	≤0,5
Assembly gap (mm)		concave		≤0,5	≤0,5		≤0,3
Lipping (mismatch) (mm)	Annex A	average		≤0,15	≤0,20	≤0,25	≤0,15
		max		≤0,20	≤0,40	≤0,50	≤0,20
Lipping (mismatch) (mm)	ISO 17959	average		≤0,15	≤0,20	≤0,30	≤0,15
		max		≤0,20	≤0,30	≤0,50	≤0,20

NOTE 1 This table illustrates the common dimension requirements for indoor bamboo flooring.

NOTE 2 Other specific dimensions of the product are permitted upon agreement of both supplier and buyer.

4.3 Property requirements

4.3.1 Physical and mechanical requirements

For sublayer materials such as solid wood, laminated board, plywood, fibreboard, oriented strand board, and any other sublayer materials not being made of bamboo; physical and mechanical properties shall meet the requirements given in their specific product standards.

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Table 3 — Physical and mechanical requirements

Parameters	Test method	Laminated bamboo flooring	Bamboo scrimber flooring	Flattened bamboo flooring	Bamboo-wood composite flooring	
MC (%)	Annex B	5,0 ≤ MC ≤ EMC				
Density (kg/m ³)	ISO 9427	≥500	≥800	≥500	≥500	
24h Thickness swelling (%)	ISO 16983	NA	≤3,0	NA	NA	
MoR ^a (MPa)	ISO 16978	≥70	≥90	≥70	≥40	
Bonding quality (%)	Annex C	not exceeding 1/3 ^c	NA	not exceeding 1/3 ^c	not exceeding 1/3 ^c	
ARS ^b (g/100 r)	ISO 7784-2	≤0,12	≤0,15	≤0,12	≤0,15	
SRS ^b (NA)	ISO 4586-2			NVC		
Key						
MC = Moisture content						
EMC = Equilibrium moisture content						
MoR = Modulus of rupture						
ARS = Abrasion resistance of surface						
SRS = Staining resistance of surface						
ASF = Adhesion of surface film						
PFH = Paint film hardness						
NVC = No visible change						
NOTE This table illustrates the physical and mechanical property requirements of indoor bamboo flooring.						
^a Modulus of rupture needs to be tested only for flooring being installed on battens.						
^b Abrasion resistance of surface, Stain resistance, Adhesion of surface film and Paint film hardness, only applicable for lacquered bamboo flooring.						
^c The cumulative ratio of delamination in each separate individual glue line on all sides shall not exceed 1/3 of the total length of glue line.						