
**Veneers — Terms and definitions,
determination of physical
characteristics and tolerances**

*Placages — Termes et définitions, détermination des caractéristiques
physiques et tolérances*

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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 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 89, *Wood-based panels*, Subcommittee SC 3, *Plywood*.

This second edition cancels and replaces the first edition (ISO 18775:2008), which has been technically revised.

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

- an editorial change was done to precise a threshold value in [Table 1](#).

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.

Veneers — Terms and definitions, determination of physical characteristics and tolerances

1 Scope

This document establishes the standard terms and definitions (including those relative to features and defects), the methods for the determination of physical characteristics and the tolerances for dimensions (length, width, thickness) for wood veneers, including natural, treated and multilaminar veneers, that can be obtained by slicing, rotary cutting or sawing. The specific definitions, properties and requirements concerning these treated, multilaminar veneers and laminated wood veneers are not included in this document.

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

ISO 16999, *Wood-based panels — Sampling and cutting of test pieces*

ISO 24294, *Timber — Round and sawn timber — Vocabulary*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 24294 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 General terms

3.1.1

backed veneer

fleeced veneer

veneer which has been backed with special paper, fabric or other material

3.1.2

batch

several veneers before a selection is made based on quality, structure, colour, dimensions, figure, etc.

3.1.3

bleached veneer

veneer which has been subjected to a bleaching treatment

3.1.4

boule

plot

veneers obtained from a single log by sequential slicing, laid together in sequence of cutting

3.1.5

bundle

number of *sliced veneers* (3.2.9) (e.g. 16, 24 or 32) stacked in the order from which they were sliced out of the trunk or log

3.1.6

clipped veneer

trimmed veneer

veneer with at least one edge cut straight and perpendicular to the surface of the veneer

3.1.7

edge joint

joint made in the general direction of the grain between two *clipped veneers* (3.1.6) placed edge to edge

3.1.8

end joint

joint made across the grain between two *clipped veneers* (3.1.6) laid end to end

3.1.9

face

veneer surface which will be visible after application

3.1.10

flitch

prismatic element, obtained by longitudinally cutting a log or trunk on the bandmill saw

Note 1 to entry: The plural "flitches" indicates the sequence of veneers cut from a log or part of a log.

3.1.11

lay-on

full size jointed and spliced veneer

3.1.12

log run parcel

trunk

whole series of veneers obtained from a single trunk, in the sequence of cutting

3.1.13

loose side

open side

slack side

<rotary cut veneers> side of the sheet that was in contact with the knife as the veneer was being cut, and containing cutting checks (lathe checks) due to the bending of the wood at the knife edge

3.1.14

multilaminar veneer

sliced veneer (3.2.9) obtained from a block or a board of *multilaminar wood* (3.1.15), to be used mainly for decorative purposes

3.1.15

multilaminar wood

material made up of wood veneers, placed one on top of the other, previously glued, pressed together so as to form a block or board

3.1.16

tape

strips of gummed paper or cloth placed on the veneer

3.1.17**texture**

size and general arrangement of the cells and pores in the wood

EXAMPLE Fine, medium, coarse, irregular.

3.1.18**through-dyed veneer**

veneer through dyed in any colour

Note 1 to entry: It has the same properties, as to workability and end use, as natural veneers.

3.1.19**treated veneer**

veneer which has been treated to achieve particular physical, chemical or esthetical characteristics

EXAMPLE Ammonia-smoked oak.

3.1.20**tight side**

<rotary cut veneers> side of the sheet that was farthest from the knife as the veneer was being cut, and containing no cutting checks (lathe checks)

3.1.21**joint**

interface between two adjacent pieces of veneer

3.1.22**jointed veneer**

veneer, the edge of which is trimmed in preparation for splicing

3.1.23**spliced veneer**

veneer made of two or more *jointed veneers* (3.1.22) joined edge to edge

3.1.24**stitched joint**

spliced veneer (3.1.23) employing glue "string" to maintain close contact at the interface

3.1.25**veneer**

thin sheet of wood with a maximum thickness of 6 mm, rotary cut, sliced or sawn from a log, bolt or *flitch* (3.1.10)

Note 1 to entry: Veneers may be assembled together to achieve bigger dimensions.

3.1.26**veneer length**

dimension of the *veneer* (3.1.25) measured in a direction parallel to the grain

Note 1 to entry: Veneer length shall be always the first dimension (Length×Width), even the length is smaller than the width.

3.1.27**veneer minimum length**

smallest distance measured in a direction parallel to the grain

3.1.28**veneer thickness**

dimension of the veneer perpendicular to the *face* (3.1.9)

3.1.29

veneer width

dimension of the veneer measured in a direction perpendicular to the grain and parallel to the face

3.2 Terms related to the production method

See [Figure A.1](#).

3.2.1

eccentric quarter cutting

quarter-round slicing

semi-rotary slicing

rift cutting

production method whereby veneers are obtained by fixing a quarter-log on the stay-log

Note 1 to entry: This results in veneers with a striped figure or in the form of a half-cathedral.

3.2.2

flat quarter slicing, tangential

Swedish quarter slicing

production method whereby veneers are obtained when the cut is made tangentially to the direction of the growth rings and perpendicularly to the rays, and cutting commences from the heart-side of the log

3.2.3

flat slicing

back cutting

plain slicing

flat cutting

production method whereby veneers are obtained when the cut is made tangentially to the direction of the growth rings and perpendicularly to the rays, and cutting commences from the sapwood side of the log

3.2.4

half-round back cutting

production method whereby veneers are obtained by fixing the log on the sapwood side on the stay-log

3.2.5

quarter cathedral cutting

production method whereby veneers are obtained by fixing a third- or quarter- log on the sapwood side on the stay-log

Note 1 to entry: Veneers are cut from the heart-side.

3.2.6

rotary cut veneer

peeled veneer

veneer continuously cut in a lathe which rotates a log or bolt, against a knife which is fixed over the whole length of the log and set at a slight angle

3.2.7

sawn veneer

veneer produced by sawing a log or a *flitch* ([3.1.10](#))

3.2.8

semi-rotary cut veneer

veneer cut purposely in a non-continuous ribbon in a lathe which rotates a log or bolt, chucked eccentrically, against a knife which is fixed over the whole length of the log and set at a slight angle

3.2.9**sliced veneer**

veneer produced by thrusting a log or a *flitch* (3.1.10) into a slicing machine which slices off the veneers as sheets

3.2.10**true half-round cutting**

production method whereby veneers are obtained by eccentric rotary cutting when the log is cut with a wider sweep than when it is mounted with its centre secured in the lathe

3.2.11**true quarter slicing**

production method whereby veneers are obtained by quarter slicing a portion ($1/4$, $1/3$) of a log, the cut being radial, perpendicular to the annual growth rings

3.3 Terms related to visual effects and veneer matching**3.3.1****bird's eye**

figure showing many small circular or elliptical areas resembling a bird's eye, due to local sharp depressions in the annual rings (e.g. maple)

3.3.2**blister grain**

figure in which the wood, while smooth, appears to be covered with blisters (depressed or elevated small roundish areas), due to uneven annual rings

Note 1 to entry: Such a figure is only obtained on flat-sawn or rotary cut surfaces.

3.3.3**burr veneer**

burl veneer

veneer obtained from fairly rare woody outgrowths (clusters of dormant buds and knots) appearing on trees around grafts or injuries or, rarely, forming spontaneously in few wood species

3.3.4**component**

individual piece of veneer that is jointed to other pieces to obtain a full length and full width sheet

3.3.5**crotch figure**

curl

figure obtained by cutting through the junction of a branch and the main stem of a tree

3.3.6**crown figure**

cathedral figure

flame pattern figure

appearance characterized by a series of stacked and inverted "V" and/or cathedral type of earlywood and latewood patterns common in plain-sliced (flat-cut) veneer

3.3.7**double-faced effect**

apparent colour differences due to different light refraction in book matched veneers

Note 1 to entry: This occurs because in adjacent veneers the loose side and tight side faces alternate, thus reflecting the light differently.

3.3.8

fiddle back figure

irregular figure, caused by wavy and curly grain, with light coloured irregular stripes perpendicular to the direction of the grain, traditionally used to decorate the backs of violins

3.3.9

finger roll figure

wavy

wavy figure in which the waves are about the width of a finger (e.g. redwood, sequoia, etc.)

3.3.10

gummed paper jointing

jointing together two veneers edge to edge by means of a strip of gummed paper, prior to overlaying

Note 1 to entry: The paper will be removed before sanding the final product.

3.3.11

half crown figure

half flame

figure corresponding to half of a cathedral figure

3.3.12

matching

assembling veneers in a sequence according to their own sequential number, or in order to obtain specific dimensions and the pattern desired

Note 1 to entry: See [Figure B.1](#).

3.3.12.1

book matching

matching ([3.3.12](#)) whereby alternating veneers from a *flitch* ([3.1.10](#)) or log are turned over so that adjacent veneers are “opened”, as two pages in a book

3.3.12.2

butt matching

matching ([3.3.12](#)) whereby veneers are assembled as for *book matching* ([3.3.12.1](#)), but the ends of the veneers are also matched

Note 1 to entry: In this case, the veneers must also be flipped end to end and the ends matched.

3.3.12.3

centre matching

matching ([3.3.12](#)) whereby an even number of veneers, not necessarily with the same width, is assembled symmetrically with respect to the central joint

3.3.12.4

diamond matching

matching ([3.3.12](#)) whereby four veneers are cut diagonally and assembled to form a diamond

3.3.12.5

four-piece matching

matching ([3.3.12](#)) whereby four veneers in cutting sequence are butt-matched forming a square

3.3.12.6

harlequin matching

matching ([3.3.12](#)) whereby strips of veneers of different colours are assembled to achieve the desired dimensions

3.3.12.7**herringbone matching**

matching (3.3.12) whereby adjacent silver grain veneers are assembled at an angle, so that the resulting figure is reminiscent of the bones of a fish

3.3.12.8**mismatching**

random matching

adjacent veneers are assembled at random without regard to *texture* (3.1.17), figure and/or colour

3.3.12.9**colour matching**

matching (3.3.12) whereby veneers are assembled by colour similarity

3.3.12.10**reverse diamond matching**

matching (3.3.12) whereby similar to *diamond matching* (3.3.12.4), but the veneers are assembled so that all grain directions run towards the middle

3.3.12.11**running matching**

matching (3.3.12) whereby veneers in sequence of slicing are assembled until the desired width is reached

Note 1 to entry: If a portion of a veneer is left over, it becomes the start of the next sheet.

3.3.12.12**slip matching**

boule assembling

matching (3.3.12) whereby veneers are slipped out in sequence of slicing and assembled, all of them with the same side being exposed

3.3.12.13**sunburst matching**

matching (3.3.12) whereby veneers in sequence of slicing are trimmed into pie-shaped pieces and book-matched with the points meeting at the centre

3.3.13**moiré figure**

wavy figure resembling sea waves, due to overlapping of interlocked grain and curl (e.g. avodiré, makoré, etc.)

3.3.14**mottle figure**

figure consisting of broken up cross markings, intermingled with stripes (sometimes appearing as a regular checkerboard pattern), giving the impression of an uneven surface, due to wavy and interlocked grain (e.g. sapele, satinwood, black bean, etc.)

3.3.15**pommele figure**

figure in which a series of apparently uneven reflections produce a visual effect of high and bas-relief on adjacent small roundish areas, resembling apples (e.g. sapele, mahogany, bubinga, etc.)

Note 1 to entry: The name derives from the French word “pomme = apple”.

3.3.16**quilted figure**

figure similar to “blister figure” but larger and with elongated and closely crowded bulges (e.g. maple, mahogany, moabi, sapele, etc.)

3.3.17

ribbon stripe

ribbon grain

ribbon effect produced by quarter slicing woods with interlocking grains

3.3.18

silver figure

flake

figure appearing on the veneer perpendicular to the direction of the grain, developed only in those species that have very heavy medullary ray growth, when the cut is radial or nearly radial (e.g. oak)

3.4 Terms related to features, defects and repairs

3.4.1

burn-mark

darkening or charring on an overlaid veneer caused by frictional heat, by worn sanding paper, or by excessive heat during application

3.4.2

calcium

inorganic material incorporated by the tree during growth, light coloured, appearing sporadically in the pores of some wood species (e.g. rosewood)

3.4.3

condensate

coloured tannic acid deposit which appears on the veneer surface as a result of a too extreme drying process

3.4.4

corrugated buckled veneer

veneer that has waving due to irregularities in the wood structure

3.4.5

delamination

separation of plies or layers in a *multilaminar veneer* ([3.1.14](#))

3.4.6

discoloration

any variation from the natural colour of wood, which does not affect its fitness to the purpose

3.4.7

dryer print

marking from the dryer bands on the veneer surface resulting from faulty or badly maintained dryer bands

3.4.8

flattening

operation for flattening corrugated veneers

3.4.9

gap

open splits in improperly joined veneers

3.4.10

harsh grained surface

more or less extensive surface *roughness* ([3.4.20](#)), due to micro-fissures on the veneer surface

3.4.11**hollow punch**

machine with multi-shaped blades for removing damaged parts of veneer, which are to be replaced by other parts obtained with the same machine

3.4.12**knife marks**

slicing marks

indentations perpendicular to the grain, due to slicing, which normally disappear after the sanding operation

3.4.13**imprint**

localized hollow or swelling (bump) on the veneer

3.4.14**lap**

condition where part of a *component* ([3.3.4](#)) of the veneer overlaps another component

3.4.15**miscut**

flaws in the veneer resulting from faulty processing

EXAMPLE Varying thicknesses.

3.4.16**open defect**

open checks, open splits, open joints, knotholes, wormholes, *gaps* ([3.4.9](#)), voids or other openings interrupting the smooth continuity of the wood surface

3.4.17**patch**

insertion of fillers or sound wood placed into veneers from which defective portions had been removed or were missing

3.4.18**pith flecks**

dark marks on the veneers of a few wood species, such as birch and maple, averaging 4 cm to 5 cm in length and 2 mm to 3 mm in width, usually parallel to the direction of the grain and irregular in shape, caused by insects

3.4.19**resin pocket**

pocket-shaped resin inclusions in softwood which can cause *open defects* ([3.4.16](#)) in the veneer

3.4.20**roughness**

unevenness occurring on the surface of the veneer, due to irregularities in the structure of wood or due to defective manufacturing

3.4.21**shim**

thin, often tapered, piece of wood used to fill in the space between *components* ([3.3.4](#))

3.4.22**sugar**

hair

fine, hair-like marking which can extend over the entire veneer surface (e.g. pear, maple, etc.)

3.4.23

surface checking

hair

telegraphing of peeler checks through to the veneers surface

3.4.24

swirl

irregular grain usually surrounding knots or crotches

3.4.25

torn grain

roughened condition (resembling hairiness) of the surface of veneers which may occur due to fibre rising (non cohesion of wood fibres)

3.4.26

whiskers

medium-size *pith flecks* ([3.4.18](#)) (e.g. beech)

4 Determination of physical characteristics

4.1 Apparatus

4.1.1 Balance, with scale interval of 0,01 g and an accuracy of 0,005 g.

4.1.2 Drying oven, ventilated and capable of being controlled at $(103 \pm 2) ^\circ\text{C}$.

4.1.3 Desiccator.

Closed vessel containing a desiccant, to maintain the air as close as possible to the absolutely dry condition.

4.1.4 Instrument for thickness measurement.

Micrometer or similar measuring instrument, having flat and parallel circular measuring surfaces of (16 ± 1) mm diameter and an operation force of (20 ± 4) N. The graduation of the apparatus shall allow reading to 0,01 mm.

4.1.5 Steel measuring tape, scale interval 1 mm.

4.1.6 Mechanical square, having two arms of $(1\ 000 \pm 1)$ mm for measuring the deviation of the angles of adjacent sides of a veneer from a right angle. It shall be accurate to 0,2 mm in 1 000 mm (see [Figure 1](#)).

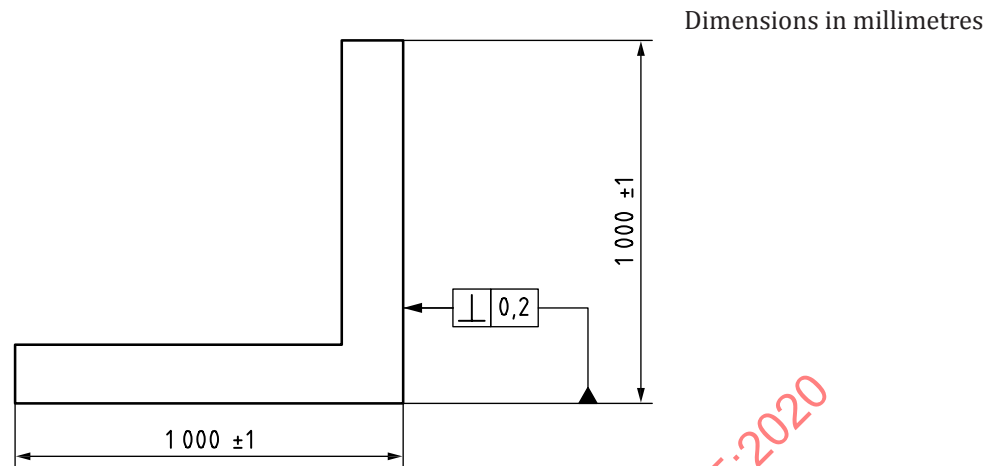


Figure 1 — Accuracy requirements of mechanical square

4.2 Determination of moisture content

4.2.1 Principle

Determination, by weighing, of the loss of mass of each test piece obtained from a veneer between its state at the time of sampling and its state after drying to constant mass at $(103 \pm 2) ^\circ\text{C}$, and calculation of this loss of mass as a percentage of the mass of the test piece after drying; these results can be used to estimate the moisture content of the whole veneer.

4.2.2 Test pieces

Sampling and cutting of the test pieces shall be carried out in accordance with ISO 16999. Each test piece shall have an initial mass of at least 20 g; shape and size are unimportant.

4.2.3 Procedure

Weigh each test piece with the balance (4.1.1). Weighing shall be done immediately after sampling; if this is not possible, test pieces shall be sealed at the time of sampling, to avoid changes in the moisture content of the test piece before weighing.

Place the test pieces in the drying oven (4.1.2) at a temperature of $(103 \pm 2) ^\circ\text{C}$ until constant mass has been reached. Constant mass is considered to be reached when the results of two successive weighing operations, carried out at an interval of 6 h, do not differ by more than 0,1 % of the mass of the test piece.

After the test pieces have been cooled to approximately room temperature in the desiccator (4.1.3), weigh each test piece with the balance (4.1.1) immediately after the extraction of the test piece from the desiccator.

Calculate the moisture content of each test piece as indicated in 4.2.4.

4.2.4 Expression of results

Calculate the moisture content, w , of each test piece, as a percentage by mass to one decimal place, in accordance with the following Formula (1):

$$w = \frac{m_w - m_0}{m_0} \times 100 \quad (1)$$

where

m_w is the initial mass of the test piece, in grams;

m_0 is the mass of the oven dried test piece, in grams.

The moisture content of the whole veneer can be estimated by calculating the arithmetic mean of the moisture content of all the relevant test pieces, and shall be expressed as a percentage, to one decimal place.

4.3 Determination of density

Density, if required, shall be determined in accordance with ISO 9427.

4.4 Determination of dimensions

4.4.1 Principle

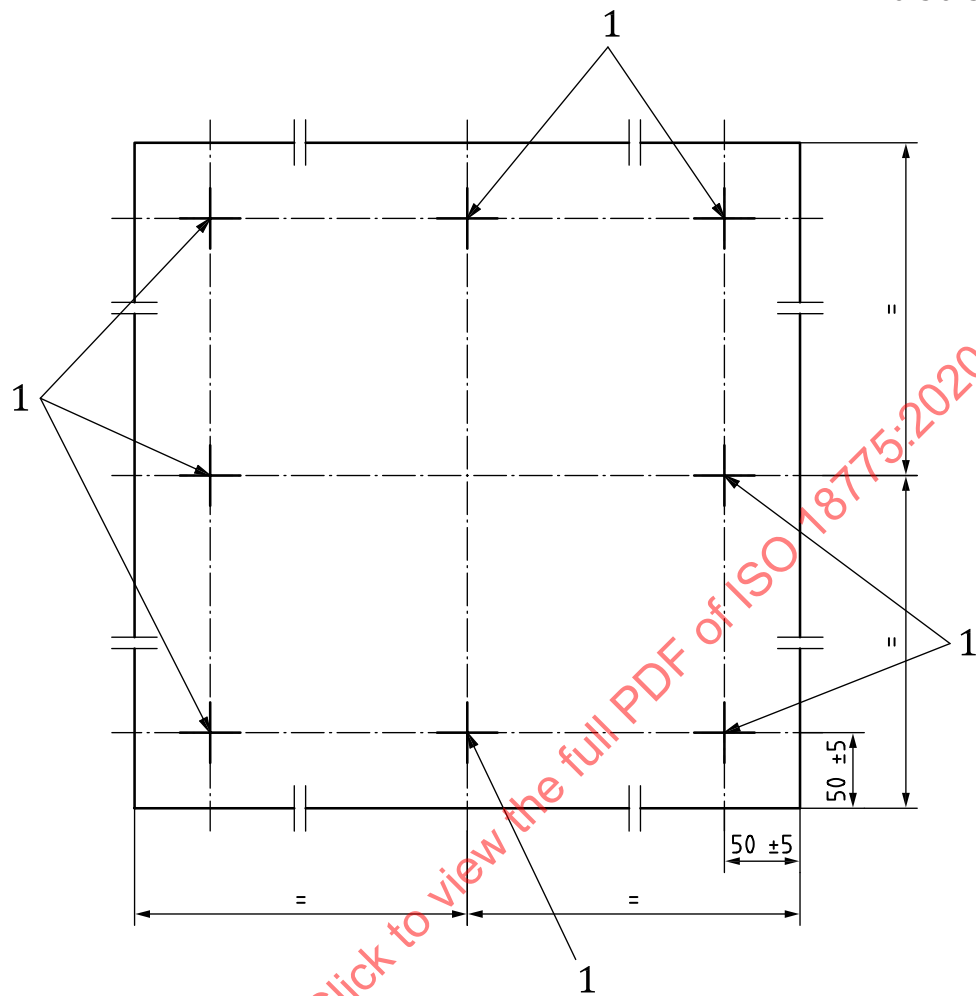
Determination, by linear measuring, of thickness, length and width of a veneer. If the veneer is not rectangular-shaped, the biggest usable rectangular area shall be identified and used for measurements.

4.4.2 Procedure

Measure the thickness with the instrument ([4.1.4](#)) near each corner and in the centre line of each side, for a total of 8 measurements, as shown in [Figure 2](#).

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Dimensions in millimetres



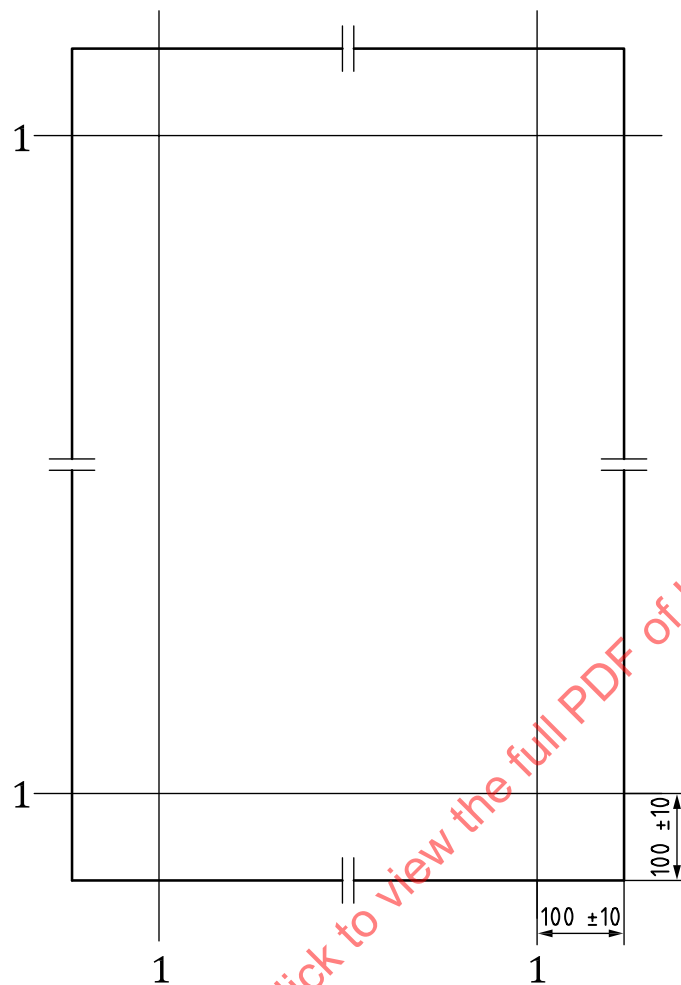
Key

1 measuring point

Figure 2 — Thickness measurement

Measure the width and the length on one of the faces of the veneer with the tape (4.1.5) along the measuring lines parallel to the edges and (100 ± 10) mm from them, as indicated in Figure 3, ensuring that it is perfectly flat.

Dimensions in millimetres

**Key**

1 measuring line

Figure 3 — Measurement of length and width of a veneer**4.4.3 Expression of results****4.4.3.1 Thickness**

Calculate the arithmetic mean value of all the relevant measurements and express it to the nearest 0,05 mm.

4.4.3.2 Length

Calculate the arithmetic mean value of all the relevant measurements and express it to the nearest 5 mm.

4.4.3.3 Width

Calculate the arithmetic mean value of all the relevant measurements and express it to the nearest 5 mm.

4.5 Determination of squareness

Place one side of the square against one side of the veneer of which the squareness is to be measured (see [Figure 4](#)).

At a distance of $(1\,000 \pm 1)$ mm from the corner of the veneer, measure the distance k_l between the edge and the side of the other arm of the square with the instrument (4.1.6) (see Figure 4).

Follow the same procedure for each of the other corners.

The result is the largest measured value of the deviation of the side of square and the veneer edge. It is expressed in millimetres over 1 m veneer edge-length to 1 mm/m.

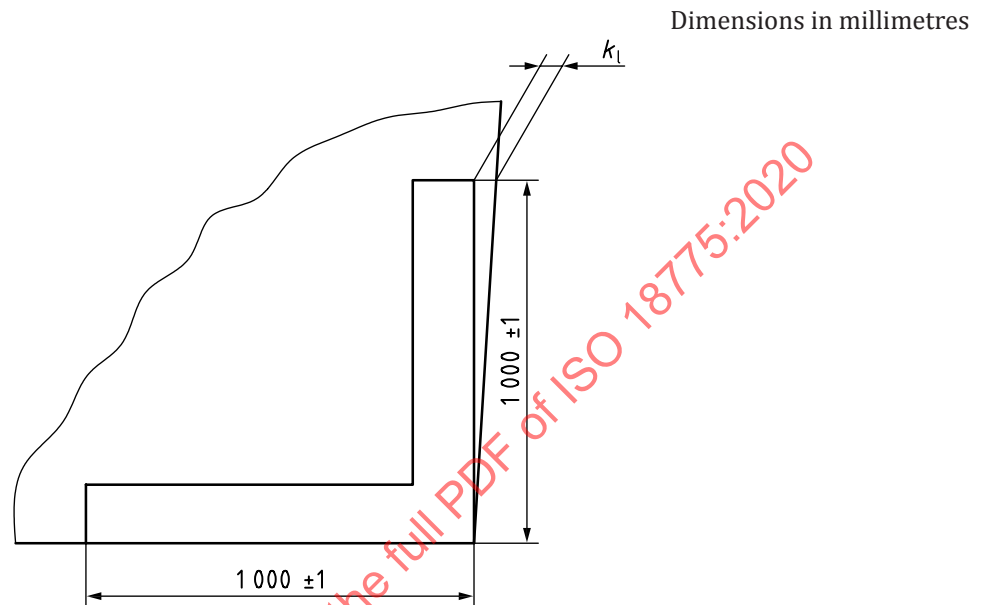


Figure 4 — Use of mechanical square to measure veneer squareness

4.6 Test report

The test report shall contain the following information:

- a reference to this document, i.e. ISO 18775:2020;
- name of the supplier (or his representative);
- place and date of sampling and persons present at sampling;
- type, kind and characteristics of the veneer;
- expression of the test results;
- number of test pieces;
- any deviation from this International Standard;
- moisture content of the test pieces at the time of testing.

5 Dimensional tolerances

5.1 Reference moisture content

The moisture content shall be determined according to 4.2.

Unless otherwise stated (e.g., by local climate conditions), this document applies to veneers with a moisture content of (10 ± 2) %.