DRAFT TANZANIA STANDARD

Plywood — Decorative veneered plywood

TANZANIA BUREAU OF STANDARDS

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0 National Foreword

The Tanzania Bureau of Standards (TBS) is the statutory national standards body for Tanzania, established under standards Act No. 3 of 1975, amended by Act No. 2 of 2009.

This draft Tanzania Standard is being prepared by BCDC 6 Sawn timber, logs and wood-based components Technical Committee under the supervision of the Building and Construction Divisional Committee (BCDC).

This draft Tanzania Standard is an identical adoption of the 1st Edition of International Standard ISO 13608: 2014 *Plywood — Decorative veneered plywood*.

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

Terminologies and conventions

The text of the International Standard is hereby being recommended for approval without deviation for publication as draft Tanzania standard.

Some terminologies and conventions are not identical with those used in Tanzania Standards; attention is drawn to the following;

The comma has been used as a decimal marker for metric dimensions. In Tanzania, it is current practice to use a full point on the baseline as the decimal marker.

Whenever the words “ISO Standard” appear referring to this standard, they should read as “Tanzania Standard”.

This standard of the International Organization for Standardization (ISO) was approved for publication as a Tanzania Standard with the following editorial changes:

a) deletion of informative preliminary material from the adopted International Standard
b) inclusion of national informative material (National foreword, terminologies and conventions)
c) deletion of the translation text in French to retain English language which is the official national language
d) changes in document layout (pagination, font type and size)
e) referred FIGURE A.1 in a body text of Annex A.4

Plywood — Decorative veneered plywood

1 Scope

This draft Tanzania Standard specifies the terms, classifications, requirements, test methods, marking, for decorative veneered plywood with natural wood veneer, coloured veneer, laminated veneer, multilaminar veneer, and other types of veneer as decorative surface and plywood as a core panel, where the surface veneer thickness is less than 0.55 mm.

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.

BCDC 6 (53) CD2/ISO 1954, *Plywood — Tolerances on dimensions*

BCDC 6 (51) CD2: 2020/ISO 2074:2007, *Plywood — Vocabulary*

BCDC 6 (57) CD2/ISO 2426-1, *Plywood — Classification by surface appearance — Part 1: General*

BCDC 6 (58) CD2/ISO 2426-2, *Plywood — Classification by surface appearance — Part 2: Hardwood*

BCDC 6 (59) CD2/ISO 2426-3, *Plywood — Classification by surface appearance — Part 3: Softwood*

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

ISO 12460-1, *Wood-based panels — Determination of formaldehyde release — Part 1: Formaldehyde emission by the 1-cubic-metre chamber method*
ISO 12460-3, *Wood-based panels — Determination of formaldehyde release — Part 3: Gas analysis method*

ISO 12460-4, *Wood-based panels — Determination of formaldehyde release — Part 4: Desiccator method*

BCDC 6 (60) CD2/ISO 12465, *Plywood — Specifications*

ISO 12466-1, *Plywood — Bonding quality — Part 1: Test methods*

BCDC 6 (67) CD2/ISO 12466-2, *Plywood — Bonding quality — Part 2: Requirements*

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

ISO 18775, *Veneers — Terms and definitions, determination of physical characteristics and tolerances*

ISO/IEC 17065, *Conformity assessment requirements for bodies certifying products, processes and services*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in BCDC 6 (51) CD2/ISO 2074, BCDC 6 (60) CD2/ISO 12465, ISO 18775, and the following apply.

3.1 Decorative veneered plywood
Plywood with natural wood veneer, coloured veneer, laminated veneer, multilaminar veneer, and any other types of veneer as decorative surface and plywood as a core panel, where the surface veneer thickness is less than 0.55 mm

3.2 Coloured veneer

Wood veneer produced from either bleaching or dying procedure

3.3 Laminated wood veneer

Veneer sliced from wood flitch that is assembled from small pieces of wood strips with joints parallel to grain

3.4 Colour difference

Difference between surface colour of the decorative veneer and the control colour of the sample veneer colour or uneven colour of the surface in some case

Note 1 to entry: It does not include the colour difference between early wood and later wood, as well as the natural grain colour difference on the wood surface itself.

4 Classifications

4.1 Classification according to the decorative veneer

a) natural wood veneered plywood;
b) coloured veneered plywood;
c) laminated wood veneered plywood;
d) multilaminar decorative veneered plywood.

4.2 Classification according to the face

a) single-faced decorative veneered plywood;
b) double-faced decorative veneered plywood.

4.3 Classification according to exposure classes

a) Exposure Class 1: for use in dry conditions;
b) Exposure Class 2: for use in tropical-dry/humid conditions.

5 Requirements and test methods

5.1 Panel dimensions and tolerances

5.1.1 General

Test methods and requirements as given in ISO 1954 and ISO 9426 apply to determine length, width, squareness, and edge straightness of the panel.

5.1.2 Panel thickness and tolerances

Tolerance of thickness of decorative veneered plywood refers to the nominal thickness marked on the product label and shall satisfy the requirements given in TABLE 1.

Tolerance of thickness within one panel shall satisfy the requirements given in TABLE 1.

TABLE 1 — **Thickness tolerance for decorative veneered plywood**

Dimension in millimetres

Thickness, t	Thickness tolerance within one panel	Tolerance on nominal thickness
t < 4	0.3	±0.20
4 ≤ t < 7	0.5	±0.30
7 ≤ t < 20	0.6	±0.40
t ≥ 20	0.6	±0.50

5.2 Surface appearance requirements and determination of quality grade

5.2.1 Determination of surface appearance

5.2.1.1 Apparatus

a) Scale magnifier glass;
b) Photoelectric integrating colour measurement instrument;
c) Steel rule, to an accuracy of 0.5 mm.

5.2.1.2 Test method

a) Inspect visually the surface appearance for each panel tested;
b) Classify the decorative veneered plywood in accordance with criteria given in Annex C.).

5.2.2 Quality grades

Decorative veneered plywood shall be classified by the surface appearance.

The list of characteristics which shall be taken into account is given in BCDC 6 (57) CD2/ISO 2426-1.

NOTE 1 An example of classification according to appearance classes is given in BCDC 6 (58) CD2/ISO 2426-2 and BCDC 6 (59) CD2/ISO 2426-3. The classes of the surface are chosen from classes E, I, or II. (See Annex C.)

NOTE 2 The quality grades of the face and back surface appearance are usually defined by contract.

Colour difference allowance shall follow the agreement or contract. Photoelectric integrating colour measurement instrument or photo electricity integral colourimeter shall be employed for arbitration, and

a) indiscernible refers to the total colour difference lower than 1.5,

b) inconspicuous refers to the total colour difference between 1.5 and 3.0, and

c) obvious refers to the total colour difference higher than 3.0.

5.3 Physical and chemical requirements, sampling, and test methods

5.3.1 Requirements

Unless otherwise specified, requirements and test methods given in TABLE 2 shall be fulfilled.

Determination of the formaldehyde release shall be carried out in accordance with ISO 12460-1 as the reference method and ISO 12460-3 or ISO 12460-4 for factory production control.

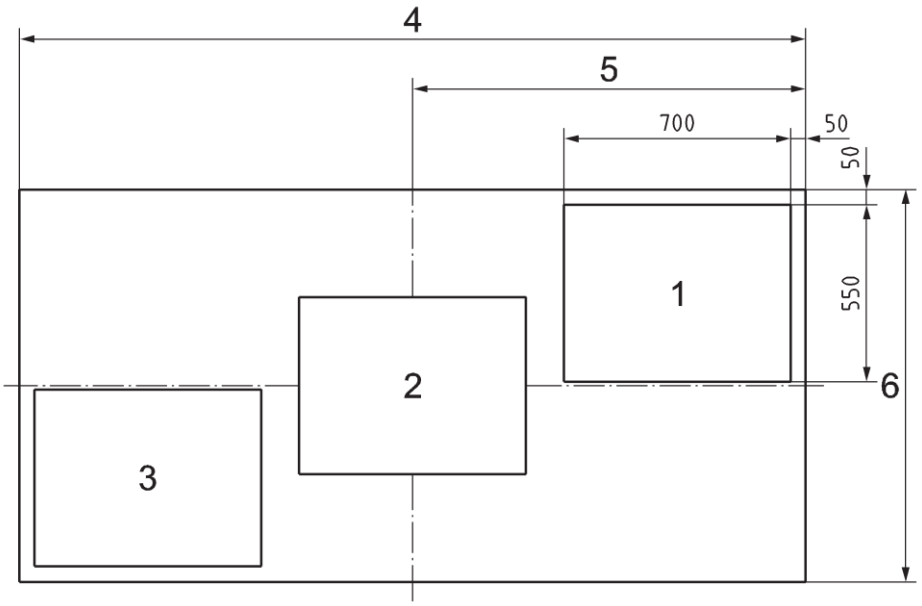
TABLE 2 — **Specifications**

Characteristics	Test method	Requirements
Moisture content (%)	ISO 16979	6.0 — 14.0
Immersion and delamination test	Annex A	Length of failure or delamination between surface veneer and plywood shall be less than 25 mm on each side.
High-low temperature cycle test	Annex B	No crack, blister, crinkle, on surface
Formaldehyde release [a]	ISO 12460-1	≤0.124 mg/m^3
NOTE If there is specific national or local law setting a lower limit of formaldehyde release, it applies.		
[a] If factory production control methods are employed to determine formaldehyde release, a correlation between the utilized method and the 1-cubic-meter chamber method as in ISO 12460-1 shall be established.		

When the faced decorative veneered plywood is manufactured in a two-stage process, the substrate plywood shall meet the requirements of BCDC 6 (60) CD2/ISO 12465.

5.3.2 Sampling and preparation of test pieces

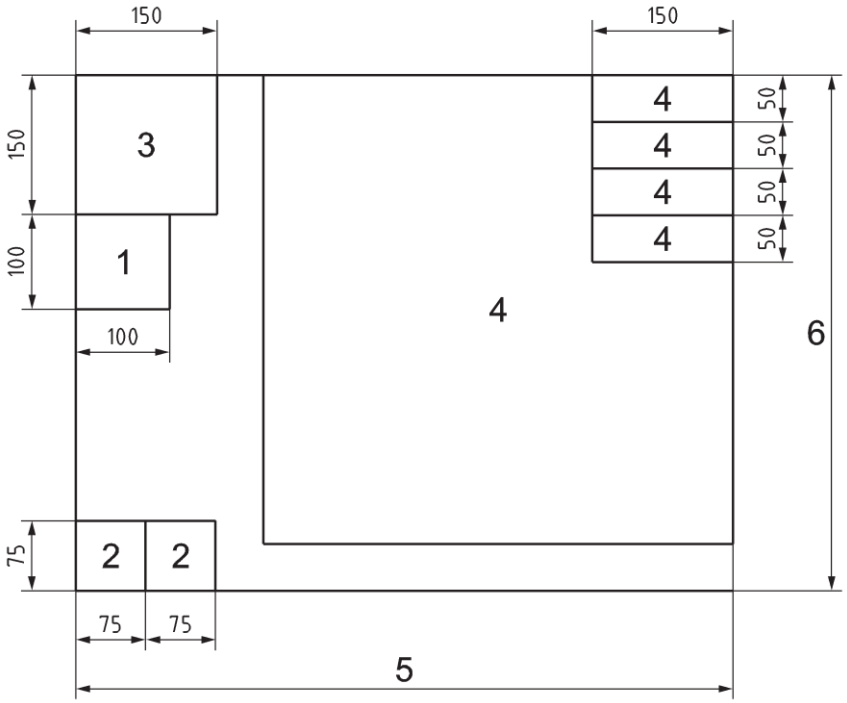
Preparation of test pieces for properties determination is given in FIGURE 1 and FIGURE 2. Three samples shall be cut from one panel to be tested as shown in FIGURE 1. Then test pieces for moisture content test, immersion and delamination test, high-low temperature cycle test, and formaldehyde release determination are cut as shown in FIGURE 2. All the test pieces shall be coded in sequence.



Key

1, 2, and 3 samples
4 length of panel
5 half-length of panel
6 width of panel

FIGURE 1 — **Example of cutting plan for test sample preparation**



Key

1, 2, 3, and 4 samples as given in Table 3

5 length of panel

6 width of panel

FIGURE 2 — **Example of cutting plan for test pieces preparation**

When cutting test pieces, it is possible to change the cutting position to avoid any defect that could affect the accuracy of test results. The surface of the test pieces shall be kept clean.

The dimension and number of test pieces shall follow the requirements in TABLE 3 with marking.

TABLE 3 — **Dimension and number of test pieces**

Property		Dimension (length × width) mm	Number	Marking of samples	Note
Moisture content		100 × 100 or at least	3	①	—
Immersion delamination		75 × 75	6	②	—
High-low temperature cycle		150 × 150	3	③	—
Formaldehyde release	1-Cubic-metre chamber method	500 × 500	2	④	Two test pieces could be taken from any position from test sample as shown in FIGURE 1.
	Desiccator method	150 × 50	10	④	—
	Gas analysis method	400 × 50	3	—	Cut from the same position as for the 1-Cubic-metre chamber method test pieces in FIGURE 2.

NOTE 1 For desiccator method, take 4, 3, and 3 test pieces separately from each of the three samples.

NOTE 2 Except the test pieces for moisture content, all test pieces shall be perpendicular to the plane of the panel, free of burns, and clean on edges. Dimension tolerance is ±0.5 mm.

5.4 Conformance

Decorative veneered plywood conforming to this standard shall be manufactured under a quality system which

a) includes factory production and quality-control with internal auditing and
b) includes external auditing of the factory quality control.

When the quality control system is certified, the bodies performing certification should operate in accordance with ISO/IEC 17065.

6 Marking, identification and documentation

Marking and the accompanying information shall be placed on the product itself, on a label attached to it, on its packaging or in the accompanying commercial documents with the following information:

a) reference to this Tanzania Standard;
b) name (or logo) or code of the manufacturer;
c) nominal dimensions, in millimetres;
d) species, or species group type of veneers;
e) bonding class;
f) formaldehyde release class;
g) reference to the quality system; and optionally
h) quality label and the certification body, if any;

i) batch number or producing dates.

NOTE Further documents, if requested, will be provided by the manufacturer.

Annex A
(normative)

Immersion and delamination test

A.1 Principle

Bonding quality shall be determined according to whether there is delamination of the surface veneer and the degree of the delamination. Test pieces are soaked in water and dried as dry-shrinking and wet- swelling cause stress within the glue line under the face.

A.2 Apparatus

a) **Thermostatically controlled water bath**, capable of maintaining a temperature of (20 ± 3) °C;
b) **Boiling tank**, enabling test pieces to be immersed in boiling water;
c) **Ventilated drying oven**, capable of maintaining a temperature of (63 ± 3) °C;
d) **Vernier**, with an accuracy of 0.1 mm;
e) **Steel rule**, with an accuracy of 0.5 mm.

A.3 Test methods

Immersion and delamination tests shall be carried out according to the exposure classes of panels to be tested.

A.3.1 Pretreatment

Procedure of pretreatment shall be carried out in accordance with ISO 12466-1.

The classification given in ISO 12466-2 provides the information on the pretreatment to be carried out.

A.3.2 Test procedures

After being pretreated, the test pieces of different bonding quality classes of decorative veneered plywood shall be hold 3 h in a ventilated drying oven under (63 ± 3) °C.

A.4 Expression of result and test report

Check if there is any failure and delamination between the surface veneer and the substrate.

Measure and record the length of each failure on the glue lines as indicated in FIGURE A.1 and add up when there are more than one, with an accuracy of 1 mm.

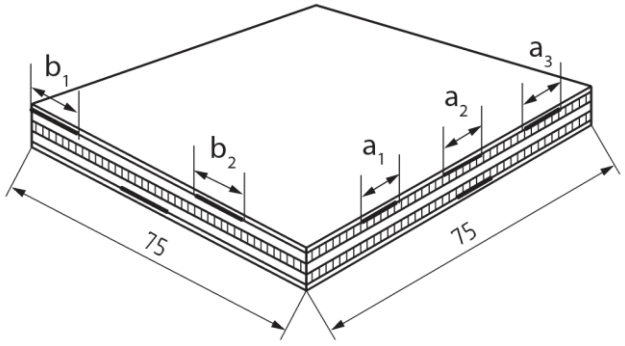


FIGURE A.1 — **Example of immersion and delamination test sample glue line failure**

Annex B
(normative)

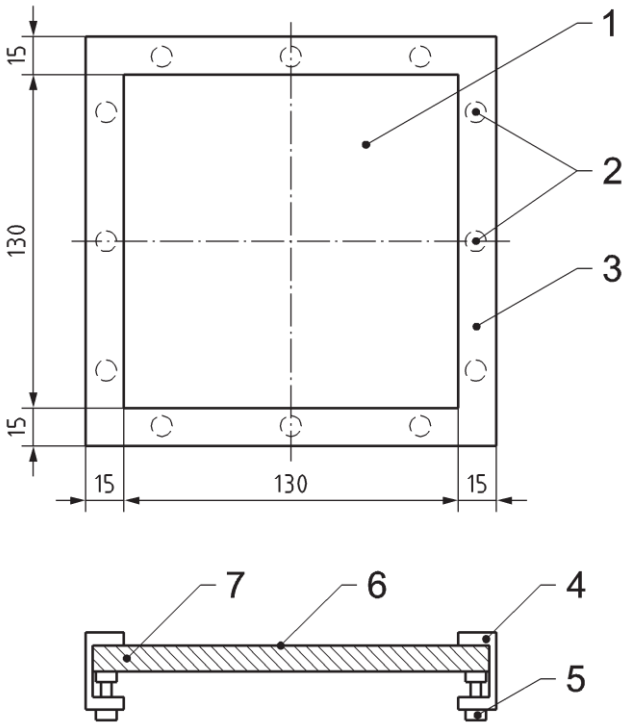
High-low temperature cycle test

B.1 Principle

Being pretreated under high-low temperature cycle, the resistance of decorative veneer to heat-cold effects shall be classified according to appearance behaviour change.

B.2 Instrument and apparatus

a) **Ventilated drying oven**, capable of maintaining a temperature of (80 ± 3) °C;
b) **Refrigerator**, capable of maintaining a temperature of (−20 ± 3) °C;
c) **Metal frame and test piece fixing method**, shown in FIGURE B.1.



Key

1 and 6	surface of test piece	2 and 5	bolt
3 and 4	frame		
7	test piece		

FIGURE B.1 — **Metal frame and test piece fixing method**

B.3 Procedure

Fix test piece in metal frame as shown in FIGURE B.1. Place the metal frame with the test piece into the ventilated drying oven and heat for 2 h at (80 ± 3) °C. Then transfer the metal frame with the test piece into the refrigerator at (−20 ± 3) °C for 2 h. Repeat the procedure two times, take the metal frame with the test piece out, and cool down under room temperature.

B.4 Test results and expression of results

Record any crack, blister, or crinkle on the veneer surface, if observed.

Annex C
(informative)

Classification by surface appearance

C.1 Classification by surface appearance — Hardwood (BCDC 6 (58) CD2:2020/ISO 2426-2:2000)

C.1.1 Characteristics inherent in wood

Classification according to characteristics inherent in wood is given in TABLE C.1

TABLE C.1

Categories of characteristics	**Appearance class**		
	E	**I**	**II**
Pin knots[a]	Practically absent	3/m^2 permitted	permitted
Sound intergrown knots		Permitted up to an individual diameter of	
		15 mm, provided their cumulative diameter does not exceed 30 mm/m^2	35 mm
		Such knots may have splits provided they are	
		Very slight	Slight
Unsound or non-adhering knots and knot holes		Permitted up to an individual diameter of	
		6 mm if filled and up to a number of 2/m^2	5 mm if unrepaired 10 mm if filled and up to a number of 3/m^2
Splits open		Permitted if less than	
		1/10	1/5
		of panel length up to an individual width of	
		3 mm	5 mm
		and up to a number of	
		3/m	3/m
		of panel width if properly filled	
Splits closed		Permitted	
Abnormalities due to insects, marine borers, and parasitic plants	Not permitted	Not permitted	Marks of parasitic plants not permitted. Insects and marine borer holes permitted up to a diameter of 3 mm vertically to the plane of the panel Up to a number of 10/m^2
Inbark	Not permitted	Permitted up to a width of 5 mm if properly filled	Permitted up to a width

NOTE Characteristics inherent to wood are permitted, provided that they do not impair the serviceability of the panel.

TABLE C.1 (continued)

Categories of characteristics	Appearance class		
	E	I	II
Irregularities in the structure of the wood	Practically absent	Permitted if very slight	Permitted if slight
Discoloration which is not wood-destroying		Permitted if low contrast	
Fungal decay wood-destroying	Not permitted		
Other characteristics	Practically absent	To be considered under the category which they most closely resemble	
NOTE Characteristics inherent to wood are permitted, provided that they do not impair the serviceability of the panel.			

C.1.2 Manufacturing defects

Classification according to manufacturing defects is given in TABLE C.2

TABLE C.2

Categories of defects	Appearance class		
	E	I	II
Open joints	Not permitted		Permitted up to a width of 3 mm and up to a number of 1/m of panel width with joints filled if more than 1 mm in width
Overlaps	Not permitted		Permitted to a number of 1/m^2 and
Blisters	Not permitted		
Hollows, imprints, and bumps	Not permitted		Permitted if slight
Roughness	Not permitted		Permitted if slight
Sanding through	Not permitted		
Glue penetration	Not permitted		Permitted if slight and
Foreign particles	Not permitted		Ferrous particles non permitted
Repairs 1) Patches 2) Shims	Practically without defects	Permitted if properly made and tightly filled up to a number of 3/m^2 6/m^2	
3) synthetic fillers	Not permitted	Not permitted	Permitted within limits of the cate- gory which is most closely
Defects at the panel edges due to sanding or sawing	Practically without defects	Permitted up to 2 mm from the edge	Permitted up to 5 mm from the edge
Other defects		To be considered under the category which it most closely	
NOTE Manufacturing defects are permitted, provided that they do not impair the serviceability of the panel.			

C.2 Classification by surface appearance — Softwood (BCDC 6 (59) CD2: 2020/ISO 2426-3:2000)

C.2.1 Characteristics inherent in wood

Classification according to characteristics inherent in wood is given in TABLE C.3.

TABLE C.3

<table>
<tr><th rowspan="2">Categories of characteristics</th><th colspan="3">Appearance class</th></tr>
<tr><th>E</th><th>I</th><th>II</th></tr>
<tr><td>Pin knots[a]</td><td rowspan="12">Practically absent</td><td>3/m^2 permitted</td><td>permitted</td></tr>
<tr><td rowspan="4">Sound intergrown knots</td><td colspan="2">Permitted up to an individual diameter of</td></tr>
<tr><td>15 mm provided their cumulative diameter does not exceed 30 mm/ m^2</td><td>50 mm</td></tr>
<tr><td colspan="2">Such knots may have splits provided they are</td></tr>
<tr><td>Very slight</td><td>slight</td></tr>
<tr><td rowspan="3">Unsound or non-adhering knots and knot holes</td><td colspan="2">Permitted up to an individual diameter of</td></tr>
<tr><td>6 mm if filled and up to a number of 2/m^2</td><td>5 mm if unrepaired
25 mm if filled and up to a number of 6/m^2</td></tr>
<tr><td rowspan="7">Splits open</td><td colspan="2">Permitted if less than</td></tr>
<tr><td>1/10</td><td>1/3</td></tr>
<tr><td colspan="2">of panel length up to an individual width of</td></tr>
<tr><td>3 mm</td><td>10 mm</td></tr>
<tr><td colspan="2">and up to a number of</td></tr>
<tr><td>3/m</td><td>3/m</td></tr>
<tr><td colspan="2">of panel width</td></tr>
<tr><td>If properly filled</td><td>All splits greater than 2 mm in width to be filled</td></tr>
<tr><td>Splits closed</td><td colspan="2">Permitted</td></tr>
<tr><td>Abnormalities due to insects, marine borers and parasitic plants</td><td>Not permitted</td><td>Not permitted</td><td>Marks of parasitic plants not permitted.
Insects and marine borer holes permitted up to a diameter of 3 mm vertically to the plane of the panel
Up to a number of 10/m^2</td></tr>
<tr><td>Resin pockets and inbark</td><td>Not permitted</td><td>Not permitted</td><td>Permitted up to a width of 6 mm if</td></tr>
<tr><td>Resin streaks</td><td>Not permitted</td><td>Not permitted</td><td>Permitted if slight</td></tr>
<tr><td>Irregularities in the structure of the wood</td><td rowspan="2">Practically absent</td><td>Permitted if very slight</td><td>Permitted if slight</td></tr>
<tr><td>Discoloration which is not wood- destroying</td><td colspan="2">Permitted if low contrast</td></tr>
<tr><td>Fungal decay wood-destroying</td><td colspan="3">Not permitted</td></tr>
<tr><td>Other characteristics</td><td>Practically absent</td><td colspan="2">To be considered under the category which they most closely resemble</td></tr>
<tr><td colspan="4">NOTE Characteristics inherent to wood are permitted provided that they do not impair the serviceability of the panel.
[a] Sound intergrown knots of no more than 3 mm diameter.</td></tr>
</table>

C.2.2 Manufacturing defects

Classification according to manufacturing defects is given in TABLE C.4.

TABLE C.4

Categories of defects	Appearance class		
	E	I	II
Open joints	Not permitted		Permitted up to a width of 3 mm and up to a number of 1/m of panel width with joints filled if more than 1 mm in width
Overlaps	Not permitted		Permitted to a number of 1/m^2 and
Blisters	Not permitted		
Hollows, imprints and bumps	Not permitted		Permitted if slight
Roughness	Not permitted		Permitted if slight
Sanding through	Not permitted		
Glue penetration	Not permitted		Permitted if slight and
Foreign particles	Not permitted		Ferrous particles non
Repairs 1) Patches 2) Shims	Practically without defects	Permitted if properly made and tightly filled up to a number of 5/m^2 unlimited	
3) synthetic fillers	Not permitted	Not permitted	Permitted within limits of the cate- gory which is most
Defects at the panel edges due to sanding or sawing	Practically without defects	Permitted up to 2 mm from the edge	Permitted up to 5 mm from the edge
Other defects		To be considered under the category which is most closely	
NOTE Manufacturing defects are permitted provided that they do not impair the serviceability of the panel.			