



The world leader in birch plywood
production

CATALOG OF PLYWOOD GRADES

Norms of restrictions of plywood processing defects
in accordance with the requirements of STO (corporate standard) 00255177-001-2013



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Part 2

DESCRIPTION OF THE DEFECTS

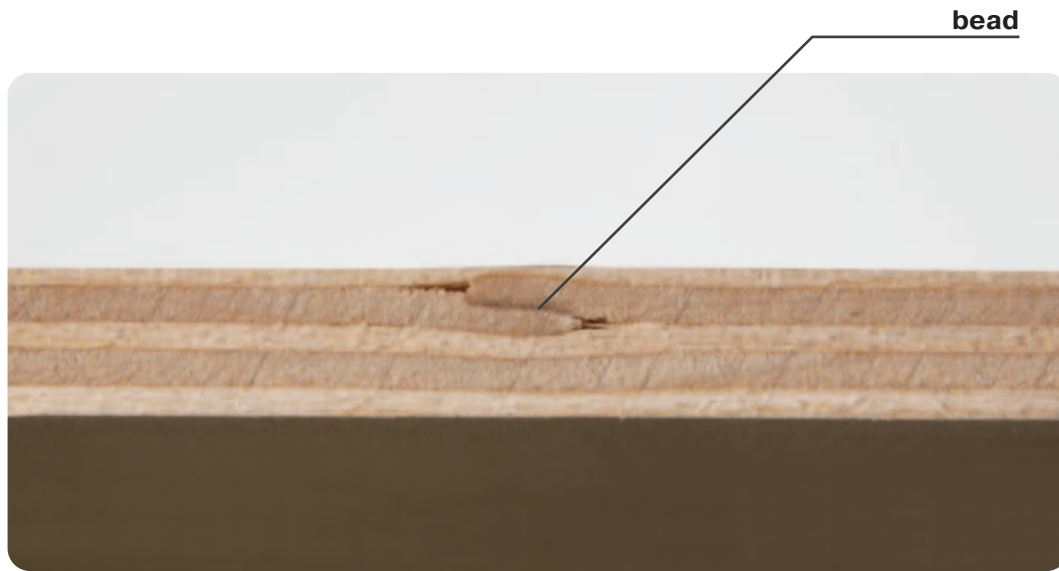


1. BEADS FROM SIDE PLATES (TRACES OF SIDE PLATES)

Bead means a local thickening caused by overlapping of the inner layers of veneer sheet.



Both length and width shall be measured.



B, S, B Sel, S Sel
Not allowable

BB, BBx
Allowable length
is up to 200 mm;
width is up to 10 mm,
or 3 pcs/sheet.

CP, WGE
Allowable length
is up to 600 mm;
width is up to 10 mm,
or 5 pcs/sheet.

WG
Allowable
width is up to 10 mm.

C, CC
Allowable
without limitations.



2. BIOLOGICAL DEFECTS (WORMHOLES)

Wormhole means channels or holes left in the timber by insects or larvae.



Wormhole shall be measured at the part with largest diameter.



B, S, B Sel, S Sel, BB, BBx, CP, WG, WGE, C, CC

It is allowable within the total number
in accordance with the norms for black knots.



3. BLISTERS, DELAMINATION, BARK

Blister is local plywood surface bulging due to delamination.

Delamination is separation of two adjacent veneer sheet layers along glue line.

Bark is part of bark or bast remaining on veneer sheet area.

Blister



Delamination



Bark



B, S, B Sel, S Sel, BB, BBx, CP, WG, WGE, C, CC
Not allowable



4. CLOSED CRACKS

Closed shake is a chap with width not more than 0.2 mm.



Closed shake is measured on maximal length and width.



B, S

Allowable the length up to 200 mm, 5 pcs/m of sheet width.

B Sel, S Sel

Allowable the length up to 200 mm, 2 pcs/m of sheet width.

BB, BBx

Allowable the length up to 300 mm, 5 pcs/m of sheet width.

CP, WG, WGE, C, CC

Edge and medial ones are allowable without number limitation.



5. COLOR DEFECTS WITH PARTIAL WOOD DEFECTS

Non sound color change means undue in color wood parts with reducing of hardness caused by wood-destroying fungi.



B, S, B Sel, S Sel, BB, BBx, CP, WG, WGE, C
Not allowable

CC

Allowable in the form of separate strips
with width not more than 30 mm,
length up to 200 mm,
2 pcs/m of sheet length.



6a. DEAD KNOTS, FALLING OUT KNOTS, HOLES FROM FALLEN OUT KNOTS (WITHOUT BARK)

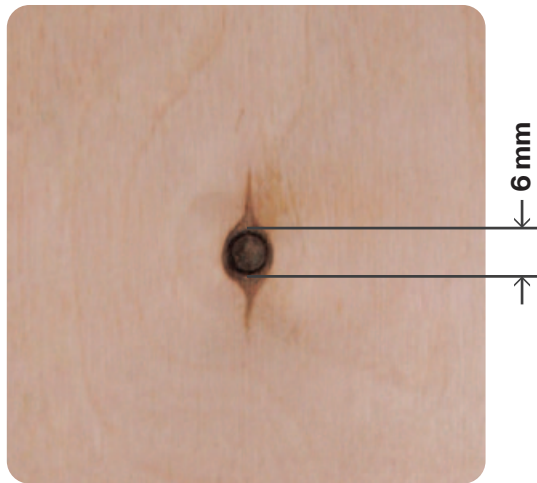
Black knot is a knot without intergrowth of annual rings with surrounding wood or intergrowth along less than 1/4 of knot size perimeter.

Fallen out knot is a knot without intergrowth with surrounding wood and tightly standing in it.

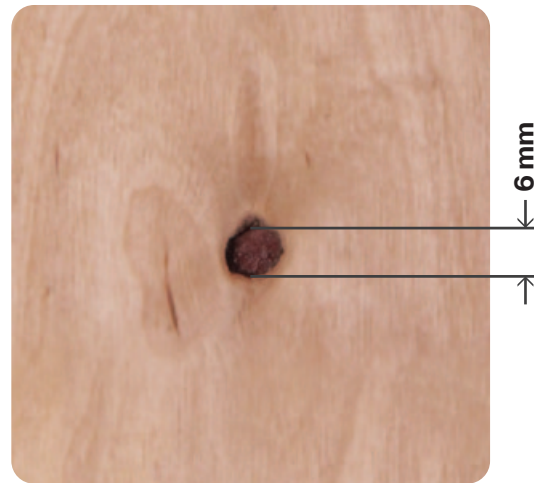


Arithmetical average of minimal and maximal diameters is set as knot (hole) diameter.

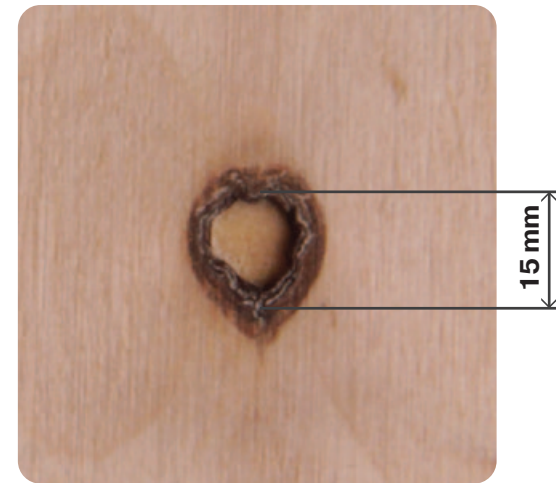
Fallen out knot



Hole of fallen out knot



Hole of fallen out knot



B, S, BB, BBx

Allowable among black knots with diameter up to 6 mm, 3 pcs/.m².

B Sel, S Sel

Allowable with diameter up to 6 mm, 2 pcs/m².

CP, WGE

Allowable with diameter up to 6 mm and without number limitations.

WG

Allowable with diameter up to 15 mm, 7 pcs/m².



6b. DEAD KNOTS, FALLING OUT KNOTS, HOLES FROM FALLEN OUT KNOTS (WITHOUT BARK)

Black knot is a knot without intergrowth of annual rings with surrounding wood or intergrowth along less than 1/4 of knot size perimeter.

Fallen out knot is a knot without intergrowth with surrounding wood and tightly standing in it.



Arithmetical average of minimal and maximal diameters is set as knot (hole) diameter.



C Allowable with diameter up to 40 mm and without number limitations.

CC

Allowable with diameter up to 70 mm and without number limitations.



7. DENTS

Dent means a local denting of the external layer.



Dent length, width and depth shall be measured.

Dent



Dent caused by gum



B, S, B Sel, S Sel, BB, BBx
Not allowable

CP, WGE
Allowable height (depth)
is up to 0.5 mm,
length is up to 120 mm,
and width is up to 10 mm.

WG
Allowable width
is up to 120 mm.

C, CC
Allowable



8. DEVIATIONS IN WOOD STRUCTURE (CURLY-GRAIN, BURL)

Curly-grain is curved or disordered arrangement of wood fibers.

Burl is local curvature of annual rings caused by knots and bark pockets.



Curly-grain, eyes and burls are not measured. Their presence is registered as assortment making feature.

Curly-grain



Burl



Allowable all sorts with no limitation.



9. DEVIATIONS IN WOOD STRUCTURE (EYES)

Eyes mean traces of non-deferred shoots. Eyes diameter is not more than 5 mm.

Dark eyes mean eyes with much darker wood than surrounding wood.

Light eyes mean eyes with wood color similar to surrounding wood.

Group eyes mean eyes grouped by three or more and separated in not more than 10 mm.



Curly-grain, eyes and burls are not measured. Their presence is registered as assortment making feature.

Light eye



Group light eyes



Dark eye



B, S, BB, BBx, CP, WG, WGE, C, CC
Allowable without number limitation.

B Sel, S Sel
Allowable
excluding dark eyes.



10. DOUBLE PLUG REPAIR



B, S, B Sel, S Sel, BBx
Not allowable

BB
Allowable
max 1 pcs/m².

CP, WG, WGE, C, CC
Allowable without number
limitation but not in color
and orientation.



11. EDGE DEFECTS BECAUSE OF GRINDING, CUTS (EDGING), VENEER SHORTAGE

Veneer shortage means a defect characterized by lack of part of the veneer sheet in the plywood.

Edging means continuous or discontinuous area on the edge of the plywood with not completely separated wood fibers.



Edge defects because of grinding, cuts, veneer shortage measured along the max distance from the defect to the plywood sheet edge.

Veneer shortage



Veneer shortage



Veneer shortage in the inner layers



Shatters (defect due to cutting)



B, B Sel, S Sel
Not allowable

S, BB, BBx, CP, WG, WGE
Allowable width
is up to 5 mm along the edge.

C
Allowable width
is up to 10 mm.

CC
Allowable width
is up to 25 mm.

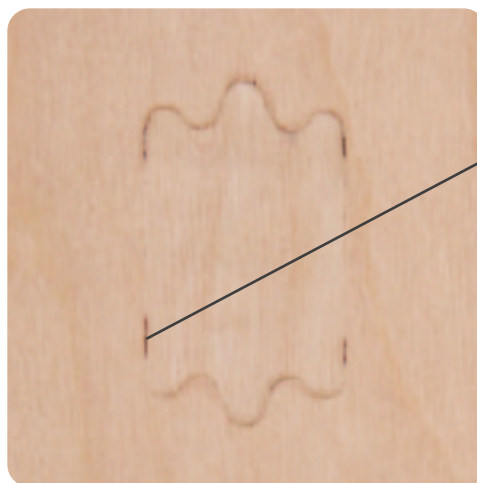


12. GLUE SEEPAGE

Glue seepage is a defect in the form of strips and spots on plywood surface caused by glue penetration from lower glue layer.



It is determined as sum of separate spots squares on plywood surface to whole sheet area.



seepage over plug



B, B Sel, S Sel
Not allowable

S
Allowable
up to 1% of sheet area.

BB, BBx
Allowable up to 2% of sheet area
(for 3 to 21 mm thickness).
Allowable up to 5% of sheet area
(for thickness 24 mm and above).

CP, WGE
Allowable up to 5% of sheet area
(for 3 to 21 mm thickness).
Allowable up to 10% of sheet area
(for thickness 24 mm and above).

WG
Allowable up to 10% of sheet area (for 3 to 21 mm thickness).
Allowable up to 15% of sheet area (for thickness 24 mm and above).

C, CC
Allowable



13. GLUE THREAD



glue thread



B, S, B Sel, S Sel, BB, BBx
Not allowable

CP, WG, WGE, C, CC
Allowable



14. GRINDING OF OUTER LAYERS

Grinding of outer layers is local removing of veneer sheet external layer to glue layer.

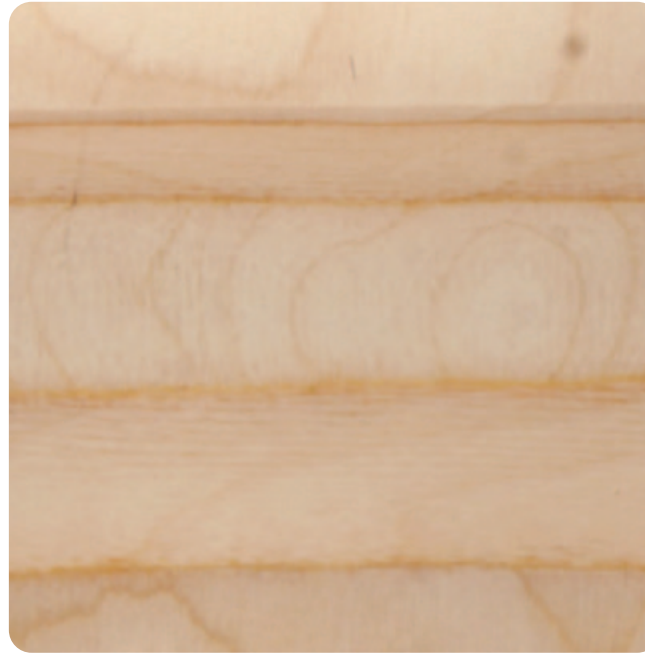


Measured along the length and width of the area of their location, and shall be expressed in percentage of the plywood sheet square.

Grinding on MR-glywood



Grinding on WBP plywood



B, S, B Sel, S Sel, BB, BBx
Not allowable

CP, WG, WGE

Allowable up to 1% of sheet area (for 3 to 21 mm thickness).

Allowable up to 2% of sheet area (for thickness 24 mm and above).

C, CC

Allowable up to 5% of sheet area.



15. INSERTED GLUED VENEER PARTS

Inserted glued veneer parts mean parts of veneer sheet glued (pressed) on plywood surface.



Patched parts are measured by length and width.



B, S, B Sel, S Sel, BB, BBx
Not allowable

CP, WG, WGE
Allowable length is up to 150 mm,
width is up to 30 mm;
1 pcs per sheet.

C, CC
Allowable

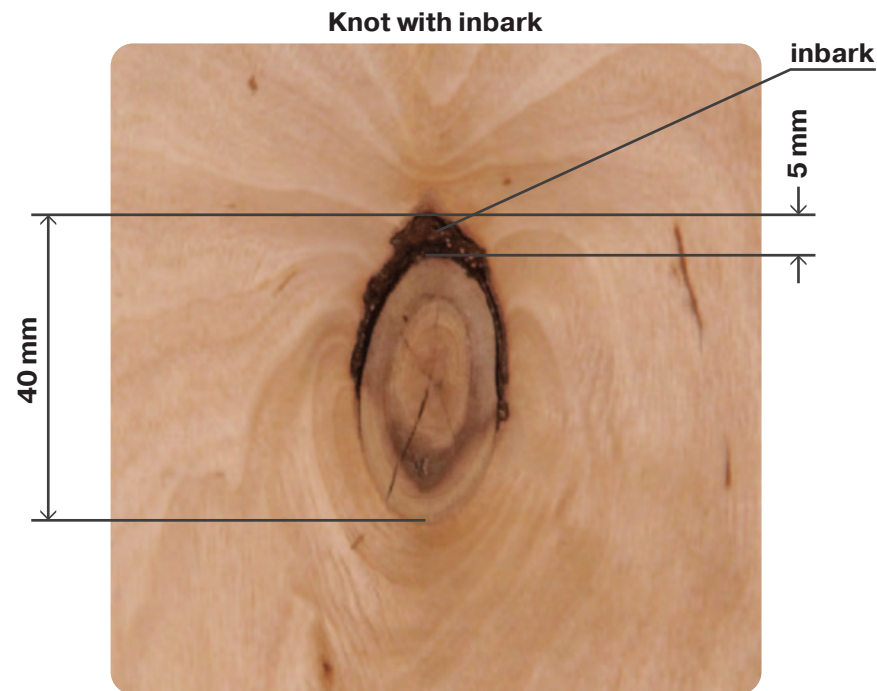


16. KNOTS WITH BARK INCLUSIONS, HOLES FROM FALLEN OUT KNOTS

Inbark is part of bark remaining on knot surface.



Arithmetical average of minimal and maximal diameters is set as knot (hole) diameter.



B, S, B Sel, S Sel, BB, BBx, CP, WG, WGE
Not allowable

C
Allowable with diameter up to 40 mm and no limitations in number (bark patch inclusions are allowable nearby knot with width 5 mm).

CC
Allowable with diameter up to 70 mm and no limitations in number (bark patch inclusions are allowable nearby knot with width 5 mm).



17a. LIVE SOUND KNOTS (LIGHT AND DARK)

Intergrown knot is a knot with annual rings intergrown with surrounding wood along not less than 3/4 of knot section perimeter.

Sound knot is a knot with wood free of dote.

Light sound knot is a sound knot with light wood similar in color to surrounding wood.

Dark sound knot is a sound knot with wood much darker than surrounding wood, richly saturated with tar, tanning and heart materials, often with mottling.

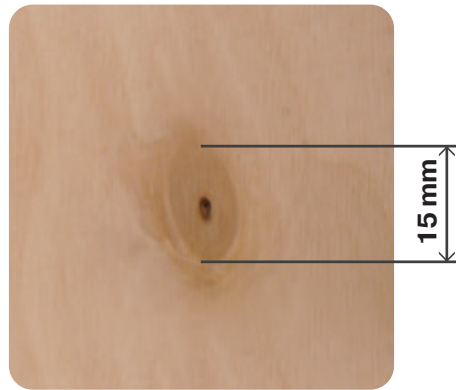


Arithmetical average of minimal and maximal diameters is set as knot (hole) diameter.

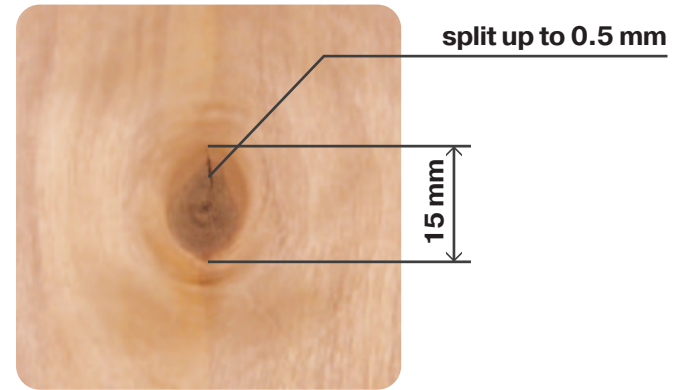
Light knot



Light knot



Dark knot



B
Light ones
with diameter up to 15 mm
with chap up to 0.5 mm,
5 pcs/m² are allowable.

S
Light and dark ones
with diameter up to 15 mm
with chap up to 0.5 mm,
5 pcs/m² are allowable.

B Sel, S Sel
Not allowable



17b. LIVE SOUND KNOTS (LIGHT AND DARK)

Intergrown knot is a knot with annual rings intergrown with surrounding wood along not less than 3/4 of knot section perimeter.

Sound knot is a knot with wood free of dote.

Light sound knot is a sound knot with light wood similar in color to surrounding wood.

Dark sound knot is a sound knot with wood much darker than surrounding wood, richly saturated with tar, tanning and heart materials, often with mottling.



Arithmetical average of minimal and maximal diameters is set as knot (hole) diameter.

Light knot



Dark knot with chap



Dark intergrown knot



BB, BBx

Light and dark ones with diameter up to 25 mm with chap up to 1 mm, 10 pcs/m² are allowable.

CP, WGE

Light and dark ones with no limitation in diameter with chap up to 1 mm are allowable.

WG, C, CC

Light and dark ones with no limitation in diameter and number are allowable.

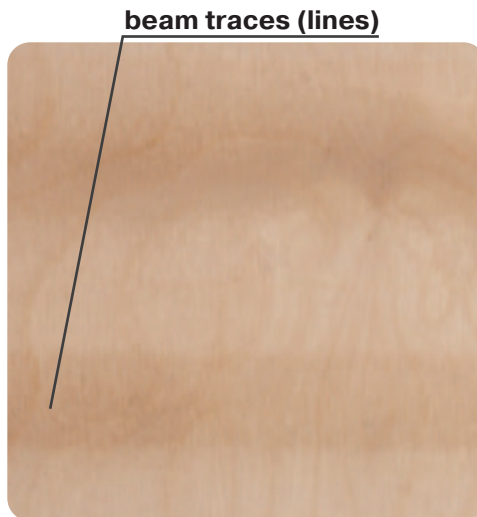
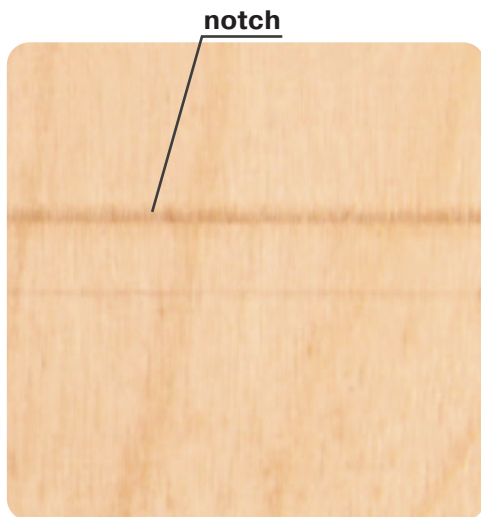


18. MANUFACTURING STAINS (BEAM TRACES, LINES)

Notch is a trace of cutter on material surface.



Determined as assortment making feature.



B, S, B Sel, S Sel
Not allowable

BB, BBx
Allowable not more
than 10% of sheets in pack.

CP, WG, WGE, C, CC
Allowable



19. MECHANICAL DAMAGE (SPLITS, KERFS)

Split is local damage by sharp object.

Kerf is local damage in sawing process.

Breaking out is surface cavity due to local wood removing during processing.



The largest diameter of pinhole is measured.

Split



Kerf



Breaking out of grain



B, S, B Sel, S Sel, BB, BBx, CP, WG, WGE, C, CC

It is allowable within the total number
in accordance with the norms for black knots.

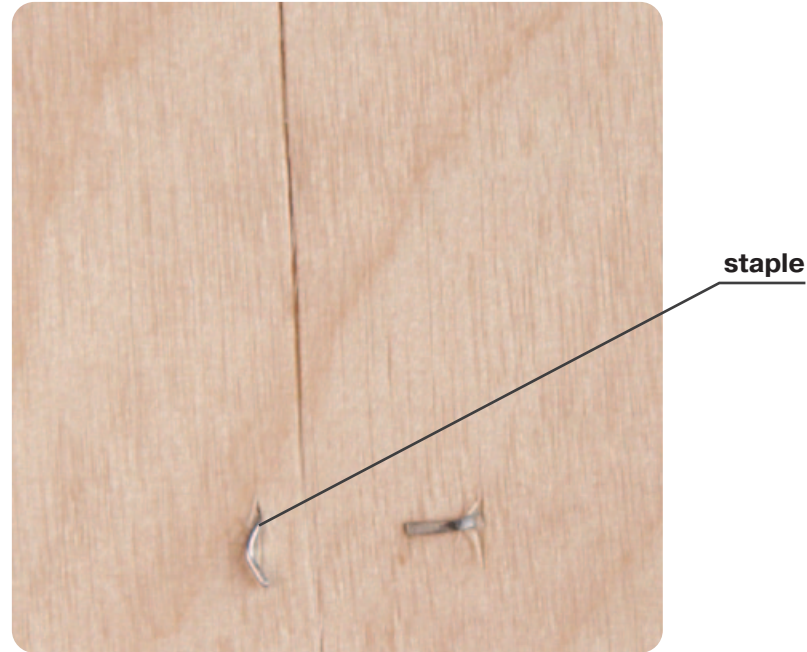


20. METAL INCLUSIONS

Metal inclusions mean metal inclusions such as nonferrous metals staples etc., in inner and external plywood layers.



Not measured, determined as assortment making feature.



B, S, B Sel, S Sel, BB, BBx
Not allowable

CP, WG, WGE, C, CC
Nonferrous metals staples
are allowable.



21. MINERAL STREAKS, SAP STAINS (BLUESTAIN, COLOR SAP SPOTS), COLOR CHANGE AT WOOD STORAGE

Mineral streak is wood coloration in pale shades not masking its structure.

Bluestain is sap grey coloration with faint bluish tinge greenish cast.

Color sap spots are orange, yellow, pink (to light-purple) and brown sap color.



The defects shall be measured along the length and width of the area of their location, and shall be expressed in percentage of the plywood sheet square.

Bluestain



Color change at wood storage



Color sap spots



Water spots



B, S
Allowable up to 30%
of sheet area.

B Sel
Not allowable

S Sel
Allowable on 5%
of sheet area.

BB, BBx
Allowable up to 50%
of sheet area
(with false core).

CP, WG, WGE
Allowable up to 75%
of sheet area
(with false core).

C, CC
Allowable
without limitation.

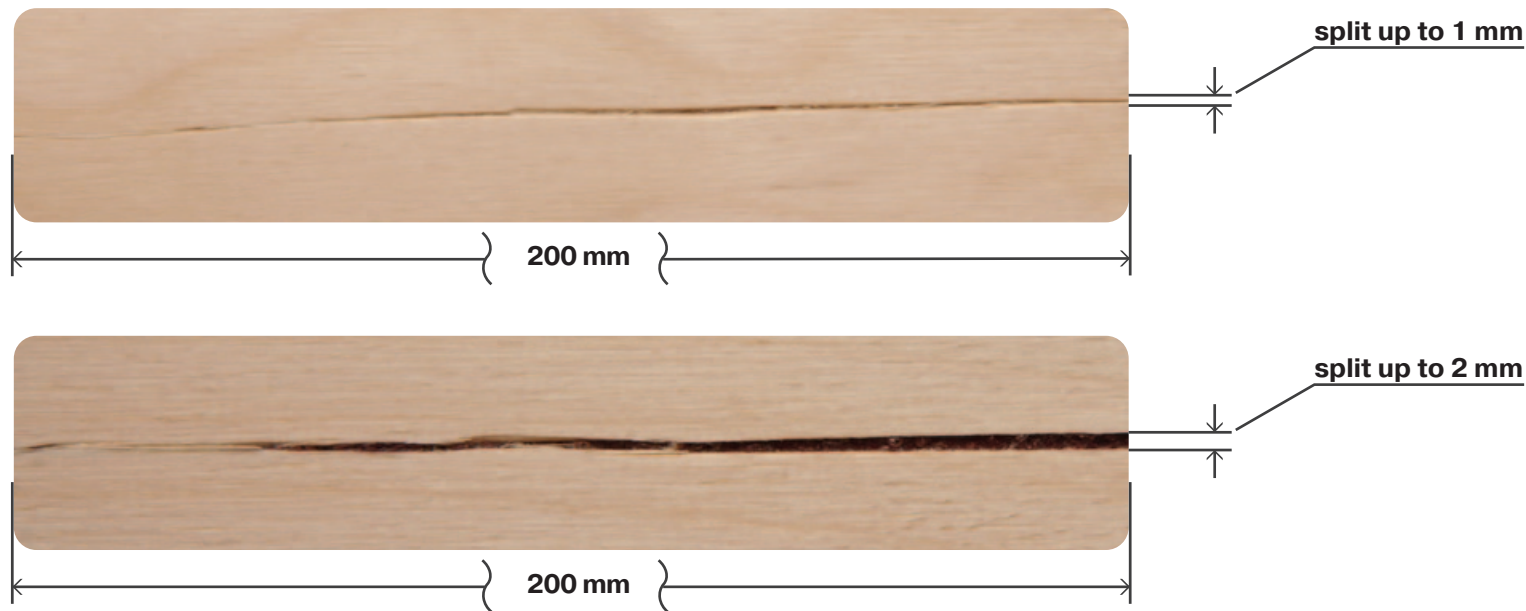


22a. OPEN SPLITS, OPEN SEAM ON SPLICED VENEER

Open splits is a split with width over 0.2 mm.



Open splits and open seam are measured by maximal length and width.



B, B Sel
Not allowable

S, S Sel
Allowable the length
up to 200 mm,
width up to 1 mm,
2 pcs/m of sheet width.

BB
Allowable the length
up to 250 mm,
width up to 2 mm,
3 pcs/m of sheet width.

BBx
Allowable the length
up to 200 mm,
width up to 2 mm,
3 pcs/m of sheet width.

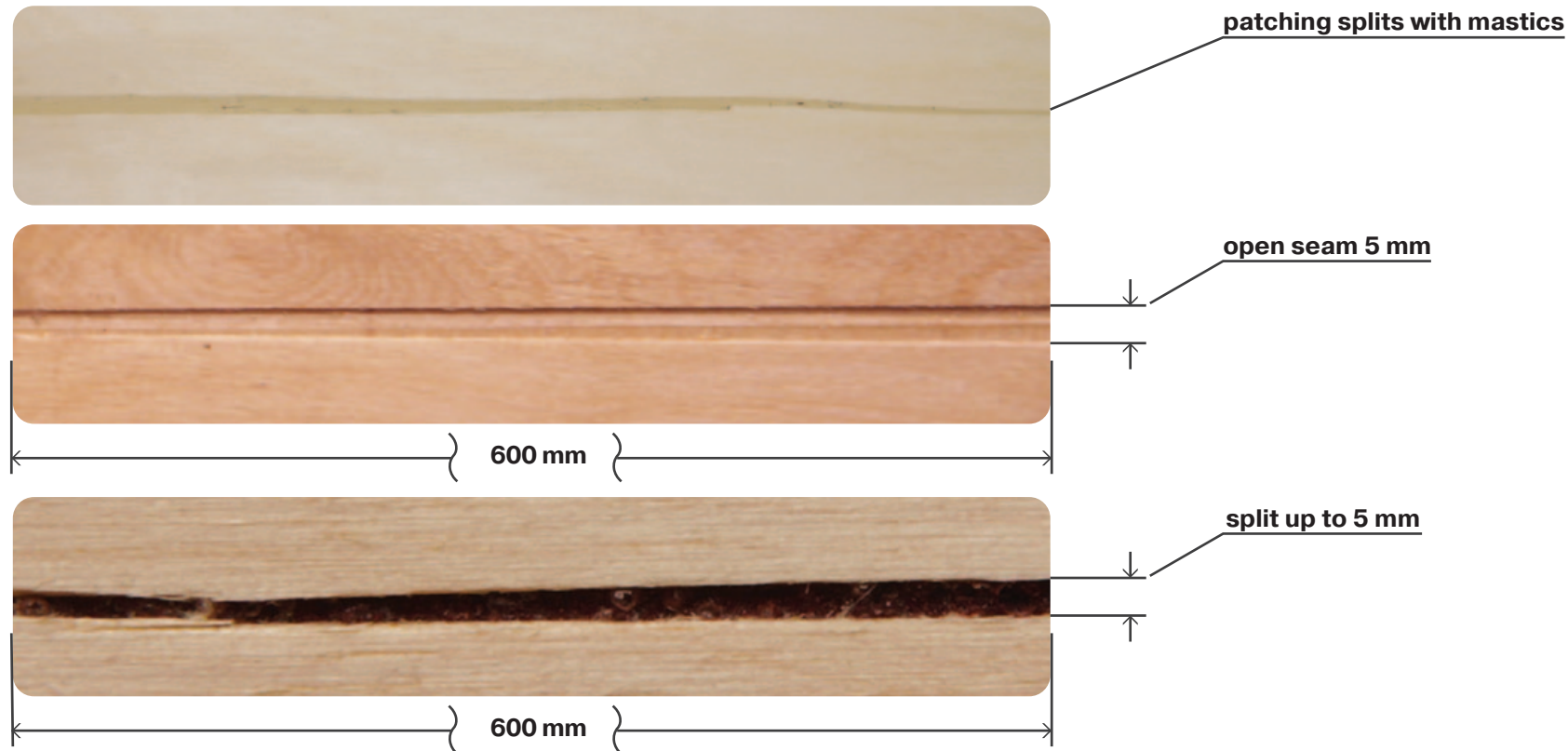


22b. OPEN SPLITS, OPEN SEAM ON SPLICED VENEER

Open splits is a split with width over 0.2 mm.



Open splits and open seam are measured by maximal length and width.



CP, WGE

Allowable the length up to 600 mm, width up to 2 mm, 2 pcs/m of sheet width.

Allowable the length up to 600 mm, width up to 5 mm, providing patching with mastic.

WG

Allowable the length up to 600 mm, width up to 5 mm, 2 pcs /m of sheet width.

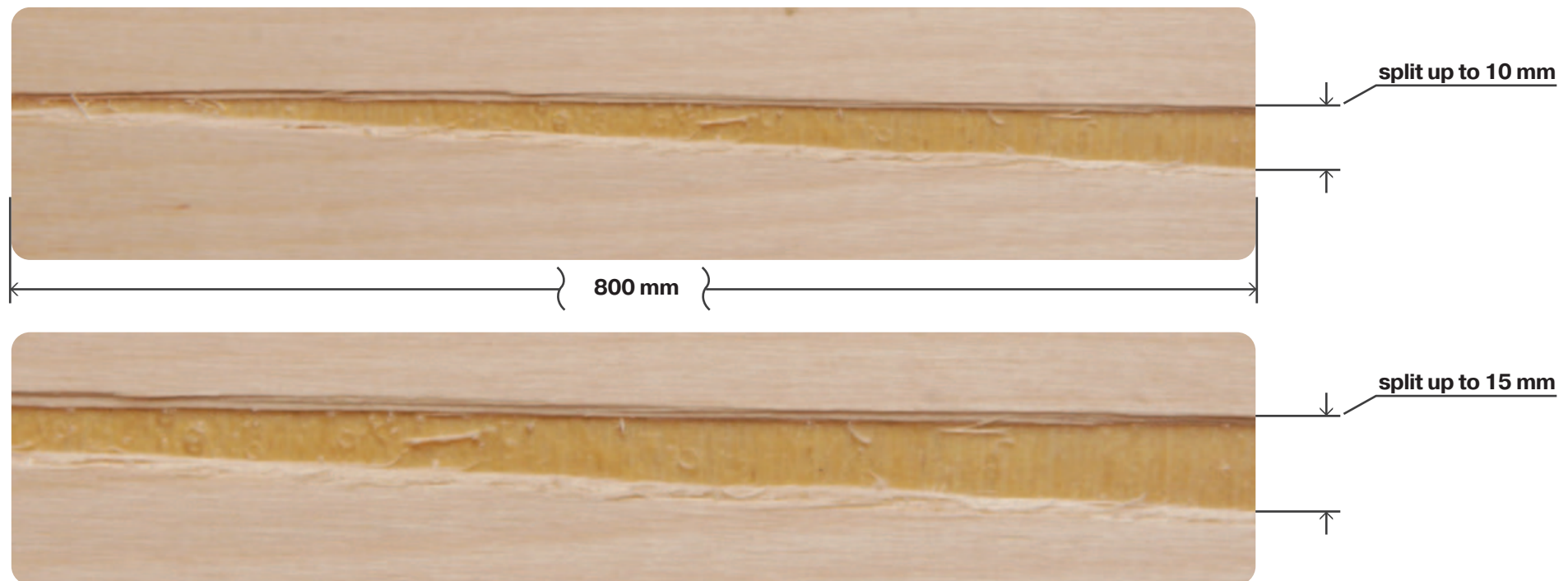


22c. OPEN SPLITS, OPEN SEAM ON SPLICED VENEER

Open splits is a split with width over 0.2 mm.



Open splits and open seam are measured by maximal length and width.



C
Allowable the length up to 800 mm,
width up to 10 mm,
without number limitations.

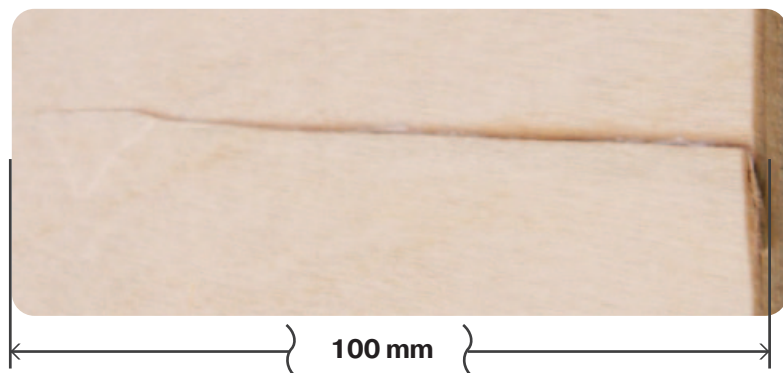
CC
Allowable with the width
up to 15 mm,
without number limitations.

23. OVERLAPPING

Overlapping is a local thickening caused by overlapping of veneer sheets in the external layer of plywood.



Overlapping is measured on maximal length and width.



B, S, B Sel, S Sel
Not allowable

BB, BBx
Allowable
the length
up to 100 mm,
width up to 2 mm,
1 pcs/m of sheet width.

CP, WGE
Allowable
the length
up to 300 mm,
width up to 2 mm,
2 pcs/m of sheet width.

WG
Allowable
the length
up to 600 mm,
width up to 4 mm,
2 pcs/m of sheet width.

C, CC
Allowable
without limitation.

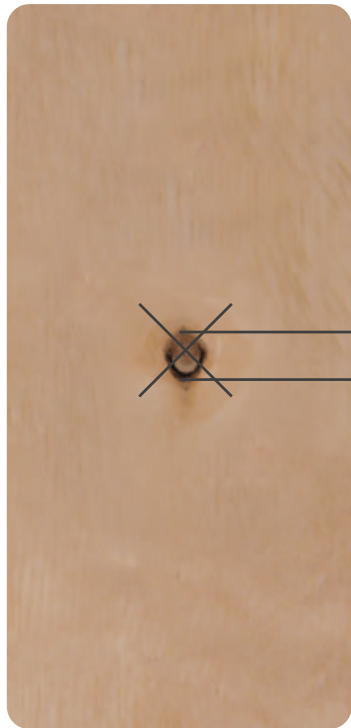


24. PARTIALLY INTERGROWN KNOTS

Partially intergrown knot is a knot with annual rings intergrown with surrounding wood along from 1/4 to 3/4 of knot section perimeter.



Arithmetical average of minimal and maximal diameters is set as knot (hole) diameter.



6 mm



15 mm



40 mm



70 mm



B, S

Allowable among black knots with diameter up to 6 mm, 3 pcs/m².

B Sel, S Sel

Allowable among black knots with diameter up to 6 mm, 2 pcs/m².

BB, BBx, CP, WG, WGE

Allowable among intergrown knots with diameter up to 15 mm, 10 pcs/m².

C

Allowable with diameter up to 40 mm and without number limitations.

CC

Allowable with diameter up to 70 mm and without number limitations.

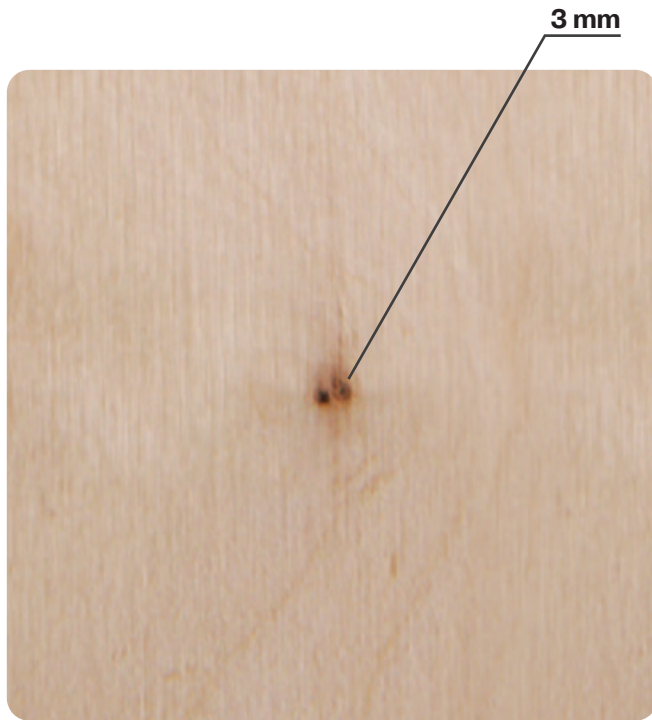


25. PIN KNOT

Pin knot is a sound intergrown knot with diameter not more than 3 mm.



Arithmetical average of minimal and maximal diameters is set as knot (hole) diameter.



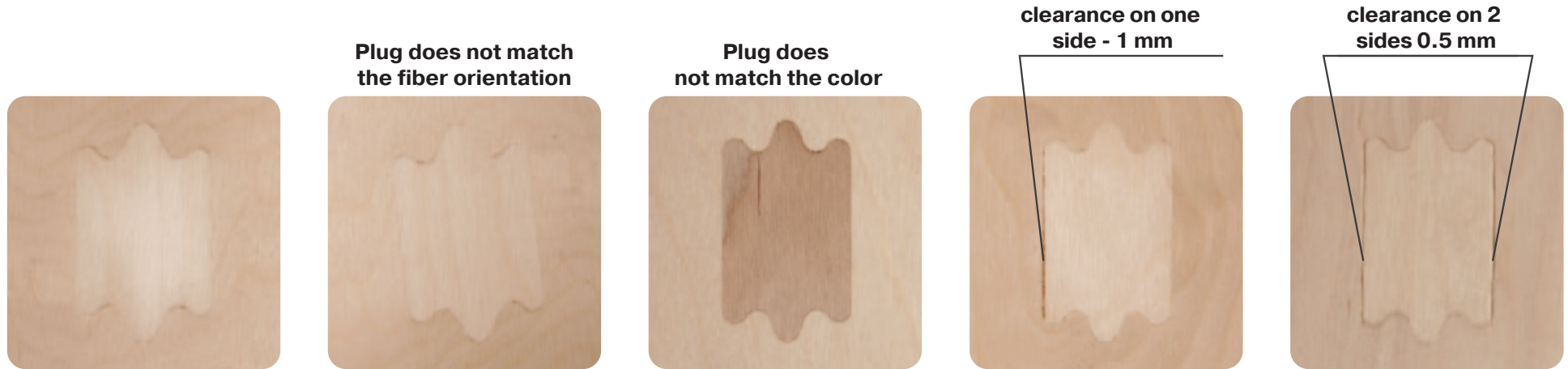
3 mm



Allowable for all sorts with no limitation in sizes and number.



26. PLUG REPAIR



B, B Sel, BBx
Not allowable

S, S Sel
1 pcs/m² is allowable
with color and grain
flow match.

BB
8 pcs/m² is allowable
with color and grain
flow match.

CP, WGE
Insertions with gap on one side
up to 1 mm (or on both sides 0.5 mm)
are allowable without number limitation
but not in color and orientation.

WG, C, CC

Insertions are allowable
without number limitation
but not in color and orientation.



27. POCKET (WITHOUT BARK)

Pocket is a cavity within wood or between annual rings filled in with tar or gum.



Both length and width shall be measured for pockets.



B, S, B Sel, S Sel
Not allowable

BB, BBx
Allowable in size
of group stringers
(60x40 mm) 1 pcs/m².

CP, WG, WGE, C, CC
Allowable



28. RIPPLING (FOR SANDED PLYWOOD), ROUGHNESS OF SAWN SURFACE

Rippling means surface irregularities in the form of regularly alternating elevations and arch shaped hollows.

Roughness means on the surface there are often occurring not completely separated wood fibers.

Roughness of sawn surface means on the surface there are often occurring small hollows, oriented along the fibers.



The defects shall be measured along the length and width of the area of their location, and shall be expressed in percentage of the plywood sheet square.

Rippling



B, S, B Sel, S Sel, BB, BBx
Not allowable

CP, WG, WGE, C, CC
Allowable



29. SANDER SKIPS (NON-UNIFORM SANDING)



The defects shall be measured along the length and width of the area of their location, and shall be expressed in percentage of the plywood sheet square.



B, B Sel, S Sel
Not allowable

S, BB, BBx
Allowable
5 mm from the edge.

CP, WG, WGE
Allowable up to 5%
of sheet area.

C
Allowable up to 50%
of sheet area.

CC
Allowable



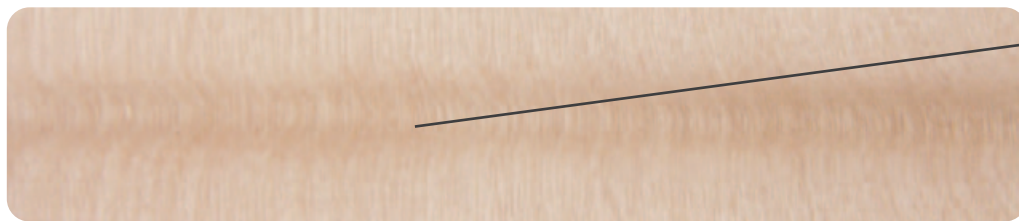
30. SCRATCHES, SCARS, PIMPLES, RIDGES

Scratch is surface damage in the form of long narrow cavity caused by sharp object.

Ridge is a section in the form of narrow strip projecting above the surface.



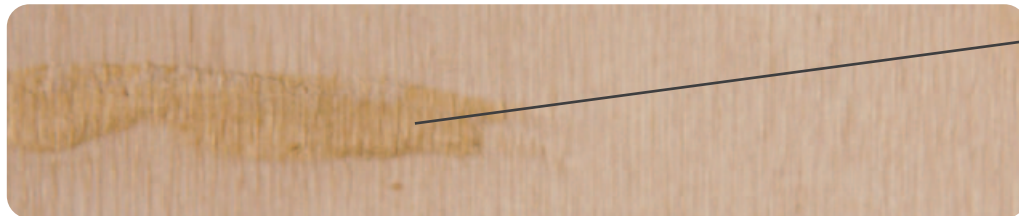
Dent length, width and depth shall be measured.



ridge



scratch



scratch, width 10 mm,
depth up to 0.5 mm



B, S, B Sel, S Sel, BB, BBx
Not allowable

CP, WGE
Allowable
height (depth) is up to 0.5 mm,
length is up to 120 mm,
width is up to 10 mm.

WG
Allowable width
is up to 120 mm.

C, CC
Allowable



31. SCUFFLENESS NON-SMOOTH

Scuffleness non-smooth is a surface cavity due to local wood removing during processing.



The defects shall be measured along the length and width of the area of their location, and shall be expressed in percentage of the plywood sheet square.



B, S, B Sel, S Sel
Not allowable

BB, BBx
Allowable up to 5%
of sheet area.

CP, WG, WGE
Allowable up to 15%
of sheet area.

C, CC
Allowable



32. SOUND COLOR CHANGES (FALSE CORE)

False core is dark varicolored heart the border of that usually does not match with annual rings. It is separated from sapwood with dark (less often light) border and solid as surrounding wood.



The false core shall be measured along the length and width of the area of their location, and shall be expressed in percentage of the plywood sheet square.



B, S, B Sel, S Sel
Not allowable

BB, BBx
Allowable up to 25%
of sheet area.

CP, WG, WGE, C
Allowable up to 75%
of sheet area.

CC
Allowable
without limitation.

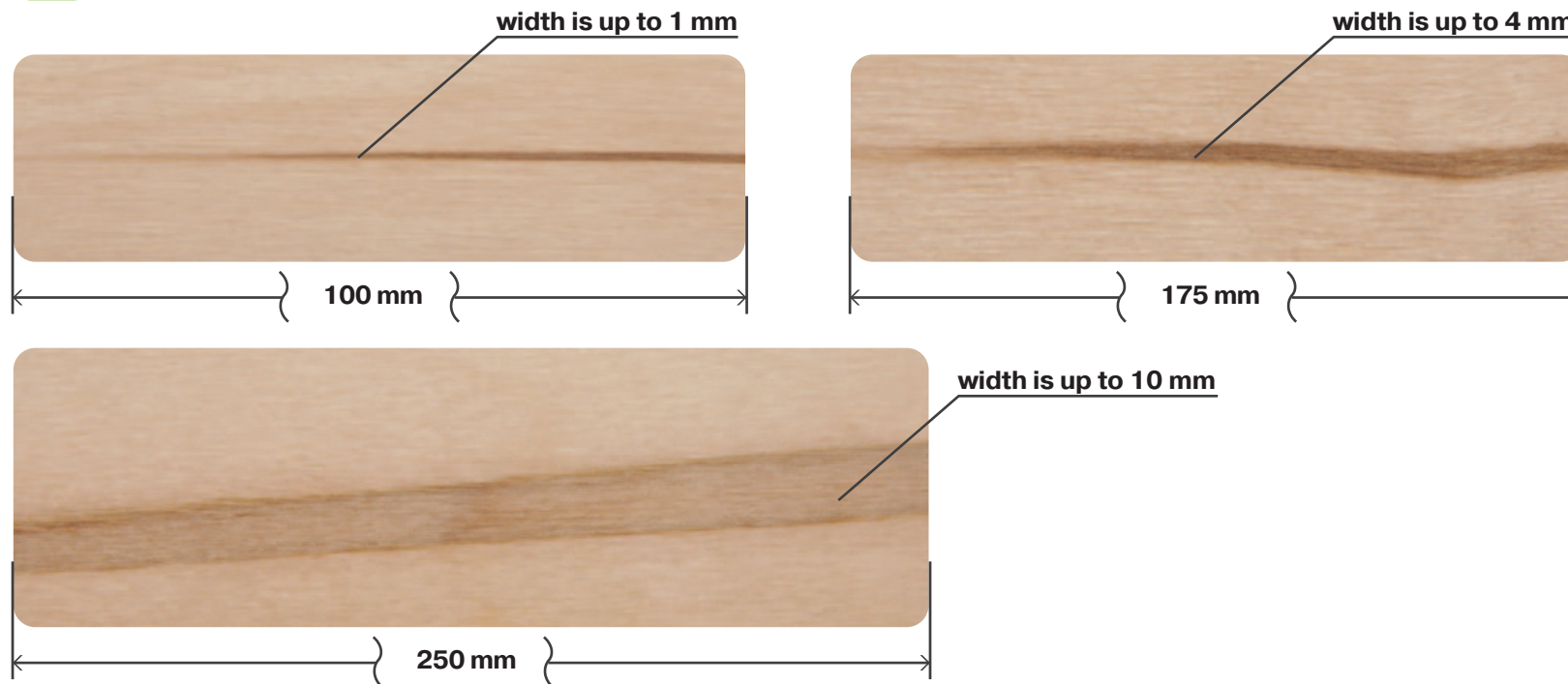


33. SOUND COLOR CHANGES (MOTTLES)

Mottles mean hardwood sap color in the form of spots and strips without reducing wood hardness occurring in growing trees and similar in color to core color.



Mottles length, width and number shall be measured.



B
The light one is allowable the length up to 175 mm, width up to 4 mm, 3 pcs/m².

S
The light one is allowable the length up to 175 mm, width up to 4 mm, 5 pcs/m².

B Sel
The light one is allowable the length up to 100 mm, width up to 2 mm, 3 pcs/m².

S Sel
The light one is allowable the length up to 175 mm, width up to 2 mm, 3 pcs/m².

BB, BBx
Allowable the length up to 250 mm, width up to 10 mm, 10 pcs/m².

CP, WG, WGE, C, CC
Allowable without limitation.



34. SOUND COLOR CHANGES (STRINGERS, TRACES OF STRINGERS)

Stringers mean mottling in the form of thin yellowish and brown strips of spongy tissue located along border of annual rings.

Traces of stringers are bleached or darkish strips on veneer sheet area due to stringers under it at a depth of not more than 1 mm.



Stringers length, width and number shall be measured.

Light stringer



Traces of stringers



Dark stringer



B
The light ones are allowable the length up to 175 mm, width up to 4 mm, 3 pcs/m².

S
The light ones are allowable the length up to 175 mm, width up to 4 mm, 5 pcs/m².

B Sel
The light ones are allowable the length up to 100 mm, width up to 2 mm, 3 pcs/m².

S Sel
The light ones are allowable the length up to 175 mm, width up to 2 mm, 3 pcs/m².

BB, BBx
The light and dark ones are allowable the length up to 250 mm, width up to 10 mm, 10 pcs/m².

CP, WG, WGE, C, CC
Allowable without limitation.



35. SOUND COLOR CHANGES (VEINS GROUPS)

Veins groups are stringers close spacing in the form of overlap strips.



Veins length, width and number shall be measured.



B, S, S Sel

The light ones 30x30 mm are allowable, 1 per m².

B Sel

Not allowable

BB, BBx

The light ones 60x40 mm are allowable, 1 per m².

CP, WG, WGE, C, CC

Allowable without limitations.



36. SPLIT REPAIR WITH PATCHES OR PLUG REPAIRS

Patch or plug repair if agreed with customer.



B, S, B Sel, S Sel, BBx
Not allowable

BB
Splits over 2 mm
shall be filled
with veneer sheet
insertions with glue.

CP, WG, WGE
Splits over 5 mm
shall be filled
with veneer sheet
insertions with glue.

C, CC
Allowable

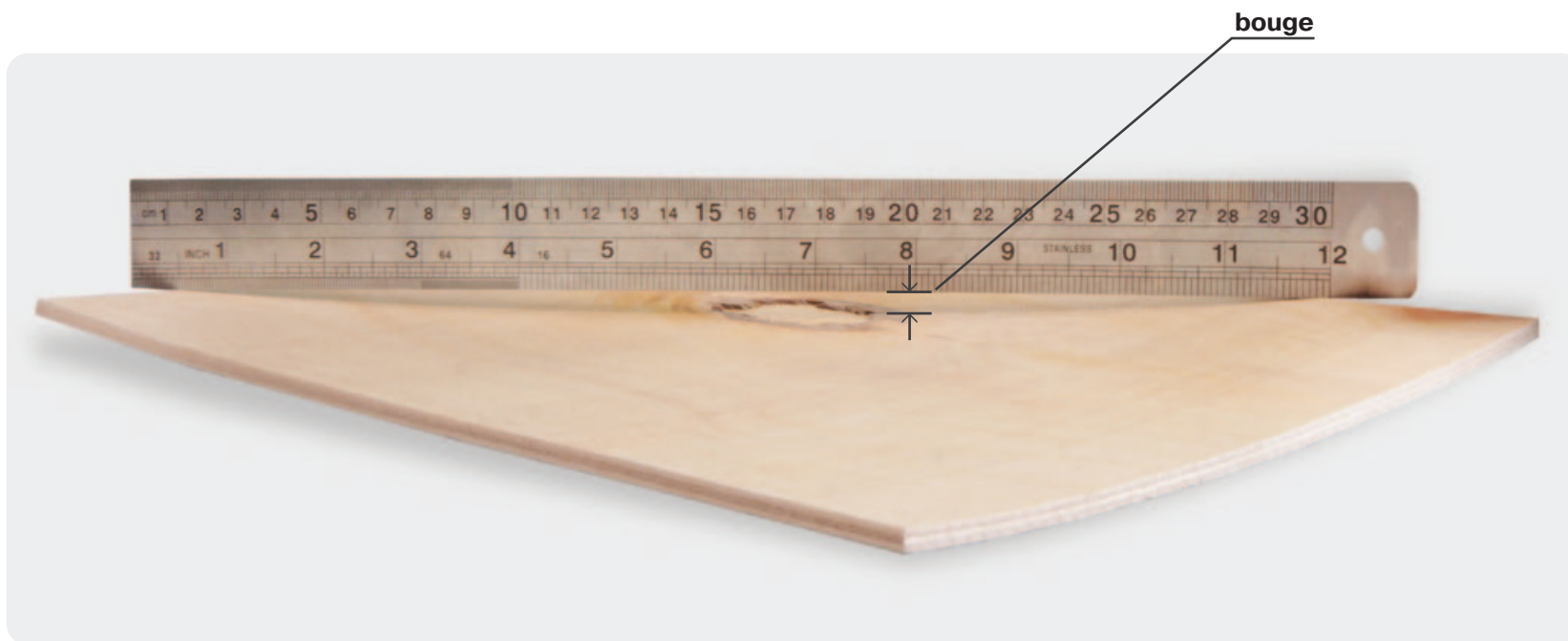


37. WARPAGE

Warpage is a curvature of plywood sheet flatness.



It is measured by putting ruler on the cross of a sheet placed on the flat surface and measuring maximal bouge.



B, S, S Sel, BB, BBx, CP, WG, WGE, C, CC

It is not considered in plywood with width up to 6.5 mm; it is allowable with width over 6.5 mm not more than 15 mm by 1 m of sheet diagonal length.

B Sel

It is not considered in plywood with width up to 6.5 mm; it is allowable with width over 6.5 mm not more than 10 mm by 1 m of sheet diagonal length.



38. WOOD DEFECTS (OPEN INBARK)

Open inbark is healing streak with radial gap cavity generally filled in with bark waste and dead tissues.



Bark pocket length shall be measured.



B, S, B Sel, S Sel, BB, BBx, CP, WG, WGE, C, CC

It is allowable within the total number in accordance with the norms for black knots.



39. WOOD STRUCTURE DEFECTS (GROWN TOGETHER LIGHT AND DARK BARK POCKET)

Bark pocket is healing streak or scab with radial gap cavity generally filled in with bark waste and dead tissues.

Grown together bark pocket is a trace of closed bark pocket in the form of elongated section (seam) of wave growth timber on veneer sheet area.

Light bark pocket is bark pocket with wood similar in color to surrounding wood without bark inclusions.

Dark bark pocket is bark pocket with wood much darker than surrounding wood or with bark inclusions.



Bark pocket length shall be measured.

Light bark pocket



Dark bark pocket



B, S, B Sel, S Sel

Only light bark pocket is allowable, dark bark pocket is allowable in the size and in the number among black knots.

BB, BBx, CP, WG, WGE, C, CC

Light bark pocket is allowable, dark bark pocket is allowable in the size of intergrown knots.

