SVEZA

LIMITED LIABILITY COMPANY SVEZA-Les

COMPANY STANDARD*

BIRCH PLYWOOD FOR GENERAL USE
Technical Specifications

STO 52654419-001-2024

Saint Petersburg
2024

* In case of discrepancies, the Russian version of the organization's standard is to be considered as priority. / В случае возникновения разночтений приоритетной является версия стандарта организации на русском языке

Foreword

Development purposes and objectives, as well as the use of standards of organizations in the Russian Federation are established by Federal Law of December 27, 2002 No. 184-FZ «*On Technical Regulation»* and Federal Law of June 29, 2015, No. 162-FZ «*On Standardization in the Russian Federation».*

Development and presentation rules are specified by GOST R 1.0-2012 «*Standardization in the Russian Federation. Basic provisions»* and GOST R 1.4-2004 «*Standardization in the Russian Federation. Standards of organizations. General»*, taking into account GOST R 1.5-2012 « *Standardization in Russian Federation. National standards. Rules of structure, drafting, presentation and indication».*

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RUS: Фанера березовая общего назначения
Технические условия

Date of introduction «14» May 2024

1 SCOPE OF APPLICATION

This company standard (hereinafter standard) applies to birch plywood for general use (hereinafter birch plywood).

It is allowable to apply this standard by manufacturing special purpose plywood.

2 NORMATIVE REFERENCES

This standard hereby includes normative references to the following standards:

GOST 12.1.044-89 Occupational safety standards system. Fire and explosion hazard of substances and materials. Nomenclature of indices and methods of their determination

GOST 12.4.011-89 Occupational safety standards system. Means of protection. General requirements and classification

GOST 427-75 Measuring metal rules. Basic parameters and dimensions. Specifications

GOST 2140-81 Visible defects of wood. Classification, terms and definitions, methods of measurement

GOST 3749-77 Checking 90° squares. Specifications

GOST 6507-90 Micrometers. Specifications

GOST 7016-2013 Products of wood and wood materials. Roughness parameters

GOST 7076-99 Building materials and products Method of determination of steady-state thermal conductivity and thermal resistance

GOST 7502-98 Measuring metal tapes. Specifications

GOST 8925-68 Flat clearance gauges for machine retaining devices. Design and sizes

GOST 9620-94 Laminated glued wood. Sampling and general requirements in testing

GOST 9621-72 Laminated glued wood. Methods for determination of physical properties

GOST 9622-2016 Glued laminated wood. Methods for determination of ultimate strength and modulus of elasticity in tension

GOST 9624-2009 Laminated glued wood. Method for determination of shear strength

GOST 9625-2013 Laminated glued wood. Method for determination of ultimate strength and modulus of elasticity in static bending

GOST 9626-90 Laminated glued wood. Method for determination of impact viscosity in bending

GOST 9627.1-75 Glued plywood. Method for determination of hardness

GOST 11358-89 Dial-type thickness gauges and dial-type wall thickness gauges graduated in 0.01 and 0.1 mm. Specifications

GOST 15612-2013 Products from wood and wood materials. Methods for determination of roughness parameters

GOST 16297-80 Sound insulation and sound absorption materials. Methods of testing

GOST 25898-2012 Building materials and products. Methods for determination of water vapour permeability and steam-tightness

GOST 27296-2012 Buildings and constructions. Methods for measurement of sound insulation of protecting designs

GOST 27678-2014 Wood-based panels and plywood. Perforator method for determination of formaldehyde content

GOST 30244-94 Building materials. Methods for combustibility test

GOST 30255-2014 Furniture, timber and polymers. The method for determination of formaldehyde and other volatile chemicals in the air of climatic chambers

GOST 30427-96 Plywood for general use. Classification of veneer surfaces by appearance

GOST 32155-2013 Wood-based panels and plywood. Determination of formaldehyde release by the gas analysis method

GOST R 50779.12-2021 Statistical methods. Statistical quality control. Item random sampling methods

Note: While using this standard, it is advisable to check the validity of the standards referenced against the National Standards Reference Index.

3 TERMS AND DEFINITIONS

This standard hereby includes terms as follows:

Birch plywood for general use (birch plywood) – plywood with outer plies of birch veneer and inner plies of birch or other hardwood.

FULL – birch plywood the panel volume of which corresponds to that of the full-size panel.

SHOP – film-faced birch plywood with conditional transverse or longitudinal cut up to 300 mm along one edge, panel volume corresponds to that of a full-size panel but with a reduced usable area. The SHOP (conventional cut) area may include defects listed in Appendix A to this standard, as well as other defects not listed therein. Deviation from squareness and veneer delamination are not allowed in the SHOP zone.

4 CLASSIFICATION AND DIMENSIONS

4.1 Birch veneer classification depends on the:

— surface appearance of the outer plies;

— water resistance of the glue bond; and

— degree of mechanical treatment of the surface.

4.1.1 Based on appearance, birch plywood is divided into grades depending on the combination of its face veneer grades: B Sel, B, S Sel, S, BBx, BB, CP, WGE, WG, C, CC (when designated by Latin letters) and I, II, III, IV (when designated by Roman numerals).

The grade is designated both by Latin letters and by Roman numerals.

Birch plywood of B Sel, B, S Sel, and S grade is classified as grade I; birch plywood BBx and BB – as grade II; birch plywood CP, WGE and WG – as grade III; and birch plywood C and CC – as grade IV.

Note: for birch plywood with inner plies of another hardwood veneer, the grade designation is preceded by two letters from the Latin name of the used hardwood (for example, when aspen veneer is used for inner layers, the grade designation is preceded by *As* (Aspen)).

4.1.2 Depending on the water resistance degree of glue bond and on the plywood intended end use, the birch plywood shall be divided into the following types:

— INT/FK – water-resistant birch plywood glued using urea-formaldehyde adhesives and intended for indoor use;

— EXT/FSF – birch plywood with increased water resistance of the glue bond, glued using phenol-formaldehyde adhesives, and intended for indoor and outdoor use;

Note: birch plywood of INT/FK type belongs to INT formaldehyde emission group and birch plywood of the EXT/FSF type – to EXT formaldehyde emission group.

4.1.3 Depending on the degree of mechanical treatment of the surface, birch plywood is divided into:

— unsanded, NS/ НШ; and

— sanded on both sides, S2S/Ш2.

Note: Sanding belts with a grain size of P80-P100 microns are used for sanding plywood.

4.2 Dimensions

4.2.1 Length and width of birch plywood panels must be as shown in Table 1 below.

Table 1

In mm

Length and width of birch plywood panels	Tolerances
1,220/1,250	±3.0
1,500/1,525	±4.0
2,440/2,500	±4.0
3,000/3,050	±5.0
Notes: 1. Birch plywood may be manufactured with other dimensions and tolerances by agreement between the manufacturer and the customer. 2. The birch plywood panel length is measured along the grain direction of the face veneers. 3. It is allowed to manufacture SHOP plywood.	

4.2.2 Birch plywood thickness and number of plies must be as shown in Table 2 below.

Table 2

In millimeters

Nominal thickness of birch plywood, mm	Number of plies	Sanded birch plywood		Unsanded birch plywood	
		Tolerance on nominal thickness, mm	Thickness tolerance within one panel, max mm	Tolerance on nominal thickness, mm	Thickness tolerance within one panel, max mm
2.7	3	-	-	+ 0.2 - 0.2	0.6
3	3	+ 0.3 - 0.4	0.6	+ 0.4 - 0.3	
4	3	+ 0.3 - 0.5		+ 0.8 - 0.4	1.0
5	4 and 5	+ 0.4 - 0.5		+ 0.8 - 0.4	
6	5	+ 0.4 - 0.5		+ 0.9 - 0.4	
6.5	5	+ 0.4 - 0.5		+ 0.9 - 0.4	
8	6 and 7	+ 0.4 - 0.5		+ 1.0 - 0.5	
9	7	+ 0.4 - 0.6		+ 1.0 - 0.5	

Table 2 (continued)

Nominal thickness of birch plywood	Number of plies	Sanded birch plywood		Unsanded birch plywood	
		Tolerance on nominal thickness, mm	Thickness tolerance within one panel, max mm	Tolerance on nominal thickness, mm	Thickness tolerance within one panel, max mm
8	6 and 7	+ 0.4 - 0.5	0.6	+ 1.0 - 0.5	1.0
9	7	+ 0.4 - 0.6		+ 1.0 - 0.5	
10	7 and 8	+ 0.5 - 0.6		+ 1.0 - 0.5	
12	9	+ 0.5 - 0.7		+ 1.1 - 0.6	
15	11	+ 0.6 - 0.8		+ 1.2 - 0.7	1.5
18	13	+ 0.7 - 0.9		+ 1.3 - 0.8	
21	15	0.0 - 1.1		+1.0 - 1.1	
24	17	0.0 - 1.5		+1.0 - 1.5	
27	19	0.0 - 1.8	1.0	+1.5 - 1.8	2.0
30	21	0.0 - 2.0		+1.6 - 2.0	
35	25	0.0 - 2.0		+1.6 - 2.0	
40	28 and 29	+ 1.2 - 1.2		+1.6 - 2.0	

Notes:
1. Birch plywood with an even number of plies has two internal, adjacent plies with the parallel grain orientation.
2. It is allowed to manufacture birch plywood of other thicknesses, number of plies, and tolerances by agreement between the manufacturer and the customer.

4.2.3 Birch plywood panels must be cut square.

Tolerance for squareness must not exceed 2 mm per 1 m of the panel edge length when controlled according to 7.4.1.

Difference in the diagonal lengths must not exceed 2 mm per 1 m of the panel edge length when controlled according to 7.4.2

4.2.4 Tolerance for straightness of edges must not exceed 2 mm per 1 m of panel length.

4.3 The reference designation for birch plywood must include the following information:

— product name;
— type;
— combination of face veneer grades (by Latin letters and Roman numerals);
— emission class;
— surface treatment type;
— dimensions;
— reference to this Standard.

Example of a reference designation for birch plywood of INT/FK type, B/BB (I/II) grade, emission class E1, sanded on both sides, 1,525 mm in length, 1,525 mm wide, and 10 mm thick:

Фанера береза / Birch Plywood,
INT/ФК B/BB (I/II), E1, S2S/S2, 1,525 x 1,525 x 10
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Example of a reference designation for birch plywood with inner plies of aspen veneer of EXT/FSF type, As CP/C (III/IV) grade, E1 emission class, sanded on both sides, 2,500 mm long, 1,250 mm wide, and 18 mm thick:

Фанера береза / Birch Plywood,
EXT / ФСФ, As CP/C (III/IV), E1, S2S / Ш2, 2500 x 1250 x 18
СТО 52654419-001-2024

5 TECHNICAL REQUIREMENTS

5.1 Characteristics

5.1.1 The following materials are used by manufacturing birch plywood:

— birch veneer for outer layers;
— birch or other hardwood veneer for inner layers.

Veneer thickness used for outer and inner layers of birch plywood must not exceed 4 mm.

5.1.2 Defects inherent in wood and manufacturing defects exceeding the limits specified in Appendix A are not permitted in outer layers of birch plywood.

Terms and definitions of defects inherent in wood and manufacturing defects are according to GOST 30427 and Appendix C.

Tolerances on defects inherent in wood and manufacturing defects for special purpose plywood are agreed between the manufacturer and the customer.

5.1.3 For inner layers of birch plywood, defects inherent in wood and manufacturing defects are permitted provided that they do not affect plywood quality or dimensions the requirements to which are set forth in this standard,.

5.1.4 Birch plywood is available in any combination of the outer layer grades mentioned in clause 4.1.2 of this standard.

5.1.5 It is allowed to compose external plies of B Sel, B, S Sel, S, BBx, and BB grades from two or three strips of veneer of the same width and color. External plies of grades CP, WGE, WG, C, and CC may be composed from an unlimited number of veneer strips without color matching.

5.1.6 Knots, holes, and cracks may be patched with veneer inserts of various shapes and sizes. Defect areas up to 30 mm wide may be patched with rectangular veneer inserts along the entire length of the defect. For CP grade and below, a combination of inserts of different shape is allowed on one surface of the panel by agreement between the customer and the manufacturer.

The veneer inserts must be attached firmly, match the panel surface, and be of the same species as the birch plywood outer layer. For S Sel, S and BB grades, the insert should match the wood color and grain orientation of the birch plywood outer layer.

The putty must match the wood color, ensure adhesion of finishing materials, not crumble and not crack during birch plywood mechanical treatment and bending.

5.2 Formaldehyde content and formaldehyde release from birch plywood into the room air must meet the requirements specified in Table 3.

Table 3

Emission class	Formaldehyde content per 100 g of oven dry board (perforator method), mg	Formaldehyde release	
		Chamber method, mg / m^3 of air	Gas analysis method, mg / m^2*h
E 0.5	Up to 4.0 inclusive	Up to 0.01 inclusive	Up to or equal to 1.5
E1	Over 4.0 and up to 8.0 inclusive	Over 0.01 and up to 0.124 inclusive	Over 1.5 and up to or equal to 3.5 or less than 5 within 3 days after production

5.3 Physical and mechanical properties of birch plywood are shown in Tables 4 and 5.

Table 4

Performance characteristics	Thickness (mm)	Values
1 Moisture content (%)	2.7–40	5–12

2 Ultimate bending strength: — along the grain of face veneer (MPa), min INT/FK type birch plywood EXT/FSF type birch plywood — across the grain of face veneer (MPa), min INT/FK type birch plywood EXT/FSF type birch plywood	6.5–40	 45 60 30 30
3 Modulus of elasticity in bending: — along the grain of face veneer (MPa), min INT/FK type birch plywood EXT/FSF type birch plywood — across the grain of face veneer (MPa), min INT/FK type birch plywood EXT/FSF type birch plywood	6.5–40	 7,000 7,000 3,000 3,000
4 Tensile strength along the grain (MPa), min	2.7–6.5	30
5 Impact strength in bending, KJ/m^2 , minimum	9–40	34
6 Hardness, MPa, minimum	9–40	20
7 Thermal conductivity, W (mK), by mean density, kg/m^3 300 500 700 1,000	2.7–40	 0.09 0.13 0.17 0.24
8 Water vapour permeability wet-cup μ, by mean density, kg/m^3 300 500 700 1,000 dry-cup μ, by mean density, kg/m^3 300 500 700 1,000	2.7–40	 50 70 90 110 150 200 220 250

Table 4 (continued)

Performance characteristics	Thickness (mm)	Values
9 Sound absorption, dB, for frequency range, Hz	2.7–40	

250–500 1,000–2,000		0.10 0.30
10 Airborne sound insulation, dB	6.5–40	23.0
11 Biological durability, hazard class	2.7–40	5fDa, St
12 Reaction to fire class	2.7–40	Acc. to GOST 30244
Note - Values of items 4 to 12 shall be selected by agreement between the manufacturer and the customer.		

Table 5

Ultimate shear strength, mean value (MPa)	Wood failure percentage
Above 0.2 up to 0.4 inclusively	Greater than or equal to 80
Above 0.4 up to 0.6 inclusively	Greater than or equal to 60
Greater than 0.6 but less than 1.0	Greater than or equal to 40
1.0 and more	-

Notes:
1. Testing of INT/FK type birch plywood is done after test pieces pre-treatment by soaking them in water at (20 ± 3) °C for 24 hours.
2. Test pieces pre-treatment before testing of EXT/FSF type plywood is done by using one of four methods:
2.1 soaking in boiling water for 1 hour;
2.2 soaking in boiling water for 6 hours;
2.3 soaking in boiling water for 4 hours, drying in a vented cabinet at (60 ± 3) °C for (16–20) hours, repeated soaking in boiling water for 4 hours and cooling in water at (20 ± 3) °C for 1 hour;
2.4 soaking in boiling water for (72 ± 1) hours, cooling in water at (20 ± 3) °C for 1 hour - every 3 months;
2.5 soaking in water at (20 ± 3) °C for 24 hours, every 3 months.
Methods 2.3, 2.4, and 2.5 for test pieces pre-treatment for EXT/FSF type birch plywood are used to test new resins.
A test pieces pre-treatment method is agreed between the manufacturer and the customer.
3. Percentage of wood failure is determined visually
4. The shear test shall be performed in various glue lines by agreement between the manufacturer and the customer.

5.4 Birch plywood stock is accounted for in cubic meters. One panel's volume is calculated without rounding. The volume of a plywood stack and a batch is calculated with an accuracy of 0.001 m^3. The area of a birch plywood panel is accounted for with an accuracy of 0.01 m^2, and the area of all panels in a batch – with an accuracy of 0.5 m^2.

5.5 Plywood panel marking.

Marking is applied with indelible paint onto the edge face of each birch plywood panel.

The marking when applied automatically shall include the following information:

- manufacturer (number or name);
- type;
- thickness;
- grade;
- shift and / or the sorter’s number;
- date and/or time of manufacture.

The marking when applied manually (stamp) shall include the following information:

- manufacturer’s number;
- shift.

The manual marking (stamp) is applied onto the corner of longitudinal or transverse edge face.

It is allowed to apply one common stamp onto every (1 to 3) panels of birch plywood with thickness of 2.7 to 9 mm.

Marking shall be applied in the following colors:

— for INT/FK type birch plywood – in green or black;

— for EXT/FSF type birch plywood – in purple or black.

By agreement between the manufacturer and the customer, it is allowed to:

— apply no marking onto the birch plywood panels;

— include additional information in the mandatory marking.

The panels’ surfaces (face layers) must be free of ink/ marks from the panel edge marking.

5.6 Packing of birch plywood

The birch plywood should be packed in stacks 400, 600 or 900 mm high separately by wood species, types, grades, dimensions, thicknesses, and types of surface treatment.

The higher-grade surface should be stacked upwards.

By agreement between the manufacturer and the customer, the birch plywood may be packed in stacks of different height other than that specified.

Birch plywood with thickness over 3 mm must be put in stacks in the same grain orientation.

By agreement between the manufacturer and the customer, the birch plywood may stacked with the lower-grade surface upwards.

5.7 Packing and labeling of birch plywood stacks

5.7.1 Packing of birch plywood stacks shall ensure their integrity and protection during transportation.

The main methods and types of packaging are regulated by LLC “SVEZA-Les”. Other types and methods of birch plywood packaging may be used by agreement between the manufacturer and the customer.

5.7.2 Packed birch plywood stacks shall be marked by labels. The information on the labels is applied in Russian and/or English on two side panels parallel or perpendicular to each other. Both labels shall include the same information:

— trademark;

— product designation - Birch Plywood / Фанера березовая;

— dimensions, birch plywood thickness and thickness tolerances (if required);

— birch plywood grade according to Appendix B;

— birch plywood type (INT/FK, EXT/FSF);

— type of the plywood surface treatment;

— number of panels in the stack;

— working shift;

— birch plywood manufacture date;

— emission class;

—No. of the Order with special terms and conditions (by agreement between the manufacturer and the customer);

— reference to the technical regulatory document used to manufacture birch plywood;

— manufacturer’s name and address;

— certification signs and quality control mark;

— handling signs: “Keep away from moisture” and “Do not use hooks”;

— bar code (if a data collection terminal (scanner) is available).

For more streamlined storage operations, additional marking may be applied by using labels or stencils.

5.7.3 Marking of packed birch plywood stacks with different brand names is possible by agreement between the manufacturer and the customer.

6 ACCEPTANCE RULES

6.1 Birch plywood is accepted in batches.

A batch means a certain number of birch plywood panels of the same wood species, type, grade, dimension, thickness, and type of surface finish. A batch is registered by one document that includes the following information:

— trademark;

— manufacturer’s name and address;

— birch plywood designation;

— batch size;

— reference to the technical regulatory document used to manufacture birch plywood.

6.2 Birch plywood panels’ quality and dimensions check is done by usins random sampling method. By random sampling, birch plywood panels are sampled randomly according to GOST 18321 in the amounts stated in Table 6.

Table 6

In panels

Batch size	Checked parameter according to sections herein			
	4.2.1; 4.2.2; 4.2.3; 4.2.4		5.1.2; 5.1.5; 5.1.6	
	Sample size	Acceptance number	Sample size	Acceptance number
Up to 500	8	1	13	1
501 to 1,200	13	1	20	2
1,201 to 3,200	13	1	32	3
3,201 to 10,000	20	2	32	3

Sample size for items (4 through 12) of Table 4 is by agreement between the manufacturer and the customer.

6.3 Moisture content, bonding strength, ultimate strength at bending across and along the grain direction, and modulus of elasticity at bending along and across the grains direction of face veneers are controlled for every birch plywood type, thickness and number of layers at least once per month. It is allowed to control each batch by agreement between the manufacturer and the customer, and for this purpose 0.1% of panels shall be sampled from a batch, but at least one panel.

6.4 To determine formaldehyde emission, one birch plywood panel shall be sampled from any sample size. Formaldehyde emission is determined at least once every 7 days for each emission group.

6.5 The necessity of testing, test frequency and scope for characteristics in items 4 through 12 of Table 4 is agreed between the manufacturer and the customer.

6.6 A batch is considered compliant to the requirements of this standard and accepted, provided that:

— the number of birch plywood panels non-compliant with the standard’s requirements to dimensions, squareness, edge straightness, wood-inherent defects, and manufacturing defects is less than or equal to the acceptance number established in Table 6;

— all birch plywood panels are free of blisters, delamination, or bark pockets;

—formaldehyde emission is compliant with the limits specified in Table 3.

7 CONTROL METHODS

7.1 Sampling procedure — according to GOST 9620, GOST 27678, GOST 30255, GOST 32155, [1] - [2].

7.2 Birch plywood panel length and width are measured by using a metal measuring tape at two points parallel to the edges, at least 100 mm from edges, according to GOST 7502, with a tolerance of 1 mm. The arithmetic mean value of the two measurement results is considered the actual length (width) of the panel.

7.3 The thickness is measured at a distance of at least 25 mm from the edges, in the middle of the each panel's side.

The arithmetic mean value of the four measurements is considered the actual thickness of the panel.

The following measuring tools are used for thickness measurement:

— thickness gauge according to GOST 11358 with a scale division not exceeding 0.1 mm;

— micrometer according to GOST 6507 with a scale division not exceeding 0.1 mm.

Thickness tolerance within one panel is determined as the difference between the maximum and the minimum thickness of four measurements.

7.4 Squareness of birch plywood panels

7.4.1 Squareness of a birch plywood panel is measured according to GOST 30427. The squareness is measured by using a measuring square according to GOST 3749. The squareness is determined by measuring the maximum deviation of a panel edge from the measuring square side by using a metal ruler in accordance with GOST 427 with an accuracy of 1 mm.

7.4.2 It is allowed to determine squareness by the difference of the panel's diagonal lengths measured by metal measuring tape according to GOST 7502 with an accuracy of 1 mm.

7.5 Straightness of edges of a birch plywood panel is determined by using a thickness gauge to measure the maximum gap between the panel's edge and the edge of a metal ruler according to GOST 8925, with an accuracy of 0.2 mm.

7.6 Warping

7.6.1 The warping of birch plywood of FK Type, 1500 mm and 1525 mm long, with a combination of outer layers' grades: B Sel, B, S Sel, S, BBx, and BB, is determined on a horizontal table with the dimensions not less than the length and width of the plywood panel.

Initially, the W- or P-shape of the panel's warping is estimated visually by placing the panel on a horizontal table.

7.6.1.1 An FK birch plywood panel, 1500 mm and 1525 mm long, with a combination of outer layers' grades: B Sel, B, S Sel, S, BBx, and BB with a W-shape warping must be firmly pressed and secured on a horizontal table at points 1, 2 and 3; the measurement is performed at point 4 by using a metal ruler according to GOST 427 or tape measure according to GOST 7502, as shown in Figure 1.

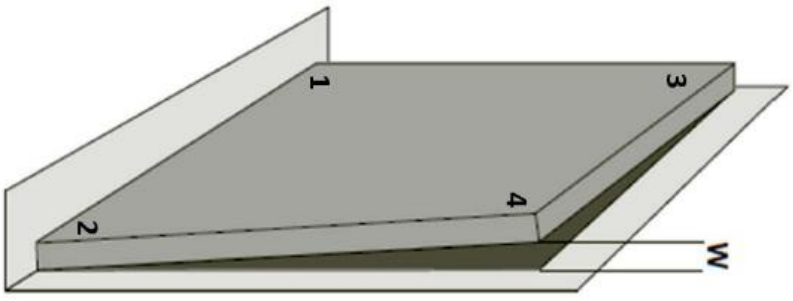

Fig.1

7.6.1.2 An FK birch plywood panel, 1500 mm and 1525 mm long with an outer layers' grades combination: B Sel, B, S Sel, S, BBx, and BB with the P-shape warping must be fixed at points 1 and 2, while the measurement is performed at point 3 by

using a metal ruler according to GOST 427 or tape measure according to GOST 7502, as shown in Figure 2.

Fig.2

7.6.1.3 Warping tolerances by shapes for birch plywood of FK Type, 1500 mm and 1525 mm long, with an outer layers' grades combination: B Sel, B, S Sel, S, BBx, and BB are shown in Table 7.

Table 7

Warping shape	Nominal thickness of a plywood panel, mm	Distance from the reference plane to the panel surface, max., mm
		for length 1500 mm and 1525 mm
P / W	≤ 6.5	not estimated
P	6.5 to 15	12
P	> 15	7.5
W	> 6.5	15

7.6.2 For birch plywood other than specified in paragraph 7.6.1 – according to GOST 30427.

7.7 Moisture content — according to GOST 9621, [3].

7.8 Bonding strength — according to GOST 9624, [4].

7.9 Modulus of elasticity at bending and ultimate strength – according to GOST 9625, [5].

7.10 Tensile strength along the grain direction — according to GOST 9622.

7.11 Formaldehyde content — according to GOST 27678 (this method is used as an arbitration method), formaldehyde release — according to GOST 30255, GOST 32155 and [1].

7.12 Surface roughness — according to GOST 15612.

7.13 Measurement of defects inherent in wood and manufacturing defects – according to GOST 30427 and GOST 2140.

7.14 Acoustic absorption coefficient — according to GOST 16297.

7.15 Impact viscosity in bending — according to GOST 9626.

7.16 Sound insulation — according to GOST 27296.

7.17 Hardness — according to GOST 9627.1.

7.18 Biological durability — according to [6].

7.19 Reaction to fire class — according to GOST 30244 and GOST 12.1.044.

7.20 Thermal conductivity — according to GOST 7076.

7.21 Water vapour permeability — according to GOST 25898, [7].

7.22 Other control methods may be used by agreement between the manufacturer and the customer.

7.23 Presence of burnt and weak edges is estimated visualy by comparence with a reference.

8 TRANSPORTATION AND STORAGE

8.1 Birch plywood is transported in closed vehicles in accordance with the rules of cargo transportation valid for this type of transport.

During transportation, moisturizing of birch plywood should be avoided to prevent changes of dimensional, physical, and qualitative characteristics of birch plywood and its emission class.

FK birch plywood with length of 1,500 mm and 1,525 mm with combination of outer layers' grades: B Sel, B, S Sel, S, BBx, BB and requirements to warping should be transported only in a horizontal position and in a specially developed packing preventing warping.

In case of non-compliance with this requirement (transportation in vertical position in order to increase the amount of transported plywood, i.e. putting bundles on edge or without special packing), the manufacturer guarantees warping not more than 15 mm per 1 m of the panels' diagonal length for plywood with the thickness over 6.5 mm. For plywood with thickness up to 6.5 mm, any degree of warping is allowed.

8.2 Storage of birch plywood

The birch plywood must be stored indoors in stacks put horizontally on pallets or on wooden spacers, at a temperature range from −40 °C to +50 °C and a relative humidity under 80%.

9 MANUFACTURER'S WARRANTY

The manufacturer guarantees compliance of birch plywood with the quality requirements of this standard provided that the transportation and storage conditions are observed.

The warranted period of storage for INT/FK type birch plywood is 3 years, and for EXT/FSF type birch plywood – 5 years from the day of receipt by the customer.

For birch plywood used for further processing, it is recommended to contact the manufacturer for more details about the properties and specifications of different types of birch plywood.

10 SAFETY AND ENVIRONMENTAL REQUIREMENTS

10.1 The content of hazardous chemicals released into the air of residential or public buildings by using of birch plywood products must not exceed limits in items [8], [9], and [10].

10.2 Birch plywood must be manufactured using materials and components approved by the national sanitary and epidemiological inspection authorities.

10.3 Only persons aged 18 and older with a clean bill of health are permitted to work in birch plywood production. Medical examinations are conducted according to the applicable instructions from the Ministry of Health of the Russian Federation.

10.4 Personnel engaged in birch plywood manufacturing must be provided with personal protection equipment, according to the applicable regulations under GOST 12.4.011.

10.5 The specific activity of cesium-137 in birch plywood must not exceed the health standards set forth in [11].

10.6 The standard birch plywood composition does not include raw materials or components classified as hazardous waste.

10.7 Birch plywood usually has a long service life, and there are a number of ways to recycle it. Birch plywood must be recycled according to the ordinances regarding recycling in the effective laws of various countries.

APPENDIX A
(mandatory)

Restrictions for defects inherent in wood and manufacturing defects in outer layers of birch plywood

Restrictions for defects inherent in wood and manufacturing defects in outer layers of birch plywood are shown in Table A.1

Table A.1

<table>
<tr><th>DEFECTS INHERENT IN WOOD AND MANUFACTURING DEFECTS</th><th>B Sel
(I)</th><th>S Sel
(I)</th><th>B
(I)</th><th>S
(I)</th><th>BBx
(II)</th><th>BB
(II)</th><th>CP
(III)</th><th>WGE
(III)</th><th>WG
(III)</th><th>C
(IV)</th><th>CC
(IV)</th></tr>
<tr><td>1. Pin knots</td><td colspan="10">permitted</td></tr>
<tr><td>2. Sound knots, intergrown, light and dark</td><td colspan="2">not permitted</td><td>light knots up to 15 mm in diameter, with cracks up to 0.5 mm wide and no more than 5 per m^2, are permitted</td><td>permitted up to 15 mm in diameter with cracks up to 0.5 mm wide, no more than 5 per m^2</td><td colspan="2">permitted up to 25 mm in diameter with cracks up to 1 mm wide, no more than 10 per m^2</td><td>permitted: with a crack up to 1.5 mm wide</td><td>permitted: with a crack up to 1 mm wide</td><td colspan="2">permitted</td></tr>
<tr><td>3. Partially intergrown knots</td><td colspan="2">permitted within the number of par. 4 of this appendix, up to 6 mm in diameter, 2 per m^3 maximum</td><td>permitted within the number of par. 4 of this appendix, up to 6 mm in diameter, 3 per m^3 maximum</td><td>permitted within the number of par. 4 of this appendix, up to 6 mm in diameter, 2 per m^3 maximum</td><td colspan="4">intergrown knots up to 15 mm in diameter, 10 per m^2 maximum — permitted</td><td>permitted: any number with a diameter up to 40 mm</td><td>permitted: any number with a diameter up to 70 mm</td></tr>
</table>

Appendix A — continued

DEFECTS INHERENT IN WOOD AND PROCESSING DEFECTS	B Sel (I)	S Sel (I)	B (I)	S (I)	BBx (II)	BB (II)	CP (III)	WGE (III)	WG (III)	C (IV)	CC (IV)
4. Black knots, loose knots, knot holes (no bark inclusions)	permitted: up to 6 mm in diameter, 2 per m^2 maximum		permitted, including intergrown knots up to 6 mm in diameter, 3 per m^2 maximum			permitted, including intergrown knots up to 6 mm in diameter, 6 per m^2 maximum	permitted: any number with a diameter up to 6 mm		permitted up to 15 mm in diameter, no more than 7 per m^2	permitted: any number with a diameter up to 40 mm (bark patches up to 5 mm wide are permitted near the knot)	permitted: any number with a diameter up to 70 mm (bark patches up to 5 mm wide are permitted near the knot)
5. Closed cracks	permitted: up to 2 per meter of the panel width, up to 200 mm long		permitted: up to 5 per meter of the panel width, up to 200 mm long		permitted: up to 5 per meter of the panel width, up to 300 mm long		edge and middle cracks are permitted				
6. Open cracks, open joints on a spliced veneer	not permitted	permitted: up to 2 per meter of the panel width, up to 200 mm long and up to 1 mm wide	not permitted	permitted: up to 2 per meter of the panel width, up to 200 mm long and up to 1 mm wide	permitted: up to 3 per meter of the panel width, up to 200 mm long and up to 2 mm wide	permitted: up to 3 per meter of the panel width, up to 250 mm long and up to 2 mm wide	permitted: up to 2 per meter of the panel width, up to 600 mm long and up to 2 mm wide + permitted up to 600 mm long and up to 5 mm wide, provided it is filled with a sealing agent		permitted: up to 2 per meter of the panel width, up to 600 mm long and up to 5 mm wide	permitted: up 800 mm long and up to 10 mm wide, no limitation on number	permitted: up to 15 mm wide, no limitation of number
7. Timber structure flaws (diagonal grain, swirly grain, burls, or bud traces)	permitted, except for dark bud traces		permitted								

Appendix A — continued

DEFECTS INHERENT IN WOOD AND PROCESSING DEFECTS	B Sel (I)	S Sel (I)	B (I)	S (I)	BBx (II)	BB (II)	CP (III)	WGE (III)	WG (III)	C (IV)	CC (IV)
8. Timber structure flaws (light/dark inner inbark)	only light inbark is permitted, dark inbark is permitted in the number and size corresponding to the number of black knots				light inbark is permitted, dark inbark is permitted within the dimensions of jointed knots						
9. Timber structure flaws (surface inbark)	permitted: with the total number under the black knot requirements										
10. Heavy discoloration (false heartwood)	not permitted				permitted: up to 25% of the panel surface area		permitted	permitted: up to 75% of the panel surface area	permitted		
11. Heavy discoloration (stains, streaks, streak traces)	permitted: light, no more than 3 per m^2 of the panel, up to 100 mm long and up to 2 mm wide	permitted: light, no more than 3 per m^2 of the panel, up to 175 mm long and up to 2 mm wide	permitted: light, up to 15% of the panel surface area	permitted: light, no more than 5 per m^2 of the panel, up to 175 mm long and up to 4 mm wide	permitted: up to 250 mm long and up to 10 mm wide, no more than 10 per m^2	permitted					
12. Heavy discoloration (grouped streaks)	not permitted	permitted: light, up to 30x30 mm, no more than 1 per m^2	permitted: light, up to 15% of the panel surface area	permitted: light, up to 30x30 mm, no more than 1 per m^2	permitted: up to 60x40 mm, no more than 1 per m^2	permitted					

Appendix A — continued

DEFECTS INHERENT IN WOOD AND PROCESSING DEFECTS	B Sel (I)	S Sel (I)	B (I)	S (I)	BBx (II)	BB (II)	CP (III)	WGE (III)	WG (III)	C (IV)	CC (IV)
13. Chemical colorations, sap stains (blue and colored sap stains), changes in color after storage	not permitted	permitted: up to 5% of the surface	permitted: up to 30% of surface		permitted: up to 50% of the panel surface area (false heartwood included)	permitted		permitted: up to 75% of the panel surface area (false heartwood included)		permitted	
14. Biological damage (wormholes)	permitted within the total number under the black knot requirements										
15. Discoloration with partial wood integrity damage	not permitted										permitted as separate strips up to 30 mm in width and up to 200 mm in length, max 2 per meter of the panel length
16. Patching of knots and holes with wood inserts	not permitted	permitted: no more than 1 per m^2	not permitted	permitted: no more than 1 per m^2	not permitted	permitted: no more than 8 per m^2	permitted, with a 1 mm gap from one side or 0.5 mm gap from both sides		permitted		
17. Double insert	not permitted					permitted: no more than 1 per m^2	permitted				

Appendix A — continued

DEFECTS INHERENT IN WOOD AND PROCESSING DEFECTS	B Sel (I)	S Sel (I)	B (I)	S (I)	BBx (II)	BB (II)	CP (III)	WGE (III)	WG (III)	C (IV)	CC (IV)
18. Sealing of cracks Note: Sealing cracks with putty or inserts – by agreement with the customer.	not permitted					open shakes wider than 2 mm must be patched with glued veneer inserts	open cracks wider than 5 mm must be patched with glued veneer inserts			permitted	
19. Bulges on surface because of veneer overlaps in inner layers (traces)	not permitted				permitted: up to 200 mm long and up to 10 mm wide, no more than 3 per panel		permitted: up to 600 mm long and up to 10 mm wide, no more than 5 per panel		permitted: up to 10 mm wide	permitted	
20. Overlaps	not permitted				permitted: up to 1 per meter of the panel width, up to 100 mm long and up to 2 mm wide		permitted: up to 2 per meter of the panel width, up to 300 mm long and up to 2 mm wide		permitted: up to 2 per 1 meter of the panel width, up to 600 mm long and up to 4 mm wide	permitted	
21. Stains of production nature (beam traces, strips)	not permitted				permitted: up to 10% of the panel surface area		permitted				

Appendix A — continued

<table>
<tr><td>DEFECTS INHERENT IN WOOD AND PROCESSING DEFECTS</td><td>B Sel (I)</td><td>S Sel (I)</td><td>B (I)</td><td>S (I)</td><td>BBx (II)</td><td>BB (II)</td><td>CP (III)</td><td>WGE (III)</td><td>WG (III)</td><td>C (IV)</td><td>CC (IV)</td></tr>
<tr><td>22. Glue penetration</td><td colspan="3">not permitted</td><td>permitted: up to 1% of the panel surface area</td><td colspan="2">permitted: up to 2% of the panel surface area (for panels 3–21 mm thick)
permitted: up to 5% of the panel surface area (for panels min. 24 mm thick)</td><td colspan="2">permitted: up to 5% of the panel surface area (for panels 3–21 mm thick)
permitted: up to 10% of the panel surface area (for panels min. 24 mm thick)</td><td>permitted: up to 10% of the panel surface area (for panels 3–21 mm thick)
permitted: up to 15% of the panel surface area (for panels min. 24 mm thick)</td><td colspan="2">permitted</td></tr>
<tr><td>23. Mechanical damage (punctures, saw gashes)</td><td colspan="11">permitted within the total number under the black knot requirements</td></tr>
<tr><td>24. Scratches, ribs, bumps, dents</td><td colspan="6">not permitted</td><td colspan="2">permitted: up 120 mm long, 10 mm wide and 0.5 mm in height (depth)</td><td>permitted: up to 120 mm long</td><td colspan="2">permitted</td></tr>
<tr><td rowspan="2">25. Warping</td><td colspan="7">for birch plywood of FK Type, 1500 mm and 1525 mm long, according to clause 7.6.1</td><td colspan="4"></td></tr>
<tr><td>Not limited for plywood up to 6.5 mm thick; for thickness over 6.5 mm permitted not more than 10 mm per 1 m of panel diagonal length</td><td colspan="10">not considered for plywood up to 6.5 mm thick; no more than 15 mm per 1 m of panel diagonal is permitted for plywood thicker than 6.5 mm</td></tr>
</table>

Appendix A — continued

DEFECTS INHERENT IN WOOD AND PROCESSING DEFECTS	B Sel (I)	S Sel (I)	B (I)	S (I)	BBx (II)	BB (II)	CP (III)	WGE (III)	WG (III)	C (IV)	CC (IV)
26. Presence of glue threads/ tapes	not permitted						permitted				
27. Blisters, delamination, bark pockets	not permitted										
28. Unsanded spots (nonuniform sanding)	not permitted			permitted: within 5 mm from the edge			up to 5% of the surface — permitted			permitted: up to 50% of the panel surface area	permitted
29. Sanding through surface layer	not permitted						permitted: up to 1% of panel surface area (for panels 3–21 mm thick) permitted: up to 2% of panel surface area (for panels min. 24 mm thick)			permitted	
30. Metal inclusions	not permitted						brackets of non-ferrous metals are permitted				
31. Edge defects caused by sanding, trimming, or lack of veneer	not permitted			up to 5 mm wide along panel edge						permitted: up to 10 mm wide	permitted: up to 25 mm wide
32. Rough peeling	not permitted				permitted: up to 5% of the panel surface area		up to 15% of the surface — permitted			permitted	
33. Waviness (for sanded plywood), roughness, ripples	not permitted						permitted				
34. Surface roughness	the roughness parameter, R_m, per GOST 7016 (μm), maximum: 100 for sanded birch plywood, 200 for unsanded										

Appendix A — continued

DEFECTS INHERENT IN WOOD AND PROCESSING DEFECTS	B Sel (I)	S Sel (I)	B (I)	S (I)	BBx (II)	BB (II)	CP (III)	WGE (III)	WG (III)	C (IV)	CC (IV)
35. Pockets (without bark inclusions)	not permitted				permitted, within the total number under the requirements of par. 12 of this appendix		permitted				
36. Glued-in veneer particles	not permitted						permitted: up to 150 mm long and 30 mm wide, no more than 1 per panel			permitted	
37. Gradient spots	not permitted for plywood with at least one side of these grades						permitted				
38. Weak edge	not permitted for plywood with at least one side of these grades						permitted				
39. Burnt edge	not permitted for plywood with at least one side of these grades						permitted				

Note: No defects inherent in wood and manufacturing defects other than specified in Appendix A are permitted.

APPENDIX B
(mandatory)

Birch Plywood Grade Designations

Birch plywood grade designations are presented in Table B.1

Table B.1

Latin Letters	Roman Numerals	Text on the label in the “Grade” field for birch plywood	Text on the label in the “Grade” field for birch plywood with inner plies of birch and aspen veneer
B/B	I/I	B/B (I/I)	As B/B (I/I)
S/S	I/I	S/S (I/I)	As S/S (I/I)
B Sel/B Sel	I/I	B Sel /B Sel (I/I)	As B Sel /B Sel (I/I)
S Sel/S Sel	I/I	S Sel /S Sel (I/I)	As S Sel /S Sel (I/I)
B/BB	I/II	B/BB (I/II)	As B/BB (I/II)
B Sel /BB	I/II	B Sel /BB (I/II)	As B Sel /BB (I/II)
S/BB	I/II	S/BB (I/II)	As S/BB (I/II)
S Sel /BB	I/II	S Sel /BB (I/II)	As S Sel /BB (I/II)
B/CP	I/III	B/CP (I/III)	As B/CP (I/III)
B Sel /CP	I/III	B Sel /CP (I/III)	As B Sel /CP (I/III)
BB/C	II/IV	BB/C (II/IV)	As BB/C (II/IV)
BBx/C	II/IV	BBx/C (II/IV)	As BBx/C (II/IV)
BB/BB	II/II	BB/BB (II/II)	As BB/BB (II/II)
BBx/BBx	II/II	BBx/BBx (II/II)	As BBx/BBx (II/II)
BB/CP	II/III	BB/CP (II/III)	As BB/CP (II/III)
BBx/CP	II/III	BBx/CP (II/III)	As BBx/CP (II/III)
BB/WG	II/III	BB/WG (II/III)	As BB/WG (II/III)
BB/WGE	II/III	BB/WGE (II/III)	As BB/WGE (II/III)
CP/CP	III/III	CP/CP (III/III)	As CP/CP (III/III)
WG/WG	III/III	WG/WG (III/III)	As WG/WG (III/III)
WGE/WGE	III/III	WGE/WGE (III/III)	As WGE/WGE (III/III)
CP/C	III/IV	CP/C (III/IV)	As CP/C (III/IV)
CP/CC	III/IV	CP/CC (III/IV)	As CP/CC (III/IV)
C/C	IV/IV	C/C (IV/IV)	As C/C (IV/IV)
CC/CC	IV/IV	CC/CC (IV/IV)	As CC/CC (IV/IV)

Note:
– Letters *As* (Aspen) preceding the grade designation indicates the use of aspen veneer for the inner plies.
– Birch plywood stacks may be labeled with only one side grade (for example, C (IV)) by agreement between the manufacturer and customer if both outer layers belong to the same grade.
– Birch plywood grade may be shown either only by letters (C/C) or only by numerals (IV/IV) on the stack labels if agreed between the manufacturer and customer.

APPENDIX C
(mandatory)

Terms and definitions for manufacturing defects of outer layers of birch plywood

See Table B.1 for terms and definitions for manufacturing defects of outer layers of birch plywood.

Table C.1

Name of processing defect	Description
Glued-in veneer particles	Veneer particles glued onto or pressed into the birch plywood surface
Rough peeling	Small, shallow surface recessions caused by a local removal of wood during peeling on the birch plywood surface
Pocket	A cavity in the wood or between annual rings filled with resin or gum
Burnt edge	A surface area darkened by partial charring as a reaction to high temperature arising by the increased friction of cutting tools on wood
Weak edge/ weak cut	A defect in form of an edge area with protruding/torn-out wood fiber bundles characterized by decreased density
Gradient spots	Color variations in form of a screen on the plywood surface, either a dark one on a light background or light on a dark background.

References

[1] DIN EN ISO 12460-3	Wood-based panels - Determination of formaldehyde release – Part 3. Gas analysis method
[2] EN 326-1-1994	Wood-based panels. Sampling, cutting, and inspection – Part 1. Sampling and cutting of test pieces and expression of test results
[3] EN 322:1993	Wood-based panels. Determination of moisture content
[4] EN 314-1:2004	Plywood – Bond quality – Part 1. Test methods
[5] EN 310:1993	Wood-based panels – Determination of modulus of elasticity in bending and of bending strength
[6] EN 1099-1997	Plywood – Biological durability – Guidance for the assessment of plywood for use in different hazard classes
[7] ISO 12572:2001	Hygrothermal performance of building materials and products. Determination of water vapour transmission properties
[8] GN 2.1.6.3492-17	Maximum permitted concentrations (MAC) of pollutants in the atmospheric air of urban and rural settlements
[9] GN 2.1.6.2309-07	Approximate safe exposure levels (ESEL) of pollutants in the atmospheric air of populated areas. Hygienic standards
[10] GN 2.1.6.2328-08	Addendum to GN 2.1.6.2309-07, Approximate safe exposure levels (ESEL) of pollutants in the atmospheric air of populated areas. Hygienic standards
[11]	Unified sanitary epidemiological and health standards for goods subject to sanitary and epidemiological control approved by the Customs Union Commission decision No. 299 as of May 28, 2010
[12] DIN EN 13986 (German edition of EN 13986-2004+A1-2015)	Wood-based panels for use in construction – Characteristics, evaluation of conformity and marking

UDC 674-415:006.354 MKS 79.060.10 OKPD 2 16.21.12.110

Keywords: company standard, birch plywood for general use, dimensions, specifications, packaging, labeling, quality control methods, transportation, storage, warranty.

Developing company
LLC “SVEZA-Les”