



PLITWOOD LLC.
birch plywood manufacture

Proprietary standard General purpose birch plywood

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1. SCOPE

This proprietary standard applies to general purpose WBP/FCF plywood with outer plies of birch veneer (hereinafter referred to as the birch plywood).

2. REGULATORY REFERENCES

The following regulatory references shall be used herein:

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. Specifications.

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

GOST 3749-77 Checking 90° squares. Specifications.

GOST 3916.1-2018 Plywood for general use with outer layers of deciduous veneer. 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.

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. Methods for determination of ultimate 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 Laminated glued wood. 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 18321-73 Statistical quality control. Item random sampling methods.

GOST 25898-2012 Building materials and products. Methods for determination of water vapor 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.

EN 310-1993 Wood-based panels; determination of modulus of elasticity in bending and of

bending strength.

EN 314-1-2005 Plywood. Bonding quality. Part 1. Test methods.

EN 314-2-1993 Plywood. Bonding quality. Part 2. Requirements.

EN 322-1993 Wood-based panels; determination of moisture content.

EN 326-1-1994 Wood-based panels – Sampling, cutting and inspection – Part 1: Sampling, cutting and expression of test results.

EN ISO 12460-3 Wood-based panels and plywood. Determination of formaldehyde release, Part 3: The gas analysis method.

EN 13986-2015 Wood-based panels for use in construction – Characteristics, evaluation of conformity and marking.

GOST R ISO 9001-2015/ISO 9001:2015 Quality management system. Requirements.

Note: When using this standard the validity of the reference standards shall be checked in the public information system – on the official website of the national standards body of the Russian Federation, in the Internet or in the annually published information index «National standards», which is published as of January 1 of the current year and by the corresponding monthly published information indices published in the current year. If the reference document is replaced (amended), the use of this standard shall be guided by the replaced (amended) document. If the reference document is cancelled without being replaced, the provision where reference is made thereto shall be applied insofar as it does not affect this reference.

3. TERMS AND DEFINITIONS

3.1 The following terms shall be used herein:

3.1.1 General-purpose birch plywood (Birch Plywood) – plywood with outer plies of birch veneer and inner plies of birch veneer or other hardwoods.

4. CLASSIFICATION AND DIMENSIONS

4.1 Birch plywood shall be subdivided according to:

4.1.1 the appearance of the surface of the outer plies into grades;

4.1.2 the degree of water resistance of the adhesive bond;

4.1.3 the degree of mechanical processing of the surface into sanded and unsanded.

4.2 By the appearance the birch plywood shall be subdivided into grades depending on the combination of the outer grade plies: B, S, BB+, BB, CP, WGE, C, plywood strip (when designated by Latin letters) and I, II, III, IV (when designated by Roman numbers).

4.2.1 The manufacture of birch plywood in SHOP, TU1, and TU2 grades shall be allowed.

SHOP Grade Birch Plywood with a conditional crosswise or lengthwise trim on one edge up to 300 mm, with the sheet area corresponding to the full format but having a reduced usable part. The SHOP area (conditional trim area) may include defects listed in Appendix A hereof as well as those not listed therein. The veneer delamination and out-of-squareness in accordance with 4.5.3 hereof are not permitted in the SHOP area.

The defects listed in Appendix B shall be permitted on birch plywood of grades TU1 and TU2. Non-conformance with the requirements of Section 4 (Classification and Dimensions) and Section 5 (Technical Requirements) is permitted for birch plywood of grades TU1 and TU2.

4.2.2 The grade designation shall be indicated both in Latin letters and in Roman digits.

Birch plywood of grades B, S is referred to grade I, birch plywood of grades BB+, BB – to grade II, birch plywood of grades CP, WGE – to grade III, and birch plywood of grade C – to grade IV.

4.3 According to the degree of water resistance of adhesive bond and conditions of use, birch plywood shall be subdivided:

4.3.1 WBP/FSF – birch plywood of increased water resistance adhesive bond, glued with

phenol-formaldehyde adhesives, both for interior and exterior use;

4.4 According to the degree of mechanical surface treatment the birch plywood shall be subdivided into:

4.4.1 unsanded – NS;

4.4.2 sanded on both sides – S2S.

4.5 Dimensions:

4.5.1 The length and width of the birch plywood sheets shall correspond to those specified in Table 1.

Table 1

Length (width) of plywood sheets, mm	Maximum deviation, mm
1220, 1250	±3.0
1500, 1525	±4.0
2440, 2500	±4.0
3000, 3050, 4000	±5.0
Notes:	
1. Manufacture of other sizes of plywood is allowed in accordance with the terms of the contract.	
2. Length of the plywood sheet is determined along the direction of the wood grain of the outer plies.	

4.5.2 Thickness and plies of birch plywood shall comply with those specified in Table 2.

Table 2

Nominal thickness of plywood, mm	Number of plies	Sanded birch plywood		Unsanded birch plywood	
		Maximum deviation, mm	Thickness variation, max, mm	Maximum deviation, mm	Thickness variation, max, mm
4	3	+0.3 -0.4	0.6	+0.8 -0.4	1.0
6	5	+0.4		+0.9	
6.5		-0.5		-0.4	
9	7	+0.4 -0.6		+1.0 -0.5	
12	9	+0.5 -0.7		+1.1 -0.6	1.5
15	11	+0.6 -0.8	0.6	+1.2 -0.7	
18	13	+0.7 -0.9		+1.3 -0.8	1.5
21	15	+0.8 -1.0		+1.4 -0.9	
24	17	+0.9 -1.1		+1.5 -1.0	
27	19	+1.0 -1.2	1.0	+1.6 -1.1	2.0
30	21	+1.1 -1.3		+1.7 -1.2	
35	25	+1.3 -1.5		+1.9 -1.4	
40	29	+1.4 -1.6		+2.0 -1.5	

Note: plywood of other thicknesses and number of plies may be manufactured as agreed between the manufacturer and the customer, therewith the maximum deviations are found by formulas:

for sanded plywood: $+(0.2 + 0.03 Sp)$, $-(0.4 + 0.03 Sp)$;

for unsanded plywood: $+(0.8 + 0.03 Sp)$, $-(0.3 + 0.03 Sp)$,

where Sp – nominal thickness of plywood.

4.5.3 Plywood sheets shall be cut at right angles. The out-of-squareness of a sheet shall not exceed 2 mm per 1 m of the length of the sheet edge.

4.5.4 Deviation from straightness of edges shall not exceed 2 mm per 1 m of the sheet length.

4.5.5 The birch plywood designation shall contain:

4.5.5.1 product name;

4.5.5.2 wood species of outer and inner plies;

4.5.5.3 brand;

4.5.5.4. combination of the outer veneer grades, indicated by Latin letters and Roman numbers;

4.5.5.5 emission class;

4.5.5.6 type of surface finish;

4.5.5.7 dimensions;

4.5.5.8 designation of this standard.

An example of a birch plywood with birch veneer inner plies, type WBP/FSF, grade BB/CP (II/III), emission class E1, sanded on both sides, length 1500 mm, width 3000 mm, thickness 15 mm:

***Birch Plywood, WBP/FSF, BB/CP (II/III), E1, S2S, 1500 × 3000 × 15
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5. SPECIFICATIONS

5.1 In the manufacture of birch plywood:

- birch veneer is used for making the outer plies;

- birch veneer and other hardwood veneer are used for making inner plies.

The thickness of the veneer used both in the outer and inner plies of birch plywood shall not exceed 4 mm.

5.1.1 Plywood shall be considered to be made of wood species of which the outer plies thereof are composed.

5.1.2 Plywood made from wood of the same or different species shall be classified as homogeneous and composite, respectively.

5.1.3 Under an even number of veneer plies, the two middle plies shall have the grain parallel to each other. Symmetrically arranged plies of veneer across the thickness of the plywood shall be of the same species and thickness.

5.1.4 The outer plies of plywood shall not have wood defects and processing defects exceeding the standards set out in Appendix A.

5.1.4.1 Tolerances in wood and processing defects for custom-made plywood shall be as agreed between the manufacturer and the customer.

5.1.5 The inner plies of plywood may have wood defects and defects of processing not affecting the quality and dimensions thereof with the requirements thereto being set out herein.

5.1.6 Depending on the quality of the outer plies birch plywood shall be manufactured in any combination of grades listed in 4.2. hereof.

5.1.7 The outer plies of grades B, S, BB+, BB may be composed of two or three strips of the same color. Outer plies of grades CP, WGE, C may be composed of an unlimited number of veneer strips and with no color matching.

5.1.8 Veneer inserts of various shapes and sizes shall be used for patching knots, holes and cracks. Veneer inserts should fit to the surface, hold tight, correspond to the direction of grain and the species of the outer ply of plywood. Inserts for grades S, BB+, and BB must match the color of the wood and the grain direction of the outer ply of plywood.

5.1.8.1 The patches shall provide the adhesion of the facing materials, not breaking out under machining and bending the birch plywood, and not cracking.

5.2 The content of formaldehyde in birch plywood and release thereof from birch plywood into the room air shall be as specified in Table 3.

Table 3

Emission class	Formaldehyde content per 100 g of absolutely dry weight of plywood, mg (perforator method)	Release of formaldehyde	
		Chamber method, mg/m ³ of air	Gas analysis method, mg/m ² per hour
E0.5	Up to 4.0 inclusively	Up to 0.01 inclusively	Up to 1.5 inclusively
E1	Up to 8.0 inclusively	Up to 0.124 inclusively	Up to 3.5 inclusively or less than 5.0 within 3 days after manufacturing

5.3 Physical and mechanical properties of birch plywood shall be specified in Tables 4 and 5.

Table 4

N o.	Parameter	Thickness, mm	Value of physical and mechanical properties
1	Moisture, %	3-40	5-12
2	Ultimate strength in static bending: - along grain of the outer plies, MPa, not less than - across grain of the outer plies, MPa, not less than	9-40	40 30
3	Modulus of elasticity in static bending: - along grain, MPa, not less than - across grain, MPa, not less than	9-40	6000 3000
4	Tensile strength along the grain, MPa, not less than	3-6.5	30
5	Impact bending strength, KJ/m ² , not less than	9-40	34
6	Hardness, MPa, not less than	9-40	20
7	Heat transfer coefficient, W (mK), at average density, kg/m ³ 300 500 700 1000	9-40	0.09 0.13 0.17 0.24
8	Coefficient of resistance to water vapor: when tested in wet cups at an average density, kg/m ³ 300 500 700 1000 when tested in dry cups at an average density, kg/m ³ 300 500 700 1000	9-40	50 70 90 110 150 200 220 250
9	Sound absorption factor, dB, in the frequency range, Hz 250 – 500 1000 - 2000	3-40	0.10 0.30
10	Sound insulation, dB	6.5-40	23.0

11	Biological resistance, hazard class 11.1 Hazard class 11.2 Natural resistance against: - wood destroying fungi; - wood borers: - borers (Hylotrupes); - beetles (Anobium); - termites	3-40	2 3 5 Dhy Da St
12	Combustibility class		according to GOST 30244
	Note: values of items 4-12 are selected by agreement between the manufacturer and the customer.		

Table 5

Average value of split strength along the adhesive ply, MPa	Wood failure, %
Above 0.2 to 0.4 inclusively	Over or equal to 80
Above 0.4 to 0.6 inclusively	Over or equal to 60
Above 0.6 but less than 1.0	Over or equal to 40
From 1.0 and more	-
1. The birch plywood shall be tested by one of the methods: 1.1 boiling in water for 1 hour (according to GOST 3961.1); 1.2 soaking in water at $(20 \pm 3) ^\circ\text{C}$ for 24 hours (according to EN 314-1 p.5.1.1); 1.3 boiling in water for 4 hours, drying in a ventilated cabinet at $(60 \pm 3) ^\circ\text{C}$ for (16-20) hours, repeated boiling in water for 4 hours, cooling in water at $(20 \pm 3) ^\circ\text{C}$ for 1 hour (according to EN 314-1 p.5.1.3); 1.4 boiling for (72 ± 1) hours, cooling in water at $(20 \pm 3) ^\circ\text{C}$ for 1 hour (according to EN 314-1 p.5.1.4). The method of sampling shall be by agreement between the manufacturer and the customer. 2. Percentage of destruction in wood shall be determined visually. 3. The shear test shall be performed in various adhesive plies as agreed between the manufacturer and the customer.	

5.4 Plywood shall be accounted for in cubic meters and/or square meters. The volume of one sheet shall be determined with an accuracy of 0.00001 m^3 , the volume of a batch of plywood – with an accuracy of 0.01 m^3 . The area of a plywood sheet shall be taken into account with an accuracy of 0.01 m^2 , the area of sheets in a batch – with an accuracy of 0.5 m^2 . When calculating the volume and area of sheets, the permissible maximum deviations in length, width and thickness shall not be taken into account.

5.5 Marking.

5.5.1 Indelible marking of sheets shall be placed on the edge face of the right-hand corner. Plywood sheets shall be stacked in bundles with the high-quality up. The stamp shall include the sorter's number, grade and type of plywood. Sheet marking shall be applied as agreed between the manufacturer and the customer.

5.5.2 Birch plywood bundles shall be marked with labels in Russian and/or English on two side covers parallel or perpendicular to each other. The content of the inscription on both covers shall be the same:

5.5.2.1 name of the manufacturer and/or the trademark thereof;

5.5.2.2 name of the product;

5.5.2.3 designation of the plywood;

5.5.2.4 geometrical dimensions;

5.5.2.5 grade of plywood;

5.5.2.6 type of plywood;

5.5.2.7 emission class;

5.5.2.8 mechanical treatment of the plywood surface;

5.5.2.9 number of sheets in the bundle;

5.5.2.10 shift;

5.5.2.11 regulatory and technical document whereby the birch plywood is produced;

5.5.2.12 designation of the national compliance mark for the products being certified;

5.5.2.13 date of manufacture;

5.5.2.14 packaging number;

5.5.2.15 handling marks («Keep away from moisture» and «Use no hooks»);

5.5.2.16 barcode.

5.6 Packaging.

5.6.1 Plywood shall be bundled into packages not exceeding 1500 kg in weight (or as agreed with the customer) separately by species, grades, brands, formaldehyde emission class, surface treatment and dimensions.

5.6.2 Packaging of bundles of other weights shall be agreed between the manufacturer and the customer.

5.6.3 Bundles of plywood shall be packed to ensure integrity and safety thereof during transportation. Other types of packaging shall be allowed. The bundles should be strapped with side strips.

6. SAFETY AND ENVIRONMENTAL REQUIREMENTS

6.1 The content of harmful chemicals emitted during usage of plywood in residential premises and public buildings shall comply with the requirements established by the national sanitary and epidemiological supervision authorities.

6.2 Birch plywood shall be manufactured using materials and components approved for use thereof by the national sanitary and epidemiological supervision authorities.

6.3 The permissible level of specific activity of cesium-137 radionuclides in plywood (radiation safety index) shall comply with the standards established by the national sanitary and epidemiological supervision authorities.

6.4 Persons involved in the manufacture of plywood shall be provided with personal protective equipment in accordance with GOST R 59123-2020 and the Order № 767n of the Ministry of Labor of Russia.

6.5 The concentration of harmful substances emitted during plywood production at the boundary of the sanitary protection area of the enterprise shall not exceed the maximum permissible concentrations according to SanPiN 1.2.3685-21. Air protection shall be arranged to control emissions in accordance with GOST R 58577-2019.

6.6 The quality of surface wastewater discharged after local treatment facilities and conditionally clean storm water coming from the roofs of the main production building and the finished product warehouse shall meet the requirements of SanPiN 1.2.3685-21.

6.7 Waste accumulation shall be provided taking into account the requirements of SanPiN 2.1.3684-21 «Sanitary and epidemiological requirements for the maintenance of territories of urban and rural settlements, for water facilities, drinking water and potable water supply, atmospheric air, soils, residential premises, operation of industrial, public premises, arrangement of sanitary and anti-epidemic (preventive) measures».

7. ACCEPTANCE PROCEDURE

7.1 Plywood shall be accepted in batches.

Plywood shall be submitted for acceptance in batches. The batch shall consist of plywood of the same species, grade, formaldehyde emission class, type of surface treatment and sheet size, and shall be accompanied by one document of quality containing:

7.1.1 name of the manufacturing country;

7.1.2 name and/or trade mark of the manufacturer and the registered address thereof;

7.1.3 plywood reference designation;

7.1.4 batch volume;

7.1.5 regulatory and technical document whereby the plywood is produced.

7.2 The quality and dimensions of plywood sheets shall be checked by random inspection, or by complete inspection by agreement between the manufacturer and the customer. During the random inspection the plywood sheets shall be selected «randomly» according to GOST 18321 in the quantity specified in Table 6.

Table 6

Batch volume, Number of sheets	Monitored indicator by items:			
	4.2.1 – Length/width of plywood sheets; 4.2.2 – Thickness and number of plies; 4.2.3 – Out-of-squareness; 4.2.4 – Deviation from edge straightness		5.1.4 – Tolerance for flaws and defects in outer plies; 5.1.7 – Composition of outer plies by grade; 5.1.8 – Veneer inserts	
	Sampling volume	Acceptance number	Sampling volume	Acceptance number
Up to 500	8	1	13	1
from 501 to 1 200	13	1	20	2
from 1 201 to 3 200	13	1	32	3
from 3 201 to 10 000	20	2	32	3

7.2.1 Sampling volume for items (4-12) of Table 4 – as agreed between the manufacturer and the customer.

7.3 Moisture, the strength limit for shearing along the adhesive layers, at static bending along the grain, at tension along the grain shall be controlled for each grade, thickness and ply of plywood at least once a month. Each batch may be controlled in accordance with the terms of the contract, therefore 0.1% of sheets from the batch are selected, but not less than one sheet.

7.4 One sheet of plywood shall be taken from any sample volume for formaldehyde emission control. The indicator of formaldehyde emission shall be controlled for birch plywood of WBP/FSF grade at least once every 7 days.

7.5 The batch shall be considered to comply with the requirements of this standard and shall be accepted if in the samples:

7.5.1 the number of birch plywood sheets that do not meet the requirements of the standard in terms of dimensions, out-of-squareness, straightness, wood defects and processing defects is less than or equal to the acceptance number specified in Table 6;

7.5.2 all sheets of plywood contain no blisters, delaminations and patches;

7.5.3 formaldehyde emission complies with the standards specified in Table 3;

7.5.4 physical and mechanical properties correspond to the standards specified in Tables 4, 5.

8. INSPECTION PROCEDURES

8.1 Sampling for physical and mechanical testing shall be made according to GOST 9620, EN 326-1. Formaldehyde release by gas analysis method – according to GOST 30255, GOST 32155, EN ISO 12460-3. Formaldehyde content – according to GOST 27678.

8.2 The length and width of plywood shall be measured at two points parallel to the edges at a distance of at least 100 mm from the edges using a metal tape according to GOST 7502 with an error of 1 mm. The actual length (width) of the sheet shall be the mean value of the results of two measurements.

8.3 The thickness shall be measured at a distance of at least 25 mm from the edges and in the middle of each side of the sheet with an accuracy of up to 0.1 mm using thickness gage according to GOST 11358 or micrometer according to GOST 6507.

8.3.1 The mean value of the results of four measurements shall be taken as the actual thickness of the sheet.

8.3.2 The thickness variation in one sheet of plywood shall be considered as the difference

between the largest and the smallest thickness of four measurements.

8.4 Deviation from the straightness of the edges of a plywood sheet shall be determined by measuring the maximum gap between the edge of the sheet and the edge of the metal ruler according to GOST 427, gauge – according to GOST 8925 with an accuracy of 0.2 mm.

8.5 The out-of-squareness of a birch plywood sheet shall be measured according to GOST 30427. The out-of-squareness shall be measured with an L-square according to GOST 3749. The out-of-squareness shall be determined by measuring the greatest deviation of the sheet edges from the surface of the angle with a metal ruler according to GOST 427 with an error of 1 mm.

8.6 Warping of birch plywood sheet shall be measured in accordance with GOST 30427. Warping of birch plywood sheet shall be determined by applying a ruler diagonally to the sheet placed on an even horizontal surface and measuring the maximum deflection range by an indicator of ICh-10 type, fixed on the ruler's sliding scale according to GOST 577.

8.7 Moisture – according to GOST 9621, EN 322.

8.8 Strength limit for shearing along the adhesive layer – according to GOST 9624, EN 314 parts 1 and 2.

8.9 Strength and modulus of elasticity in static bending – according to GOST 9625, EN 310.

8.10 Tensile strength along the grain – according to GOST 9622.

8.11 Formaldehyde content – according to GOST 27678, release of formaldehyde into the environment - according to GOST 30255, GOST 32155, EN ISO 12460-3.

8.12 Surface roughness – according to GOST 15612.

8.13 Measurement of wood flaws and processing defects – according to GOST 30427 and GOST 2140.

8.14 Sound absorption coefficient – according to GOST 16297.

8.15 Impact bending strength – according to GOST 9626.

8.16 Sound insulation – according to GOST 27296.

8.17 Hardness – according to GOST 9627.1.

8.18 Biological resistance – according to GOST 34034, EN 1099.

8.19 Combustibility class – according to GOST 30244 and GOST 12.1.044.

8.20 Heat conduction coefficient – according to GOST 7076.

8.21 Water vapor resistance coefficient – according to GOST 25898.

8.22 Other methods of control may be used as agreed between the manufacturer and the customer.

9. TRANSPORTATION AND STORAGE

9.1 Birch plywood shall be transported in closed vehicles in accordance with the rules of cargo transportation operating in this type of transport.

9.1.1 During transportation humidification of birch plywood shall be avoided to prevent changes in geometric, physical, qualitative characteristics of birch plywood and emission class.

9.2 Birch plywood shall be stored packed in the form of horizontally stacked packages on pallets or wooden shims in closed premises at the temperature from minus 40 °C to plus 50 °C and relative humidity of no more than 80%. Distance from the outermost shims to the edges should not exceed 150 mm.

10. MANUFACTURER WARRANTY

10.1 The manufacturer shall guarantee that the quality of birch plywood meets the requirements of this standard, provided that the transportation and storage conditions are met.

10.2 The warranty storage period of birch plywood WBP/FSF shall be 5 years from the date of manufacture thereof.

10.3 When using birch plywood for further processing, it is recommended to contact the manufacturer to specify the properties and characteristics of plywood.

APPENDIX A

Standards for limitation of wood flaws and processing defects for the outer plies of birch plywood

Table 7

Wood flaws and defects according to GOST 30427	B (I)	S (I)	BB+ (II)	BB (II)	CP (III)	WGE (III)	C (IV)
1. Pin knots	Allowed						
2. Inter-grown sound knots both light and dark	Ignored up to 10 mm. Light knots with a diameter of up to 15 mm with a crack of up to 0.5 mm of up to 5 pcs/m ² are allowed	Ignored up to 10 mm. Knots with a diameter of up to 15 mm with a crack of up to 0.5 mm of up to 5 pcs/m ² are allowed	Knots with a diameter of up to 25 mm with a crack of up to 1 mm of up to 10 pcs/m ² are allowed		Allowed with a crack of up to 1.5 mm in width	Allowed	Allowed
3. Partially inter-grown knots	Allowed with a diameter of up to 6 mm of up to 3 pcs/m ²		Allowed among inter-grown knots with a diameter of up to 15 mm of up to 10 pcs/m ²				Allowed any quantity of up to 40 mm in diameter
4. Loose knots, with knotholes therefrom (w/o bark)	Allowed with a diameter of up to 6 mm of up to 3 pcs/m ²		Allowed with a diameter of up to 6 mm of up to 4 pcs/m ²	Allowed with a diameter of up to 6 mm of up to 6 pcs/m ²	Allowed with a diameter of up to 6 mm of up to 10 pcs/m ²	Allowed with a diameter of up to 15 mm of up to 10 pcs/m ²	Allowed any quantity of up to 40 mm in diameter
5. Close cracks	Allowed up to 200 mm in length of up to 5 pieces per 1 m of sheet width		Allowed up to 300 mm in length of up to 5 pieces per 1 m of sheet width		Allowed		

Table 7 continued

Defects	B (I)	S (I)	BB+ (II)	BB (II)	CP (III)	WGE (III)	C (IV)
6. Open cracks	Not allowed	Allowed up to 200 mm in length and up to 1 mm in width of up to 2 pieces per 1 m of the sheet width		Allowed up to 250 mm in length and up to 2 mm in width of up to 3 pieces per 1 m of the sheet width. Subject to be filled with putties	Allowed up to 600 mm in length and up to 2 mm in width of up to 2 pieces per 1 m of sheet width + allowed up to 600 mm in length and up to 5 mm in width. Subject to be filled with putties	Allowed any quantity of up to 600 mm in length and up to 5 mm in width. Subject to be filled with putties	Allowed any quantity of up to 600 mm in length and up to 5 mm in width
7. Light inner inbark	Allowed						
8. Dark inbark	Allowed in general quantity and with standards for black knots		Allowed in general quantity and with standards for sound knots				Allowed any quantity of up to 40 mm in diameter
9. Deviations in wood structure (curly grain, dip grain, burr, inclination of grain)	Allowed						
10. Sound discoloration (false heart)	Not allowed			Allowed up to 25% of the sheet surface	Allowed up to 75% of the sheet surface	Allowed	
11. Sound discoloration (block mottle, vein lines, vein marks)	Allowed the light ones in the area of up to 15% of the sheet surface			Allowed			
12. Sound discoloration (group veins)	Allowed up to 60x40 mm of up to 1 pcs/m ²			Allowed			
13. Chemical stains (brown stain, blue stain, colored sapwood spots)	Allowed up to 30% of the sheet surface		Allowed up to 20% of the sheet surface	Allowed up to 50% of the sheet surface (with false heart)	Allowed		

Table 7 continued

Defects	B (I)	S (I)	BB+ (II)	BB (II)	CP (III)	WGE (III)	C (IV)
14. Discoloration with partial damage to the integrity of the wood integrity (rotting): - without damage to the grain integrity; - with damage to the grain integrity	Not allowed Not allowed				Allowed Not allowed		
15. Biological damage (wormhole)	Allowed in general quantity and with standards for black knots						
16. Bark patch	Not allowed						
17. Breaking out of grain	Not allowed			Allowed up to 5% of the sheet surface	Allowed up to 15% of the sheet surface	Allowed	
18. Insert of wood for knotting	Not allowed	Allowed up to 1 piece per m ²	Allowed up to 4 pieces per m ²	Allowed up to 8 pieces per m ²	Allowed		
19. Double insert	Not allowed			Allowed up to 1 piece per m ²	Allowed		
20. Fallen-out insert	Not allowed					Allowed up to 2 pieces per m ²	
21. Filling of cracks Note: filling of cracks with putties or inserts – to be agreed with the customer	Not allowed			Cracks opened over 2 mm in width to be sealed with adhesive veneer inserts	Cracks opened over 5 mm in width to be sealed with adhesive veneer inserts		Allowed
22. Marks from caul plates (marks from pressing plates)	Not allowed		Allowed up to 100 mm in length and 2 mm in width of up to 1 piece per 1 m of sheet width		Allowed up to 300 mm in length and 2 mm in width of up to 2 pieces per 1 m of sheet width		Allowed

Table 7 continued

Defects	B (I)	S (I)	BB+ (II)	BB (II)	CP (III)	WGE (III)	C (IV)
23. Veneer gap, edge defects due to trimming and sanding	Allowed up to 2 mm in width along the edge		Allowed up to 2 mm in width along the edge				
24. Industrial stains (traces of beams, streaks)	Not allowed		Allowed up to 15% of the sheet surface		Allowed		
25. Glue stain	Not allowed	Allowed up to 1% of the sheet surface	Allowed up to 2% of the sheet surface		Allowed up to 5% of the sheet surface	Allowed	
26. Mechanical damage	Allowed in general quantity and with standards for black knots						
27. Scratches, scars, pimples, hollow, crests	Not allowed			Allowed within the thickness tolerance values			Allowed
28. Pocket (without bark inclusion)	Not allowed				Allowed		
29. Warping	Ignored in plywood up to 6.5 mm thick, allowed in plywood over 6.5 mm thick for up to 15 mm per 1 m of the diagonal length of the plywood sheet						
30. Blisters, delamination	Not allowed						
31. Over-sanding	Not allowed				Allowed up to 1% of the sheet surface (for thickness from 3 to 21 mm) Allowed up to 2% of the sheet surface (for thickness of 24 mm and more)		Allowed
32. Under-sanding	Not allowed			Allowed 5 mm	Allowed up to 5 % of the sheet surface		Allowed up to 50 mm of the sheet surface
33. Waviness (for sanded plywood), fuzziness, ripple)	Not allowed				Allowed		
34. Plywood roughness	Roughness parameter Rmax according to GOST 7016, μm, up to: for sanded birch plywood – 100, for unsanded - 200						
35. Veneer particles pasted	Not allowed				Allowed up to 150 mm in length and up to 30 mm in an width for up to 1 piece per sheet		Allowed

APPENDIX B

Limiting Norms for Wood Defects and Processing Defects in the Face and Back Plies of Birch Plywood with Extended Tolerances

Table 8

Wood defects and processing defects according to GOST 30427	TU-1	TU-2
1. Pin knots	Allowed	
2. Inter-grown sound knots both light and dark	Allowed	
3. Partially inter-grown knots	Allowed with no restrictions on size or number	
4. Loose knots, with knotholes therefrom (w/o bark)	Allowed with no restrictions on size or number	
5. Close cracks	Allowed with no restrictions on size or number	
6. Open cracks	Allowed with no restrictions on size or number	
7. Light inner inbark	Allowed	
8. Dark inbark	Allowed	
9. Deviations in wood structure (curly grain, dip grain, burr, inclination of grain)	Allowed	
10. Sound discoloration (false heart)	Allowed	
11. Sound discoloration (block mottle, vein lines, vein marks)	Allowed	
12. Sound discoloration (group veins)	Allowed	
13. Chemical stains (brown stain, blue stain, colored sapwood spots)	Allowed	
14. Discoloration with partial damage to the integrity of the wood integrity (rotting)	Allowed	
15. Biological damage (wormhole)	Allowed	
16. Bark patch	Allowed	
17. Breaking out of grain	Allowed	
18. Insert of wood for knotting	Allowed	
19. Double insert	Allowed	
20. Filling of cracks Note: filling of cracks with putties or inserts – to be agreed with the customer	Allowed	
21. Marks from caul plates (marks from pressing plates)	Allowed	
22. Overlap	Allowed	
23. Veneer gap at the edge (inner plies)	Allowed within 300 mm from the edge	Allowed
24. Veneer gap on the face (outer plies)	Allowed on up to half of the surface area on one side	Allowed
25. Edge defects due to trimming and sanding	Allowed	
26. Deviation from geometric dimensions (out-of-squareness, beveled edge)	Not allowed	Allowed
27. Industrial stains (traces of beams, streaks)	Allowed	
28. Glue stain	Allowed	
29. Mechanical damages	Allowed	

Table 8 continued

30. Scratches, scars, pimples, hollow, crests	Allowed	
31. Warping	Allowed	
32. Blisters, delamination	Not allowed	Allowed
33. Over-sanding, under-sanding	Allowed	
34. Waviness (for sanded plywood), fuzziness, ripple	Allowed	
35. Plywood roughness	Allowed	
36. Veneer particles pasted	Allowed	