



Open Joint Stock Company
plywood and particleboard manufacturer, Fanplit

CORPORATE STANDARD

FILM FACED BIRCH PLYWOOD **Technical specifications**

CORPORATE STANDARD STO 00255177-002-2014

Kostroma
2014



APPROVAL RECORD SHEET

to the **CORPORATE STANDARD STO 00255177-002-2014** **Film faced birch plywood. Technical specifications**

Approved:

SVEZA - Les, LLC

Director for Technical Development
and Investments _____

A.S. Shangin

Date _____

SVEZA - Les, LLC

Sales and marketing
manager _____

A.I. Imoreev

Date _____

SVEZA - Les, LLC

Marketing Dept. Head _____

Yu.A. Ermakova

Date _____

Fanplit OJSC

Director General _____

B.V. Didenko

Date _____

OJSC UIFK

Director General _____

S.G. Sarson

Date _____

Perm Plywood Factory, LLC

Director General _____

M.V. Vyatkin

Date _____

OJSC Novator Plywood Factory, Veliky Ustyug

Director General _____

A.B. Stepanov

Date _____

OJSC FANKOM, Manturovo

Director General _____

D.L. Maltsev

Date _____

OJSC FANKOM, Verkhnyaya Sinyachikha

Director General _____

I.V. Radchenko

Date _____

Preface

The objectives and the tasks of development as well as application of the corporate standards in the Russian Federation are established by the Federal Law No. 184-FZ On Technical Regulation as of December 27, 2002.

The rules of development and execution are established 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 provisions.

This standard is harmonized with the national standard GOST R 53920-2010 Film faced Plywood. Technical specifications

Information on Standard

1 DEVELOPED AND INTRODUCED by the Open Joint Stock Company Fanplit for plywood and particleboard production instead of TU 5512-007-00255177-01

2 APPROVED AND PUT INTO EFFECT by the Order of the Director General of Fanplit OJSC No. 523 dated November 01, 2014.

3 AGREED with the Director for Technical Development and Investments of SVEZA - Les, LLC A.S. Shangin on October 10, 2014.

4 SUPPORTED BY THE EXPERT REPORT of the Federal State-Funded Institution State Regional Center for Standardization, Metrology and Testing in the Kostroma Region (FSFI Kostroma SMCC) as of 04.07.14.

This standard can be applied for work only upon the written permission of Fanplit OJSC.

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CORPORATE STANDARD

FILM FACED BIRCH PLYWOOD**Technical specifications**

Film Faced Birch Plywood
Specifications

Effective date November 01, 2014

1 SCOPE OF APPLICATION

This standard applies to water resistant birch plywood laminated with film based on thermosetting polymers (hereinafter referred to as plywood) designed for use in construction industry, automotive engineering, car building, development of containers, by manufacture of packing.

2 NORMATIVE REFERENCES

The standard contains references to the following standards:

- GOST 12.4.011-89 Occupational safety standards system. Means of protection. General requirements and classification
 - GOST 427-75 Metal measuring rulers. Technical specifications
 - GOST 3749-77 Precision square 90⁰. Technical specifications.
 - GOST 6507-90 Micrometers. Technical specifications
 - GOST 7502-98 Metal measuring rulers. Technical 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 9622-87 Laminated glued wood. Methods for determination of ultimate strengths and modulus of elasticity in tension.
 - GOST 11358-89 Dial-type thickness gauges and dial-type wall thickness gauges graduated in 0.01 and 0.1 mm. Technical specifications
 - GOST 14192-96 Marking of cargo.
 - GOST 18321-73 Statistical quality control. Item random sampling methods.
 - GOST 27678-88 Wood particle boards. Perforatory method for determining formaldehyde content.
 - GOST 30255-95 Furniture, timber and polymer materials. Method for determination of formaldehyde and other volatile chemicals in the air of climatic chambers.
 - GOST 30427-96 Plywood for general purpose. General principles of classification by appearance
 - GOST R 1.0-2012 Standardization in the Russian Federation. Basic provisions
 - GOST R 1.4-2004 Standardization in the Russian Federation. Standards of Organizations. General provisions.
 - GOST R 53920-2010 Film faced plywood. Technical specifications
 - TU 5512-007-00255177-01 Plywood laminated with films. Technical specifications
 - CORPORATE STANDARD STO 00255177-001-2013 Plywood for general use with outer layers of birch veneer. Technical specifications
- Notice: when using this standard it is reasonable to check if the normative references are applicable in the reference index "National Standards".

3 TERMS AND DEFINITIONS

In this standard the following terms are used:

FSF / EXT – plywood with increased water resistance of the glue joint for both indoor and outdoor application.

UNCOATED (UN) – without coating

4 CLASSIFICATION AND SIZES

4.1 Plywood is divided:

- depending on direction of grains in adjacent layers;
- by degree of glue water resistance;
- depending on type and method of applied coating into surface types;
- depending on outer layer's appearance into grades.

4.1.1 Depending on direction of grains in adjacent layers plywood is divided into:

- X – with perpendicular grain;
- U – with parallel grain;
- G – with composite grain.

4.1.2 As for degree of glue water resistance FSF / EXT plywood is manufactured.

4.1.3 Depending on type and method of applied coating plywood is divided by surface types:

- F – smooth surface;
- W – surface with net-line coating;
- SP – surface for painting;

UN – surface without coating

Notes:

1. Combination of types of surfaces is possible.

2. By generation of orders and marking of plywood bundles for the surface without coating the designation of the grade of plywood outer layer according to the CORPORATE STANDARD STO 00255177-001 is indicated.

Depending on outer layer's appearance plywood is divided into the following grades: 1, 2, 3.

4.2 Sizes

4.2.1 Length and width of plywood sheets must comply with Table 1.

Table 1

Length (width) of plywood sheets	Tolerance	mm
1220, 1250	± 3.0	
1500, 1525	± 4.0	
2440, 2500	± 4.0	
3000, 3050	± 5.0	
Notes:		
1. Other sizes are available on the terms agreed upon with the customer.		
2. The length of plywood sheets is measured along the grain of outer layers.		

4.2.2 Thickness of plywood must comply with Table 2.

Table 2

Nominal thickness of plywood	Number of plies	Tolerance	Difference in 4 measurements	mm
6	5	+ 0.4 - 0.5	0.6	
6,5	5	+ 0.4 - 0.5		

8	6 and 7	+ 0.4 - 0.5
9	7	+ 0.4 - 0.6
10	7 and 8	+ 0.5 - 0.6
12	9	+ 0.5 - 0.7
15	11	+ 0.6 - 0.8
18	13	+ 0.7 - 0.9
21	15	0.0 - 1.1
24	17	0.0 - 1.5
27	19	0.0 - 1.8
30	21	0.0 - 2.0
35	25	0.0 - 2.0
40	28 and 29	+ 1.2 - 1.2

Note: Plywood with other thickness, number of plies and tolerance is available on the terms agreed upon with the customer.

4.3 Plywood sheets must be cut at a right angle. The obliquity must not exceed 1 mm per 1 m of a sheet edge length.

4.4 The sheet edge obliquity in plywood must not exceed 1 mm per 1 m of the sheet edge length.

4.5 The conventional notation for plywood must include:

- product name with wood species information;
- type;
- direction of grains in adjacent layers;
- surface type;
- grade;
- emission class;
- sizes;
- film type
- the present standard reference.

Example of conventional notation for film faced birch plywood with perpendicular direction of grains in adjacent layers, of FSF type, with the surface of smooth type on both sides, with film type DB 120/120, grade 1/1, emission class E1, length 2440 mm, width 1220 mm, thickness 12 mm:

Film faced birch plywood, X, FSF, F/F, 1/1, E1, 2440x1220x12, DB 120/120
CORPORATE STANDARD STO 00255177-002-2014

5 TECHNICAL SPECIFICATIONS

5.1 The following items are applied for manufacture of plywood:

- plywood for general purpose with outer layers of birch veneer manufactured in compliance with the CORPORATE STANDARD STO 00255177-001 of FSF type, sanded, with the grade not lower than WGE (III);

- resin-treated paper (hereinafter referred to as film);

- acrylic water-based paint for protection of plywood edges from moisture penetration according to regulatory technical documentation.

5.2 Depending on quality of the surface's appearance plywood of the following grades is manufactured: 1/1, 1/2, 2/2, 3/3.

The plywood surface's appearance must comply with values given in Appendix A.

5.3 Formaldehyde content and formaldehyde emission in room air must not exceed given in Table 5.3.

Table 3

Emission class	Formaldehyde content in 100 g of plywood, dry weight (perforatory method), mg	Formaldehyde emission	
		Chamber method, mg/m ³	Gas analysis method, mg/m ² h
E1	up to 8.0 inclusive	up to 0.124	up to 3.5 inclusive or less than 5.0 during 3 days after manufacturing

5.4 As for physical and mechanical performance plywood must comply with requirements given in Tables 4 and 5.

Table 4

Parameter name	Thickness, mm	Value
1 Moisture content, %	6 – 40	5 – 14
2 Ultimate strength in static bending: along the outer layer grain, MPa, not less across the outer layer grain, MPa, not less	9 – 40	60 30
3 Elasticity module in static bending: along the grain, MPa, not less across grain, MPa, not less	9 – 40	6000 3000
4 Along outer layer grain stretching ultimate strength, MPa, not less	6 – 6.5	30
5 Strength of gluing of laminated coating to plywood	6 – 40	The coating must not delaminate in the point where two tear lines are crossed

Table 4, continued

Parameter name	Thickness, mm	Value
6 Resistance to vapor	6 – 40	No swelling. Insignificant loss of gloss. No blisters
7 Resistance to sodium hydroxide (NaOH)	6 – 40	Color of solution after testing (NaOH) from light yellow to colorless
8 Resistance to concrete	6 – 40	No concrete coloration after interaction with plywood

Note: Parameters of items 4 – 8 can be selected on the terms agreed upon with the customer.

Table 5

Average value of ultimate strength on shearing along glue line, MPa	Wood destruction, %
Over 0.2 up to 0.4 inclusive	Over or equal to 80
Over 0.4 up to 0.6 inclusive	Over or equal to 60
Over 0.6 but not less than 1.0	Over or equal to 40
1.0 and more	-

Notes

1 The preparation for testing of FSF / EXT plywood is made by one of the three methods:
boiling in water for 1 hour;
- water soaking the samples for 24 hours @ (20 ± 3) °C, boiling in water for 6 hours;
- water soaking the samples for 24 hours @ (20 ± 3) °C, boiling in water for 4 hours; drying in a ventilated room for (16-20) hours, reboiling in water for 4 hours, cooling in water for 1 hour;
- water soaking the samples for 24 hours @ (20 ± 3) °C, boiling in water for (72 ± 1) hours, cooling in water for 1 hour.
Sample preparation method is selected as agreed with the customer.

2 Wood destruction percentage is defined visually.

3 Shearing test is conducted for different glue lines as agreed with the customer.

5.5 Plywood shall be measured in square meters. One sheet volume shall be defined without rounding. Plywood bundle volume – with the precision up to 0.001 m³. Plywood sheet area shall be measured with the precision of up to 0.01 m², sheet area in a bundle – with the precision of up to 0.5 m² - taking in account product type

5.6 Application of per sheet marking to plywood is allowed.

The plywood is marked with indelible paint on an edge or on the face of each sheet. By thickness of the plywood less than 10 mm one stamp is applied for two or three sheets.

The marking contains the following information:

plywood;
plywood grade;
manufacturer;
thickness and / or sorter number;
certification information.

5.7 Plywood bundling

Plywood shall be packed in bundles 400, 600, 900 mm high separately by plywood type, grade, surface type, size, thickness, type of films.

Other heights of bundles are allowable as agreed with the customer.

5.8 Packing and marking of the ready plywood bundles

5.8.1 Plywood bundles are to be packed to ensure damage-free condition during transportation.

Various types of packaging are allowable.

5.8.2 The packed bundles shall be marked with adhesive labels.

In Russian and/or English on two opposite sides. With the same marks giving the following information:

brand name;
manufacturer, manufacturer address;
document according to which the plywood is manufactured;
origin country, contact information;
certification information;
production name;
plywood sizes and thickness;
plywood;

plywood grade;
 - surface type;
 - film type
 - emission class;
 number of sheets in a bundle;
 manufacturing date;
 working shift number
 manipulation signs: “moister sensitive” and “do not use hooks”
 bar-code if there is a scanner
 Transportation marking (manipulation signs) - in compliance with GOST 14192.

6 ACCEPTANCE RULES

6.1 Plywood shall be accepted in lots.

A lot is a certain number of plywood sheets of the same type, grade, emission class, surface type, film type and sizes. One document must be drawn up for the lot giving the following information:

brand name;
 manufacturing country;
 name and (or) trade mark of manufacturer and its address;
 conventional notation for plywood;
 Lot volume;
 name of the regulatory document stating the requirements with which the product complies.

6.2 Quality and size control shall be done by test sampling. The sheets for sampling are chosen at random according to GOST 18321 in quantity indicated in Table 6.

Table 6

Lot volume	Tested parameter, items			
	4.2; 4.3; 4.4		5.2	
	sampling amount	acceptance number	sampling amount	acceptance number
up to 500	8	1	13	1
from 501 to 1200	13	1	20	2
from 1201 to 3200	13	1	32	3
from 3201 to 10000	20	2	32	3

Note – Sampling amount for items of Table 4 as agreed with the customer.

6.3 Ultimate shear strength in glue line, static bending strength cross and along grain, static bending elasticity module cross and along grain shall be tested for each thickness of plywood not less frequently than once a month.

It is allowable to test each lot as agreed with the customer, for this purpose 0.1% of the sheets in the lot are selected, but not less than one sheet.

6.4 Formaldehyde content is tested once in 30 days.

To test for formaldehyde content one sheet is selected from any sampling amount. It is allowable to test for formaldehyde once in 7 days as agreed with the customer.

6.5 For the plywood presented to acceptance it is allowed to apply the parameters of physical testing and free formaldehyde tests for the plywood manufactured during the same period.

6.6 The lot is considered to be in line with this standard if in samples:

the number of plywood sheets that does not meet the standard requirements for sizes, obliquity, straightness and manufacturing defects is less or equal to acceptance number, defined in Table 6;

physical and mechanical properties comply with the values given in Tables 4 and 5;
formaldehyde content and emission comply with values given in Table 3.

7 CONTROL METHODS

7.1 Samples are selected according to GOST 9620, GOST 27678, [1], [5] for determination of physical and mechanical parameters.

7.2 The length and width shall be measured in two points parallel to the edges at the distance not less 100 mm from the edges with a metal measuring tape according to GOST 7502 with tolerance 1 mm. The actual length (width) of the sheet is average arithmetic value of two measurements.

7.3 The thickness is measured by thickness gauge according to GOST 11358 or micrometer according to GOST 6507 with unit divisions not more than 0.1 mm. at the distance of not less than 25 mm from the edges at the middle of each side of the sheet.

The actual thickness is average arithmetic value of four measurements.

Thickness variation in one sheet is the difference between maximal and minimal thickness in four measurements.

7.4 Obliquity shall be measured with precise square according to GOST 3749. The obliquity is maximal difference between a sheet edge and precise square measured with a metal ruler according to GOST 427 with tolerance 1 mm.

7.5 Edges obliquity shall be defined by measuring maximal gap between the edge and metal ruler. The measure shall be taken by gage probe according to GOST 8925 with tolerance 0.2 mm.

7.6 Warpage is according to GOST 30427.

7.7 Moisture content is according to GOST 9621.

7.8 Ultimate glue line shear strength is according to [2] - [3].

7.9 Static bending ultimate strength and elasticity module is according to [4].

7.10 Ultimate strength in tension according to GOST 9622.

7.11 Determination of manufacturing defects according to GOST 30427.

7.12 Strength of gluing of laminated coating is determined according to GOST 14614 by tearing the surface of the plywood samples to the depth of the laminated coating along two directions crossed at the angle 45 degree. Then visual inspection of the tested sample is carried out.

7.13 Resistance to vapor – according to Appendix C.

7.13 Resistance to sodium hydroxide (NaOH) – according to Appendix D.

7.13 Resistance to concrete – according to Appendix E.

7.16 Formaldehyde content is according to GOST 27678 (the method is used for arbitration testing), formaldehyde emission according to GOST 30255, [1].

8 TRANSPORTATION AND STORAGE

8.1 Plywood is transported in sheltered vehicles according to transporting rules applicable for this type of transport.

8.2 Plywood storage.

Plywood is stored as horizontally placed butches on pallets or bunks in closed rooms at temperature from minus 40° C to plus 50° C and relative humidity not more than 80 %.

9 MANUFACTURER'S WARRANTY

The manufacturer guarantees that the plywood quality complies with the present technical specifications if properly transported and stored.

The warranty storage period for FSF / EXT plywood is 5 years, for FSF / EXT is 5 years since receipt by the customer.

10 SAFETY REQUIREMENTS AND ENVIRONMENTAL PROTECTION

10.1 The emissions of harmful chemical substances of plywood products into the air of residential premises and public buildings must not exceed the requirements stipulated in [6], [7], [8].

10.2 The plywood must be manufactured using such materials and components that are allowable by national sanitary and epidemiological inspection authorities.

10.3 Persons not younger than 18 years old and having no medical contraindications can be engaged in plywood manufacturing. The medical inspections are conducted according to the orders by the Ministry of Health of the Russian Federation.

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

10.5 The values of specific activity of cesium-10.5 in plywood must not exceed the standards of hygiene stipulated in the requirements [9].

10.6 The composition of standard plywood does not contain raw material and components classified as hazardous waste products.

10.7 Plywood has, as a rule, a long service life and there are several methods of plywood utilization. The plywood utilization must be conducted in compliance with the applicable utilization regulations of different countries.

11 OPERATION INSTRUCTIONS

11.1 Film faced birch plywood is designed for multiple use. Observance of rules for plywood use and storage will help to increase its service life.

11.2 Film faced plywood shall be transported in a closed truck with protection from adverse environmental conditions. By transportation it is necessary to avoid high humidity in order to prevent swelling by edges, warping of sheets, and strong denting of packing belts or any other loss of quality.

11.3 Insignificant tolerance for plywood thickness when subjected to humid air during transportation at the distance 50 mm from the edge is allowed.

11.4 It is necessary to provide proper storage of plywood boards designed for transportation in vehicles: to store in closed areas protecting the plywood from atmospheric precipitation.

11.5 Sawing of plywood into parts shall be carried out using cutting bands or rotatory saws. In order to have a clean cut sawing shall be fulfilled correctly. At first sawing shall be carried out crosswise the direction of grains at the face side, than along. This method enables to avoid splitting of corners and to reduce sizes and quantity of splits on the face. If it shall be sawed by rotatory saw, high speed and low charge efficiency are recommended.

To prevent absorption of moisture by plywood in case of its sawing the edges of the plywood shall be necessarily treated by special types of acrylic water-based paint.

11.6 All the opening made during assembly works shall be filled with acrylic water-based paint in order to prevent ingress of moisture into the plywood.

By drilling the opening will have even edges if the drill is rather sharp and equipped with front cutter. Drilling shall be started from the face side. It is possible to avoid splitting on the back side of the plywood if to use underlay sheet.

If nails are used, then in order to prevent splitting of the plywood layers use the nails with thread or special screws. Appropriate distance from the edge of the sheet to the nail is considered to be 12 – 15 mm.

11.7 When the works are completed, the surface of the plywood shall be cleaned from the rest of concrete mixture.

11.8 By continuous application of plywood as concrete forms the content of moisture in the plywood sheets increases and it reduces its strength properties. In this connection drying of plywood becomes necessary. In order to avoid external deformations the material shall be dried in the air.

11.9 By film faced plywood a deviation as for unequal color of film and logo is possible.

Requirements for restriction of defects for plywood grades

The requirements for restriction of defects for plywood grades are given in Table A.1

Table A. 1

Name of defects	Requirements for restriction of defects for grades		
	1	2	3
1. Coverage of wood grain structure, sound knots, inserts	Allowed		
2. Delamination, tearing, absence, shedding of the film	Allowed on one edge not more than 3 mm provided that it is coated with moisture-protective paint	Allowed not more than 2% of the sheet square provided that it is coated with moisture-protective paint	Allowed
3. Temperature stains	Not allowed	Allowed without integrity damage of laminated coating	Allowed
4. Overlaying (folds) of film	Allowed with width not more than 10 mm and length not exceeding 500 mm in the quantity 1 pc./m ²	Allowed	
5. Sticking of pieces of film	Allowed with the size not exceeding 30x30 mm in the quantity 1 pc./m ² or 10x100 mm in the quantity 1 pc./m ²	Allowed	
6a. Burnt film (burnout) due to defects of outer layer: cracks, damages, knot-holes	Not allowed	Allowed	
6b. Burnt film (burnout) due to defects of outer layer: non-smooth scuffleness	Not allowed	Allowed	
6c. Burnt film (burnout) due to defects of outer layer: stripes and stains from grinding	Not allowed	Allowed not more than 25% of the sheet square	Allowed
7a. Traces of defects of inner layer: knotholes, openings	Allowed as stains with the size not exceeding 25x25 mm in the quantity not more than 1 pc./m ²	Allowed	
7b. Traces of defects of inner layer: open joint, cracks	Allowed with width not more than 5 mm and length not exceeding 300 mm in the quantity not more than 1 pc./running meter	Allowed	

Name of defects	Requirements for restriction of defects for grades		
	1	2	3
8. Trace of built-up or spliced veneer	Allowed without damage of coating	Allowed	
9. Stripes and stains from press plates	Allowed		
10. Stripes and stains from film	Allowed not more than 15% of the sheet square	Allowed	Allowed
11. Local plywood blisters	Not allowed	Allowed with diameter not exceeding 100 mm in the quantity not more than 1 pc./m ²	Allowed
12. Veneer parts inserted glued in outer layer	Not allowed	Allowed	
13. Impress of press plates	Allowed not more than 5% of the sheet square	Allowed	
14. Dents	Allowed with diameter up to 6 mm in the quantity not more than 1 pc./m ² providing strong gluing of the film	Allowed with depth not exceeding 0.5 mm without damage of coating	Allowed
15. Scratches	Not allowed	Allowed without damage of coating	Allowed
16. Defects of cutting, shatters on edges	Allowed with length not more than 3 mm provided that it is coated with moisture-protective paint	Allowed with length not more than 10 mm provided that it is coated with moisture-protective paint	Allowed
17. Down flows	Allowable width not more than to 5 mm	Allowed	
18. Lack of veneer sheet	Not allowed	Allowed on one edge with width not exceeding 5 mm	Allowed
19. Local delamination in inner plywood layers (hidden bubble)	Not allowed		Allowed
20. Warping	In plywood with thickness up to 6.5 mm is not considered, in plywood with thickness more than 6.5 mm is allowed with bouge not exceeding 15 mm per 1 m of sheet diagonal length		
21. Deviations from allowable sizes	Sizes according to items 4.2, 4.3, 4.4		Allowed

APPENDIX B
(mandatory)

Terms and definitions of processing defects

Terms and definitions of processing defects are given in Table B.1

Table B. 1

Name of processing defects	Definition
Coverage of wood grain structure, sound knots, inserts	Outline of sound knots, wood grain structure, inserts on the surface of film faced birch plywood
Delamination, tearing, absence, shedding of the film	Sections of the surface of film faced birch plywood not covered with film
Temperature stains	Change of the color of film (with integrity damage of coating and / or without such damage) caused by early setting of the film without pressure
Overlaying (folds) of film	Local thickening caused by overlaying of the film at the surface of plywood
Sticking of pieces of film	Glued on pieces of the film having occurred on the external surface of plywood in the process of lamination
Burnt film (burnout)	Integrity damage of the film due to defects of outer layer
Traces of defects of inner layer	Integrity damage of the film due to defects of inner layer
Stripes and stains from press plates	Stripes and stains on the laminated surface of plywood caused by contamination of press plates
Stripes and stains from film	Abnormally painted sections of the surface of film faced plywood due to emissions of volatile chemicals from the film during pressing
Local plywood blisters	Partial delamination of the film from the surface of plywood
Veneer parts inserted glued in outer layer	Veneer parts inserted glued in the plywood outer layer before lamination
Impress of press plates	Local protuberances on the surface of plywood built up because of the defects on the lamination press plates
Dents	Local denting of the outer layer without damage of the laminated coating
Scratches	Damage of the plywood laminated coating by sharp object in the form of a narrow long dent or local denting of the outer layer with the damage of the laminated coating
Shatters on edges, defects of cutting	The defects characterized by absence of the laminated coating at the plywood sheet edge.
Down flows	Ingress of paint to the face of plywood sheet
Lack of veneer sheet	The defect characterized by absence of veneer parts in the inner layer except for edge knots and cracks
Local delamination in inner plywood layers (hidden bubble)	Separation of two adjacent veneer sheet layers along glue line.

APPENDIX C
(mandatory)

Method for determining resistance to vapor

Pour water into 500 ml flask with the neck diameter 60 mm at the half level and boil.
Place the sample of the plywood on the neck and holding tightly keep it above vapor during 60 min.

Then take the sample, dry it and estimate the extent of damage on a three-point scale:

- 1 – No swelling. Insignificant loss of gloss. No blisters.
- 2 – Insignificant swelling along the whole surface. Change of gloss. Small formation of bubbles.
- 3 – Strong swelling. Big change of gloss. Big formation of bubbles.

APPENDIX D
(mandatory)

Method for determining resistance to sodium hydroxide (NaOH)

Pour 5% NaOH-solution into 50 ml glass cup. Press the sample of the plywood from the top to leave about 10 cm between the edge of the cup and the edge of the sample. Then rotate the sample of the plywood together with the cup by 180° so that the solution could moisten the surface of the plywood and leave it for 2 hours.

Resistance of the plywood to sodium hydroxide is estimated depending on changes of the color of solution:

- Intense yellow color – the film is not completely set.
- Light yellow color – setting of the film is normal.
- Colorless – complete setting of the film.

APPENDIX E
(mandatory)

Method for determining resistance to concrete

Prepare cement grout based on the ratio: 120 g cement and 50 g water.

Place five grouting points (30-40 g each) on the sample of the plywood with the size 30 x 30 cm.

After 24 hours remove these grouting points from the surface of the plywood in the hardened state and dry the sample during 6 days. On the seventh day estimate change of the color of the hardened cement grout on a three-point scale:

- 1 – No coloration.
- 2 – Partial coloration of edges.
- 3 – All edges are colored.

Completely hardened surface of the plywood does not change the surface of cement. Reddish hue demonstrates that phenolic film is not completely hardened.

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REFERENCE

- [1] EN 717-1-1995 Wood-based panels. Determination of formaldehyde release Part 1. Determination of formaldehyde release using testing chamber
- EN 717-2-1995 Wood-based panels. Determination of formaldehyde release Part 2. Formaldehyde release by the gas analysis method
- [2] DIN EN 314-1 Plywood. Bonding quality. Part 1: Test methods.
- [3] DIN EN 314-2 Plywood. Bonding quality. Part 2: Requirements
- [4] EN 310-1993 Wood-based panels. Determination of modulus of elasticity in bending and of bending strength
- [5] EN 326-1 Wood-based panels. Sampling, cutting and inspection. Part 1: Sampling and cutting of test pieces and expression of test results
- [6] GN 2.1.6.1338-03 Maximum allowable concentrations (MAC) of pollutants in the air of populated areas
- [7] GN 2.1.6.2309-07 Tentatively safe impact levels (TSIL) of pollutants in the air of populated areas. Public health standards.
- [8] GN 2.1.6.2328-08 Addition to GN 2.1.6.2309-07 Tentatively safe impact levels (TSIL) of pollutants in the air of populated areas. Public health standards.
- [9] Unified sanitary epidemiological and hygienic requirements for goods subject to sanitary and epidemiological supervision (control) approved by the Decision of the Customs Union Commission No. 299 as of 28.05.2010

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Developer
Fanplit OJSC

Head of developer
Director General
Fanplit OJSC

_____ B.V. Didenko

Development Head:
Production Chief
Fanplit OJSC

_____ V.V. Tikhonov

Drafted by:

QA and Production&Process Inspection Dept. Head _____ I.A. Vinogradova