



## **CORPORATE STANDARD\***

### **FILM FACED BIRCH PLYWOOD Technical Specifications**

**STO 52654419-006-2018**

Saint Petersburg  
2018

\* 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

## Preface

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

Development and execution rules are stated by GOST R 1.0-2012 «*Standardization in the Russian Federation. General provisions*» and GOST R 1.4-2004 «*Standardization in the Russian Federation. Corporate Standards. General Provisions*», subject to GOST R 1.5-2012, «*Standardization In the Russian Federation. National standards. Regulations on arrangement, representation, execution, and designation*».

### Information on Standard

1 DEVELOPED AND INTRODUCED by SVEZA-Forest, a limited liability company

2 APPROVED AND ENACTED by order of the General Director of OOO SVEZA-Forest dated \_\_\_\_ \_\_\_\_\_ 20\_\_ No. \_\_\_\_\_

3 FIRST RELEASE

4 APPROVED by OOO SVEZA-Forest Sales and Marketing Director R.A. Muzyka, August 21, 2018

5. THE EXPERT CONCLUSION, dated 30.05.2018, HAS BEEN RECEIVED from E.Yu. Tretyakova, Expert in the confirmation of the conformity of wood-working industry products, Head of the Fantest NP Certification Body, and member of Technical Committee on Standardization TK 121.

This standard may only be used for work with the written consent of OOO SVEZA-Forest.

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# CORPORATE STANDARD

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## FILM FACED BIRCH PLYWOOD Technical Specifications

### Film Faced Birch Plywood Technical requirements

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Effective since \_\_\_\_\_, 20\_\_

#### 1 SCOPE

This corporate standard (hereinafter standard) applies to birch plywood faced with thermoset, polymer-based film (hereinafter film faced birch plywood).

Film faced birch plywood is used in the construction, automotive, railway car, container construction, packaging manufacture industries.

#### 2 REGULATORY REFERENCES

This standard hereby includes regulatory references to the following standards:

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

GOST 427-75 Metal rulers. Technical Specifications

GOST 3749-77 Checking 90 degree L-squares. Specifications

GOST 6507-90 Micrometers. Technical Specifications

GOST 7502-98 Metal measuring tapes. Specifications

GOST 8925-68 Feeler gauges for machine tool accessories. Design

GOST 9620-94 Glued laminated timber. Sampling and general requirements for testing

GOST 9621-72 Glued laminated timber. Methods for determination of physical properties

GOST 9622-2016 Glued laminated timber. Methods for determination of tensile strength and modulus of elasticity

GOST 9624-2009 Glued laminated timber. Method for determination of shear strength

GOST 9625-2013 Glued laminated timber. Methods for determination of strength and modulus of elasticity in static bending.

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

GOST 14614-79 Decorative plywood. Technical Specifications

GOST 18321-73 Static quality control. Random sampling methods for custom production

GOST 27678-2014 Chipboard panels and plywood. Perforation method for determination of formaldehyde content

GOST 30255-2014 Furniture, wood, and polymer materials. Method for determination of formaldehyde and other volatile chemicals in the air of climate chambers

GOST 30427-96 General purpose plywood. General requirements for classification by appearance

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

GOST R 53920-2010 Veneered plywood. Technical Specifications

STO 52654419-001-2018: General-purpose plywood with birch-veneer exterior plies. Technical Specifications

Note: When using this standard, it is advisable to check the validity of the standards referenced against the National Standards reference index.

### **3 CLASSIFICATION, TERMS AND DEFINITIONS, METHODS OF MEASUREMENT**

This standard includes terms, as provided below:

General purpose birch plywood – plywood with outer plies of birch veneer and inner plies of birch or other hardwood.

Film faced birch plywood – plywood with outer plies of birch veneer and inner plies of birch or other hardwood, faced with thermoset, polymer-based film.

SVEZA Deck 350 plywood – birch plywood, faced with film with the “SVEZA Deck 350” logo and layout grid, which provides convenience during cutting. Special product for use in civil construction (formwork).

SVEZA PAINT plywood – birch plywood, faced with film for further painting.

SVEZA TITAN plywood – birch plywood, faced with a film with highly tear-resistant properties due to the inclusion of corundum crystals in the film’s impregnation compound.

SHOP – film faced birch plywood with conventional a cross-cut or rip cut up to 300 mm along one edge, sheet volume corresponds to the full format but with a reduced industrial part. The SHOP (conventional cut) zone may include defects listed in Appendix A to this standard, as well as other defects not listed therein. Out-of-squareness and veneer delamination are not allowed in the SHOP zone.

### **4 CLASSIFICATION AND DIMENSIONS**

4.1 Film faced birch plywood with the EXT/FSF mark is manufactured according to the degree of glue joint water resistance: This is plywood with enhanced water resistance at the glue joint, glued using phenol-formaldehyde adhesives and intended for indoor and outdoor use.

Note: Film faced birch plywood is included in the EXT formaldehyde emission group.

4.2 Film faced birch plywood is divided into grades depending on surface appearance: 1, 2, 3.

4.3 Depending on the applied coating type and method, film faced birch plywood is divided by surface types:

- F – smooth surface;
- W – mesh surface;
- SP – surface with film for further painting;
- UN (UNCOATED) – surface without film facing.

Note:

1. Surface types may be combined.  
 2. In creating orders and marking film faced birch plywood stacks for a surface without a film coating, the designation of the plywood surface layer grade is indicated according to STO 52654419-001.

3. On film faced birch plywood with 1/2 grade and the F/W surface type, grade 2 always qualifies as side F.

#### 4.4 Dimensions

4.4.1 Length and width of film faced birch plywood sheets must be as shown in Table 1 below.

Table 1

In millimeters	
Length (width) of sheet	Maximum deviation
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. Film faced birch plywood may be produced in other dimensions and maximum deviations upon agreement between the manufacturer and the customer 2. Sheet length of film faced birch plywood is measured along the grain of the face veneers	

4.4.2 Film faced birch plywood thickness must be as shown in Table 2 below.

Table 2

In millimeters

Nominal Thickness	Number of plies	Maximum deviation	Thickness variation, max.
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	

Notes:

1. Film faced birch plywood may be produced with different thicknesses, number of plies, and tolerance limits upon agreement between the manufacturer and the customer.
2. Birch plywood with inner plies of other hardwood veneer is manufactured at a thickness of 12, 15, 18, and 21 mm

4.4.3 Film faced birch plywood sheets must be cut square.

Out-of-squareness must not exceed 1 mm per 1 m of the sheet edge length, when controlled as per section 7.4.1.

Difference in the diagonal lengths must not exceed 1 mm per 1 m of the sheet edge length, when controlled as per section 7.4.2.

4.4.4 Out-of-straightness for film faced birch plywood edges must not exceed 1 mm per 1 m of the sheet edge length.

4.4.5 Out-of-straightness of the layout grid lines to the edge of the film faced birch veneer (for SVEZA Deck 350 plywood) should not exceed 2 mm per 1 m of the sheet edge length, and maximum deviation should not exceed 4 mm.

4.5 Film faced birch plywood identification markings must include the following information:

- product name;
- grade;
- quality;
- surface type;
- emission class;
- dimensions;
- film type;
- this Standard number.

4.5.1 Marking example for film faced birch plywood of the EXT/FSF type, 1/1 grade, with a smooth surface (both sides), E1 emission class, 2,440 mm length, 1,220 mm width, 18 mm thickness, and DB 120/120 film type:

*Film Faced Birch Plywood*  
*EXT/FSF, 1/1, F/F, E1, 2440x1220x18, DB 120/120*  
*STO 52654419-006-2018*

4.5.2 Marking example for SVEZA Deck 350 of the EXT/FSF type, 1/1 grade, with a smooth surface on both sides, E1 emission class, 2,440 mm length, 1,220 mm width, 18 mm thickness, and Deck 350/Deck 350 film type:

*SVEZA Deck 350 Plywood*  
*EXT/FSF, 1/1, F/F, E1, 2440x1220x18, Deck 350/Deck 350*  
*STO 52654419-006-2018*

4.5.3 Marking example for SVEZA PAINT plywood of the EXT/FSF type, 1/1 grade, with a film coating for further painting (both sides), E1 emission class, 2,440 mm length, 1,220 mm width, 18 mm thickness, and TXP KRAFT 214/TXP KRAFT 214 film type:

*Plywood SVEZA PAINT*  
*EXT/FSF, 1/1, SP/SP, E1, 2440x1220x18, TXP KRAFT 214/TXP KRAFT 214*  
*STO 52654419-006-2018*

4.5.4 Marking example for SVEZA TITAN plywood of the EXT/FSF type, 1/1 grade, with a smooth surface on one side and a mesh surface on the other, E1 emission



class, 2,440 mm length, 1,220 mm width, 18 mm thickness, and DB 120/TPS 422 film type:

*SVEZA TITAN Plywood*  
*EXT/FSF, 1/1, F/W, E1, 2440x1220x18, DB 120/TPS 422*  
*STO 52654419-006-2018*

4.5.5 Marking example for film faced birch plywood with inner plies of aspen veneer of the EXT/FSF type, As 1/1 grade, with a smooth surface (both sides), E1 emission class, 2,440 mm length, 1,220 mm width, 18 mm thickness, and DB 120/120 film type:

*Film Faced Birch Plywood*  
*EXT/FSF, As 1/1, F/F, E1, 2440x1220x18, DB 120/120*  
*STO 52654419-006-2018*

4.5.6 Example of marking for SVEZA Deck 350 with inner plies of aspen veneer of the EXT/FSF type, As 1/1 grade, with a smooth surface (both sides), E1 emission class, 2,440 mm length, 1,220 mm width, 18 mm thickness, and Deck 350/Deck 350 film type:

*Plywood SVEZA Deck 350 Plywood*  
*EXT/FSF, As 1/1, F/F, E1, 2440x1220x18, Deck 350/Deck 350*  
*STO 52654419-006-2018*

4.5.7 Marking example for SVEZA PAINT plywood with inner plies of aspen veneer of the EXT/FSF type, As 1/1 grade, with a film coating for further painting (both sides), E1 emission class, 2,440 mm length, 1,220 mm width, 18 mm thickness, and TXP KRAFT 214/TXP KRAFT 214 film type:

*Plywood SVEZA PAINT*  
*EXT/FSF, As 1/1, SP/SP, E1, 2440x1220x18, TXP KRAFT 214/TXP KRAFT 214*  
*STO 52654419-006-2018*

4.5.8 Marking example for SVEZA TITAN plywood with inner plies of aspen veneer of the EXT/FSF type, As 1/1 grade, with a smooth surface on one side and a mesh surface on the other, E1 emission class, 2,440 mm length, 1,220 mm width, 18 mm thickness, and DB 120/TPS 422 film type:

*SVEZA TITAN Plywood*  
*EXT/FSF, As 1/1, F/W, E1, 2440x1220x18, DB 120/TPS 422*  
*STO 52654419-006-2018*

## 5 TECHNICAL REQUIREMENTS

### 5.1 Characteristics

5.1.1 Birch plywood is used in the manufacture of film faced birch plywood of the EXT/FSF type, sanded, and graded WGE (III) or higher, per STO-52654419-001.

5.1.2 The thermoset, polymer-based film (hereinafter face coating or film) is used to coat the external ply of film faced birch plywood.

5.1.3 To protect against moisture absorption, film faced birch plywood butt ends are coated with an acrylic water dispersion paint.

5.1.4 Film faced plywood is fabricated in grades depending on the appearance quality of the surface as follows: 1/1, 1/2, 2/2, 3/3.

Note: for film faced birch plywood with inner plies of another hardwood veneer, the grade designation is preceded by two Roman letters for the hardwood used (for example, in the case of aspen veneer used for inner plies, the grade designation is preceded by As (Aspen)).

Film faced birch plywood surface appearance must be conform to the regulations set forth in Appendix A.

For terms and definitions of processing defects, see Appendix B.

5.2 Formaldehyde content in film faced birch plywood and formaldehyde emission from film faced birch plywood into the room air must comply with the value specified in Table 3.

Table 3

Emission class	Formaldehyde content per 100 grams of absolutely dry weight of film faced birch plywood, (mg)	Formaldehyde emission	
		Chamber method (mg/m <sup>3</sup> of air)	Gas analysis method (mg/m <sup>2</sup> ·h)
E1	Up to 8.0 inclusively	Up to 0.124	Up to 3.5 inclusive, or less than 5.0 at 3 days after manufacturing

5.3 For the physical and mechanical properties of film faced birch plywood, see Tables 4 and 5.

Table 4

Parameter	Thick- ness (mm)	Physical and mechanical parameter values
1 Moisture, %	6–40	5–12
2 Static bending strength: — along the grain of face plies (MPa), min — across the grain of face plies (MPa), min	9–40	60 30
3 Modulus of elasticity in static bend- ing: — along the grain (MPa), min — across the grain (MPa), min	9–40	6,000 3,000
4 Tensile strength along the grain of face plies (MPa), minimum	6–6.5	30
5 Durability of face coating bonding with veneer	6–40	The face coating must not peel at the intersection of two cut lines.
6 Face coating resistance to steam	6–40	No swelling. Minor gloss loss. No blisters
7 Face coating resistance to sodium hy- droxide (NaOH)	6–40	Solution color after (NaOH) tests ranges from bright yellow to clear

Table 4 (end)

Parameter	Thick-ness (mm)	Physical and mechanical parameter values
8 Face coating water resistance	6–40	Spots and swelling are not allowa-ble
9 Face coating resistance to concrete	6–40	No concrete discoloration. No gloss alteration, the face coating is hard.
10 Surface waviness of film faced birch plywood (Rippling test)	6–40	Average beam length no greater than 20 mm
11 Face coating resistance to abrasion (Taber test), revolutions, minimum	6–40	300
12 Face coating resistance to cracking	6–40	No cracking after (1-10) cycles. Sample surface is free of cracks, swelling, and blisters
Note - values of clauses 4-12 shall be selected by agreement between the manufacturer and the cus-tomer.		

Table 5

Average value of shear strength through adhesive layer (MPa)	Percentage of destruction in wood
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	-
<p>Notes:</p> <p>1 Film faced birch plywood shall be prepared for testing using one of these methods:</p> <p>1.1 boiling in water for 1 hour;</p> <p>1.2 boiling in water for 6 hours;</p> <p>1.3 boiling in water for 4 hours, drying in a vented cabinet at <math>(60 \pm 3) ^\circ\text{C}</math> temperature for (16–20) hours, repeated soaking in boiling water for 4 hours and cooling in <math>(20 \pm 3) ^\circ\text{C}</math> water for 1 hour;</p> <p>1.4 boiling in water for <math>(72 \pm 1)</math> hours, cooling in <math>(20 \pm 3) ^\circ\text{C}</math> water for 1 hour - once every 3 months;</p> <p>1.5 soaking in water at a temperature of <math>(20 \pm 3) ^\circ\text{C}</math> for 24 hours, once quarterly.</p> <p>Methods 1.3, 1.4, and 1.5 are used to prepare film faced birch plywood for new resins testing.</p>	

*Table 5 (end)*

<p>The method of preparing samples shall be selected by agreement of the manufacturer with the customer.</p> <p>2 Percentage of destruction in wood is determined visually</p> <p>3 The shear test shall be performed in various adhesive layers by agreement between the manufacturer and customer</p>
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5.4 Film faced birch plywood stock is recorded in cubic meters. One sheet's volume is calculated without regard to rounding. The volume of assembled film faced birch plywood stacks and batches is calculated with 0.001 m<sup>3</sup> accuracy. The area of a single film faced birch plywood sheet is calculated with 0.01 m<sup>2</sup> accuracy, and the area of sheets in a batch is calculated with 0.5 m<sup>2</sup> accuracy.

5.5 Markings shall be applied with indelible paint on the edge or face (film side only) of each film faced birch plywood sheet.

Marking must include the following information:

- type of film faced birch plywood;
- grade of film faced birch plywood;
- manufacturer (number or name);
- thickness and/or sorter number.

A single stamp per (1-3) sheets may be applied for film faced birch plywood with a thickness of 6 to 9 mm.

Allowable by agreement between the manufacturer and the customer:

- to skip labeling film faced birch plywood sheets;
- to not include additional information in the mandatory marking.

#### 5.6 Packing film faced birch plywood

Film faced birch plywood must be packed in 400, 600, or 900 mm high stacks, separated by grades, surface types, sizes, thicknesses, and film types.

Film faced birch plywood may be packed in stacks of a height other than that specified upon agreement between the manufacturer and the customer.

#### 5.7 Packing and labeling ready stacks of film faced birch plywood

5.7.1 Packing for film faced birch plywood stacks shall ensure their integrity and preserve the stacks during transport.

Main packing methods and types are regulated by OOO SVEZA-Forest. Other types and methods of packing film faced birch plywood may be used upon agreement between the manufacturer and the customer.

5.7.2 Marking of packed plywood stacks shall be performed with labels. The label text shall be in Russian and/or English, placed on two parallel or perpendicular side strips. Both labels shall bear the same information:

- trademark;
- product designation : Film Faced Birch Plywood, SVEZA Deck 350 Plywood, SVEZA PAINT Plywood, SVEZA TITAN Plywood;
- dimensions, plywood thickness and the thickness tolerance value of film faced birch plywood (if required);

- grade of film faced birch plywood;
- type of film faced birch plywood;
- surface type;
- film type;
- number of sheets in a stack;
- working shift;
- film faced birch plywood production date;
- emission class;
- order No. as per Special Terms and Conditions (by agreement with the customer);
- reference document governing the manufacture of film faced birch plywood;
- manufacturer name and address;
- certification signs and quality control marks;
- handling signs: “Keep Dry” and “Use No Hooks”;
- barcode (if a data collection terminal (scanner) is available).

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

## **6 ACCEPTANCE REQUIREMENTS**

6.1 Film faced birch plywood must be accepted in lots.

Lot means a certain number of film faced birch plywood sheets with the same product designation, grade, surface finish, film type and dimensions.

For each lot, a single supporting document must be issued, containing the following information:

- trademark;
- manufacturer name and address;
- film faced birch plywood designation;
- lot size;
- reference document governing the manufacture of film faced birch plywood.

6.2 Checking the quality and dimensions of film faced birch plywood sheets shall be done through selective sampling and testing. In sampling inspection, sheets of film faced birch plywood are selected as a “random” sampling per GOST 18321 in the quantity stated in Table 6.

Table 6

In sheets

Lot size	Checked parameter as per sections herein			
	4.4.1; 4.4.2; 4.4.3; 4.4.4; 4.4.5		5.1.4	
	Sample size	Acceptance number	Sample size	Acceptance number
Up to 500	8	1	13	1
501-1,200	13	1	20	2
1,201-3,200	13	1	32	3
3,201-10,000	20	2	32	3

The definition of sampling scope for subsections (4 – 12) of Table 4 is as by agreement between the manufacturer and the customer.

6.3 Moisture, strength limit when cleaving through the adhesive layer, strength limit for static bending across and along the outer veneers, and module of elasticity for static bending along and across the grains of the outer veneers should be inspected for each thickness and number of plies of film faced birch plywood at least once per month.

Checking of each lot is allowed as agreed by the manufacturer with the customer, and for this purpose 0.1% of sheets shall be selected from the lot, but at least one sheet.

6.4 One film faced birch plywood sheet shall be selected from any sampling volume for the purpose of testing the formaldehyde content and/or emission.

The formaldehyde content reading shall be tested at least once every 30 days within the EXT formaldehyde emission group.

The formaldehyde emission reading shall be tested at least once every 7 days within the EXT formaldehyde emission group.

6.5 The necessity of test performance, frequency and scope of testing as per parameter of Sections (4-12) of Table 4 shall be set by agreement between the manufacturer and the customer.

6.6 Results of formaldehyde content or emissions tests, as well as physical and mechanical tests of a plywood lot manufactured per STO 52654419-001, may be applied to film faced birch plywood manufactured within the same lot.

6.7 The lot is considered compliant to the applicable requirements of the standard and is accepted, provided that in the samples:

— the number of film faced birch plywood sheets in non-compliance with the standard requirements for dimensions, squareness, straightness, and processing defects must be less than or equal to the acceptance number shown in Table 6;

— the physical and mechanical properties are in conformity with the values established in Tables 4 and 5;

— the formaldehyde content and/or emission is compliant with limits set forth in Table 3.

## 7 TEST METHODS

7.1 Sampling procedure — per GOST 9620, GOST 27678, GOST 30255, and GOST 32155, [1] – [2].

7.2 Film faced birch plywood length and width are measured with a metal measuring tape at two points parallel to the edges, at least 100 mm from the edges, according to GOST 7502, with a tolerance of 1 mm. The arithmetic mean value of the two measurements is considered the actual length (width) of the sheet.

7.3 The thickness shall be measured at least 25 mm from the edges, in the middle of each sheet's face.

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

The following devices are used for thickness measurement:

— thickness gauge as per GOST 11358 with a scale division not exceeding 0.1 mm;

— micrometer as per GOST 6507 with a scale division not exceeding 0.1 mm.

Thickness difference in one film faced birch plywood sheet is defined as the difference between the maximum and minimum thickness of the four measurements.

7.4 Out-of-squareness of film faced birch plywood sheets

7.4.1 Out-of-squareness of film faced birch plywood shall be measured per GOST 30427. Out-of-squareness shall be measured with an L-square as per GOST 3749 and defined by measuring the maximum deviation of the sheet edges from the L-square surface using a metal ruler in accordance with GOST 427 with an error of 1 mm.

7.4.2 Out-of-squareness may be also determined by the difference of diagonal lines of the sheet measured by metal measuring tape as per GOST 7502 with a scale division 1 mm.

7.5 Out-of-straightness

7.5.1 Out-of-straightness of a film faced birch plywood sheet edge shall be determined by using a probe to measure the maximum gap between the sheet's edge and the edge of the metal ruler, according to GOST 8925, with a tolerance of 0.2 mm.

7.5.2 Deviation of the layout grid lines parallel to the edge of the film faced birch plywood is determined by using a metal measuring tape to measure the maximum offset of the layout grid line from the edge, in accordance with GOST 7502, with a division value of 1 mm.

7.6 Warping — as per GOST 30427.

7.7 Moisture — as per GOST 9621, [3].

7.8 Strength limit for cleaving through adhesive layer — as per GOST 9624, [4].

7.9 Modulus of elasticity in static bending and strength limit as per GOST 9625, [5].

7.10 Tensile strength along the grain — as per GOST 9622.

7.11 Measurement of processing defects — as per GOST 30427.

7.12 Durability of the face coating bond with the veneer — as per GOST 14614.



7.13 Face coating resistance to steam — as per GOST R 53920.

7.14 Face coating resistance to sodium hydroxide (NaOH) — as per GOST R 53920.

7.15 Face coating water resistance — as per GOST 14614.

7.16 Face coating resistance to concrete — as per Appendix C.

7.17 Surface waviness of film faced birch plywood (Rippling test) — as per Appendix D.

7.18 Face coating resistance to abrasion (Taber test) — as per Appendix E.

7.19 Face coating resistance to cracking — as per Appendix F.

7.20 Formaldehyde content as per GOST 27678; formaldehyde emission into the environment as per GOST 30255, GOST 32155 and [1].

## **8 TRANSPORTATION AND STORAGE**

8.1 Film faced birch plywood shall be transported in enclosed vehicles, in accordance with the haulage rules applicable to the respective means of transport.

During transportation, it is essential to avoid severe humidification of film faced birch plywood to avoid swelling at the edges, sheet warping, significant indentation from the packing straps or other deterioration.

### **8.2 Storage of film faced birch plywood**

Film faced birch plywood must be stored in indoor premises that protect the plywood from atmospheric precipitation in stacks placed horizontally on pallets or on wooden shims, at a temperature between  $-40\text{ }^{\circ}\text{C}$  and  $+50\text{ }^{\circ}\text{C}$  and relative humidity up to 80%.

## **9 MANUFACTURER'S WARRANTY**

The manufacturer guarantees conformance of the film faced birch plywood to the quality requirements of this standard if transportation and storage conditions are met.

Film faced birch plywood has a guaranteed shelf life of 5 years from the day of receipt by the customer.

For film faced birch plywood used for further processing, contacting the manufacturer for more details about the properties and specifications of the plywood is recommended.

## **10 SAFETY AND ENVIRONMENTAL REQUIREMENTS**

10.1 The content of hazardous chemicals emitted into the air of residential or public buildings during use of film faced birch plywood products shall not exceed the requirements of [6], [7], and [8].

10.2 Film faced birch plywood must be produced 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 allowed to work in film faced 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 the manufacture of film faced birch plywood 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 film faced birch plywood must not exceed the health-based exposure limits set forth in [9].

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

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

## **11 RECOMMENDATIONS FOR USE**

11.1 Film faced birch plywood is designed for multiple use. Adherence with plywood application and storage regulations will make it possible to increase its service life.

11.2 A slight variation due to moist air during transport in film faced birch plywood thickness along the edge and for a distance up to 50 mm from the edge is allowed.

### **11.3 Sawing film faced birch plywood**

Sawing film faced birch plywood into pieces must be performed with band or circular saws.

To obtain a clean cut, the sawing shall be performed correctly - first, the sawing shall be done transversely to the face side of the grain direction, and then lengthwise. This method makes it possible to avoid splitting the corners and to decrease face chip size and quantity.

When sawing with a circular saw, high speed and low feed rate are recommended.

To prevent plywood from absorbing moisture while sawing, the film faced birch plywood butt ends must be treated with special types of water-based emulsion paint or another sealant.

### **11.4 Drilling film faced birch plywood**

In order to prevent moisture penetration into the film faced birch plywood during installation work, all holes must be filled with water-based emulsion paint or other sealants, and it is recommended to treat the sheet surface with a water-repellent compound.

To obtain a hole with even edges, a sufficiently sharp drill fitted with a front cutter shall be used.

Drilling should start from the face side. Using a padding sheet is recommended to avoid splitting on the reverse face of the film faced birch plywood.

To avoid splitting the film faced birch plywood layers, using threaded nails or special wood screws is recommended. A distance from the sheet edge to nail of (12-15) mm is considered as recommended.

11.5 Rippling is common, wave-shaped convexities on the surface of the film faced birch plywood. It is related to the wood processing technology and material properties of the wood, and is up to approximately 0.8 mm height and varies in length. They appear due to water absorption in the film faced birch plywood (see Photo 1).



Photo 1

This is observed especially often when the film faced birch plywood is used in conditions with direct contact of the plywood with water.

For use in open premises, sudden climate change during the day and/or seasonal precipitation conditions (for example, spring and autumn months) may also contribute to the appearance of the ripple effect.

The waviness formation continues until complete saturation with moisture up to approximately 28% through cut edges, edges without additional sealant protection, drilled holes, installed rivets or face coating damage not seen during visual examination with the naked eye (see Photo 2).



Photo 2

After complete saturation, the waviness on a film faced birch plywood sheet surface disappears almost completely. Typically, this takes place after 2-3 cycles of film faced birch plywood making contact with water and drying after each contact.

11.6 The film faced plywood surface must be carefully cleaned of concrete mixture residue after completing the formwork.

11.7 After long-term use, the moisture content in the film faced plywood increases significantly, which decreases the plywood's structural performance.

Therefore, film faced plywood must be dried between cycles. To avoid external deformations, the plywood shall be dried under natural conditions.

11.8 OOO SVEZA-Les has performed numerous tests using film faced birch plywood with a concrete mixture of Portland cement, sand, crushed stone and water. Test results have confirmed the high quality of the resulting concrete surfaces.

Due to the diversity and rapid development of concrete mixture production technologies (the introduction of different additives, such as hardening agents, separating liquids, etc.), it is recommended to test concrete pouring to assess possible concrete color change before using film faced birch plywood to obtain the concrete surface.

#### 11.9 Recommendations for use of SVEZA PAINT plywood

##### 11.9.1 Preparations for painting:

— SVEZA PAINT plywood does not require any sanding, priming or use of biocidal coatings before painting;

— it is recommended to clean the surface of dust and slightly sand the butt ends to chamfer sharp edges.

##### 11.9.2 Painting:

— SVEZA PAINT plywood should be painted on all sides;

— use of alkyd or acrylic paints is recommended for indoor and outdoor work with wood;

— use of alkali paints and acrylate putty is not recommended;

— we recommend testing the paint compatibility with the SVEZA PAINT plywood in each case;

— while painting, it is recommended to maintain consistent air humidity.

##### 11.9.3 Installation:

— workplace must be dry;

— minor changes (shrinkage or swelling) of SVEZA PAINT plywood due to air humidity variation are allowable;

— small (1-2 mm) gaps should be left between SVEZA PAINT plywood sheets during installation;

— holes formed on the surface of SVEZA PAINT plywood during installation should be filled with sealant to avoid water penetration.

APPENDIX A  
(mandatory)

**Limit Standards for Defects of Film Faced Birch Plywood Grades**

For limit standards on defects of film faced birch plywood grades, see Table A.1

Table A.1

Description of defects	Defects limits for plywood grades		
	1	2	3
1. Printing of wood grain structure, sound knots, inserts	allowable		
2. Film detaching, ruptures, absence, peeling	allowable: on a single edge, up to 3 mm, provided it is coated with moisture-resistant paint	allowable: no more than 2% of sheet area provided it is coated with moisture-resistant paint	allowable
3. Temperature-related stains	not allowable	allowable: without face coating integrity loss	allowable
4. Film overlaps (riffles, wrinkles)	allowable: no more than 10 mm wide, no more than 500 mm long, and no more than 1 per m <sup>2</sup>	allowable	
5. Sticking of film fragments	allowable: up to 30x30 mm, no more than 1 per m <sup>2</sup> or up to 10x100 mm or no more than 1 per m <sup>2</sup>	allowable	

## Appendix A — continued

Description of defects	Defects limits for plywood grades		
	1	2	3
6a. Burned film (burnout) due to outer ply defects: cracks, damages, detached knots	not allowable	allowable	
6b. Burned film (burnout) due to outer ply defects: rough peeling	allowable: up to 2% of the sheet area, provided there is a durable film bond	allowable	
6c. Burned film (burnout) due to outer ply defects: stripes and spots from sanding	not allowable	allowable: up to 25% of sheet area	allowable
7a. Traces from inner ply defects: detached knots, holes	allowable: in the form of spots up to 25x25 mm, not more than 1/m <sup>2</sup>	allowable	
7b. Traces of inner ply defects: open split, cracks	allowable: no more than 5 mm wide, no more than 300 mm long, and no more than 1 per running meter	allowable	
8. Trace of glued or edge-jointed veneer	allowable: without face coating damage	allowable	
9. Stripes and spots from press platens	allowable		

## Appendix A — continued

Description of defects	Defects limits for plywood grades		
	1	2	3
10. Stripes and spots from film	allowable: up to 15% of sheet area	allowable	
11. Local swellings on the film faced birch plywood surface	not allowable	allowable: no more than 100 mm, no more than 1/m <sup>2</sup>	allowable
12. Veneer particles glued into the face ply	not allowable	allowable	
13. Press platen indents	allowable: up to 5% of the sheet area	allowable	
14. Dents	allowable: up to 6 mm in diameter, no more than 1 per m <sup>2</sup> , provided there is a durable film bond	allowable: no more than 0.5 mm depth without face coating damage	allowable
15. Scratches	not allowable	allowable: without face coating damage	allowable
16. Trimming defects, edge splintering	allowable: no more than 3 mm long provided it is coated with moisture-resistant paint	allowable: no more than 10 mm long provided it is coated with moisture-resistant paint	allowable
17. Paint streaks	allowable: no more than 5 mm	allowable	

*Appendix A — end*

Description of defects	Defects limits for plywood grades		
	1	2	3
18. Absence of veneer	not allowable	allowable: on single edge, no more than 5 mm depth	allowable
19. Local veneer delamination in inner plies of film faced birch plywood (concealed blister)	not allowable		allowable
20. Warping	for film faced plywood up to 6.5 mm thick, inclusive - not considered; for film faced plywood thickness of more than 6.5 mm, it is allowable, with up to 15 mm deflection per 1 m of the plywood sheet diagonal length		
21. Deviations from allowable dimensions	dimensions as per Sections 4.4.1, 4.4.2, 4.4.3, 4.4.4, 4.4.5		allowable

Note: Any defects not specified in Appendix A are not allowed.



APPENDIX B  
(mandatory)

**Terms and definitions of processing defects**

The terms and definitions of processing defects are presented in Table B.1

Table B.1

Processing defects designation	Definition
Printing of wood grain structure, healthy knots, inserts	Contour of sound knots, wood grain structure, substrates on the surface of the birch face filmed plywood
Film detaching, ruptures, absence, peeling	Areas of the birch face filmed plywood surface not coated with film
Temperature-related stains	Alteration of film color (with loss of face coating integrity and/or without such loss) due to premature film hardening without pressure
Film overlaps (riffles)	Local thickening due to film overlap on the film faced birch plywood surface
Film wrinkles	A surface defect in the form of a group of alternating longitudinal depressions and protrusions, with irregular shape and arbitrary direction (resembling wrinkles or riffles) resulting from improper operation of the film deposition station and / or defective film
Sticking of film fragments	Glued film fragments deposited on the film faced birch plywood face surface during the filming process
Burned film (burnout) due to outer ply defects	Loss of film integrity due to outer ply defects
Traces from inner ply defects	Loss of film integrity due to inner ply defects
Stripes and spots from press platens	Stripes and spots on the film faced birch plywood surface due to dirty press platens

*Appendix B — end*

Processing defects designation	Definition
Stripes and spots from film	Abnormally colored areas on film faced birch plywood surface due to the emission of volatile film substances during pressing
Local swellings on the film faced birch plywood surface	Partial delamination of film from the film faced birch plywood surface
Veneer particles glued into the face ply	Veneer particles glued into the face veneer before the face-filming
Press platen indents	Local convexities on the film faced birch plywood surface, formed due to defects on the face filming press platens
Dents	Local indentation of outer ply with damage of lining surface
Scratches	Damage from a sharp object on the film faced birch plywood surface in the form of a long, narrow recession or local indentation of the face ply with face coating damage
Trimming defects, edge splintering	Defects involving the absence of the face coating along the film faced birch plywood sheet edge
Paint streaks	Paint intrusion on the film faced birch plywood sheet face
Absence of veneer	Defect characterized by lack of inner ply veneer, except butt knots and cracks
Local veneer delamination in film faced birch plywood inner plies (concealed blister)	Separation of two adjacent plywood plies along the adhesive layer

## APPENDIX C (mandatory)

### Method of Determining Face Coating Resistance to Concrete

Test is performed using:

- cement;
- sand;
- 5 % NaOH solution;
- container for preparing the concrete solution, cups; and
- UV lamp.

Two 100x100 mm samples shall be taken from a single sheet of film faced birch plywood to perform the test. Other sample size may be used, provided the dimensions will not affect test results. Tests must be performed on both faces of the sample (upper and lower). Conditioning of samples is not required.

Test performance and assessment of results.

1. Prepare the concrete solution with following proportions:

- 1 part cement;
- 2 parts sand;
- 1/4 part 5% NaOH solution;
- 0.5–1 part water (to obtain a homogenous mixture).

2. Cut 1/3 of the upper part of a plastic cup, place the lower cup part on the sample of film faced birch plywood, pour the prepared concrete solution into the lower part of the plastic cup to 5 cm high, and cover the cup with its upper half. After three days (after the solution has completely cured), remove the cup with cured concrete from the surface of the film faced birch plywood in cured condition and dry for three days. On the fourth day, visually inspect the color change of the cured concrete and structure change on the face coating surface.

To accelerate the concrete curing process, a UV lamp may be used. The UV lamp should be placed 40 cm from the concrete. Drying will take 5 hours. At the sixth hour, the color change of the cured concrete and the change of the face coating surface structure should be visually checked.

3. Face coating resistance to concrete shall be assessed on a three-point scale in accordance with Table B.1, based on the change of the cured concrete color and the tested surface structure.

*Appendix C — end*

Table C.1

Result	Assessment of cured concrete color	Assessment of face coating alteration
1. Complete (normal) curing of film	No concrete discoloration	No gloss alteration, the face coating is hard.
2. Partial non-curing of the film	Partial coloring on the edges of the concrete	Minor gloss alteration, partial loss of face coating color
3. Total non-curing of film	All concrete edges are colored	Absence of gloss, surface softening and swelling, complete discoloration

APPENDIX D  
(mandatory)

**Method of Determining the Surface Waviness of Film Faced Birch Plywood  
(Rippling test)**

Test is performed using:

- drill of 1 mm diameter;
- aluminum adhesive tape, acrylic water dispersion paint, and wax.

To perform the test, two 100x100 mm samples shall be taken from a single sheet of film faced birch plywood. Other sample size may be used, provided the dimensions will not affect test results. Tests must be performed on both faces of the sample (upper and lower). Conditioning of samples is not required. Before the test, sample butt ends must be sealed with aluminum tape, acrylic water dispersion paint or wax.

Tests performance and assessment of results

1. Nine holes should be drilled through to the depth of the face coating and outer ply of the film faced birch plywood surface, as shown in Figure D.1.

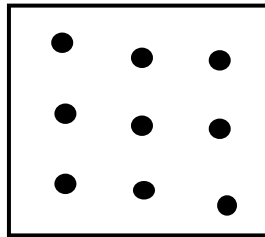


Figure D.1

2. Samples with punctures are to be covered with a damp cloth and left for 2 hours, periodically moistening the cloth.

3. The tested surface is subjected to visual inspection and waviness (rays) measurements with a ruler or measuring tape as per GOST 7502.

The arithmetic mean value of 9 measurements shall be considered as the test result.

ANNEX E  
(mandatory)

**Method for Determining the Face Coating Resistance to Abrasion (Taber test)**

Test is performed using:

- the TABER ABRASER-5131 device (or similar), which consists of a rotary table, two rotary angles with rotating stationary rollers and two 500-gram weights, and a rotation counter;
- sanding paper with an adhesive reverse surface, 33 grit.

To perform the test, one 100x100 mm sample shall be taken from a single sheet of film faced birch plywood. Other sample size may be used, provided the dimensions will not affect test results. Conditioning of samples is not required.

Test performance and assessment of results

1. A (7-9) mm diameter hole should be drilled through the center of the film faced birch plywood.
2. The sample must be fastened to the rotary table of the device and the friction rollers lowered onto the sample surface. Set the counter to 25 revolutions and start the device.

After every 25 revolutions, visually assess the degree of surface tear without changing the position of the sample or friction rollers.

Replace the sanding paper before testing each sample and after every 500 revolutions of the rotary table.

3. Determine the number of revolutions corresponding to initial point of tearing on the face coating (NO). The initial point of tearing will be defined as the moment when the coating is worn away and the external plywood jacket becomes visible.

Perform the test shall until 95% of the coating has worn away, recording the number of revolutions of the terminal tearing point (KO).

4. To determine the result of the sample's degree of tearing, take the number of rotary table revolutions  $n$ , determined in formula 1:

$$n = \frac{(NO + KO)}{2}, \quad (1)$$

*Appendix E — end*

where NO – number of revolutions corresponding to initial point of the coating tearing;

KO – quantity of revolutions, which corresponds to the terminal point of the coating tearing (the moment when at least 95% of the coating has been removed).

Results of each test surface should be rounded to the next whole integer and counted separately.

APPENDIX F  
(mandatory)

**Method of Determining the Face Coating Resistance  
to Cracking**

Test is performed using:

- a drying chamber to ensure a constant temperature of  $(70\pm 2)$  °C;
- tank with water;
- drill of 5 mm diameter;
- sanding paper, the abrasive grit is not defined.

To perform the test, three 200x200 mm samples shall be taken from a single sheet of film faced birch plywood. Other sample size may be used, provided the dimensions will not affect test results. Tests must be performed on both faces of the sample (upper and lower). Sand the edges of the samples. Conditioning of samples is not required.

Test performance and assessment of results

1. Drill holes of 5 mm diameter and 5 mm depth on the surface of samples of film faced birch plywood at a distance of 50 mm from edges, as shown in Figure E.1. Holes may be drilled from both sides of the samples. Such holes should not meet, i.e. they should be located in different planes of the sample.

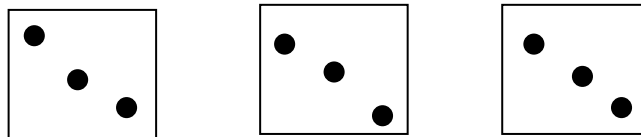


Figure F.1

2. Soak samples at room temperature for 8 hours.
3. Keep the samples in a drying chamber at a temperature of  $(70\pm 2)$  °C for 18 hours.
4. Samples are cooled, subjected to room temperature for  $(10\pm 1)$  minutes, while the crack distribution around the holes is assessed.
5. Repeat the test cycle 3 to 10 times.



*Appendix F — end*

6. Face coating resistance to cracking shall be assessed visually on a three-point scale in accordance with Table F.1, based on the change in the tested surface structure and number of test cycles.

Table F.1

Result	Assessment of surface change
1. No cracking after (1-10) test cycles	Sample surface is free of cracks, swelling, and blisters
2. Minor cracking after (1-10) test cycles	Up to 50% cracks, minor formations of blisters and swelling on the sample surface
3. Major cracking after (1-10) test cycles	The sample surface has cracked completely (up to 100%), severe formation of blisters and swelling

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