PLYWOOD SPECIFICATIONS

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PLYWOOD WITH HARDWOOD FACE VENEER

)F SPECIFICATION

overs general use plywood with hardwood face veneer.
oes not apply to customized plywood or film faced plywood.
nents to the plywood quality are covered in 3.3, 4.2, 5.1, 5.8.

ΓION AND SIZES

ion of plywood is based on the following criteria: the quality of the
resistance degree of glue bond, the degree of face veneer treatment.

e quality of the face veneer plywood is subdivided into grades: E
)escriptions of the face grades of the plywood are specified in

ıter resistance degree of glue bond plywood is subdivided into the

proof plywood
esistant plywood

e degree of face veneer treatment plywood is subdivided into:

l (NS)
one side (S1)
:wo sides (S2)

plywood sheets and the number of plies in a sheet should
e stated in Tables 1, 2.

TABLE 1. (mm)

Sheet Length (Width)	Maximum Deviation

TABLE 2. (mm)

Nominal Plywood Thicknessd	Minimum Number of Plies	Sanded Plywood Maximum Deviation	Sanded Plywood Different Thickness	Non-sanded Maximum Deviation	Non-sanded Different Thickness
3 mm	3	+0.3/-0.4		+0.4/-0.3	
4	3	+0.3/-0.5		+0.8/-0.4	
6	5	+0.4/-0.5		+0.9/-0.4	1.0
9	7	+0.4/-0.6		+1.0/-0.5	
12	9	+0.5/-0.7	0.6	+1.1/-0.6	
15	11	+0.6/-0.8		+1.2/-0.7	
18	13	+0.7/-0.9		+1.3/-0.8	
21	15	+0.8/-1.0		+1.4/-0.9	1.5
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	

Note: Plywood of a different thickness and with a different number of plies in a sheet can be produced if stipulated by a contract. Then the deviations are calculated by the following formulae:

for sanded plywood:

+(0,2+0,03 Sp), (1)
-(0,4+0,03 Sp); (2)

for non-sanded plywood:

+(0,8+0,03 Sp), (3)
-(0,3+0,03 Sp), (4)

where Sp - nominal plywood thickness

2.2.2. Plywood sheets should be cut at a square angle. Deviation must not exceed 2 mm per 1 lineal meter.

2.2.3. Plywood marking should include:

product name,
core and face plies species,
glue bond (based on water resistance),
combination of face veneer species,
formaldehyde emission class,
type of surface treatment,
sizes,
reference to the Specification (GOST 3916.1-96)

Here is an example of marking birch plywood with core plies made of birch veneer, water resistant, combination of face veneer grades I/III, emission class E1, sanded on 2 sides, 2440 mm long, 1525 mm wide, 9 mm thick.

Birch plywood/birch, FK, I/III, E1, S2, 2440*1220*9 GOST 3916.1-96

3. TECHNICAL REQUIREMENTS

3.1.1. Such wood species as birch, alder, maple, elm, beech, asp, poplar and lime are used to produce plywood face veneers. The same species as well as pine, spruce, fir, larch and cedar are used for core plies production. Plywood is considered to be produced of the species used for making its face veneers. Plywood can be made of one or more wood species; therefore it is divided into "homogeneous" and "combined".

If the number of veneer plies is even, the direction of fibers of the two middle plies must be parallel. Veneers, located symmetrically in the plywood, must be of the same species and thickness. The thickness of the veneer used for face plies must not exceed 3.5 mm, for core plies - 4 mm

3.1.2. In face plies wood flaws and manufacturing defects exceeding the limits stated in Table 3 are not allowed.

3.1.3. In core plies wood flaws and manufacturing defects are allowed if they do not influence the quality and the size of the plywood, stated in the Specification.

3.1.4. Table 3 states the maximum number of permitted flaws and manufacturing defects on the plywood surface.

TABLE 3. PLYWOOD DEFECTS DESCRIPTION AND LIMITATIONS

<table>
<tr><th>Wood flaws, manufacturing defects underGOST 30427</th><th>E grade plywood face veneers</th><th>I grade plywood face veneers</th><th>II grade plywood face veneers</th><th>II grade plywood face veneers</th><th>IV grade plywood face veneers</th></tr>
<tr><td>1.Pin knots</td><td>Not allowed</td><td>Max 3 per M2 allowed</td><td colspan="3">Allowed</td></tr>
<tr><td>2.Sound lights and/or dark knots</td><td>Not allowed</td><td>Max 5 per m2, 15mm diam. cracks max 0,5mm wide</td><td>Max 10 per m2, 25mm diam. cracks max 1mm wide</td><td colspan="2">Cracks max 1,5mm wide</td></tr>
<tr><td>3.Loose knots or with/without knot holes, worn holes in cluster or scattered</td><td>Not allowed</td><td>Up to 3, max 6mm diam.</td><td colspan="2">Up to 6, max 6mm diam.</td><td>Unlimited, max 40 diam.</td></tr>
<tr><td>4.Small cracks/splits</td><td>Not allowed</td><td colspan="2">Up to 2 per 1m2, max 200mm long</td><td colspan="2">Allowed</td></tr>
<tr><td>5.Wide</td><td colspan="2">Not allowed</td><td colspan="2">Up to 2 per 1m2 filled</td><td>Allowed</td></tr>
</table>

cracks/splits			with putty, max 200mm long		
6.Light mold	Not allowed	Allowed			
7.Dark mold	Not allowed		See item 2 of the Table		Allowed
8.Deviation in wood structure	Very insignificant,incidental disposition	Allowed			
9.Light color variation	Not allowed	Allowed, no more than 5% of the sheet surface	Allowed		
10.Strong color variation	Not allowed				Allowed
11.Decay	Not allowed				
12.Pinholes	Not allowed	See item 3 of the Table			
13.Face veneer overlap	Not allowed		Max 1 overlap 100 mm wide per 1 m2	Max 2 overlaps 200 mm wide per 1m2	Allowed
14.Lack of veneer, sheet edge defects due to sanding or squaring	Not allowed	Max 2 mm wide	Max 4 mm wide		Max 5 mm wide
15.Glue band	Not allowed		Allowed in non-sanded plywood		
16.Glue exudation	Not allowed		Allowed no more than 2% of sheet surface	Allowed no more than 5% of sheet surface	Allowed
17.Scratches	Not allowed		Allowed		
18.Hollows or imprints	Not allowed		Allowed if depth/height is in range of thickness deviation		Allowed
19.Fiber lift-up	Not allowed		Max on 5% of sheet surface	Max on 15% of sheet surface	Allowed
20.Overpolishing	Not allowed				Allowed
21.Crook	Does not apply to plywood up to 6.5mm thick. If over 6.5 mm thick then allowed with sag of no more than 15mm over 1M sheet's diagonal length				

22.Metal inclusions	Not allowed			Color metal staples
23.Joint gaps	Not allowed	Max 1 piece 1 mm wide on 1 m2 of sheet	Max 2 piece 1 mm wide on 1 m2 of sheet	Allowed
24.Decrepitation bubbles, etc	Not allowed			
25.Waviness(for sanded plywood), fuzziness	Not allowed		Allowed	
26.Scuffleness	Scuffleness parameter(Rm) under GOST 7016 is max 100 micron for sanded plywood and 200 micron for non-sanded plywood			
27.Wooden plugs	Not allowed		Max 8 pieces when plugging per 1m2 of sheet	Allowed
28.Overlapped plugs	Not allowed	Max 2 pieces per 1m2 of panel	Allowed	

Note:
Norm of manufacturing defects "lack of veneer" refers both to outer and core plies.
Wood and manufacturing defects which are not mentioned in Table 3 are not allowed.

TABLE 4 (pieces)

Face Veneer Grade	**Maximum of permitted wood flaws and manufacturing defects**
E	No visible defects
I	3
II	6
III	9
IV	Number of wood flaws and manufacturing defects is unlimited. Sizes are limited according to items 3,5,11,12,14,24 of Table 3

3.1.6. In plywood less than 1525 mm wide E grade face ply may be made up of 2 pieces of veneer with a joint in the middle of the sheet. In plywood 1525 mm wide E grade face ply may be made up of 3 veneer pieces similar in width. Grade I and II face plies are allowed to be made up of unlimited number of veneer pieces.

Veneer joints for grades E, II, III should be parallel to sheet edges, veneer pieces should match in color

3.1.7. Veneer plugs should be even with the surface, hold strongly and match face veneer in color and fiber direction. For grades I and II plugs should match the color of the wood. Putties should match the color of wood, provide easy gluing, retain their color during plywood treatment and not crack when bending.

3.2 Physical and mathematical parameters of plywood are stated in Table 5.

TABLE 5

Parametr	Thickness(mm)	Glue bond	Birch	Alder Beech	Pine Larch Fir Silver fir Cedar	Lime Asp Poplar
Moisure content	3-30	FSF FK	5-10	5-10	5-10	5-10
Shear strength (MPa) min						
after boiling in water for 1 hour	3-30	FSF	1,5	1,2	1,0	0,6
after soaking in water for 24 hours		FK	1,5	1,0	1,0	0,6
Minimum static bending strength of fibres (MPa)	9-30	FSF	60	50	40	30
		FK	55,0	45,0	35,0	25,0
Minimum tensile strength along fibers (MPa)	3-6,5	FSF	40,0	40,0	40,0	40,0
		FK	30,0	30,0	30,0	30,0

Note: Birch plywood with shear strength along glue line of 1.2. Mpa is permitted if stipulated by a contract.

3.3. Formaldehyde content in plywood depending on the emission class should correspond to the one specified in Table 6.

TABLE 6

Glue Emission Class	Formaldehyde content in 100 grams of dry plywood mass, in mg.
E1	Max 10
E2	From 10 to 30

3.4. Plywood is measured in either square or cubic meters. The volume of one sheet is measured with a precision of up to 0.00001 m3. The volume of sheets in a loading is measured with the precision of up to 0.5 m3. The square of a sheet is measured with the precision of up to 0.01 m2. The square of sheets in a loading is measured with a precision of up to 0.5 m2.

3.5. The marking is stamped with indelible paint on the back side of every sheet stating plywood grade and inspector's number. A plywood pack marking includes the following data:

·Name of the manufacturing country,
·Manufacturer's name or its trade mark,
·Standard plywood marking,
·Number of sheets in a pack,
·National certificate mark for certified goods,
·Transport marking under GOST 14192

3.6. Packaging.

3.6.1. Plywood must be packed in packs weighing max 1500 kg sorted by species, glue bond, grade, glue emission class, type of surface treatment, and size. Plywood may be packed in packs of different weight if stipulated by a contract.

3.6.2. If plywood is to be shipped to the regions of the Far North or other remote regions, it is packed according to 3.6.1. and GOST 15848.

4. ACCEPTANCE PROCEDURES

4.1. Plywood is accepted in loadings. A loading should consist of plywood of one species, one glue bond, one grade, one glue emission class, one type of surface treatment and one sheet size.

There should be a document for each loading stating its quality and containing the following data:

·Name of the manufacturing country,
·Manufacturer's name or its trade mark,
·Standard plywood marking,
·Volume or square of the sheets in the loading,
·Technical control stamp,
·National certificate mark for certified goods,

4.2. Quality and size of the sheets are subject to random inspection. If stipulated by a contract loadings may be subject to full inspection. When inspected randomly sheets are selected indiscriminately under GOST 18321 in the amounts stated in Table 7.

TABLE 7 (sheets)

Loading size	Controlled parameter on the items below			
	2.2.1, 2.2.2, 2.2.3;		3.1.2, 3.1.6, 3.1.7, 3.3	
	Number selected	Number permitted	Number selected	Number permitted
Up to 500	8	1	13	1
501 to 1200	13	1	20	2
1201 to 3200	13	1	32	3
3201 to 10000	20	2	32	3

4.3. Plywood shear, tensile and static bending strengths are checked for every species, glue bond and ply number at least once a month. It is permitted under the contract to inspect every loading taking 0.1% of the loading for the inspection but not less than 1 sheet.

4.4. Formaldehyde emission is checked every 30 days for FSF plywood and every 15 days for FK plywood. Inspection may be done every 7 days if stipulated by a contract.

4.5. A loading is considered to meet the requirements of the Specification and is accepted, if the random inspection confirms the following:

·number of plywood sheets failing to meet the requirements of the Specification due to their size, obliquity, straightness , wood and manufacturing defects is LESS or EQUAL to the amount stated in Table 7,
·all plywood sheets have no bubbles, no decrepitation and no trace of bark,
·formaldehyde emission corresponds to the norms defined in Table 6.

5. CONTROL METHODS

5.1. Selection of samples for strength and mechanical tests is done in accordance with GOST 9620. Selection of samples for formaldehyde emission tests is done in accordance with GOST 27678.

5.2. The length and width is measured in two points of a sheet, which are parallel to the edges and are located at least 100 mm from the edges. The measurements are done with a metal tape, which has an index error of 1 mm or less in accordance with GOST 7502. Measurements have to be taken twice and the actual length (width) of the sheet is their average.

5.3. Thickness is measured at a distance of at least 25 mm from the edges. Thickness also has to be measured in the middle of each side of the sheet with a thickness meter as per GOST 11358, or with a micrometer with a scale division of at least 0.1 mm in accordance with GOST 6507.

Measurements of thickness have to be taken 4 times and the actual thickness would be the average of those 4 measurements.

The difference in thickness in one plywood sheet is calculated as a difference between the maximum and minimum thickness from these 4 measurements.

5.4. Moisture content is determined in accordance with GOST 9621.

5.5. Shear strength along the glue line is determined in accordance with GOST 9624.

5.6. Static bending strength is determined in accordance with GOST 9625

5.7. Tensile strength is determined in accordance with GOST 9662

5.8. Formaldehyde emission is determined in accordance with GOST 27678

5.9. Roughness of the surface is determined in accordance with GOST 15612

5.10. Wood and manufacturing defects are measured in accordance with GOST 30427

5.11. Edge angle deviation is determined by measurements of the maximum gap between the sheet edge and metallic square edge in accordance with GOST 8925 and within an index error of 0.2 mm.

5.12. Obliquity measurements are determined in accordance with GOST 30427.

6. TRANSPORTATION AND STORAGE

6.1. Plywood is transported in covered vehicles, in accordance with the transportation consignment rules for each given vehicle.

6.2. Transportation and storage of plywood, which is to be shipped to the Far North or remote regions are done in accordance with GOST 15846.

6.3. Plywood is stored in horizontally stacked packs, on pallets or wooden pallets. The temperature in the closed premises where the plywood is stored should be between -40C to +50C. The humidity should not exceed 80%

7. MANUFACTURERS' GUARANTEE

Producers guarantee that the plywood conforms with the Specification if transportation and storage instructions are observed. FK plywood has a guarantee of 3 years and FSF plywood has a guarantee of 5 years from the day it was shipped.