

HANDBOOK

SyPly



SYKTYVKAR PLYWOOD MILL

BFU	Bau-Furniersperrholz aus Nadelholz – birch plywood for construction and furniture
BFU-100	Class of construction materials the requirements of which Plywood SyPly meets. It is confirmed by WKI certificate
DNV	Det Norske Veritas (Finnish agency) - independent classification and certification Norwegian company
GOST	Russian State Standard
TR	Technical requirements
SPM	Syktyvkar Plywood Mill Ltd
SyPly™	Syktyvkar Plywood – plywood trade mark, registered March 24, 2005 in Russia and April 6, 2005 in 32 countries of the world
CPD	Construction Product Directive - construction materials directive adopted by the European Union
CE	(fr. Conforme Européenne) - European conformity – marking of construction materials according to the construction standard CPD that corresponds to European standards
FSC	Forest Stewardship Council
ISO	International Standard Organization
WBP	Plywood glued with phenol-formaldehyde resin
MR	Plywood glued with urea-formaldehyde resin
WKI	Wilhelm Klauditz Institut - Fraunhofer-Institut für Holzforschung (Germany)



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Edition – March 2016

Authors of the current handbook do not guarantee that the information below is complete and up to date as this guide is not for technical reference but for marketing and information purposes only. Current edition cancels and replaces all previous ones.



SYKTYVKAR PLYWOOD MILL

SPM is one of the largest Russian manufacturers of plywood and particleboard.

Rich experience in particleboard and plywood production accumulated since 1976 and 1987 respectively helps to manufacture products matching world standards.

The mill is situated in the region rich with forests. Best wood is sourced from taiga and birch groves of the Komi Republic, Tatarstan and Udmurtiya, Arkhangelsk , Vologda, Kirov, Kostroma, Nizhniy Novgorod and Yaroslavl regions.



Current handbook is designed for plywood end-users, trade representatives, project-planners, marketing specialists, other persons involved in this area.

Qualified and competent staff is a competitive advantage of SPM. Strategic management, marketing and complex information system uniting all structures of the mill allow effective control of production and sales activities of Syktyvkar plywood mill.

Quality management system is a part of corporate culture of Syktyvkar plywood mill. It is certified according to the international standard ISO 9001:2008 and all mill's operations from product engineering up to its shipment are standardized in accordance with it.

High quality of plywood SyPly provides opportunity for a wide range of applications: concrete house building, construction, furniture production, auto and wagon industry, packaging.

The main purpose of Syktyvkar plywood mill is to satisfy needs of customers in spheres of service, reliability and delivery convenience to a maximum extent.

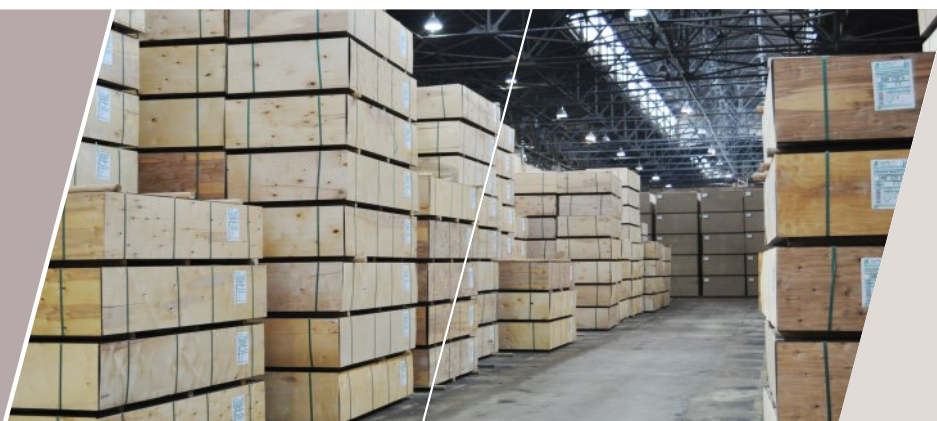
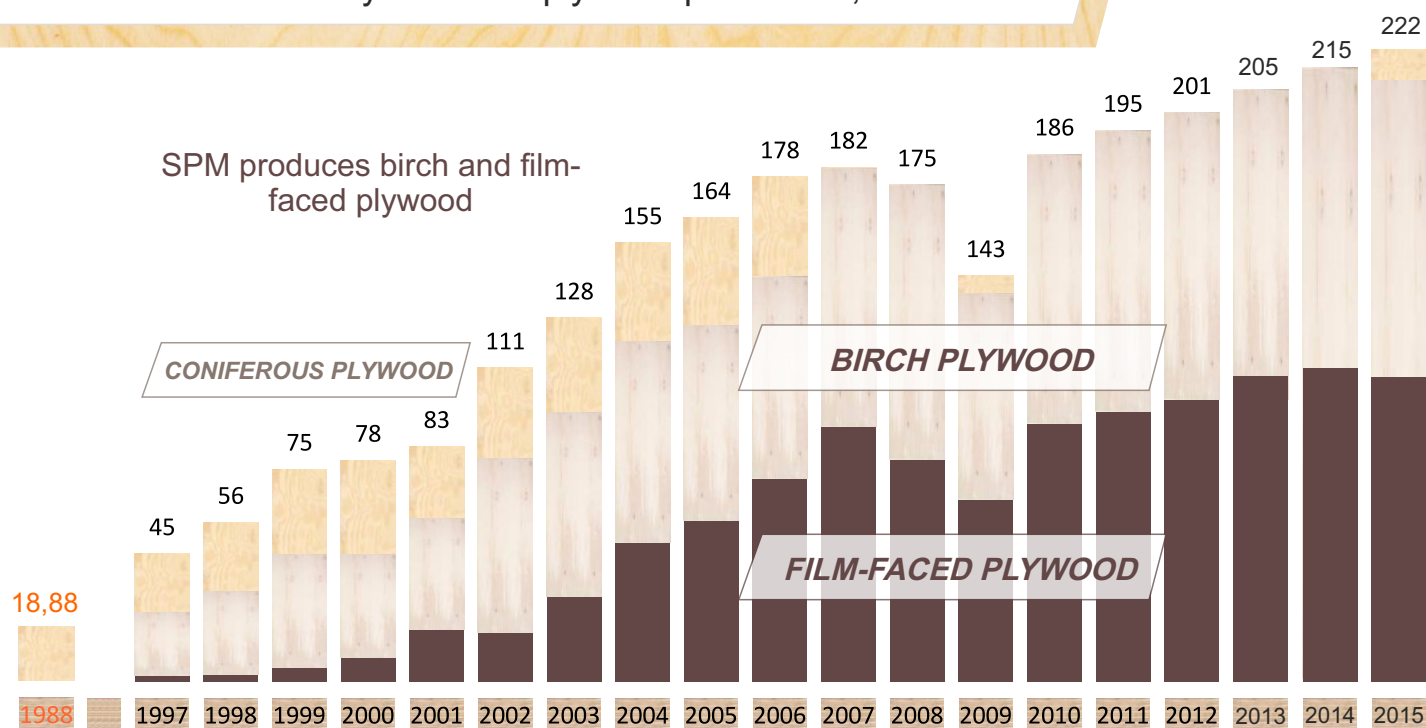


*All information necessary for end-user was considered while creating this handbook – description of plywood types and properties, spheres of application, choice of grades.
Perfect quality of plywood SyPly will help you to improve your business.*

Modern equipment and technologies used in the production process enable SPM to produce goods that fit the highest demands of customers.

Plywood production capacity of the enterprise is more than 220 000 m³ per year.

Dynamics of plywood production, th. m³





Certificate №220213 protects graphic representation of the trade mark «SPM Ltd» concerning class 19 of goods (services) in Russia.

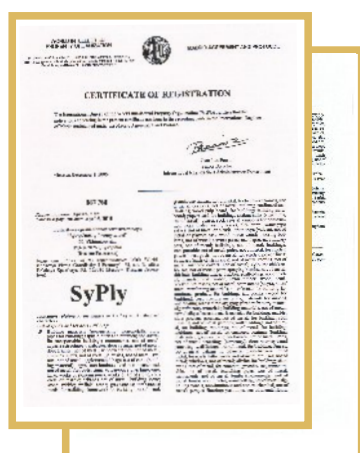


Certificate №212611 protects trade mark «PlyPan» concerning class 19 of goods (services) in Russia.



Certificate №284909 protects trade mark «SyPly» concerning class 19 of goods (services) in Russia.

The certificates are given by the Federal service of intellectual property, patents and trade marks



International certificate №867780 protects trade mark «SyPly» concerning class 19 of goods (services) in 32 countries of the world.

This number includes: Austria, Belarus, Benelux countries, China, The Czech Republic, France, Germany, Hungary, Italy, Kazakhstan, Latvia, Poland, Portugal, Serbia, Montenegro, Slovakia, Slovenia, Spain, Switzerland, Ukraine, Denmark, Estonia, Finland, Greece, Iceland, Lithuania, Norway, Sweden, Turkey, Great Britain, USA.

The certificate is given by the International bureau of World organization of Intellectual property

MILESTONES OF DEVELOPMENT

Main phases of project development and modernization of the plywood production

1987	Plywood manufacturing shop start up (Finnish equipment Raute Wood is installed, an nual production capacity is 100 000 m ³ per year)
1997	Syktyvkar Plywood Mill becomes a subsidiary of Syktyvkar Forest Enterprise
1999	Plywood and particleboard range of sizes and thicknesses is increased
2000	New plywood sanding line (Steinemann/Switzerland) is installed; Plywood certification in accordance with BFU 100 DIN 68705 (Germany); Peeling and splicing line (Raute/Finland) is installed
2001	Syktyvkar Plywood Mill Ltd. quits the holding company Syktyvkar Forest Enterprise and becomes an independent company
2003	New defect chopping and veneer splicing line "Raute" (Finland) is installed; New long grain veneer drying line Grenzebach BSH (Germany) is installed; New additional plywood format cutting line "IMA Klessmann GmbH" (Germany) is installed which allows to produce plywood with cut edge profile
2004	Chain of custody certification – from log harvesting to production and sales – according to FSC system within «Smart Wood» program





2005 New peeling line «Meinan» (Japan) is installed;
Second long and cross grain veneer drying line “Grenzebach BSH” (Germany) is installed;
Replacement of the existing chipping machine in veneer shop by new Raute (Finland) line allows to process waste wood products more effectively

2007 Modernization of drive mechanisms and increase of plywood film-facing capacity;
New cold press «Kitagawa Engineering» (Japan) is installed which helps to increase hot press productivity

2008 Improvement of ecological situation due to launch of filter plant «Moldow» (Denmark) on the system of aspiration at sanding lines;
Change of gantry crane helped to optimize time of unloading, and increased reliability of wood supply

2009 New plywood sanding line «Steinemann» (Switzerland) increased the production capacity and improved the quality of sanding due to the additional sanding with granularity of 120 mk/mm²

2010 Installation of additional spreaders increased plywood production capacity up to 200 000 m³ per year

2011 New debarking and log-cutting line is installed;
Upgrade of short grain peeling lines;
Upgrade of loading and processing system of lamination press increased film-faced plywood production capacity by 11,4%

2012 Upgrade of long grain peeling line Raute (Finland);
Veneer splicing line Hashimoto (Japan) is put into operation;
Renovation of the hot presses

2013 Reconstruction of plywood hot presses;
Replacement of cold presses;
Installation of a water heating equipment for pools of hydro- thermal processing of raw materials;
Modernization of veneer drying equipment

2014 Modernization of conveyors of log yard.
Modernization of Raute peeling lines 4x8 and 8x4
2015 Replacement of Grenzebach veneer scanners with scanners Mecano
New veneer dryer Sunway
New glue mixer «Industry Technologies», Latvia

TO THINK OF THE FUTURE

One of principles of SPM work is to take care of a regional ecology.

One of the oldest known building materials - wood - self-renewed and non-polluting - is used for plywood production. Wood is easy to process and utilize without damage to the environment.

Plywood manufacture is practically zero waste as wood chips and sawdust are used in manufacturing of particleboard. Other wood waste is completely utilized, turning into “green thermal energy”. Application of modern technologies in resins and different additives for production of wood-based panels allowed to reduce environmental impact greatly while preserving high physic-mechanical properties.

Plywood meets the requirements of the German national standard DIN 68705-3 for BFU 100 class construction plywood and the requirements of the European standard EN 636 as well.



heating equipment works on wood waste (Classen / Germany)

The main principles of the company in environment protection are based on constant development and the use of the unique self-renewed raw materials and controlled processes.

The ecological program of the enterprise provides step-by-step introduction of adequate measures, constant monitoring of the results and updating of plans in accordance with the international standards of economic forest-use.

In June 24, 2014 SPM passed the certification confirming that the chain of custody corresponds to the norms of Forest Stewardship Council – international independent organization that develops standards in the field of forest-use, wood processing and manufacture of wood-based products. Goal of FSC is to help ecologically responsible, socially oriented and economically stable forest-use and world forest resource management

Due to the certification of the chain of custody buyers of FSC-certified plywood can be sure that:

- ☐ Logs that were used for the production were legally harvested;
- ☐ While harvesting these logs stable forest-use methods, rights of employees, local and native population were respected.

FSC - CERTIFICATE



WOOD RAW MATERIAL



Wood stock provides stable work of the Enterprise through all seasons

Process of plywood manufacture begins with a selection and delivery of high-quality wood. Northern wood is especially durable due to annual rings which are narrow because of slow tree growth in a severe climate.

Plywood SyPly reflects the best characteristics of birch wood: perfect physic-mechanical properties and excellent quality of surface. It is the basis of SyPly quality.

USE of GLUE

Plywood glued with urea-formaldehyde glue (MR) – according to standard EN 636-1 can be used in dry conditions ($W^* < 65\%$), it refers to the first class of biological durability.

Plywood glued with phenolic-formaldehyde glue (WBP) – according to standard EN 636-2 can be used in damp conditions ($W^* < 85\%$), it refers to the second class of biological durability.

Plywood glued with phenolic-formaldehyde glue (WBP) and faced with resin impregnated paper (laminated) – according to standard EN 636-3 can be used in the open air ($W^* > 85\%$), it refers to the second class of biological durability.

Adhesive strength and content of formaldehyde correspond to the requirements of BFU 100 DIN 68705-3 standard. Plywood SyPly has ultra-low emission of formaldehyde (class E1).

QUALITY CONTROL

THE SYSTEM OF QUALITY CONTROL



Management system of quality control is certified in accordance with the international standard ISO 9001-2000, that is all operations and processes inside the mill are standardized and traced under the standard:

- ✓ control of raw wood and materials
- ✓ parameters of technological production process
- ✓ service and operation (running, exploration) of the equipment
- ✓ staff training

*W - parameter of relative atmospheric humidity

THE PROCESS OF MANUFACTURE



Wood stock



1. Hydro thermal treatment



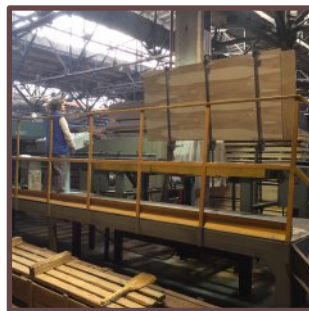
2. Debarking and cutting



3. Peeling



14. Manual repair



13. Grading

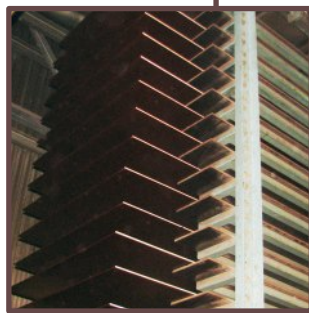


12. Sanding



11. Cutting to size

Birch plywood SyPly™



15. Film-facing



16. Cutting to size and edge profile trimming



17. Grading



18. Edge sealing

Stages 1 to 6

Logs are hydrothermal treated with steam and hot water to improve smoothness and density of veneer. After treatment logs are cut into pieces sized for peeling, debarked and peeled. Veneer which is produced on peeling lines is then cut into sheets, dried and graded

Stage 7

Graded veneer is patched (veneer defects are removed from a veneer sheet and replaced with patches that are made from high-quality veneer), pieces of veneer are joint at splicing lines

Stages 8 to 10

Graded, patched and spliced veneer continues to the composing shop where dry veneer sheets are interlaced with sheets that are covered with glue. Ready batches are then cold pressed. Final gluing is made in hot presses under high pressure and temperature



4. Cutting of veneer sheet



5. Drying

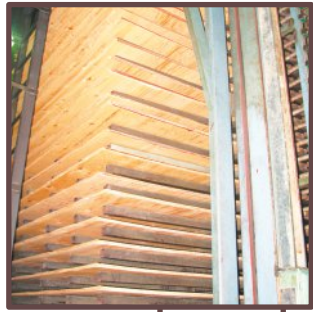


6. Grading



7. Patching and splicing

veneer pieces
full size veneer



10. Hot pressing



9. Cold pressing (pre-pressing)



8. Composing



19. Packaging



20. Warehousing and shipping

Stages 11 to 14

After pressing plywood sheets are cut to size, sanded to get smooth surface, graded and manually repaired. Graded birch plywood SyPly is packed into bundles after that

Stages 15 to 18

During film-facing plywood is covered with impregnated (soaked with phenolic resin) paper, pressed, cut to size and edge sealed. After grading plywood is packed and transferred to the warehouse

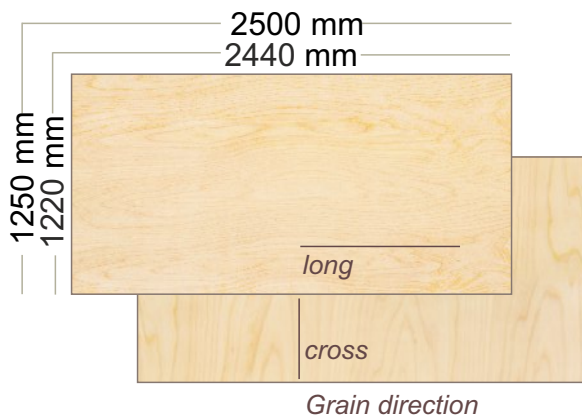
Stages 19 to 20

Plywood sheets are packed into bundles (number of sheets in each bundle depends on a thickness of plywood). Each bundle is tied with plastic bands, marked and transferred to the warehouse. Plywood is shipped with rail transport (wagons and containers) and trucks

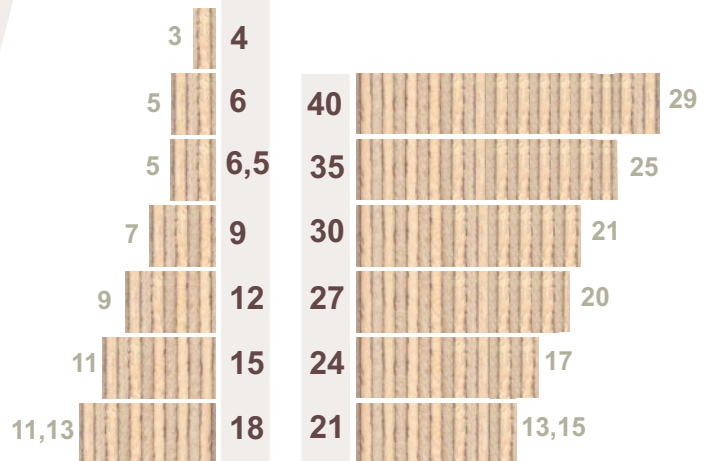


Birch plywood SyPly is a strong and water-resistant material. Birch wood gives its beautiful structure and high physic-mechanical characteristics to plywood. These qualities made it popular in furniture industry, construction, interior and exterior design

FORMATS, mm



THICKNESS, mm



Number of plies, pcs.

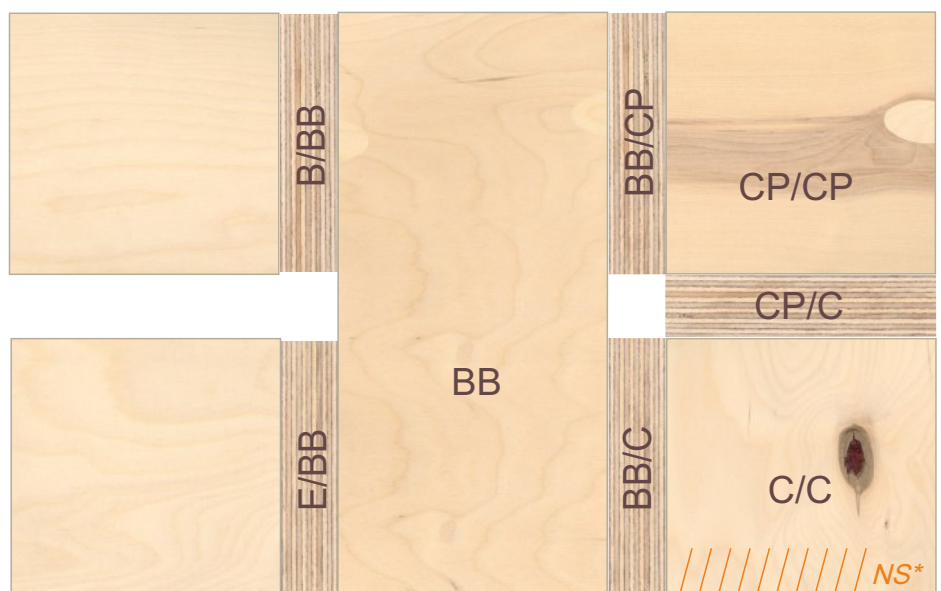
Water resistance	WBP (high), MR (standard)
Class of formaldehyde emission	E1
Humidity	5-10%
Length / width tolerance	+/- 2 mm

PLYWOOD GRADES

There is a difference between grades of plywood and grades of veneer. Grades of plywood depend on the grade of veneer used as for the top ply. For example, plywood panels faced with veneer grade “B” on one side and “BB” on the other side will have “B/BB” grade –the highest grade is indicated in the first place

B/BB
E/BB
BB
BB/CP
BB/C
CP/CP
CP/C
C/C (NS*)

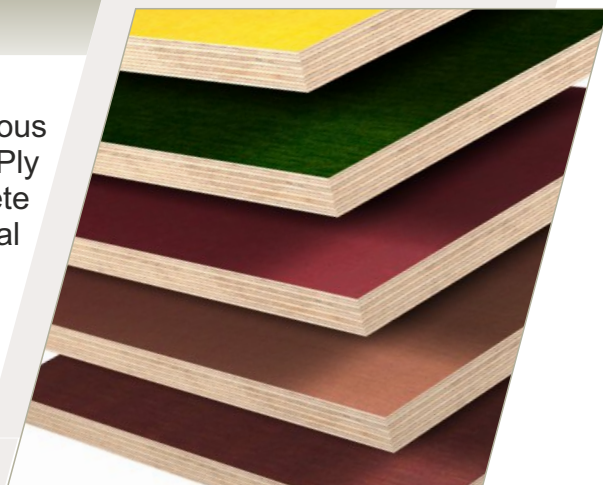
*NS - not sanded



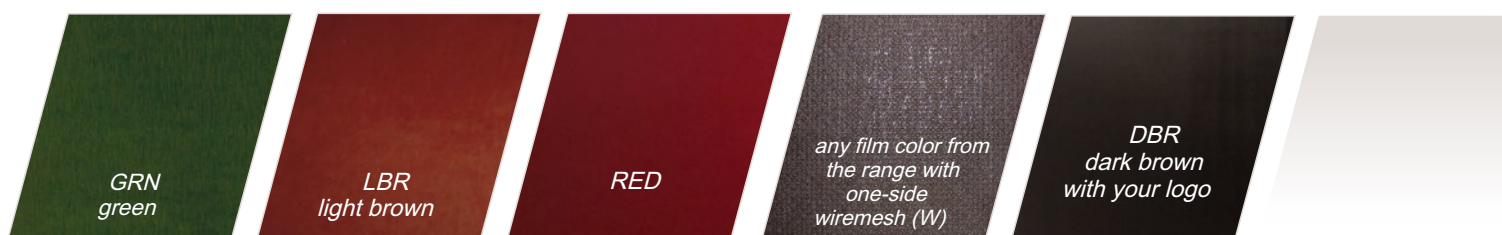
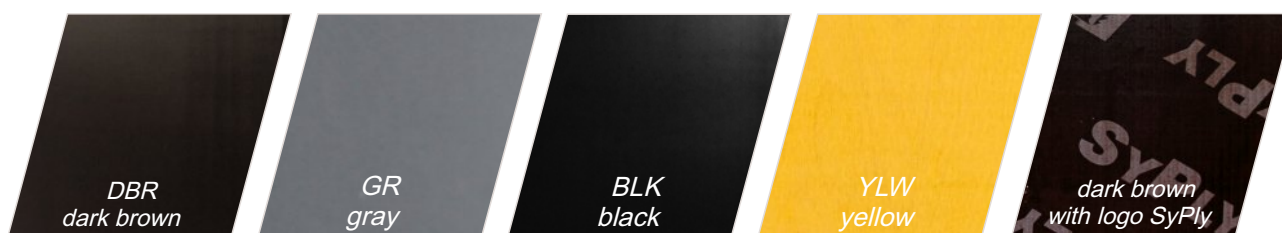
Scheme of plywood composition from different grades of veneer

FILM-FACED PLYWOOD SyPly™

Film-faced surface of SyPly panel has a high resistance to various natural and chemical effects. It makes film-faced plywood SyPly irreplaceable for the manufacture of wearproof surfaces (concrete formwork, storage and transportation of food and pharmaceutical goods, motor vans and wagons, ship decks, scaffolding)



RANGE OF POSSIBLE COLORS SyPly



TYPE OF FILM SURFACE

Smooth (F/F) smooth/meshed (F/W)

THICKNESSES: 6 - 35 mm

Water resistance: **WBP (high)**

Class of formaldehyde emission: **E1**

Humidity: **5-12%**

ADVANTAGES



Exclusive durability



Choice of color and density of film



Fast installation and easy processing



Ability to combine with other materials



Increased water resistance



Big format

PLYWOOD FOR FILM-FACING



Birch plywood **SyPly™** is faced with phenolic resin impregnated paper

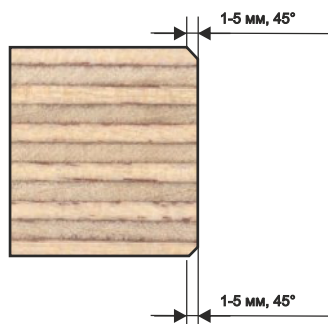


CUTTING OF EDGE PROFILES SyPly™



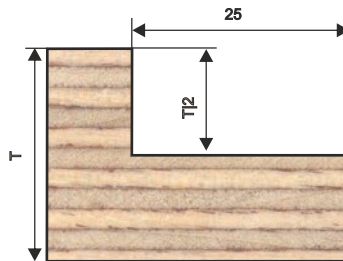
Joints and connections are important components of plywood constructions. Use of panels with edge profiles provides reliable stable structure of walls, floors and supporting elements. Edge profiles prevent panels from lifting or declining. They are capable to bear bigger loads than usual connection end-to-end is.

Edge profile can be cut on one, two opposite or all four sides depending on a customer's request. Standard panels can be "tongue and groove" connected with special glue. "Half and lap" joint can be additionally fixed by screws or long nails.



CHAMFERING

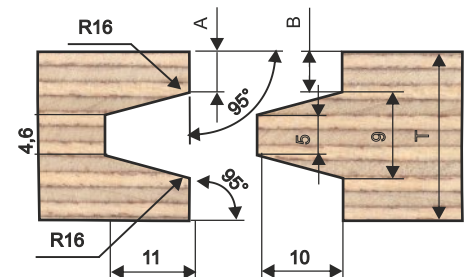
2440 x1220, 2500 x1250
(long grain)



HALF AND LAP

Available for sizes

2440 x1220
(long grain)



TONGUE AND GROOVE

2440 x1220, 2500 x1250
(long grain)

Available for thicknesses

4 - 35 mm

12 - 30 mm

18 - 30 mm

Parameters

Edge chamfering, size: 1 to 5 mm,
angle: 45 degrees
One-side cutting available

step width – 25 mm.
step height – ½ of
board thickness

	18	21	24	27	30
A	4.47	5.96	7.45	8.94	10.43
B	4.50	6.00	7.50	9.00	10.50

ADVANTAGES:

- Any format is available
- Economy due to the reduction of waste of material when cutting the boards
- Rigid panel fixation
- Prevention of panel lifting or declining
- Tight fitting of panels
- Fast installation

APPLICATION:

- Motor industry
- Interior and exterior design
- Wagon and container production
- Housing construction
- Flooring underlayment
- Roofing materials
- Industrial packing

REFERENCE DATA ON WEIGHT AND VOLUME OF PLYWOOD SyPly™

Thickness, mm	Length, mm	Width, mm	Volume of 1 sheet, m ³	Number of sheets in a bundle	Volume of 1 bundle, m ³	Weight of birch plywood, kg			Weight of film-faced plywood,		
						Factor of Volume to weight conversion	of 1 sheet	of 1 bundle	Factor of Volume to weight conversion	of 1 sheet	of 1 bundle
1	2	3	4 (=1 x 2 x 3)	5	6 (=4 x 5)	7	8 (=4 x 7)	9 (=6 x 7 +cover)	10	11 (=4 x 10)	12 (=6 x 10 +cover)
4	2440	1220	0,0119072	120	1,429	645	7,7	932	-	-	-
	2500	1250	0,0125000	120	1,500	645	8,1	978	-	-	-
6	2440	1220	0,0178608	80	1,429	645	11,5	932	665	11,9	960
	2500	1250	0,0187500	80	1,500	645	12,1	978	665	12,5	1 008
6,5	2440	1220	0,0193492	73	1,412	645	12,5	921	665	12,9	949
	2500	1250	0,0203125	73	1,483	645	13,1	966	665	13,5	996
9	2440	1220	0,0267912	54	1,447	645	17,3	943	665	17,8	972
	2500	1250	0,0281250	54	1,519	645	18,1	990	665	18,7	1 020
12	2440	1220	0,0357216	40	1,429	645	23,0	932	665	23,8	960
	2500	1250	0,0375000	40	1,500	645	24,2	978	665	24,9	1 008
15	2440	1220	0,0446520	32	1,429	645	28,8	932	665	29,7	960
	2500	1250	0,0468750	32	1,500	645	30,2	978	665	31,2	1 008
18	2440	1220	0,0535824	27	1,447	645	34,6	943	665	35,6	972
	2500	1250	0,0562500	27	1,519	645	36,3	990	665	37,4	1 020
21	2440	1220	0,0625128	23	1,438	645	40,3	937	665	41,6	966
	2500	1250	0,0656250	23	1,509	645	42,3	984	665	43,6	1 014
24	2440	1220	0,0714432	20	1,429	645	46,1	932	665	47,5	960
	2500	1250	0,0750000	20	1,500	645	48,4	978	665	49,9	1 008
27	2440	1220	0,0803736	18	1,447	645	51,8	943	665	53,4	972
	2500	1250	0,0843750	18	1,519	645	54,4	990	665	56,1	1 020
30	2440	1220	0,0893040	16	1,429	645	57,6	932	665	59,4	960
	2500	1250	0,0937500	16	1,500	645	60,5	978	665	62,3	1 008
35	2440	1220	0,1041880	13	1,354	645	67,2	884	665	69,3	911
	2500	1250	0,1093750	13	1,422	645	70,5	927	665	72,7	956
40	2440	1220	0,1190720	12	1,429	645	76,8	932	-	-	-
	2500	1250	0,1250000	12	1,500	645	80,6	978	-	-	-

Thickness tolerance of plywood panels meets the requirements of German national standard DIN 68705-3.

BIRCH PLYWOOD SyPly™, mm

nominal thickness	thickness tolerance (DIN 68705-3 and TR)				
		actual thickness in 2015			
	min	min	average	max	max
4 +/- 0.1	3,9	3,9	4,0	4,1	4,1
6 +/- 0.2	5,8	5,8	6,0	6,1	6,2
6.5 +/- 0,2	6,3	6,3	6,4	6,5	6,7
9 +/- 0,3	8,7	8,8	9,0	9,1	9,3
12 +/- 0,4	11,6	11,8	11,9	12,1	12,4
15 +/- 0,5	14,5	14,7	14,8	15,2	15,5
18 +/- 0,5	17,5	17,7	17,9	18,0	18,5
21 +/- 0,6	20,4	20,6	21,0	21,2	21,6
24 +/- 0,7	23,3	23,5	23,7	23,9	24,7
27 +/- 0,8	26,2	26,5	26,8	27,0	27,8
30 +/- 0,9	29,1	29,4	29,5	29,6	30,9
35 +/- 1,0	34,0	36,5	34,8	35,1	36,0
40 +/- 1,2	38,8	39,8	40,0	40,3	41,2

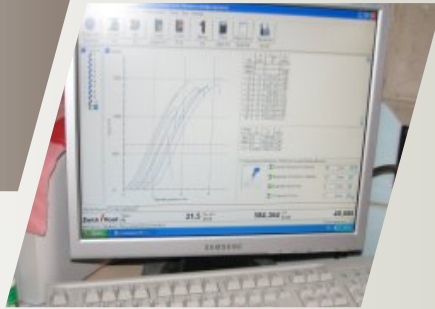
PS: for unsanded birch plywood SyPly of "C" grade the tolerance is +/- 6% from nominal thickness

FILM-FACED PLYWOOD SyPly™, mm

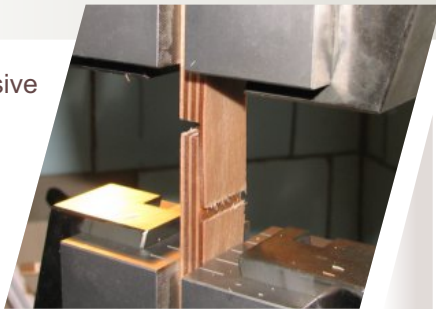
nominal thickness	thickness tolerance (DIN 68705-3 and TR)				
		actual thickness in 2015			
	min	min	average	max	max
6 +0,3/-0,5	5,5	5,8	6,0	6,1	6,3
6.5 +0,3/-0,5	6,0	6,2	6,3	6,5	6,8
9 +0,4/-0,6	8,4	8,7	8,8	8,9	9,4
12 +0,5/-0,7	11,3	11,6	11,8	11,9	12,5
15 +0,6/-0,8	14,2	14,4	14,5	14,7	15,6
18 +0,7/-0,9	17,1	17,4	17,6	17,8	18,7
21 +0,8/-1,0	20,0	20,2	20,4	21,0	21,8
24 +0,9/-1,1	22,9	23,0	23,4	24,7	24,9
27 +1,1/-1,2	25,8	26,8	27,0	27,7	28,1
30 +1,1/-1,5	28,5	28,7	28,8	30,0	31,1
35 +1,1/-1,5	33,5	33,7	34,0	35,0	36,1

Average values as measured in 2015

Process of measurement of
p.m. properties is automated

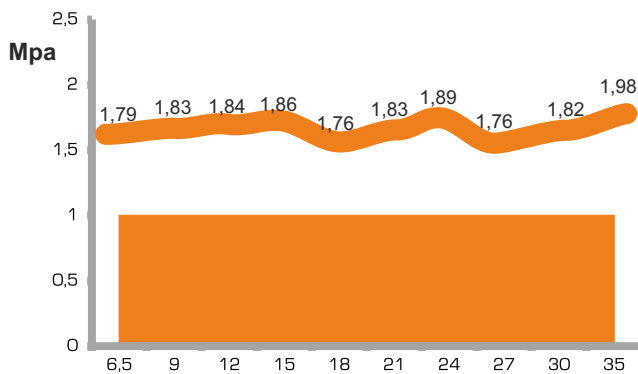


Measurement of adhesive
strength SyPly

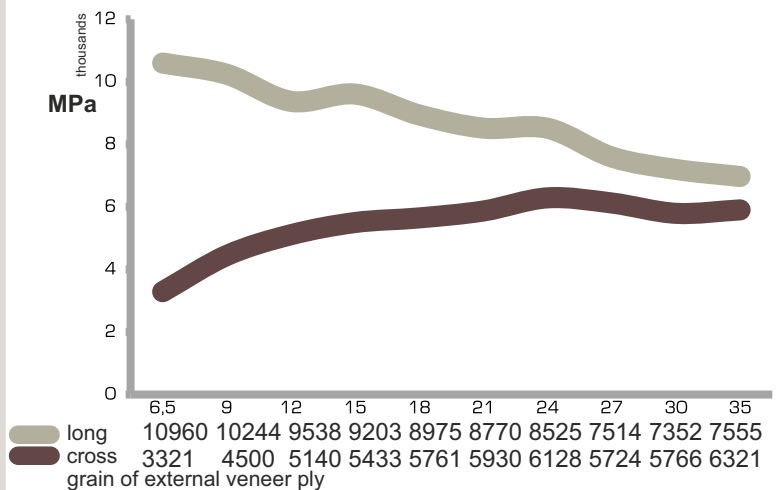


Measurement of bending strength SyPly

Adhesive strength



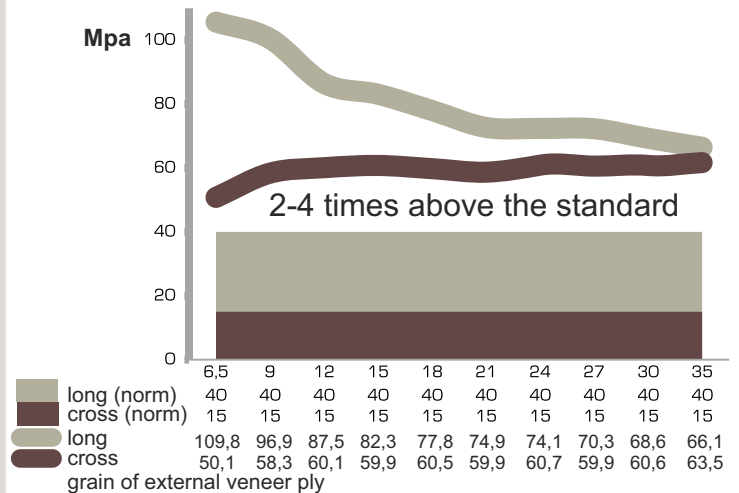
Mean modulus of elasticity



Plywood SyPly is certified in accordance with the national standard DIN-68705-3, as plywood of class BFU-100 - a weather resistant construction material. Adhesive strength meets the standard and exceeds it.

Plywood tests are carried out according to DIN 68705-3 "construction plywood" and EN314-1 "Plywood - quality of adhesion. Test methods". Norm according to DIN 68705-3 is 1.0 N/mm² - plywood SyPly adhesive strength exceeds the norm as shown on the above picture.

Bending strength



B



used for composing of the
highest grade of birch plywood:

face of
B/BB

Practically without defects. Discoloration is allowed up to 15% of a sheet surface, loose knots and knotholes sized up to 5 mm are allowed up to 3 per square meter

E



used for composing of the
following grades of birch plywood:

face of
E/BB

Practically without defects. Discoloration is allowed up to 30% of a sheet surface, loose knots and knotholes sized up to 5 mm are allowed up to 3 per square meter.

BB



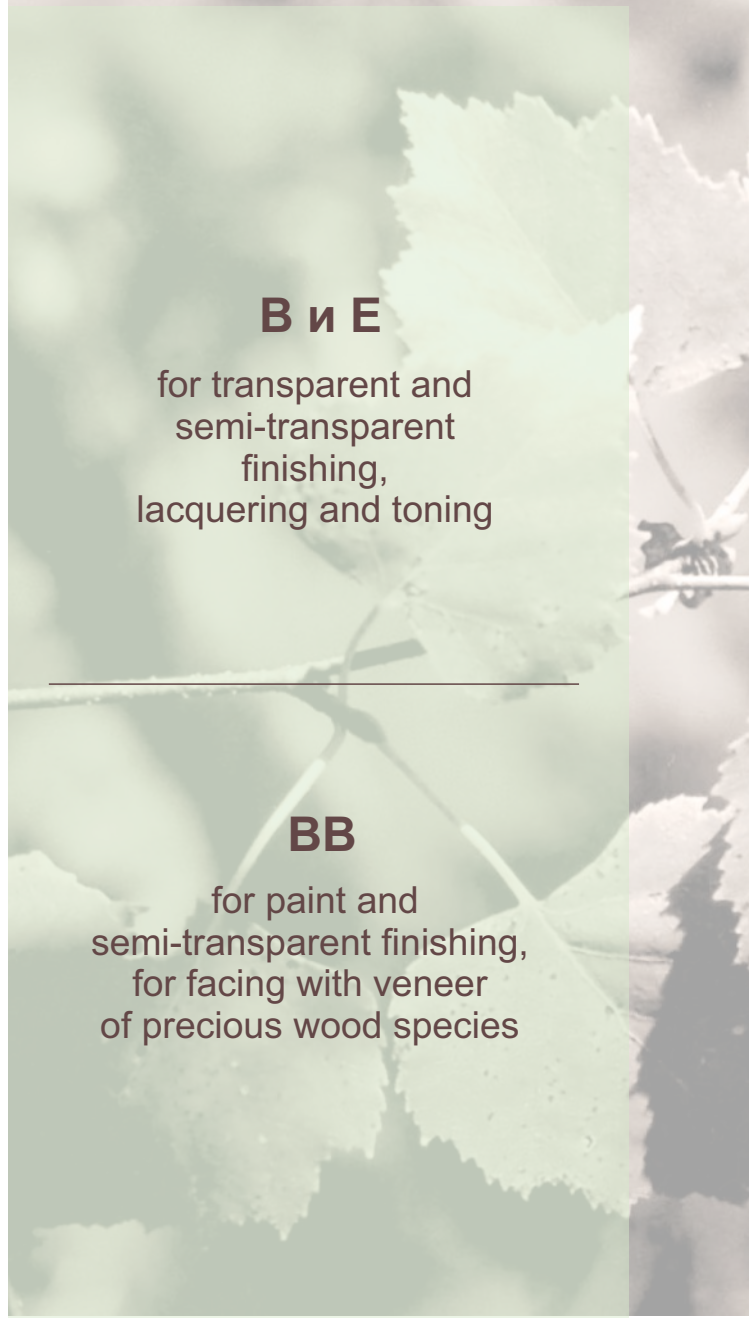
APPLICATION

B и E

for transparent and
semi-transparent
finishing,
lacquering and toning

BB

for paint and
semi-transparent finishing,
for facing with veneer
of precious wood species



used for composing of
the following grades of
birch plywood:

face of
BB
BB/C
BB/CP

back of
B/BB
E/BB

Discoloration is allowed up to 70% of a sheet surface, loose knots and open defects are patched, patches should match surrounding grain direction and color.

CP



C



Discoloration and patches are allowed without limits, putty repair is allowed

Open defects of wood structure and processing defects are allowed

APPLICATION

CP

for non-transparent
finishing and
film-facing or painting

C

for construction purposes
when exterior of a sheet
does not matter,
for packaging

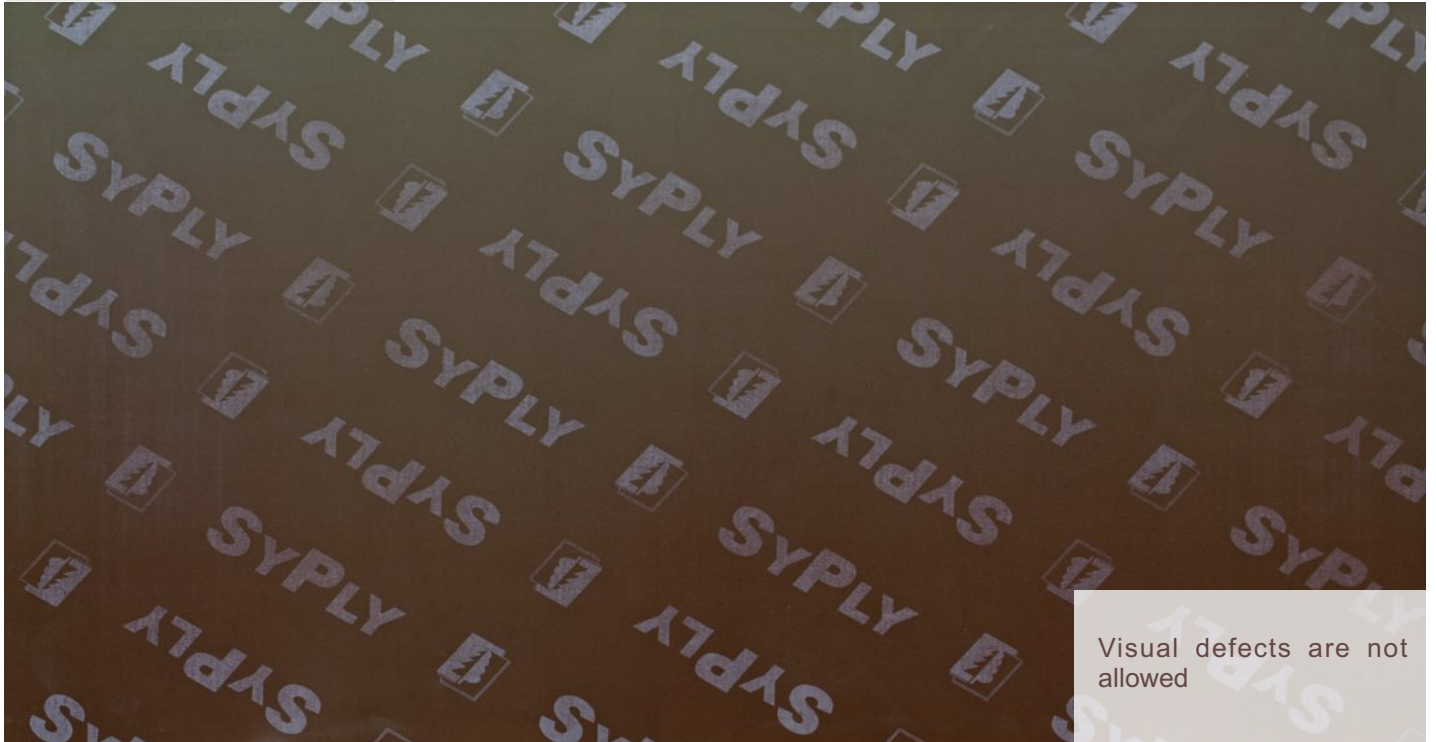
DEFECTS OF WOOD AND PROCESSING DEFECTS OF BIRCH SyPLY PLYWOOD

Defects of wood and processing	grade differentiation by allowed defects					
	B	E	BB	CP	C	
1. Knots						
a) inter-grown, sound light and dark knots	not taken into consideration up to, mm			sound knots with splits not more than 1,5 mm allowed	allowed	
	light knots 10		light and dark knots 10			
	size up to, mm					
	light knots 20		light and dark knots 25			
	quantity up to, pcs					
	3		20			
	per m2 of a sheet allowed					
b) partly inter-grown				allowed		
	inter-grown knots size up to, mm					
	5		15			
	in quantity up to, pcs					
	3		10			
per m2 of a sheet allowed						
c) loose knots and knotholes	size up to, mm 5 quantity up to, pcs 3		not allowed		size up to, mm 40 quantity up to, pcs 10	
d) tobacco knots	not allowed				per m2 of a sheet allowed	
2. Splits						
a) closed splits	edge splits up to, mm long			allowed		
	250		300			
	quantity up to, pcs					
	5		10			
per 1 m of panel width allowed						
b) open splits	not allowed		edge splits up to, mm width			
			2		2	10
			edge splits up to, mm width			
			250		600 allowed without quantity restrictions	400
			quantity up to, pcs			quantity, pcs
			2			5 per 1 m of panel width allowed
			per 1 m of panel width allowed			
3. Defects of wood structure						
a) Slope of grain, wavy fiber, curly grain, eye-shaped defects	allowed					
b) inter-grown bark pocket (light)	not allowed	allowed among inter-grown knots in number and size according to item 1 a)	allowed among inter-grown knots in number and size according to item 1 a)	allowed	allowed among inter-grown knots in number and size according to item 1 c)	
c) inter-grown bark pocket (dark)	not allowed		allowed according to item 1 a) of the current table			
d) false heartwood	not allowed		25	75	75	
e)Flecks: - scattered fiber veins - fiber vein groups	allowed up to 175 mm long, 4 mm width in quantity up to 3 flecks per m2 of a sheet	allowed	allowed up to 250 mm long, 10 mm width	allowed		
	allowed up to size 60x40					allowed
4. Chemical coloring						
	not allowed			allowed		
5. Fungal affection						
a) sap fungous coloring (blue stain, colored sap spots)	allowed up to			allowed		
	15%	50%	70%			
b) brown streak	not allowed		allowed up to 50% of a sheet surface	allowed		
6. Knots and holes repair						
	not allowed		knots and knotholes should be repaired by veneer patches		allowed without putty repair within limits indicated in item 1 c)	
			veneer patches should be selected according to color and direction of wood grain			
			Total number of patches with inter-grown, sound light knots should be no more than total number of allowed inter-grown			
			double patches are allowed, putty repair of holes in places of loose patches is allowed with following			

Defects of wood and processing	grade differentiation by allowed defects				
	B	E	BB	CP	C
			knots indicated in item 1 a) one double patch per sheet allowed		
7. Splits repair					
	not allowed		not allowed	putty repair of splits is allowed up to, mm width	
				10	25
				long	
				600	1000
				followed by sanding	
8. Glue penetration					
	glue penetration is allowed in a shape of a spot no more than 175mm long in quantity of 1 per m2 and/or in a shape of a spot no more than 15x15 mm in quantity up to 1 per sheet		slight glue penetration is allowed in shape of a spot no more than	allowed	
			25 x 25		
			up to 1 per m2		
9. Hollows					
	not allowed			hollows are allowed under condition of putty repair	allowed
10. Mechanical defects, scratches					
	not allowed			allowed	
11. Sanding through					
	not allowed			allowed no more than 5% of a sheet surface	allowed no more than 25% of a sheet surface
12. Spots of a production nature					
	not allowed				allowed
13. Presence of glue tape					
	allowed in not sanded plywood				
14. Lack of veneer in inner layer					
	up to 2 mm wide and 100 mm long is allowed under condition of putty repair		up to 5 mm wide and 150 mm long is allowed under condition of putty repair	up to 5 mm wide and 200 250 long is allowed	
15. Edge defects while plywood cutting					
a) scribe saw marks	not allowed				all edge long and up to 2 mm wide is allowed
b) cleavage	not allowed				all edge long and up to 5 mm wide is allowed under condition of putty repair
16. Surface roughness					
	Roughness parameter RM under GOST 7016-82,mkm, up to 100 for sanded plywood 200 for not sanded plywood				
17. Warping					
	warp of plywood with thickness 6,5 mm and more is allowed with bending deflection up to 15 mm per 1m of diagonal dimension of a plywood sheet				

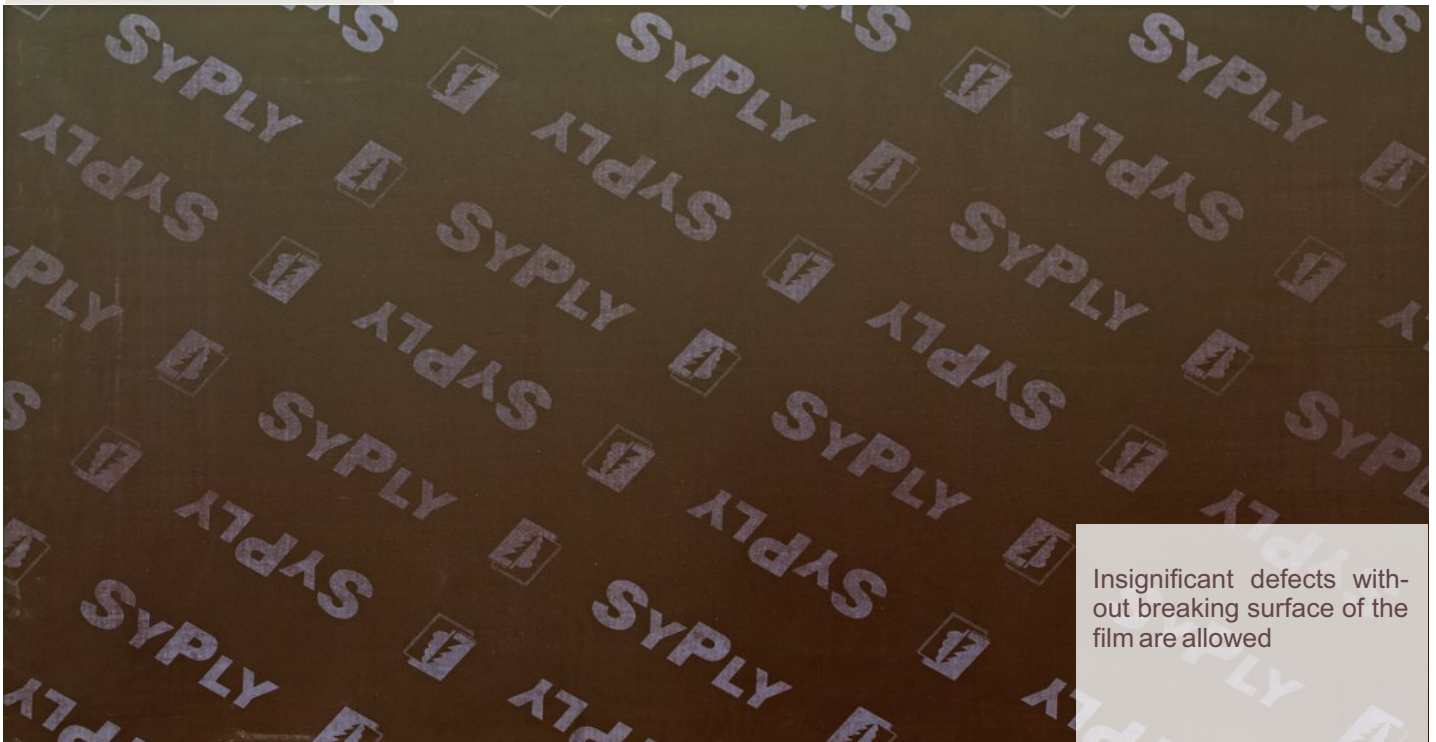
Names of wood defects are defined by GOST 2140, names of processing defects are defined by GOST 15812

Grade **1**



Visual defects are not allowed

Grade **2**



Insignificant defects without breaking surface of the film are allowed

DEFECTS OF WOOD AND PROCESSING DEFECTS OF FILM-FACED SyPly PLYWOOD

Grade differentiation by allowed defects	
Grade 1	Grade 2
1. Film exfoliation and breaking	
Not allowed	
2. Film crumbling or lack of film on edges	
Not allowed	Allowed up to 5 mm from edge with mandatory water-proof painting
3. Film overlaps	
Not allowed	Allowed
4. Burnout	
– burnt film	
Not allowed	Allowed without film penetration
– from core layer defects	
Allowed as single dots	Allowed
5. Whitish stains and strips on the film	
Not allowed	Allowed
6. Marks on the film from core layer defects	
Allowed	Allowed
7. Hollows	
Allowed if insignificant	Allowed without film penetration
8. Scratches	
Allowed without film penetration	
9. Edge defects after cutting:	
– cleavage	
Not allowed	Allowed up to 15 mm long edge with mandatory water-proof painting
– scribe saw traces	
Allowed	

Grade differentiation by allowed defects	
Grade 1	Grade 2
10. Imprints, caused by press plate roughness	
Allowed without burnout	Allowed
11. Sticking of film pieces	
Not allowed	Allowed
12. Film creases	
Not allowed	Allowed
13. Bubbles, delamination on the edge	
Not allowed	
14. Film bulging	
Not allowed	Allowed up to 40 mm - without limit, up to 100 mm - not more than 3 per 1m ²
15. Weak corner, weak edge, lack of glue	
Not allowed	
16. Mechanically damaged corner, edge	
Not allowed	
17. Spots of production origin	
Not allowed	Allowed
18. Drips on sheet surface	
Allowed on edges up to (mm)	
3	5
19. Warp	
Doesn't apply to thickness up to 6.5 mm. For plywood 6.5 mm thick and more allowed up to 15 mm per 1 m of the diagonal length of the panel	
20. Veneer missing in core layers	
Allowed with up to 5 mm deep, 40 mm wide or 250 mm wide in case of putty applied	

Extract from TR 5512-002-44769167-12

Names of wood defects are defined by GOST 2140, names of processing defects are defined by GOST 15812

SURFACE

Mechanical properties of the surface of plywood SyPly depend on different factors: density, veneer thickness, surface hardness, finishing type, film density etc.

Surface quality can be improved by film-facing. It increases abrasion resistance and durability of a plywood surface. These properties are valued by truck and wagon producers, in warehousing and concrete construction.

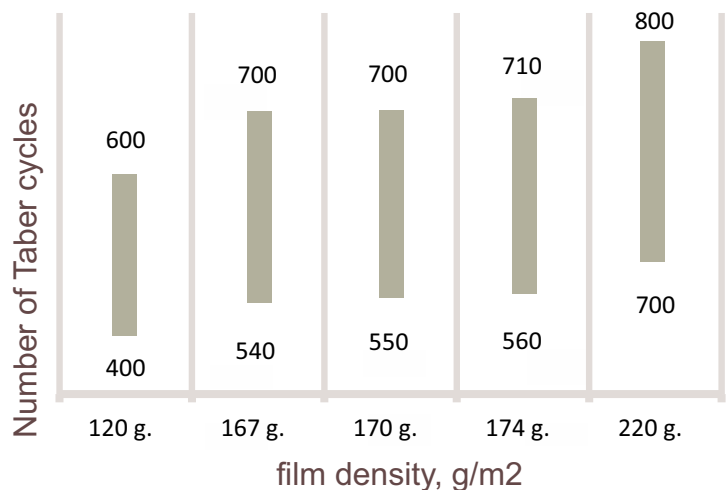
Film-faced plywood SyPly is resistant to appearance of cracks and scratches, which is important for outdoor application (traffic signs and billboards).

Surface durability of film-faced plywood depends a lot on film density. Increased film density also increases abrasion resistance of a surface and life-cycle of plywood. Abrasion resistance properties of film-faced plywood SyPly measured during Taber test are shown on the diagram.

Taber test results for film-faced plywood SyPly
(test methods correspond to DIN 52371, 53255, 53799)



Abrasion resistance test (Taber-test)



THERMAL CONDUCTIVITY

Thermal conductivity of plywood SyPly depends on moisture content. It is because water is heated almost three times as faster than wood. In temperature range from 0 C up to 100 C heating of plywood can achieve 1.4 KJ / (kg*K).

With increase of moisture content thermal conductivity also increases. Thermal conductivity of dry birch plywood SyPly is about 0.15 W / (m*K).

At normal temperature of the environment, wood properties remain practically unchanged. However when temperature rises from 20 C to 100 C durability of wood decreases. Temperatures below 0 C increase durability and elasticity of plywood in comparison with 20 C.

FIRE RESISTANCE

Plywood SyPly is classified as combustible material with medium inflammability. Ignition temperature is about 280 C. Spontaneous ignition is impossible until the temperature exceeds 440 C.

Fire resistance of birch plywood SyPly is about 13-15 minutes for 18 mm thickness. Carbonization rate of birch plywood SyPly varies from 0.8 to 1.2 mm/min depending on a panel thickness. Charred surface of plywood has isolating properties and slows down the process of burning.

Impregnation with special chemicals and covering a panel with fire-resistant substances increase fire resistance of plywood SyPly.

FORMALDEHYDE EMISSION

Content and emission of formaldehyde meets the requirements of E1 emission class.

Results of the formaldehyde emission tests of plywood SyPly (dated 2015)

Test method	Chamber (EN 717-1)	Gas analysis (EN 717-2)
Summary	Samples are put into a closed chamber and are blown by the air which circulates at pre-set speed, temperature and humidity. After certain time air in the chamber is tested to define formaldehyde content in it.	Samples are put into a closed chamber, emitting formaldehyde is mixed with the air of the chamber. After that air from the chamber passes through gas collector which contains water that absorbs free formaldehyde. Photo colorimeter measures formaldehyde content.
Unit	mg/m ³	mg/(m ² *h)
Norm	< 0,124 (birch) < 0,01 (film-faced)	< 3,5 (MR) <0,5 (WBP)
Birch plywood SyPly	WBR: 0,003-0,007 MR: 0,021-0,047	WBR: 0,37 (0,29-0,48) MR: 1,25 (0,84-1,7)
Film-faced plywood SyPly	0,0060 (0,0034-0,0084)	0,46 (0,40-0,49)

BIOLOGICAL AND CHEMICAL DURABILITY

Plywood SyPly is resistant to fungi and bacterium due to phenol-formaldehyde resin component .

Film-facing and edge-sealing by acrylic paint provide good protection against weather conditions and allow outdoor applications of plywood.

It is not recommended to exceed moisture content of 20%. To avoid rotting it's necessary to keep plywood at the temperature from +20 to +30 C and allow air access. If film and edge-sealing is damaged during use, resistance to rotting is reduced.

Film-facing and treatment with special chemicals prevent plywood from the discoloration caused by blue stain and mold, which can appear on the surface.

Plywood SyPly is resistant to many weak acids, acid-saline solutions and fuel oils. Basic solutions soften wood and lead to swelling, acids have destructive effect.

It is necessary to avoid direct contact with chlorine, hypochlorite and nitrates. Organic solvents like acetone, gasoline, alcohol etc. dissolve resin, fats and wax, causing swelling and durability reduction.

Film-facing improves plywood resistance to chemicals and disinfectants (contact with most of them causes only a slight discoloration).

SOUND ABSORPTION

Sound-isolating properties of plywood are low. Sound-isolating capacity is proportional to the mass to be penetrated by the sound, not depending on the material. The coefficient of sound reduction depends on the thickness of the panel and reaches 22-25 dB for 18 mm plywood.

Sound-proofing properties of plywood depend on the type and the method of binding to the surface of wall or floor. They can be improved by special filling between plywood panels.

CONSTRUCTION

- ☐ footbridges and loading platforms
- ☐ household buildings and constructions
- ☐ protective structures and fences
- ☐ agricultural buildings
- ☐ roofs
- ☐ warehouses
- ☐ partitions, doors
- ☐ scaffolding
- ☐ flooring
- ☐ shuttering



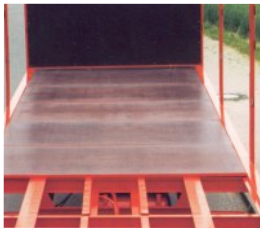
CONCRETE FORMWORK

- ☐ columns
- ☐ groundwork
- ☐ ceilings
- ☐ walls
- ☐ tunnels



TRANSPORT ENGINEERING

- | | |
|-----------------------------------|-------------------|
| ☐ trailers | in production of: |
| ☐ covering | ⇒ trucks |
| ☐ doors | ⇒ shop trailers |
| ☐ body | ⇒ vans |
| ☐ floor | ⇒ trolleybuses |
| | ⇒ containers |
| | ⇒ trailers |
| | ⇒ campings |
| | ⇒ pickups |
| | ⇒ wagons |



PACKAGING

- ☐ boxing and packaging
- ☐ decorative boxes and cases



SHIPBUILDING

- ☐ interior decoration of yachts and vessels
- ☐ shipboard finishing, partitions
- ☐ yacht, boat and vessel decks
- ☐ sits for boats, catamarans and passenger ships



EXTERIOR DECORATION

- ☐ facade decoration
- ☐ balcony ceiling
- ☐ scaffolding
- ☐ roof covering
- ☐ gates and fencing

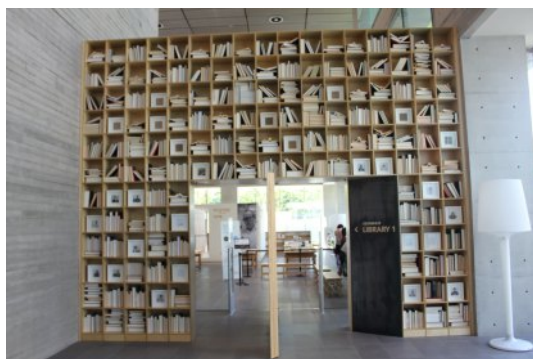
INTERIOR DECORATION

- ☐ sound-absorbing panels
- ☐ auditoriums
- ☐ concert halls
- ☐ wall panels, partitions
- ☐ windowsills
- ☐ doors



FURNITURE PRODUCTION

- ☐ facade, side and back panels for cabinets
- ☐ furniture body
- ☐ garden and cottage furniture
- ☐ bathroom furniture
- ☐ tables and tabletops
- ☐ shelves
- ☐ kitchen furniture
- ☐ racks



FURNITURE FOR KIDS AND PLAYGROUNDS

- ☐ kids tables, chairs, benches, cupboards etc.
- ☐ playground equipment
- ☐ sports grounds (hockey and extreme sports) – ramps, benches, skirts, places for spectators, rough flooring.
- ☐ school furniture
- ☐ slides for children



TRADING, SERVICE AND WAREHOUSING EQUIPMENT

- ☐ trade and service equipment (shelves, racks, counters)
- ☐ hotel, bar, restaurant, barbershop, laundry, medical and drugstore equipment
- ☐ beach cabins and shower rooms
- ☐ furniture for street restaurants
- ☐ warehouse wall panels
- ☐ fitting rooms and partitions
- ☐ information stands



OTHER APPLICATIONS

- ☐ road signs
- ☐ billboards
- ☐ toys
- ☐ tableware
- ☐ elevators etc.





Sheets of plywood are packed into bundles.

Each bundle is packed from all sides in covers* and is tightened with polyester bands.

* Fiberboard with thickness 2,5- 4,0 mm and not graded plywood with thickness 4,0 and 6,0 mm are used for covering.

LABEL INFORMATION

Company data: trade mark, logo and company name

Type of plywood SyPly™

Dimensions: width x length x thickness, mm, R- shop

Glue type: WBP, MR

Surface quality for birch plywood: sanded, unsanded; for film-faced plywood: color of film

For film-faced plywood: film density on each side - gr/m2

Unique bar code
Packing date
(day/month/year)

Producer contact data

Mark of Russian voluntary certification "RST"



SyPly™

СЫКТЫВКАР ПЛЫВУД МИЛЛ
СЫКТЫВКАРСКИЙ ФАНЕРНЫЙ ЗАВОД



Mark of ISO 9001:2008 standard

Фанера

Класс эмиссии формальдегида - E1

Plywood

Formaldehyde emission class - E1

Наименование вида фанеры

Plywood type

Ламинированная/Film-faced

Формат листа (длина x ширина x толщина), мм

Size (length x width x thickness), mm

1250*2500*18

Смола

Glue type

Сорт

Grade

WBP

F/F L

Поверхность

Surface

DBR

Plywood grade, L - with SyPly logo

Number of sheets in a bundle

Edge profile:
P1 - Tongue&groove
P2 - Hal&lap
P3 - Chamfering

Штрих код

Bar code

Пленка, г/м²

Film, g/m²

Профиль

Profile

Листов

Sheets

120/120

27

Дата

Date (dd.mm.yy)

Вес, кг

Weight, kg

Объем, м³

Volume

22/01/13

1020

1,519



Batch number 2
California 93120
compliant for
formaldehyde
Phase 2,
№562-2010-10-TPC-4



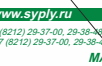
FSC mark

Emission of formaldehyde in plywood SyPly corresponds with CARB (California Air Resources Board) retirements

Mark of conformity of plywood in accordance with fire safety requirements



CPD-0765-562
OF
EN 13986
EN 636-2, S, E1



CE - mark (standard 13986:2004)

Mark of DIN
68705
certification

Plywood SyPly is transported in bundles that contain sheets of similar type, grade and size. Packaging prevents panels from being damaged during transportation.

Sheets of plywood SyPly should be protected on the way from the mill to a customer and be kept in dry conditions that prevent contact with rain, splashes or subterranean waters. While using the forklift to load or unload bundles it is necessary to cautiously prevent damage to the sheets and packaging bands. Plywood bundles should not be handled by forklift teeth. Bundles should be transported horizontal.

UNLOADING AND STORAGE

Unloading must be organized to prevent damage of bundles. There should be no contact with loops, hooks or chains. It is necessary to take panels out of bundles manually to prevent damaging the edges and surface of panels - without dropping them on the ground or dragging. When handling sheets with a forklift it is necessary to prevent them from damaging.



Sheets should be stored indoors in the same humidity and temperature with the conditions of the further application. Increased humidity and temperature changes can cause internal strain, increase of thickness or surface defects. Plywood SyPly should be placed on pallet with the number of supports, sufficient to avoid sagging, and covered to protect top and bottom from moisture.

LOADING CAPACITY FOR DIFFERENT TRANSPORT TYPES

Transport	number of bundles
20 feet container	16
Truck	20
40 feet container	24-28
Railway wagon	59

RECYCLING

Lifecycle of plywood SyPly is long. After its completion there are several methods of recycling. It is necessary to note that recycling rules are different in different countries and depend on the current legislation.

Recirculation is a preferable way of recycling of the majority of products - used plywood is re-used in other sphere. Such recirculation should not damage the environment more, than any other method of recycling, and be more expensive than usage of a new product.

If plywood is used as a fuel, burning plywood is equivalent to recirculation. At a burning temperature of +700°C plywood SyPly (painted as well) does not emit more dangerous products, than wood. It is not recommended to burn plywood outdoors as at a burning temperature below +700°C harmful products of combustion are emitted.

Products of plywood burning have higher density in comparison with the products of burning raw wood that proves higher fuel value.

Practically any plywood can be used, as compost. For this purpose it is necessary to shred plywood and consider long processing time.

Almost all plywood products can be dumped. However it is necessary to check if there are substances with smaller time of decomposition since plywood products decompose very slow.

Plywood SyPly does not contain substances classified as "hazardous waste".

ISO 9001
quality
management system

FSC
chain
of custody

Plywood SyPly and test methods confirming its' quality meet the requirements of Russian and international quality standards



CARB



WBP, F/F, FW

E1



MR, WBP, F/F, FW

BFU 100



WBP, F/F, FW

CE



MR, WBP, F/F, FW

**ULTRA-LOW EMISSION
OF FORMALDEHYDE**



**CONFORMITY
CERTIFICATE**



MR, WBP, F/F, FW

**SANITARY-
EPIDEMIOLOGICAL
CERTIFICATE**



MR, WBP, F/F, FW

**CERTIFICATE OF
CONFORMITY
TO FIRE SAFETY
TECHNICAL REGULATION**



WBP, F/F, FW

Plywood SyPly is used for projects famous all around the world

USA



World Trade Centre reconstruction

Great Britain



Tate gallery



Olympic objects in London

Paris



Luc Besson cinema school

Bulgaria



Danube bridge connecting Romania and Bulgaria



Armeec arena in Sofia

Greece



Olympic objects, Athens

Italy



Construction of the stadium «Arena di Verona»

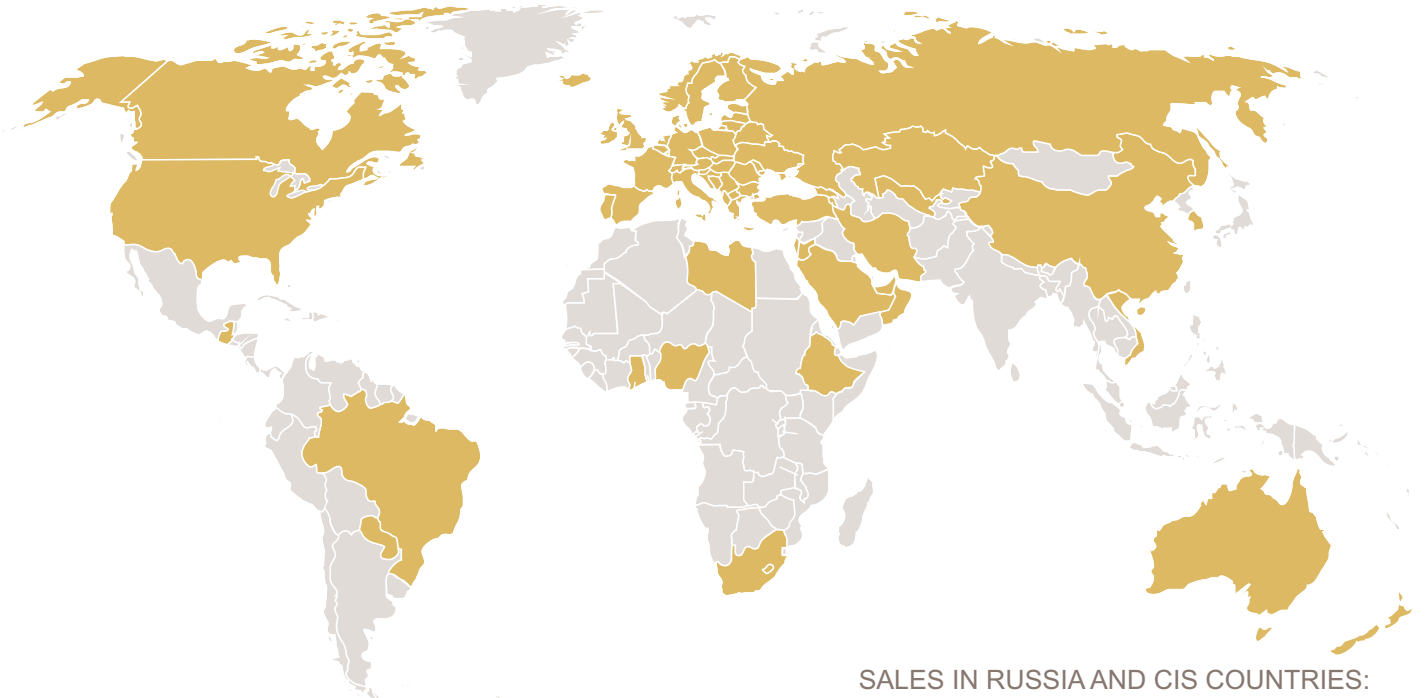
Russia



Sochi Olympic projects

And many others

We supply our plywood to more than 60 countries



SYKTYVKAR PLYWOOD MILL Ltd.

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167026, Russia

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