BRATSK SOFTWOOD PLYWOOD

Made of Angara Pine

ILIM BRATSK DOK

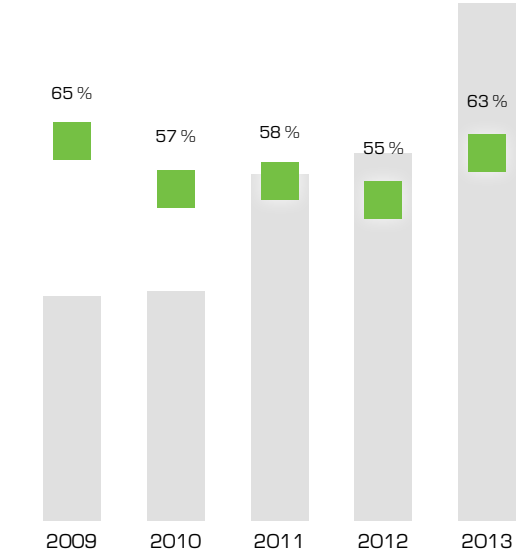
ILIM TIMBER

Ilim Bratsk DOK –

№1 * in the Russian market of softwood

* By annual sales volume

Location **Bratsk, Irkutsk region, Russia**
Estimated power **200 000 м3 of softwood plywood a year**
Sales geography **Russia, Europe, the CIS**

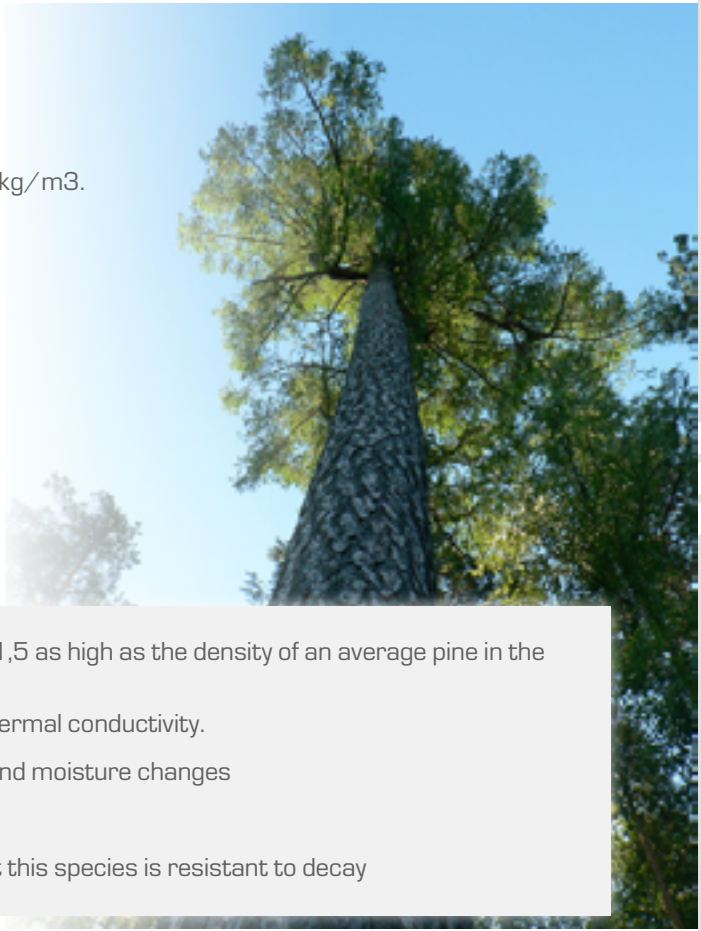


ILIM BRATSK DOK

Bratsk plywood

Made of Angara Pine

... with its unique natural properties in each plywood sheet



Light and strong construction material. Plywood density – 514 kg/m3.

Easy mechanical processing

Moisture–resistant

No cracks when drying

Durable – durability more than 50 years

Big size – length 2 440 mm & width 1 220 mm,

various thickness: from 6,5mm to 21mm and species

Resistant to bacterial affection

Angara pine implies high wood density– 540 kg/m3, that is 1,5 as high as the density of an average pine in the midland of the European continent.

Angara pine wood has a high mechanical strength and low thermal conductivity.

Flexible wood that makes it resistant to sharp temperature and moisture changes

High resistance to fungal infection.

Due to the combination of high density and high resin content this species is resistant to decay

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Bratsk plywood at the federal construction sites

Sochi Olympic facilities

MERCEDES BENZ entrusts Bratsk plywood with it's engines

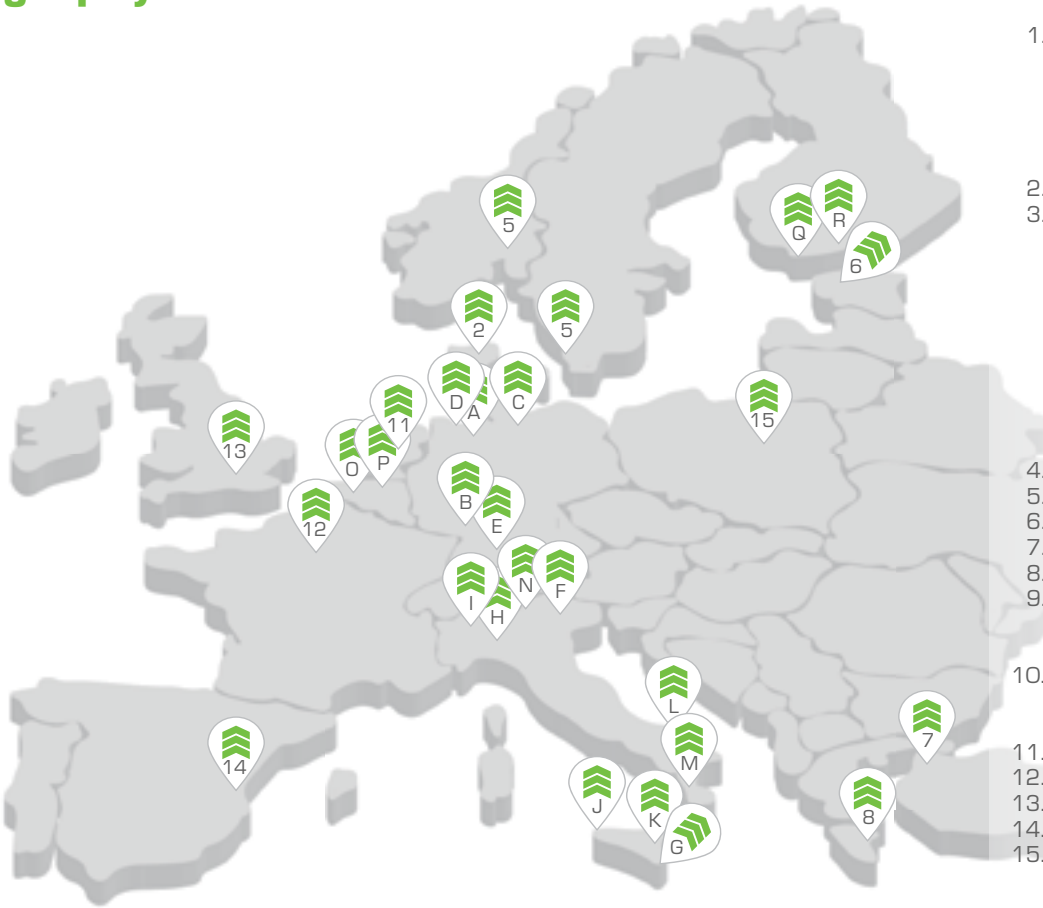
Bratsk plywood used for the packages of car engines and spare parts

APEC Summit facilities in Vladivostok

Bratsk plywood used in the production of boxcars

Bratsk softwood plywood used in the production of roofed boxcars

Geography of sales



destinations of sales:

1. Germany
   - A) Bremen
   - B) Germersheim
   - C) Hamburg
   - D) Bremerhaven
   - E) Neu–Ulm
2. Denmark (Kolding)
3. Italy:
   - F) Catania
   - G) Molfetta
   - H) Frascineto
   - I) Pioltello (Milano)
   - J) Trapani
   - K) Riese Pio X (Treviso)
   - L) Syracuse
   - M) Frugarolo
   - N) Bergamo
4. Sweden (Malmo)
5. Norway (Oslo)
6. Estonia (Tallinn)
7. Turkey (Gebze)
8. Greece (Piraeus)
9. Belgium
   - O) Ghent
   - P) Antwerpen
10. Finland
    - Q) Helsinki
    - R) Kotka
11. Netherlands (Rotterdam)
12. France (Paris)
13. United Kingdom (London)
14. Spain (Valencia)
15. Poland (Warsaw)

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Bratsk softwood FSF plywood

(highly water–resistant plywood) GOST 3916.2–96

Species	PINE, LARCH
Sizes	2440X1220 мм, 2500X1250 мм
Thickness	6,5 мм; 9 мм; 12 мм; 15 мм; 18 мм; 21 мм; 24 мм; 27 мм; 30 мм;
Grades (by the appearance of face veneer)	I/III; II/III; III/III; III/IV; (II/III III/III –TG H/O Cx/Cx); Shop
Density	514 kg/м3
Class of emission	E1
Certification	FC-COC-643076 FC-CW-643076 *1073-CPR-T808 EN 13986, EN 636-2 S,EN 314-2 class 3, E1,D-s2,d0

CE

FSC www.fsc.org FSC® C005212

Product application

- furniture
- low–rise housing
- Interior decor
- construction materials
- construction
- car manufacturing
- carriage manufacturing
- packaging and tare

Capacities and advantages

- high resistance to decay and fungal infection
- long durability
- high water–resistance
- light weight combined with high strength
- environmental
- nice natural wood structure
- easy processing and quick mounting
- match with any material
- wide range of application
- good soundproofing

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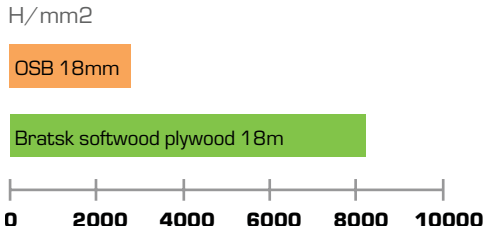
Bratsk softwood FSF plywood vs. OSB

There are main engineering tensile strength indicators. *:
*For information only. Not for engineering calculations

1. Bending Stiffness

Bending Stiffness is important when it comes to the feel of a floor. Higher stiffness panels make for a floor that doesn't feel bouncy, and will reduce tile popping and cracking.

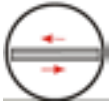


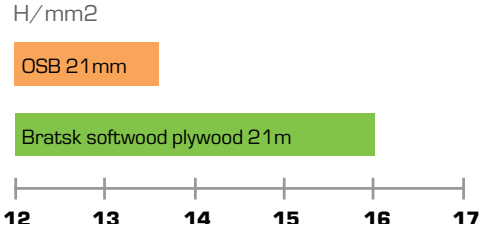
2.Compression
3.Tension

Compression and Tension are important to the Engineer for specialized designs and applications, such as roof diaphragms and splice joints.

4. Planar shear

Some industrial applications require a panel to carry very high loads over a short span, such as warehouse storage areas and decking. Planar Shear Strength is very often a limiting property in determining the maximum safe load capacity.





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Comparative physical and mechanical indices Bratsk softwood plywood vs. OSB–3

	Testing method		Bratsk softwood FSF plywood*	OSB – 3
	Bratsk softwood FSF plywood*	OSB – 3		
Static bending strength along the fibers of face layers, Н/мм3	EN–314–2	EN 310		
longitudinal strength			57,3	26
in cross direction			37,1	14
2. Ultimate shear strength along the glue line, not less, Н/мм3	EN–314–2	EN 319		
after soaking in cold water			1,3	0,34
after one hour in boiling water			1,2	0,13
Tensile strength along the fiber of face layers, not less, Н/мм2	EN–314–2	EN 319		
parallel to grain			35	–
transverse tensile			–	0,34
Formaldehyde content , Mg/100g	GOST 27678	EN 120	4,0	8,0
Density,kg/m3	GOST 9621	EN 323	514	620
Swelling in water, %				
after 24 hours	TEST TDV	EN 317	5	15
after 30 days	TEST TDV	EN 317	10	25

* Test results in the technological laboratory of IB DOC

Comparative physical and mechanical indices
Bratsk softwood plywood vs. different species veneers

Parameter by GOST* *	Thickness мм	Bratsk softwood FSF plywood * * *	Softwood FSF plywood (pine, fir, larch)	Birch plywood FSF		Other hard–wood plywood (poplar, aspen veneer)	
1. Moisture content, %	(3)*4–30	9,8	5–10	5–10		5–10	5–10
2. Ultimate shear strength along the glue line, MPa, not less: • after one hour in boiling water • after 24 hours of soaking in water	(3)*4–30	 1,0 1,64	 1,0 1,0	 1,5 1,5	 1,5 1,5	 0,6 0,6	 0,6 0,6
3. Static bending strength along the fibers of face layers, MPa, not less:	9–30	57,3	40	60	55	30	25
4.Tensile strength along the fiber of face layers, MPa, not less:	(3)*4–6,5	46,6	25	40	30	40	–
5. Density,kg/m3		514	450	640–700		390–400	390–400

* for hardwood plywood
* * by GOST 3916.2–96, GOST 3916.1–96
* * * Test results in the technological laboratory of IB DOC

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Bratsk plywood T&G (Tongue and Groove)

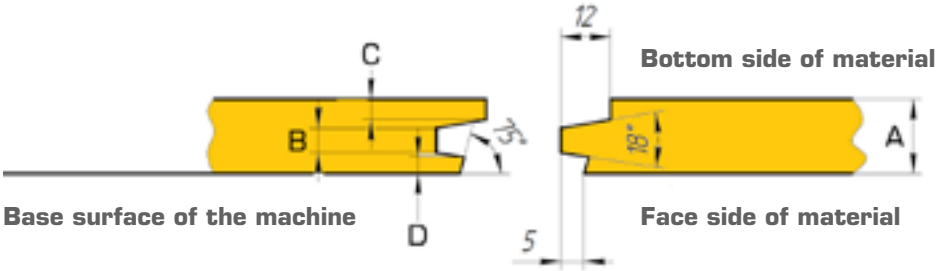
T&G is a new product from by Ilim Timber

Can be used in both dry and wet conditions.

Floor and heavy roof sheathing for residential, commercial and industrial construction.

Advantages:
- Enable fast, problem–free installation
- Prevent buckling by accommodating panel expansion due to moisture changes
- Prevent wedging action that exert damaging splitting forces
- Accommodate field applied adhesives
- Provide a uniform, ridge–free surface

T&G2 scheme:
size A – plywood thickness, mm. Can be 12, 15, 18, 21mm
size B – adjustable depending on the plywood thickness by lifting or lowering the cutter pairs
size C – locates in the middle of the workpiece butt end
adjustable depending on the plywood thickness by placing washers between the pair cutters.
size D – remaining size formed depending on B and C size adjustments, but not less than 3mm.



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Bratsk plywood T&G (Tongue and Groove)

EN 12871 Characteristic Strength and Stiffness values for Roof & Floor panels									
Thickness (nominal), мм	Number of veneers/ layers	Minimum distance between supports (span), mm Note 3	Point bending load			Resistance	Calculation		
			Characteristic Strength		Mean stiffness		Factor / Partial coefficient		Category Note 2
			Normal Fser,k H	Maximum Fult,k H	Rm, H/мм Note 4		Class	Minimum kmod/ m Note 1	
FLOOR									
15	7/7	405	2871	4008	536	In accordance with requirements	1	0,32	A
18	9/9	610	2861	3904	411		1	0,33	A
21	9/9–11/11	610	Values for 18mm are used						
ROOF									
12	5/5	610	3102	3209	159	In accordance with requirements	2		
15	7/7	815	2462	3367	206				
18	9/9	1120	3441	4160	112				
21	9/9–11/11	1120	Values for 18mm are used						

Note 1. The loading duration kmod and the partial coefficient for materials, m, may differ in different EU countries. The Minimum values indicated in the table relate to the indicated load category in combination with a kdis value by EN 12871.

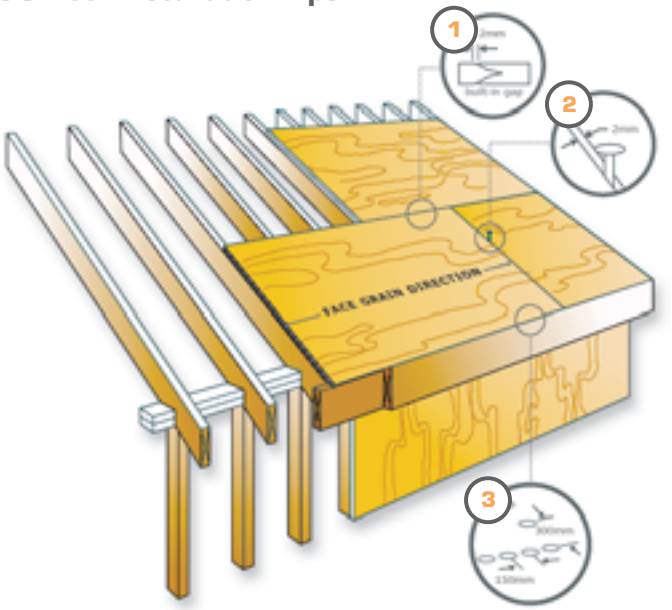
Note 2. Category A. Application. Living flats and houses, attics, hostels, rooms and wards in hospitals, bedrooms in hotels and asylums, kitchens and WC. Category H. Roof panels, that probably will not be used for living conditions due to the design and availability.

Note 3. See a separate instruction.

Note 4. The values in the table must be multiplied by 0,93 in order to get 5% characteristic stiffness values.

Bratsk T&G plywood

T&G Roof Installation Tips



1 Maintain Proper Gaps Between Panels.
Do Not Force Tightly Together!

2 Lay panels with face grain across the joist.
For increased weather–proofing install panels with tongue pointing up.

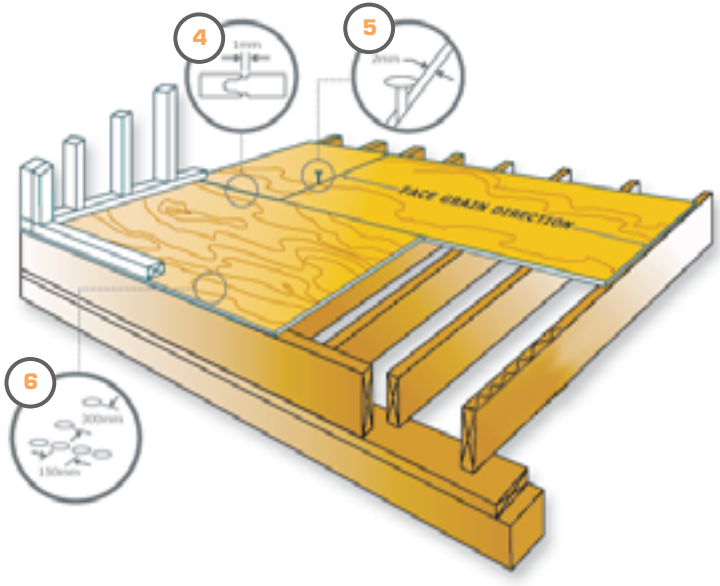
3 Maintain Proper Fastener Spacing.
Space fasteners 150mm around the perimeter of the panel and 300mm on intermediate supports.

Storage and Handling
The T&G profiles are sturdily built and designed to engage even when wet. But dry, undamaged panels install faster and easier, so maximize the time you can save by following these suggestions on the job site:

- Cover plywood bundles with plastic or tarp.
- Use three supports as dunnage to prevent sagging.
- Do not mix Bratsk T&G with other T&G's.

Bratsk T&G plywood (Tongue and Groove)

T&G Floor Installation Tips



4 Maintain Proper Gaps Between Panels.
Do Not Force Tightly Together!

5 . Leave built in 1mm expansion gap between tongue and groove edges.
Leave a 2mm gap between panel ends.

6 Lay Panels with Face GrainAcross the joint.
Maintain Proper Fastener Spacing.
Space fasteners 150mm around the perimeter of the panel and 300mm on immediate supports.

Storage and Handling
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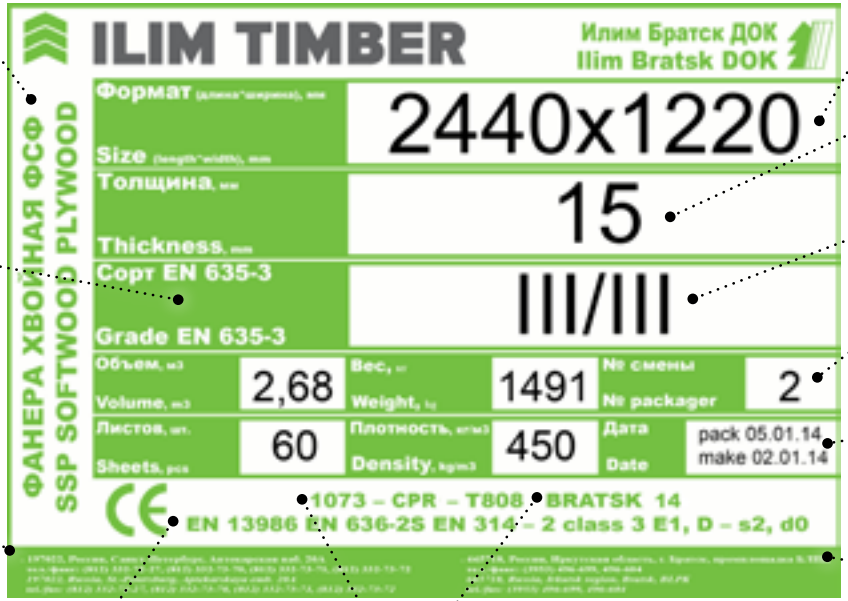
Shipping mark. Bratsk softwood FSF plywood



SSP – waterproof plywood

EN 635–3 – "Plywood. Classification by surface appearance Softwood" European Standard **Part 3** – coniferous

Company address

Size, mm

Thickness, mm

Grade

Volume, Weight and the number of packager

Number of sheets per bundle, density, date of manufacture and packing

Address of manufacturer

EN 13986 – «Wood–based panels for use in construction. Characteristics, evaluation of conformity and marking» European Standard

EN 636–2S – the technical class EN 314–2 class 3

E1 – Emission class

D–– s2 , d0 – Reaction to Fire Classes

CE 1073–CPR–T808 – certification – supervisory authority number – **1073** – Construction Products Regulation – CPR number of manufacturer – T808

BRATSK 14 – manufacturer, year of manufacture

ILIM BRATSK DOK

Notes

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