BRATSK SOFTWOOD PLYWOOD
Made of Angara Pine
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

Russian market sales, 000 м3
market share of IB DOC, %

- 2009: 65%
- 2010: 57%
- 2011: 58%
- 2012: 55%
- 2013: 63%
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.

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 2440 mm & width 1220 mm,
various thickness: from 6.5mm to 21mm and species
Resistant to bacterial affection
Bratsk plywood at the federal construction sites

Sochi Olympic facilities

APEC Summit facilities in Vladivostok

MERCEDES BENZ entrusts Bratsk plywood with it’s engines

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

Bratsk plywood used in the production of boxcars

Bratsk softwood plywood used in the production of roofed boxcars
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) Pio lama (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)
Bratsk softwood FSF plywood
(highly water-resistant plywood) GOST 3916.2–96

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

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;
- 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
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.

<table>
<thead>
<tr>
<th>H/mm²</th>
</tr>
</thead>
<tbody>
<tr>
<td>OSB 18mm</td>
</tr>
<tr>
<td>Bratsk softwood plywood 18m</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>H/mm²</th>
</tr>
</thead>
<tbody>
<tr>
<td>OSB 15mm</td>
</tr>
<tr>
<td>Bratsk softwood plywood</td>
</tr>
</tbody>
</table>

3. **Tension**

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.

<table>
<thead>
<tr>
<th>H/mm²</th>
</tr>
</thead>
<tbody>
<tr>
<td>OSB 21mm</td>
</tr>
<tr>
<td>Bratsk softwood plywood 21m</td>
</tr>
</tbody>
</table>
## Comparative physical and mechanical indices
### Bratsk softwood plywood vs. OSB–3

<table>
<thead>
<tr>
<th></th>
<th>Testing method</th>
<th>Bratsk softwood FSF plywood*</th>
<th>OSB – 3</th>
<th>Bratsk softwood FSF plywood*</th>
<th>OSB – 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Static bending strength along the fibers of face layers, Н/мм3</td>
<td>EN–314–2</td>
<td>EN 310</td>
<td></td>
<td>57.3</td>
<td>26</td>
</tr>
<tr>
<td>Longitudinal strength</td>
<td>EN–314–2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>in cross direction</td>
<td>EN–314–2</td>
<td>37.1</td>
<td>14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Ultimate shear strength along the glue line, not less, Н/мм3</td>
<td>EN–314–2</td>
<td>EN 319</td>
<td></td>
<td>1.3</td>
<td>0.34</td>
</tr>
<tr>
<td>after soaking in cold water</td>
<td>EN–314–2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>after one hour in boiling water</td>
<td>EN–314–2</td>
<td>1.2</td>
<td>0.13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tensile strength along the fiber of face layers, not less, Н/мм2</td>
<td>EN–314–2</td>
<td>EN 319</td>
<td></td>
<td>35</td>
<td>–</td>
</tr>
<tr>
<td>parallel to grain</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>transverse tensile</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Formaldehyde content, Mg/100g</td>
<td>GOST 27678</td>
<td>EN 120</td>
<td>4.0</td>
<td>8.0</td>
<td></td>
</tr>
<tr>
<td>Density, kg/m3</td>
<td>GOST 9621</td>
<td>EN 323</td>
<td>514</td>
<td>620</td>
<td></td>
</tr>
<tr>
<td>Swelling in water, %</td>
<td>TEST TDV</td>
<td>EN 317</td>
<td>5</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>after 24 hours</td>
<td>TEST TDV</td>
<td>EN 317</td>
<td>10</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>after 30 days</td>
<td>TEST TDV</td>
<td>EN 317</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Test results in the technological laboratory of IB DOC
### Comparative physical and mechanical indices

**Bratsk softwood plywood vs. different species veneers**

<table>
<thead>
<tr>
<th>Parameter by GOST** **</th>
<th>Thickness \text{mm}</th>
<th>Bratsk softwood FSF plywood ***</th>
<th>Softwood FSF plywood (pine, fir, larch)</th>
<th>Birch plywood FSF</th>
<th>Other hardwood plywood (poplar, aspen veneer)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Moisture content, %</td>
<td>(3) <em>4–30</em></td>
<td>9,8</td>
<td>5–10</td>
<td>5–10</td>
<td>5–10</td>
</tr>
<tr>
<td>2. Ultimate shear strength along the glue line, MPa, not less:</td>
<td>(3) <em>4–30</em></td>
<td>1,0</td>
<td>1,0</td>
<td>1,5</td>
<td>1,5</td>
</tr>
<tr>
<td>• after one hour in boiling water</td>
<td>1,64</td>
<td>1,0</td>
<td>1,5</td>
<td>1,5</td>
<td>0,6</td>
</tr>
<tr>
<td>• after 24 hours of soaking in water</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Static bending strength along the fibers of face layers, MPa, not less:</td>
<td>9–30</td>
<td>57,3</td>
<td>40</td>
<td>60</td>
<td>55</td>
</tr>
<tr>
<td>4. Tensile strength along the fiber of face layers, MPa, not less:</td>
<td>(3) <em>4–6,5</em></td>
<td>46,6</td>
<td>25</td>
<td>40</td>
<td>30</td>
</tr>
<tr>
<td>5. Density, kg/m(^3)</td>
<td></td>
<td>514</td>
<td>450</td>
<td>640–700</td>
<td>390–400</td>
</tr>
</tbody>
</table>

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* for hardwood plywood

** by GOST 3916.2–96, GOST 3916.1–96

*** Test results in the technological laboratory of IB DOC
Bratsk plywood T&G (Tongue and Groove)

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.

T&G is a new product from Ilim Timber

Base surface of the machine

Bottom side of material

Face side of material
### Bratsk plywood T&G (Tongue and Groove)

#### EN 12871 Characteristic Strength and Stiffness values for Roof & Floor panels

<table>
<thead>
<tr>
<th>Thickness (nominal), mm</th>
<th>Number of veneers/ layers</th>
<th>Minimum distance between supports (span), mm</th>
<th>Point bending load</th>
<th>Mean stiffness</th>
<th>Resistance</th>
<th>Calculation</th>
<th>Category Note 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Characteristic Strength</td>
<td></td>
<td></td>
<td>Factor / Partial coefficient</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Normal Fser,k H</td>
<td>Maximum Fult,k H</td>
<td>Rm, H/мм</td>
<td>Class</td>
<td>Minimum kmod / m Note 1</td>
</tr>
<tr>
<td>Floor</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>7/7</td>
<td>405</td>
<td>2871</td>
<td>4008</td>
<td>536</td>
<td>1</td>
<td>0.32</td>
</tr>
<tr>
<td>18</td>
<td>9/9</td>
<td>610</td>
<td>2861</td>
<td>3904</td>
<td>411</td>
<td>1</td>
<td>0.33</td>
</tr>
<tr>
<td>21</td>
<td>9/9–11/11</td>
<td>610</td>
<td></td>
<td></td>
<td></td>
<td>Values for 18mm are used</td>
<td></td>
</tr>
<tr>
<td>Roof</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>5/5</td>
<td>610</td>
<td>3102</td>
<td>3209</td>
<td>159</td>
<td>In accordance with requirements</td>
<td>2</td>
</tr>
<tr>
<td>15</td>
<td>7/7</td>
<td>815</td>
<td>2462</td>
<td>3367</td>
<td>206</td>
<td>In accordance with requirements</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>9/9</td>
<td>1120</td>
<td>3441</td>
<td>4160</td>
<td>112</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>9/9–11/11</td>
<td>1120</td>
<td></td>
<td></td>
<td></td>
<td>Values for 18mm are used</td>
<td></td>
</tr>
</tbody>
</table>

**Note 1.** The loading duration kmod and the partial coefficient for materials, γm, 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 Grain Across the joint. Maintain Proper Fastener Spacing. Space fasteners 150mm around the perimeter of the panel and 300mm on immediate 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.
Shipping mark. Bratsk softwood FSF plywood

SSP – waterproof plywood


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 supervision authority number – 1073 Construction Products Regulation – CPR number of manufacturer – T808

BRATSK 14 – manufacturer, year of manufacture

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

ILIM TIMBER

2440x1220

15

III/III

2,68

1491

60

450

1073 – CPR – T808 \- Bratsk 14

EN 13986 EN 636-2S EN 314–2 class 3 E1, D – s2, d0

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