SINTEF

SINTEF Certification

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Technical Approval

SINTEF Building and Infrastructure confirms that

Bolderaja OSB/3 ECO

meets the provisions regarding product documentation given in Norwegian building regulations, with properties, fields of application and conditions as stated in this document

1. Holder of the approval

Bolderaja Ltd
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2. Manufacturer

Bolderaja Ltd, Riga, Latvia

3. Product description

Bolderaja OSB/3 ECO are oriented strand board panels made of wood strands from pine and spruce, bonded together under high temperature and pressure with moisture resistant resin adhesive.

The strands are cross oriented in three layers. The face layer strands are mainly oriented with the wood fibres parallel to the length of the panels. The core layer strands are mainly parallel to the width of the panel. The glue is PMDI (polymeric methylene diphenyl diisocyanate).

The boards are produced in accordance with class OSB/3 as specified in EN 13986 and EN 300.

Standard panel thicknesses are nominal 15 mm, 18 mm and 22 mm. The surfaces are unsanded.

Standard sizes on the Norwegian market are 2440 mm x 1220 mm with tongue and groove edges at the long sides (fig. 1), and 2440 mm x 620 mm with tongue and groove at all four sides.

Declared tolerances on dimension are as follows, measured according to EN 324-1 and EN 324-2:

Tolerance on thickness:	± 0.8 mm
Tolerance on length and width:	± 3.0 mm
Edge straightness tolerance:	1.5 mm/m
Squareness tolerance:	2.0 mm/m

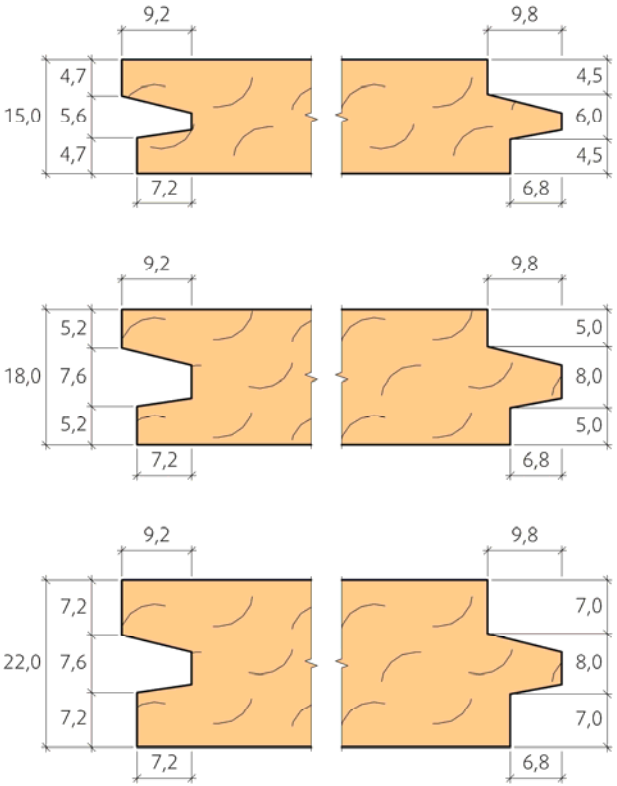

Fig. 1
Tongue and groove profiles

Mean panel density is approx. 650 kg/m³ measured according to EN 323. The density can vary from 570 to 690 kg/m³ depending on panel thickness.

The boards are delivered from the factory with a declared moisture content of 5 to 12 % weight, measured according to EN 322.

4. Fields of application

Bolderaja OSB/3 ECO may be used as subfloor on floor joists in residential and other buildings with similar floor loads, and as loadbearing roof sheathing in timber roof structures. See special conditions for application in section 6.

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5. Properties

Strength and stiffness

Table 1 shows the characteristic strength and stiffness required for OSB/3 boards manufactured according to EN 300. Structural design properties for calculating main load-bearing structures are given in EN 12369-1.

Table 1
Minimum characteristic strength and stiffness for Bolderaja OSB/3 ECO *

Property	Value in N/mm^2		Test method
	Nom. board thickness, mm		
	12 and 15	18 and 22	
Bending strength			EN 310
- Parallel to board length	20	18	
- Parallel to board width	10	9	
E-modulus in bending			
- Parallel to board length	3500	3500	
- Parallel to board width	1400	1400	
Internal bond	0,32	0,30	EN 319

* The values represent the 5 % fractile as specified in EN 300

Properties related to fire

Reaction to fire classification according to EN 13501-1 is D-s2, d0, and D_{FL}-s1 as flooring.

Design charring rate β_0 for calculating fire resistance according to NS-EN 1995-1-2 is 0,9 mm/min. for 15 mm boards, 0,8 mm/min. for 18 mm and 0,7 mm/min for 22 mm boards.

Properties related to moisture

- Moisture movement in the plane of the panels when the moisture content change from equilibrium at 35 % RH to equilibrium at 85 % RH is considered to be 3 mm/m determined according to EN 318
- The water vapour resistance coefficient is $\mu = 50$ for dry conditions and $\mu = 30$ for wet conditions according to EN 13986. This is equivalent to $s_d = 0{,}60$ m and $s_d = 0{,}36$ m for 12 mm thick boards (equivalent air thickness value)
- Thickness swelling after 24 hours water immersion is ≤ 15 % measured in accordance with EN 317
- The resin used in the boards is moisture resistant, which allows the boards to be exposed to water for a limited time during the construction period. In permanent conditions the boards must not be exposed to a climate with more than 85 % RH except for a few weeks per year
- The boards are not specially treated against growth of mould or fungi

Thermal insulation

Design thermal conductivity is $\lambda_d = 0{,}13$ W/(mK) according to EN 13986.

6. Environmental aspects

Substances hazardous to health and environment

The product contains no hazardous substances with priority in quantities that pose any increased risk for human health and environment. Chemicals with priority include CMR, PBT or vPvB substances.

Effect on indoor environment

The product is not regarded as emitting any particles, gases or radiation that have a perceptible impact on the indoor climate, or to have any significant impact on health.

Waste treatment/recycling

The product shall be sorted as wood material, not creosote impregnated, on the building/demolition site. The product shall be delivered to an authorized waste treatment plant for energy recovery.

Environmental declaration

No environmental declaration according to ISO 21930 has been worked out for Bolderaja OSB/3 ECO.

7. Special conditions for use and installation

Floor sheathing

18 mm and 22 mm Bolderaja OSB/3 ECO may be used as subfloor on floor joists spaced maximum c/c 600 mm, provided that the imposed load is maximum category B according to NS-EN 1991-1-1:2002+NA:2008, i.e. maximum 3,0 kN/m^2 uniformly distributed load and 2,0 kN concentrated load.

The use of 18 mm boards on c/c 600 mm joist spacing requires a stiff flooring material like parquet, timber flooring or laminates. 22 mm boards may be used under thin flooring materials like vinyl or linoleum.

The boards shall be installed with the long side perpendicular to the floor joists, and the tongue and groove joints glued with an adhesive designed for subfloor installation.

End joints shall be staggered, and always be continuously supported by joists.

Bolderaja OSB/3 ECO may be applied in platform constructions where the boards are exposed to direct precipitation for a limited period. The use and installation of Bolderaja OSB/3 ECO, including fastening by nails or screws, shall otherwise be in conformity with the recommendations in SINTEF Building Research Design Sheet no. 522.861 and 541.102.

Roof sheathing

Bolderaja OSB/3 ECO may be used as loadbearing roof sheathing with maximum spans as shown in Table 2. The table is valid for all roof slopes and for roofs with snow stoppers. intended to hold any snowfall on the roof in position.

The boards shall be installed with the long sides perpendicular to the rafters, and with staggered and supported end joints.

The boards shall always be covered by a watertight roofing membrane, also when discontinuous roofing is applied, and have a ventilated space underneath the boards.

Table 2
Minimum board thickness for Bolderaja OSB/3 ECO loadbearing roof sheathing

Span (rafter spacing) mm	Snow load * kN/m²	Minimum board thickness mm
Roof covered with ordinary roofing (membrane shingles etc.)		
600	$s_k \leq 6.0$	15
	$6.0 < s_k \leq 7.0$	18
	$7.0 < s_k \leq 9.0$	22
900	$s_k \leq 3.5$	15
	$3.5 < s_k \leq 4.5$	18
	$4.5 < s_k \leq 6.0$	22
1200	$s_k \leq 2.5$	18
	$2.5 < s_k \leq 3.5$	22
Roof covered with turf roofing		
600	$s_k \leq 2.5$	15
	$2.0 < s_k \leq 4.5$	18
	$4.5 < s_k \leq 6.0$	22

* Characteristic snow load on ground, s_k, according to NS-EN 1991-1-3:2003+NA:2008 (based upon the fundamental value for the municipality, with possible addition for height above the municipality centre)

Bolderaja OSB/3 ECO shall otherwise be used and installed in conformity with the recommendations in SINTEF Building Research Design Sheet no. 525.861.

8. Factory production control

Bolderaja OSB/3 ECO is subject to supervisory factory production control by Fraunhofer Institut for wood research (WKI) according to contract between SINTEF Building and Infrastructure and Bolderaja Ltd. concerning SINTEF Technical Approval.

Bolderaja Ltd. has a quality management system that is certified according to ISO 9001:2008 by Bureau Veritas, certificate DNKFRC91517A.

9. Basis for the approval

The approval is based on the material properties verified according the requirements for OSB boards type OSB/3 in EN 300 and EN 13986, plus type testing as floor and roof sheathing according to EN 12871 as verified in the following reports:

- Danish Technology Institute. Report no. 312210 dated May 2009 (EN 12871 and EN 13986)
- Fraunhofer-Institut für Holzforschung WKI Test Report No. QA-2012-0567 dated 2012-03-14
- Fraunhofer-Institut für Holzforschung WKI Test Report No. QA-2010-0770 dated 2010-03-17
- Fraunhofer-Institut für Holzforschung WKI Test Report No. QA-2010-0769 dated 2010-03-17
- Fraunhofer-Institut für Holzforschung WKI Test Report No. QA-2010-1353 dated 2010-05-18

Table 2 has been calculated by SINTEF Building and Infrastructure.

10. Marking

Bolderaja OSB/3 ECO shall be marked according to the provisions of EN 300 and EN 13986, incl. name of product and manufacturer, technical class, reaction to fire class, formaldehyde class and a production number or date of production. SINTEF Technical Approval mark no. 20155 may also be used.

Approval mark

11. Liability

The holder/manufacturer has sole product responsibility according to existing law. Claims resulting from the use of the product cannot be brought against SINTEF beyond the provisions of Norwegian Standard NS 8402

12. Technical management

Project manager for this approval is Daniel Hallingbye, SINTEF Building and Infrastructure, dep. Building materials and structures, Trondheim

for SINTEF Building and Infrastructure

Tore H. Erichsen
Approval Manager